MAY 2018

A REVIEW OF THE REGIONAL CUMULATIVE EFFECTS ASSESSMENT

For Hydroelectric Developments on the Nelson, Burntwood, and Churchill River Systems

Manitoba CLEAN·ENVIRONMENT™ COMMISSION

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May 28, 2018

Honourable Rochelle Squires
Minister of Sustainable Development
Room 344, Legislative Building
450 Broadway
Winnipeg, Manitoba R3C 0V8

Re: Regional Cumulative Effects Assessment

Dear Minister Squires,

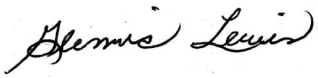
The panel is pleased to submit the Clean Environment Commission's report on the public outreach and review of the Regional Cumulative Effects Assessment conducted by Manitoba and Manitoba Hydro for the Nelson, Burntwood, and Churchill river systems.

Sincerely,

Serge Scrafield, Chairperson

Neil Harden

Terry Johnson



Glennis Lewis

Tim Sopuck

Manitoba

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Executive Summary

In 2015, the Manitoba Clean Environment Commission was mandated to conduct outreach activities regarding the Regional Cumulative Effects Assessment (RCEA) conducted by the Manitoba government and Manitoba Hydro for the Nelson, Burntwood, and Churchill river systems. The commission was also mandated to review the final Phase I and Phase II reports on the RCEA.

The commission invited communities located in or affected by development in the Nelson, Burntwood, and Churchill river systems to make submissions, and it met with community representatives on request. The commission also undertook its own review of the RCEA.

The community submissions identified a number of recurrent themes.

These included:

- concerns over the RCEA mandate, particularly the instruction that the RCEA be retrospective in nature and be based on a review and synthesis of past and ongoing studies and monitoring programs
- concerns about the RCEA report, especially concerns that the level of the impact on the environment and communities and the traditional way of life of their members has been underestimated, and concerns about the lack of community involvement in the RCEA process, the limited use of Aboriginal

Traditional Knowledge, and the limited incorporation of Indigenous worldviews in the RCEA reports

- critiques of the commission review process, including concerns over composition of the panel and the level of funding

The commission review concluded that the Phase I and II reports compiled a very significant amount of historical information, provided an extensive overview of current conditions, and identified gaps that set an agenda for future study. The separate Integrated Summary Report took the analysis a step further, providing an overview of how the major categories of impacts are linked.

After hearing from the communities and other participants, the commission also concluded that the RCEA departed from best practice in some important ways. Specifically:

- It did not carry out a community engagement process at the outset.
- Its mandate was limited to a retrospective analysis.
- Its selected spatial scoping for certain environmental components tended to minimize impacts.

The analysis, as the RCEA noted, was hampered by the:

- lack of baseline data
- mandate instruction to rely on existing research
- lack of scientific thresholds
- limited consideration of socio-economic impacts on communities

A number of these items might have been addressed by greater use of Aboriginal Traditional Knowledge and the use of simulation models to better represent the effects of development on the flow regime. The RCEA did not sufficiently assess the effectiveness of current mitigation measures or propose new ones, make findings as to the significance of effects, or assess the effectiveness of current monitoring programs or propose new programs.

The RCEA did make a commitment to publishing a Next Steps document that takes into account the community submissions and the commission's review of the RCEA. The commission identified that community engagement and a more comprehensive monitoring program should be made central elements of any next-steps process. The commission reiterated the need for the development of more detailed policies and practices and for the adoption of a strategic orientation for cumulative environmental impact assessment in Manitoba. It also proposed that the RCEA serve as a basis for future systemic monitoring, research, analysis, and planning activities as well as continued gathering of Aboriginal Traditional Knowledge.

1. Introduction

1.1 The Manitoba Clean Environment Commission's Mandate and Terms of Reference

In August 2015, in accordance with section 6(5.1) of The Environment Act, the Manitoba Minister of Conservation and Water Stewardship (now Sustainable Development) requested that the Manitoba Clean Environment Commission (CEC) conduct outreach activities regarding the Regional Cumulative Effects Assessment conducted by the Manitoba government and Manitoba Hydro for the Nelson, Burntwood, and Churchill river systems.

The Minister of Sustainable Development amended the terms of reference of the review on March 2, 2017 (Appendix 1). The terms of reference instructed the commission:

- To review the final Phase I and Phase II reports on the regional cumulative effects assessment;
- To carry out a Participant Program with limited funding available;
- To invite all affected First Nations, and communities identified in the assessment study area and the Manitoba Metis Federation to provide written input on the

regional cumulative effects assessment and its accuracy in presenting past effects and community perspectives and concerns, and to provide any additional information relevant to the assessment;

- To facilitate a web-based review of the final Phase II report for interested parties outside the Region of Interest;
- To write back to the communities who have already responded to the CEC inviting them to once again provide written comments, and offering a small amount of funding to facilitate their participation. If a community really expresses a desire to meet in person with the CEC, it could be accommodated; and
- To prepare and file a separate report with the Minister of Sustainable Development summarizing what was received from participants during the course of the public outreach program, including any comments received through the web-based review. The report should be filed within four months from the date of completion of the review.

The regional cumulative effects assessment that the commission was requested to review had been conducted in response to Recommendation 13.2 in the commission's 2013 report on the Bipole III Transmission Project. The recommendation proposed that:

> Manitoba Hydro, in cooperation with the Manitoba Government, conduct a Regional Cumulative Effects Assessment for all Manitoba Hydro projects and associated infrastructure in the Nelson River sub-watershed; and that this be undertaken prior to the licensing of any additional projects in the Nelson River sub-watershed after the Bipole III Project.

The terms of reference to the commission observed that the Phase II RCEA report "is deemed to have met the commission's recommendation."

1.2 The Manitoba Clean Environment Commission

The Manitoba Clean Environment Commission is an arm's-length provincial agency established under The Environment Act of Manitoba. The commission encourages and facilitates public involvement in environmental matters and offers advice and recommendations to the minister responsible for The Environment Act with respect to environmental issues, project approvals, and environmental licences.

Its mandate is exercised through public hearings, investigations, and mediation. The commission consists of a full-time chairperson and part-time commissioners appointed by Order-in-Council. The panel members who carried out this review were Neil Harden, Terry Johnson, Glennis Lewis, Serge Scrafield (who also served as chair of the panel), and Tim Sopuck.

1.3 The Regional Cumulative Effects Assessment Mandate and Terms of Reference

In May 2014, Manitoba Hydro and the Manitoba government established the terms of reference for a Regional Cumulative Effects Analysis (RCEA) that would be intended to meet the commission's 2013 recommendation calling for a regional cumulative effects assessment for all Manitoba Hydro projects and associated infrastructure in the Nelson River sub-watershed (Appendix 2). These terms of reference expanded the scope of the analysis to include the Churchill River Diversion and Lake Winnipeg Regulation. As a result, the terms of reference include not only the Nelson, but the Churchill, Rat, and Burntwood river systems. For the purpose of these reports, the area under review is described as the region of interest (ROI). The terms of reference also stated that the assessment was to be retrospective in nature.

The cumulative effects assessment to be undertaken was expected to:

- identify, describe, and acknowledge the cumulative effects of past Hydro developments
- describe the current state of the environment in areas affected by Manitoba Hydro's system
- describe a process for continued monitoring of and reporting on the state of the environment into the future

In conducting this assessment, the RCEA team was mandated to review and synthesize past studies, ongoing studies, and monitoring programs, and, to the extent possible, include technical science and Aboriginal Traditional Knowledge.

2. Regional cumulative effects and cumulative effects assessment

2.1 Cumulative effects and cumulative effects assessment

Environmental impact assessments are intended to contribute to sustainable development: that is, development that meets the needs of the present without compromising the ability of future generations to meet their own needs (World Commission on Environment and Development 1987). Environmental impact assessments consider the impacts of an individual project or activity but, in order to be done well, they must also include an assessment of cumulative effects. Cumulative effects are changes in the environment caused by multiple interactions among human activities and natural processes that accumulate across time and space. Cumulative effects assessment (CEA) is a systematic process of identifying, analyzing, and evaluating cumulative effects (Noble 2015).

Environmental impact assessment (EIA) has been practised in Canada for over 40 years. While CEA is a component of this process that is less developed than other parts of the process, a body of knowledge has accumulated for best practices for conducting project-based CEA. This can be found in government documents (Canadian Council of Ministers of the Environment 2014; Cumulative Effects Assessment

Working Group and AXYS Environmental Consulting 1999; Canadian Environmental Assessment Agency 2014), and academic texts (Noble 2015; Therivel and Wood 2018).

The legal requirements for CEA vary from jurisdiction to jurisdiction in Canada. On the federal level, The Canadian Environmental Assessment Act 2012 requires that the assessment of a designated project must include "any cumulative environmental effects that are likely to result from the designated project in combination with other physical activities that have been or will be carried out" (section 19[(1)(a)]). While Manitoba does not have any legal requirements for cumulative effects assessments, such assessments have been included in project proposals reviewed by the commission (for example, the Wuskwatim Generation and Transmission Projects, the Manitoba Floodway Expansion, the Bipole III Transmission Project, the Keeyask Generation Project, and the Minnesota-Manitoba Transmission Project).

2.2 Regional cumulative effects assessment

A Regional Cumulative Effects Assessment (RCEA) is an assessment of the cumulative effects of all projects and activities within a region. The boundaries for RCEAs are often based on ecologically significant entities, such as watersheds or ecoregions. An RCEA is more than just an expansion of the boundaries of a CEA for a specific project or activity. It should be viewed as being a tier above project- or activity-specific CEAs and being rooted in a strategic approach (legislation, policies, land-use planning processes) to meet the goals of sustainable development.

The fact that an RCEA has been carried out for a region does not eliminate the need for project- or activity-level CEAs. Cumulative disturbances due to individual projects or activities remain important and should not "fall out" as the focus shifts to broader landscape-scale disturbances (Noble 2015; Therivel and Ross 2007). An RCEA, however, may offer benefits to proponents of individual projects or activities and communities in providing more effective, streamlined processes for CEA (Canada, Expert Panel Review of Environmental Assessment Processes 2017).

2.3 Frameworks for cumulative effects assessment

Cumulative effects assessments are generally conducted on the basis of frameworks developed for environmental effects assessment. Specific terms and components vary from one framework to another, but they commonly identify a number of steps that involve:

- a scoping exercise
- an analysis of impacts
- the managing and monitoring of effects

In the scoping exercise, decisions are made as to what will be analyzed, the spatial area that will be considered, the temporal boundary of the analysis, and the examination of other activities in the region. A common first step in the scoping process is the selection of valued ecosystem components (VECs). These are environmental features that have been identified as being of value to the public in general or to specific sectors such as government, the proponent, or Indigenous peoples. They can be selected not only for ecological reasons, but for value that people place on them: for example, social, economic, ethical, cultural, or aesthetic reasons. They can be specific components of the environment or broad concepts. Input from the public in general, experts, traditional resources users, and local communities should be considered in the selection of VECs. It is recommended that rationales for selecting (or not selecting) specific VECs be provided.

An RCEA evaluates impacts upon the VECs within a specific geographic area and time period. Spatial scoping and temporal scoping set the geographic and temporal limits for the analysis.

Spatial scoping identifies not only the spatial scope for the entire analysis, but also the spatial scale to be employed for analyzing specific VECs and effects. Key decisions to be made involve selecting an appropriate scale (one that does not underestimate or overestimate impacts), considering the project's zone of influence, the pathways that its effects might follow, the influence of other activities, and the availability and quality of data. Different boundaries are required for the analysis of different effects.

Temporal scoping requires a consideration of how far forward and how far back in time the assessment should extend. This will depend upon the amount of information desired, the amount of information available, and what the assessment is trying to accomplish. Some guidelines recommend that temporal boundaries should ideally extend back in time to a point prior to the effects of most major actions in the region and forward in time ideally to a point where pre-action conditions have re-established themselves.

Debate exists over what sort of future actions should be considered. Some recommendations suggest that only those actions that are certain and reasonably foreseeable be considered, while others propose a less restrictive approach with consideration being given to more hypothetical scenarios.

In the analysis, the incremental effects of the project on the VECs are assessed along with the total effect of the project combined with other actions. These effects are then compared to existing policies and thresholds. One commonly used tool for carrying out this analysis is a source-pathway-receptor model (commonly referred to as a pathways-of-effects model).

There is a need for both retrospective and prospective analysis. Retrospective analysis looks back in time and identifies the drivers of change in the region, characterizes VEC or indicator response over space and time, and identifies (where and when appropriate) thresholds, management targets, or maximum allowable limits of change. Retrospective analysis should ensure that the cumulative effects of past projects are not treated as part of the current baseline condition.

Prospective analysis looks to the future and focuses on predicting and evaluating how VECs or their indicators might respond to additional stress caused by the project and other actions in the regional environment. In this process, scientific data can be supplemented with knowledge from other areas with comparable conditions, and community knowledge. Aboriginal Traditional Knowledge can inform prospective analysis as it does with all aspects of the CEA process.

Management involves identifying measures that are designed to avoid adverse effects and mitigate unavoidable adverse effects, determining the significance of residual effects after mitigation has been applied, and developing follow-up and monitoring programs. A determination of the significance of the adverse environmental effects is made that includes the impact of the project, other physical activities, and proposed mitigation measures. The development of follow-up and monitoring programs to verify the accuracy of the assessment of effects and the effectiveness of the mitigation measures is the final step in the management process. It is usually achieved through monitoring and environmental management (Canadian Environmental Assessment Agency 2014; Cumulative Effects Assessment Working Group and AXYS Environmental Consulting 1999; Noble 2015; Senécal et al., n.d.; Sinclair et al. 2017).

2.4 Regional Strategic Environmental Assessments

The concept of regional environmental assessment, particularly with a strategic thrust, has been under development in Canada for the past decade. Various terms and definitions have developed as the

field has evolved. In 2009, the Canadian Council of Ministers of the Environment (CCME) proposed the adoption of a regional strategic environmental assessment approach (Canadian Council of Ministers of the Environment 2009). This is "a process designed to systematically assess the potential environmental effects, including cumulative effects, of alternative strategic initiatives, policies, plans, or programs for a particular region." A regional strategic environmental assessment's "emphasis is on ensuring the sustainability of a region and a desired level of environmental quality both biophysical and socioeconomic, rather than solely on impact mitigation. Regional strategic environmental assessment allows for an early, overall analysis of the relationship between alternate futures for a region and the potential cumulative effects that may emerge from those futures" (Canadian Council of Ministers of the Environment 2009, 7).

As noted by the CCME, this can lead to:

- Integration of broader sustainability considerations in regional policies, plans and programs and long-term perspectives in decision-making.
- Capturing cumulative effects at the appropriate scale and tier as well as capturing potential cumulative effects of projects whether they will be subject to environmental assessment or not.
- Encouraging discussion of alternate sustainable futures and environmental goals for the region.
- Facilitating the establishment and maintenance of a regional environmental database and regional scale monitoring.
- Facilitating the address of potential environmental impacts early, thus saving time and resources on mitigation and potentially avoiding contributions to cumulative effects.
- Facilitating the establishment of regional based metrics to measure effects.
- Providing an indication of public interest in regional environmental issues. (Canadian Council of Ministers of the Environment 2009, 11)

3. The CEC and cumulative effects assessment

In previous reports, the commission has raised concerns about the need for both a regional cumulative effects assessment of hydroelectric development in northern Manitoba and improvements and clarification of environmental assessment standards in general. These issues were raised in five reports: the Wuskwatim Generation and Transmission Projects Report (2004), the Red River Floodway Expansion Report (2005), the Bipole III Transmission Project Report (2013), the Keeyask Generation Project Report (2014), and the Lake Winnipeg Regulation Report (2015). (For specific recommendations, see Appendix 3.)

In these reports and recommendations, the commission:

- identified the need for the province to develop an overall framework for environmental assessment
- recommended that any cumulative effects assessments undertaken in Manitoba exceed the Canadian Environmental Assessment Guidelines and incorporate best practices

In its report on Bipole III, the commission provided the following rationale for recommending that a regional cumulative effects assessment be carried out in the Nelson River sub-watershed.

> [P]ast hydro-electric developments in northern Manitoba have had a profound impact on communities in the area of these projects, as well as on the environment upstream and downstream. Bipole III and projects proposed for the near future will add to these impacts. As the Commission heard from the affected communities, the cumulative effects of these projects need to be considered as a whole. The Bipole III cumulative effects assessment did not take into account and was not required to take into account the breadth of all these projects.
>
> However, in order to fully understand the impact of proposed future projects, it will be necessary to understand the impact of past and current projects in addition to new impacts. A regional cumulative effects assessment is needed for all Manitoba Hydro projects and associated infrastructure in the Nelson River sub-watershed.

The commission also set out the following expectations for an RCEA of northern Manitoba hydroelectric development:

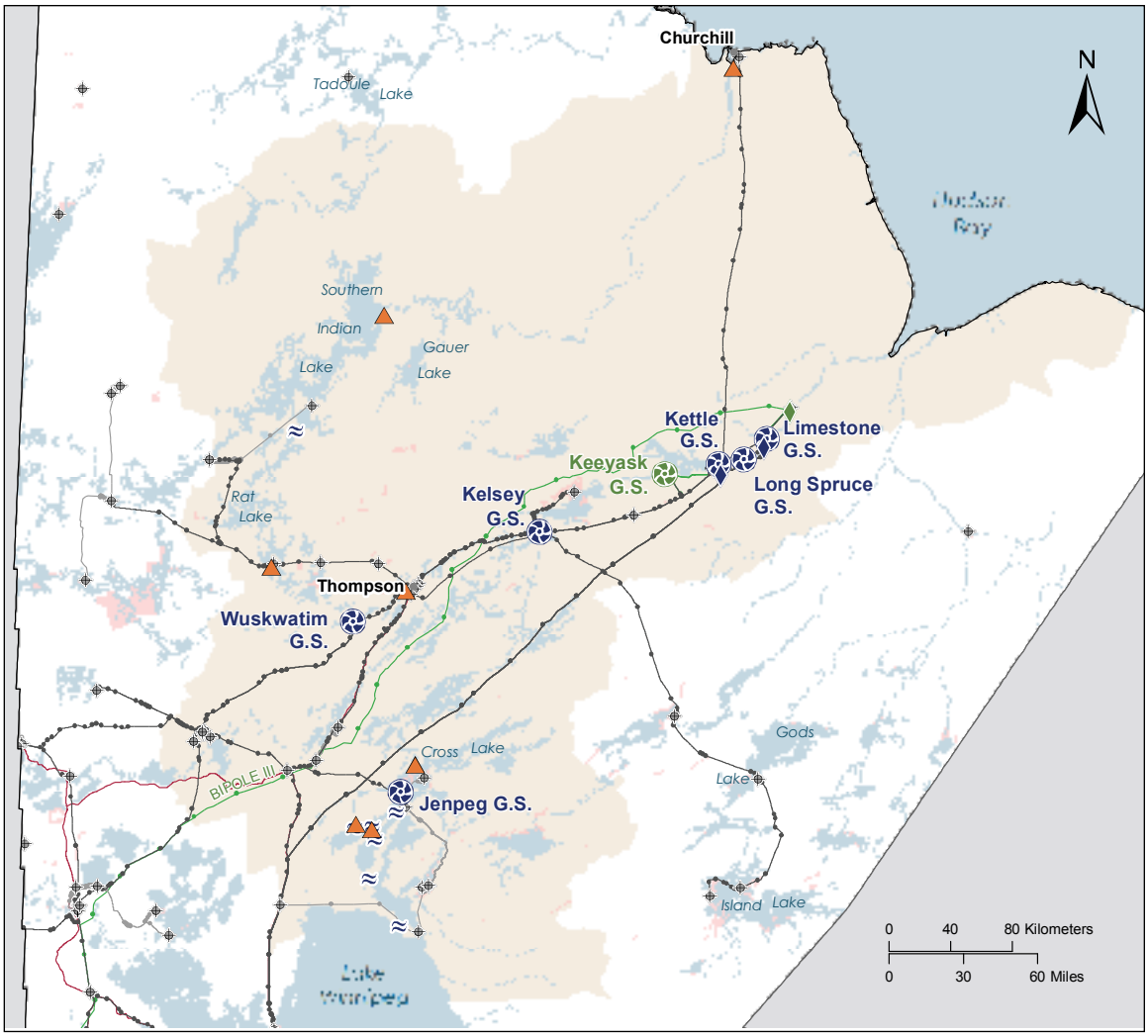
- Contemplate ways in which current mitigation measures could be applied to past impacts.
- Propose possible alterations in the structure or operation of existing projects.
- Identify measures that might offset the impacts from new projects. (Manitoba Clean Environment Commission 2013, 126)

4. Hydroelectric development in northern Manitoba

The development of the hydroelectric generating potential of the Churchill and Nelson rivers in northern Manitoba commenced in 1957 with the start of construction of the Kelsey Generating Station at the confluence of the Grass and Nelson rivers. The station was constructed to provide power for the International Nickel Company's proposed nickel mining and smelting operation in the region and the newly developed town of Thompson.

Nine years later, construction was started on a multi-phased region-wide development. Over a 20-year period, Kelsey, Kettle, Jenpeg, Long Spruce, and Limestone generating stations (along with their associated dams and dikes) were constructed on the Nelson River. The Radisson and Henday converter stations were constructed near Gillam in northern Manitoba (along with the Dorsey station near Winnipeg in southern Manitoba). (See Map 4.1 for Manitoba Hydro infrastructure in the region of interest.)

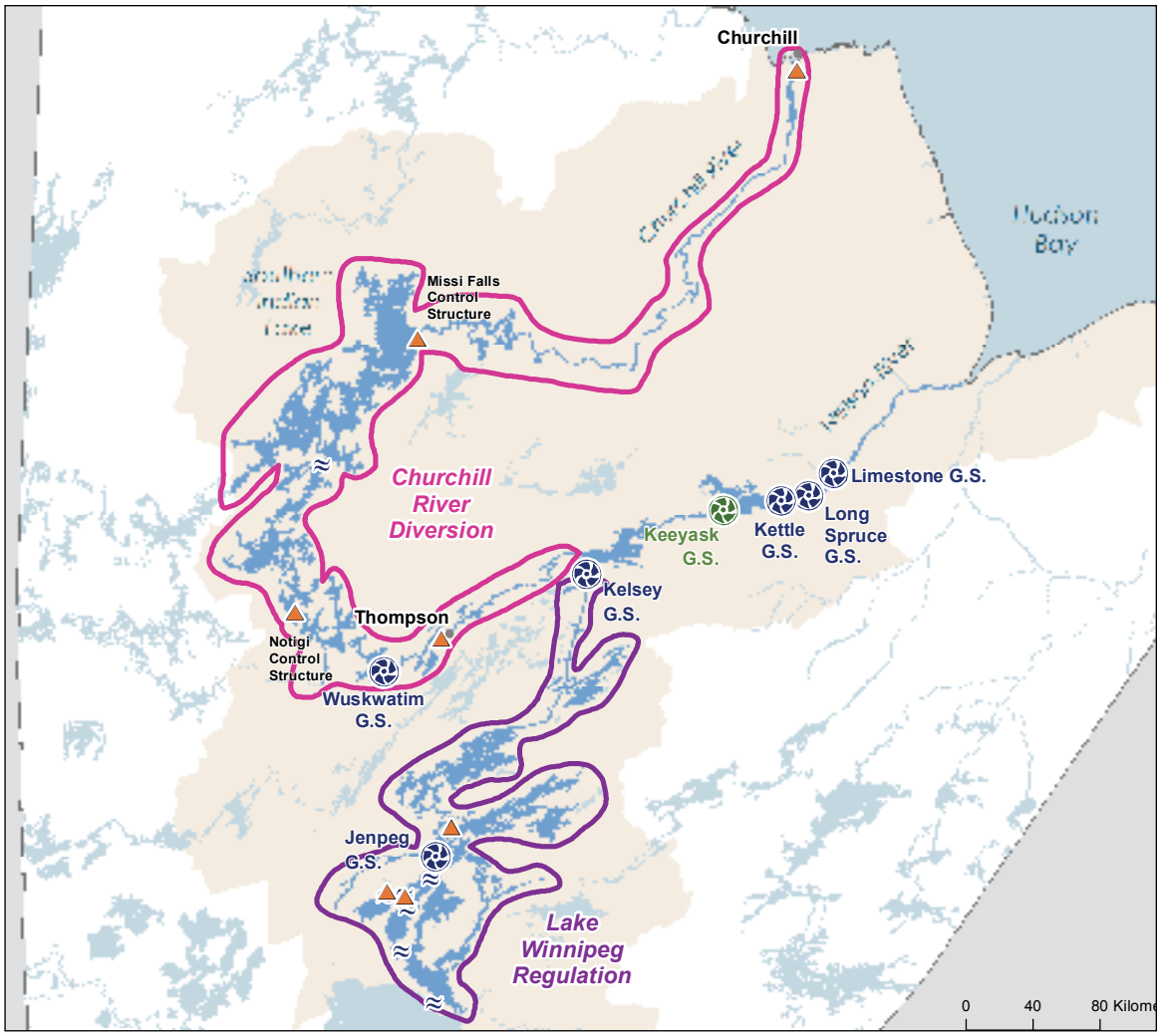
Two major infrastructure programs, involving the construction of a number



Map 4.1 Major Manitoba Hydro infrastructure in the Region of Interest.

- Generating Station
- Generation Station (under construction)
- Control Structure
- Diversion
- Converter Station
- Converter Station (under construction)
- Tranmission distribution station
- Transmission Line - 500kV-69kV
- Sub Transmisison Line 66V-25V
- Transmission Line (under construction) - 500kV
- Highway
- First Nation Reserve
- RCEA Region of Interest

of channels and control structures, were undertaken to both increase and regulate water flow down the Nelson River to facilitate the operation of the generating stations. The Churchill River Diversion (CRD) diverted much of the flow of the Churchill River down the Rat and Burntwood rivers into the Nelson River. The Lake Winnipeg Regulation (LWR) project allowed Manitoba Hydro to control the flow of water out of Lake Winnipeg. The regulated flows in these rivers is referred to as a water regime. (See Map 4.2 for Churchill River Diversion and the Lake Winnipeg Regulation hydraulic network. See Map 4.3 for Churchill River Diversion and Lake Winnipeg Regulation flow. All maps courtesy of Manitoba Hydro.)



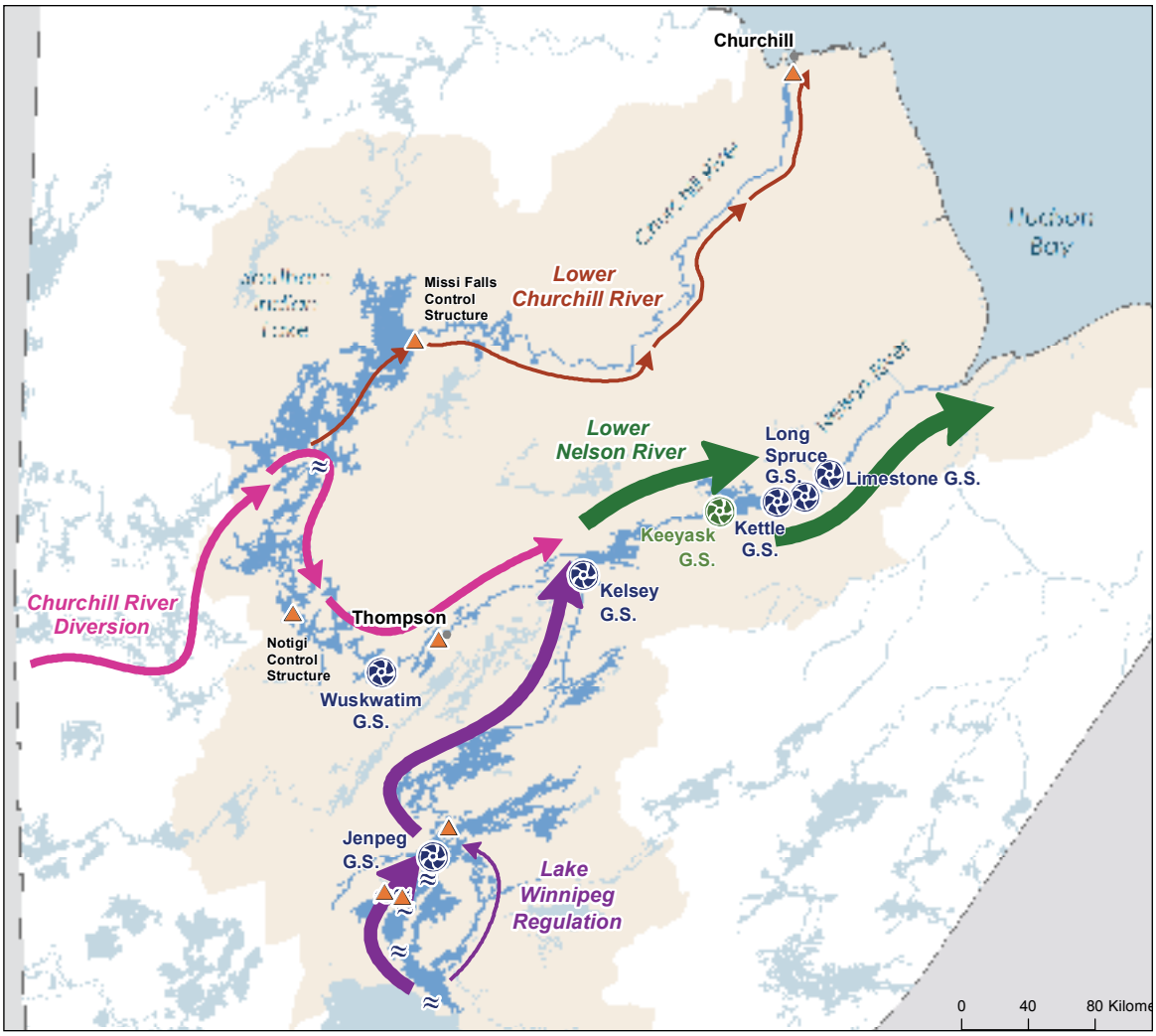
Map 4.2. Churchill River Diversion and the Lake Winnipeg Regulation hydraulic network.

- Generating Station
- Generating Station (under construction)
- Control Structure
- Diversion
- Churchill River Diversion
- Lake Winnipeg Regulation
- RCEA Region of Interest

Two direct-current, high-voltage transmission lines, Bipole I and Bipole II, were constructed to bring the power generated by these projects to southern Manitoba. (In addition, 19 shorter transmission lines were constructed in northern Manitoba between 1960 and 2012.)

In the first decade of the 21st century, several new projects were undertaken in the Nelson-Churchill watershed. Construction of the Wuskwatim Generating Station on the Burntwood River between Nelson House and Thompson commenced in 2006 and was completed in 2012. The Keeyask Generating Station at Gull Rapids on the Nelson River is currently under construction, as is a third direct-current transmission line, Bipole III.

According to Manitoba Hydro, the generating capacity of the projects completed to date in the region of interest is 4,162 megawatts (MW). (A megawatt is equivalent to one million watts.) This accounts for 73 per cent of Manitoba Hydro's total generating capacity of 5,690 MW. (For details, see table at the end of this chapter.)



Map 4.3. Churchill River Diversion and Lake Winnipeg Regulation flow.

- Generating Station
- Generating Station (Under Construction)
- Control Structure
- ≈ Diversion
- Flow[1]
- RCEA Region of Interest

1 The width of the arrow is proportional to the flow

Aside from these hydroelectric developments, there have been a number of other major undertakings in the region. Mining operations started up in some locations and ceased in others, accompanying smelting activity grew and later subsided, the city of Thompson was created, other centres alternately expanded and declined, the small railway town of Gillam was transformed into a regional service centre, and for years at a time construction camps housing up to 1,000 workers sprang into and faded out of existence.

The resulting impact on the socio-economic and biophysical environment of this region over the past half-century has been continuous and significant. Jobs have been created and regional income increased. Rivers have been rerouted, lakes and waterways flooded, and communities relocated. The seasonal and daily flows of rivers have been altered, with significant impact on the livelihoods of the region's original residents. Thousands of

transitory workers came into the region, especially during construction periods. It took considerable time to recognize and compensate Indigenous people for the impact of this development on their communities. The Northern Flood Agreement (NFA) with five First Nations in the region was signed in 1977. In the 1990s, compensation agreements were reached with other First Nations, northern communities, and resource user groups. The more recent generating stations have been developed in partnership with local First Nations.

Generating Capacity of Generating Stations in RCEA region of interest

Generating Station	Megawatts
Kelsey	286
Kettle	1,220
Jenpeg	115
Long Spruce	980
Limestone	1,350
Wuskwatim	211
Total	4,162

Source: Manitoba Hydro, Generating Stations, https://www.hydro.mb.ca/corporate/facilities/generating_stations.shtml, accessed August 30, 2017.

5. RCEA Reports

Manitoba and Manitoba Hydro have issued three separate reports in relation to the RCEA. The Phase I Report was issued in 2014; the Phase II Report, in 2015; and the Integrated Summary Report, in 2017. (The reports are posted at https://www.hydro.mb.ca/regulatory_affairs/regional_cumulative_effects_assessment.shtml. Community Profile Summaries were not initially posted. At the time of publication of this report, the Manitoba government and Manitoba Hydro were in the process of securing community approval to publish Community Profile summaries.)

5.1 Phase I Report

The Phase I report describes the geographic and temporal scope of the assessment, and the assessment methodology, and provides a summary of the available information to be used in the assessment.

5.2 Phase II Report

5.2.1 Approach and methodology

The first volume of the Phase II report contains a description of the approach and methodology used in carrying out the RCEA. The report states that "the retrospective RCEA uses and incorporates, to the extent

possible, attributes of contemporary environmental effects assessment and post-project assessment methods but has been designed to specifically meet the requirements specified in the terms of reference" (Manitoba – Manitoba Hydro 2015, 1.3-1). The Phase II report expands on information in the Phase I report and presents "information on the environmental and social changes that have taken place following the development of hydroelectric projects in the ROI [region of interest]. The report includes the collation and analyses of existing information and available data for the ROI and, in some cases, presents new analyses for data that were previously collected but not analyzed or interpreted."

The report notes that during the 60-year period in which Manitoba Hydro has undertaken development projects in the Manitoba North, the regulatory environment has evolved considerably, moving from an approach where the focus was largely on economic concerns to one that includes policy-based reviews, reviews carried out under the provisions of The Environment Act, and reviews that focus on valued environmental components. There is also far greater public involvement in the planning process, leading to the generation of far more information about a project and the environment in which the project is to be situated than was previously available.

Approvals processes were less stringent than contemporary requirements and required less in the way of pre-project data collection when Manitoba Hydro began to undertake development projects in the North. This created difficulty for the RCEA in comparing the current environment with the pre-development environment. The RCEA attempted to address this in the following ways:

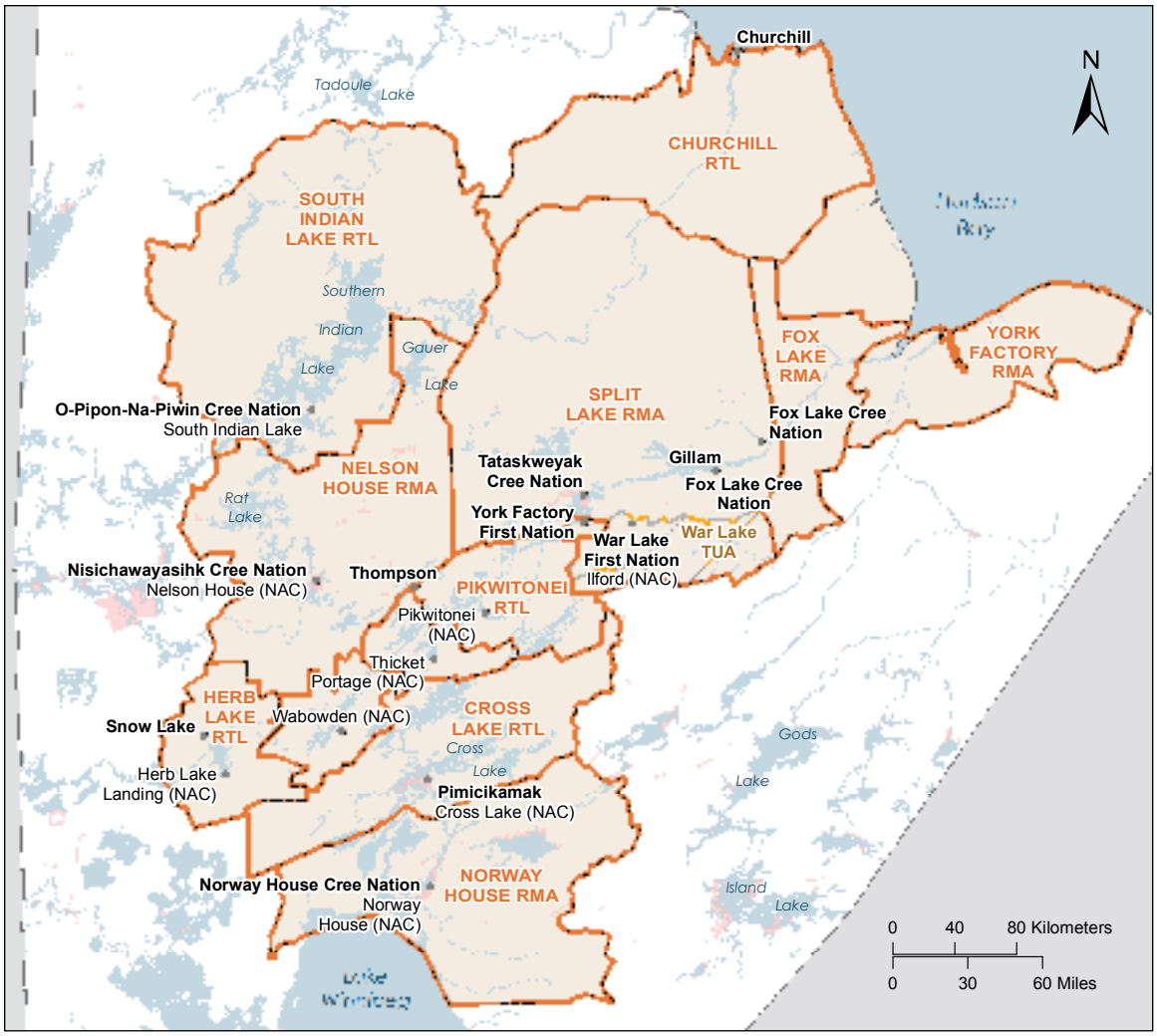
- reanalyzing data where possible
- comparing the current environment with affected and non-affected environments
- using a proxy, such as the loss of a habitat, specific to a study component to describe project effects

The report defined the region of interest (ROI) as the Nelson, Burntwood, Rat, and Churchill river systems. The area was enlarged to include "the main areas directly affected by Manitoba Hydro's northern developments associated with LWR, CRD, associated transmission projects, and other associated infrastructure" (Manitoba – Manitoba Hydro 2015, 1.3-1–2). The spatial boundaries for the People section were determined by Resource Management Areas, Registered Trapline Zones, and Traditional Use Areas. The spatial boundaries for the Physical Environment section were determined by hydraulic zones. The spatial boundaries for the Water section were determined by Resource Management Areas and Registered Trapline Zones. The spatial boundaries for the Land section were determined by terrestrial regions and terrestrial ecozones. (See maps 5.1 through 5.4. for illustrations of the spatial boundaries for People, Physical Environment, Land, and Water.)

The report stated that it dealt with non-hydroelectric projects and activities to the extent necessary to provide context and understanding. Environmental trends were also described. However, the report acknowledged that its predictions based on climate change, the presence of non-native species, or anthropogenic change were limited.

The report is intended to be "based on a review, synthesis, and analysis of the numerous environmental and socio-economic studies, post-project environmental review, environmental impact assessment for proposed developments and monitoring programs that has been conducted" over the past 50 years. In some cases, the project analyzed previously collected but unanalyzed data (Manitoba – Manitoba Hydro 2015, 1.3-9–10).

In documenting a "retrospective understanding of environmental change



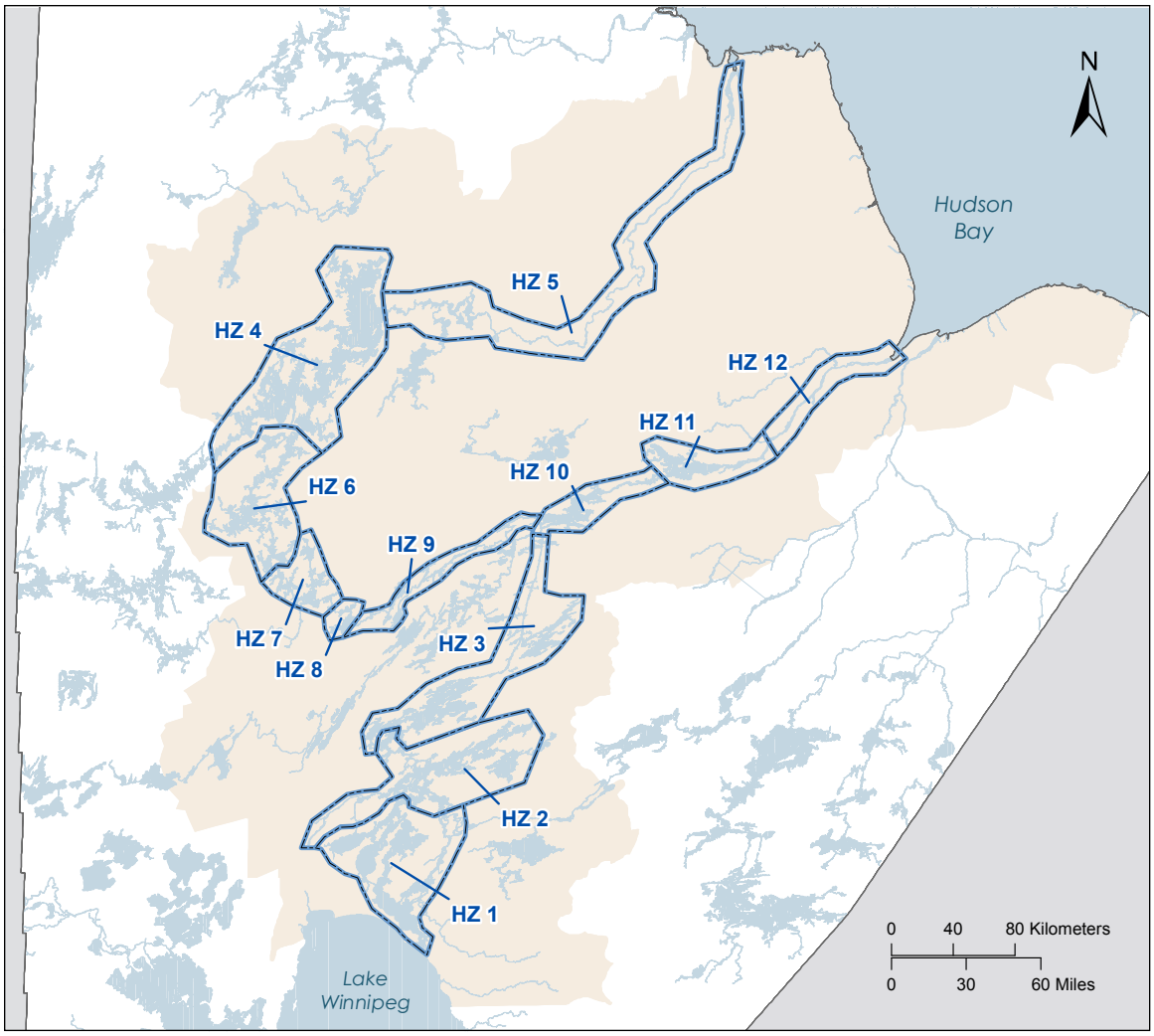
Map 5.1 People Assessment Areas.

- RCEA Community
- Resource Management Area/ Registered Trapline (RTL) Section
- Traditional Use Area (TUA)
- First Nation Reserve
- RCEA Region of Interest
- Note: NAC stands for Northern Affairs Community

in the ROI following hydroelectric development," the Phase II report includes "where possible":

- Pathways of effects diagrams to illustrate the linkages between the projects and the environment.
- An assessment to the extent possible of environmental and socio-economic effects of hydroelectric developments on the biophysical and socio-economic environments.
- A determination of the current quality of the environment in areas affected by hydroelectric developments.
- The identification of gaps in the information. (Manitoba – Manitoba Hydro 2015, 1.3-10)

The analysis of effects on water and land was to make use of what were termed regional study components (RSC) (these would be the equivalent of valued ecosystem components for the RCEA). (The RSCs are listed in Appendix 4.) The report was also



Map 5.2 Physical Environment Assessment Areas.

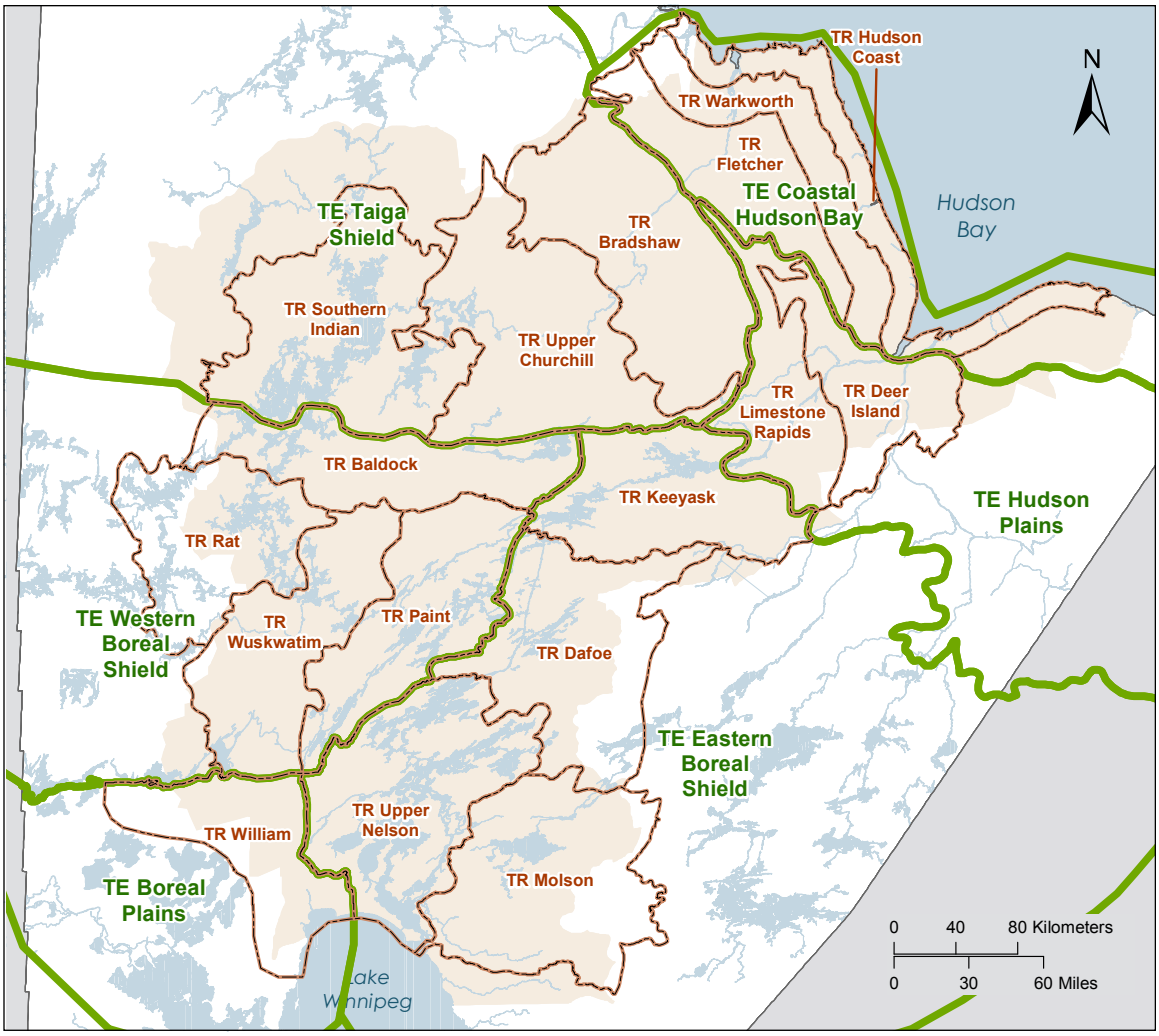
Hydaulic Zone (HZ)

RCEA Region of Interest

mandated to take available thresholds and benchmarks into consideration. The RCEA team concluded that there were "almost no established thresholds for the RSCs specific to the ROI." Benchmarks (described as "a point of reference against which things may be assessed") were developed for the RCEA (Manitoba – Manitoba Hydro 2015, 1.3-18).

The RCEA team identified the following study limitations (Manitoba – Manitoba Hydro 2015, 1.3-20):

- Past and current EA practices have changed substantially over time. The approach to EA, the types and quantity of data collected, and follow-up monitoring is substantially greater for current projects than it was in the 1960s and 1970s. This mean [sic] there is often a lack of pre-development data available, which precludes the ability to conduct quantitative, comparative assessments of post-hydroelectric development changes for some topics included in the RCEA.
- Comparisons of pre- and post-hydroelectric development data may be hindered by analytical or equipment changes that have occurred over time (e.g., changes in soil or water quality detection limits).
- Differences in the types of studies conducted can make comparisons difficult

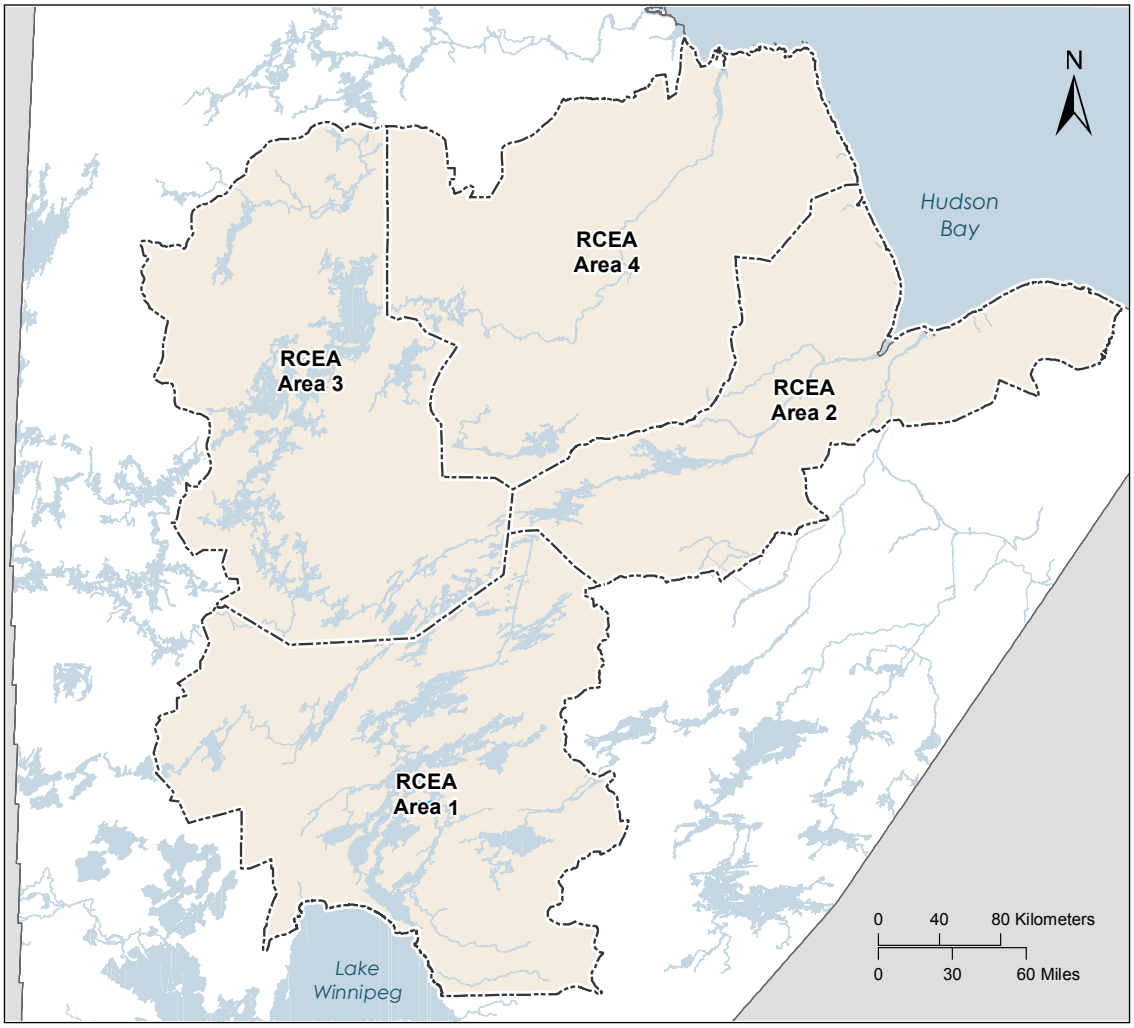


Map 5.3 Land Assessment Areas.

Terrestrial Region (TR)
Terrestrial Ecozones (TE)
RCEA Region of Interest

(e.g., resource management studies often target key fish species to monitor their abundance at specific locations over time while impact assessment studies set nets randomly to determine habitat use by the broader fish community).

- Data may be available at significantly different spatial scales, so that the information that can be derived is not comparable (e.g., among some air photos or satellite images).
- There are often insufficient data to quantify the effects on some RSCs, particularly those components that do not have a direct commercial value (e.g., information on population size and distribution of a species).
- The ability to quantify the effect of hydroelectric developments may be masked by the effects of other projects and activities (e.g., the loss of land due to clearing for hydroelectric developments in an area with large scale forestry operations).
- Some of the species included as RSCs have a broad home range and may be affected more



Map 5.4 Water Assessment Areas.
RCEA Water Assessment Area
RCEA Region of Interest

by developments outside, rather than inside, the ROI (e.g., many songbirds migrate to areas in Central and South America).

- Quantifying the effects of hydroelectric developments on species that are harvested either commercially (e.g., aquatic furbearers) or domestically or for sport (e.g., moose) is difficult as populations will reflect the level of harvest which is often linked to economics (e.g., fur prices) or resource management decisions (e.g., changes in harvest quotas).
- Depending on the data sources, while it may be possible to quantify the cumulative effects of all developments over the period on an RSC, it may or may not be possible to separate out the proportion of those effects resulting specifically from hydroelectric development (e.g., in the change in a population of animals).

5.2.2 Phase II report components

The report was divided into six parts:

Part I: Introduction and Approach.

Part II: History of Hydroelectric Development in the region of interest.

Part III: People. This part describes socio-economic impacts by type of

development, on both the general and community levels.

Part IV: Physical Environment. This part describes key changes to the physical environment, water regime, ice regime, erosion, sedimentation, area flooded, and terrestrial landscape. There is also a description of Manitoba Hydro operations that include plant cycling and mapping of all areas flooded by hydroelectric development.

Part V: Water. This part describes quantitative and qualitative change over time to the aquatic environment. It is based on the analysis of a series of regional study components.

Part VI: Land. This part describes quantitative and qualitative change over time to the terrestrial environment. It is based on the analysis of a series of regional study components.

5.3 The Integrated Summary Report

A third report, the Integrated Summary Report, was published by Manitoba Hydro and Manitoba in 2017, although it is undated (Manitoba – Manitoba Hydro, n.d.). It is organized in a different manner, with all of the issues that the previous reports treated under three headings—Physical Environment, Water, and Land—grouped under the heading Physical and Biological Effects of Hydroelectric Development. Using this change in structure, the summary follows the pathways of effects forward from each of the main Manitoba Hydro control structures.

The panel comments on the RCEA reports are contained in Section 7 of this document.

5.4 Next Steps

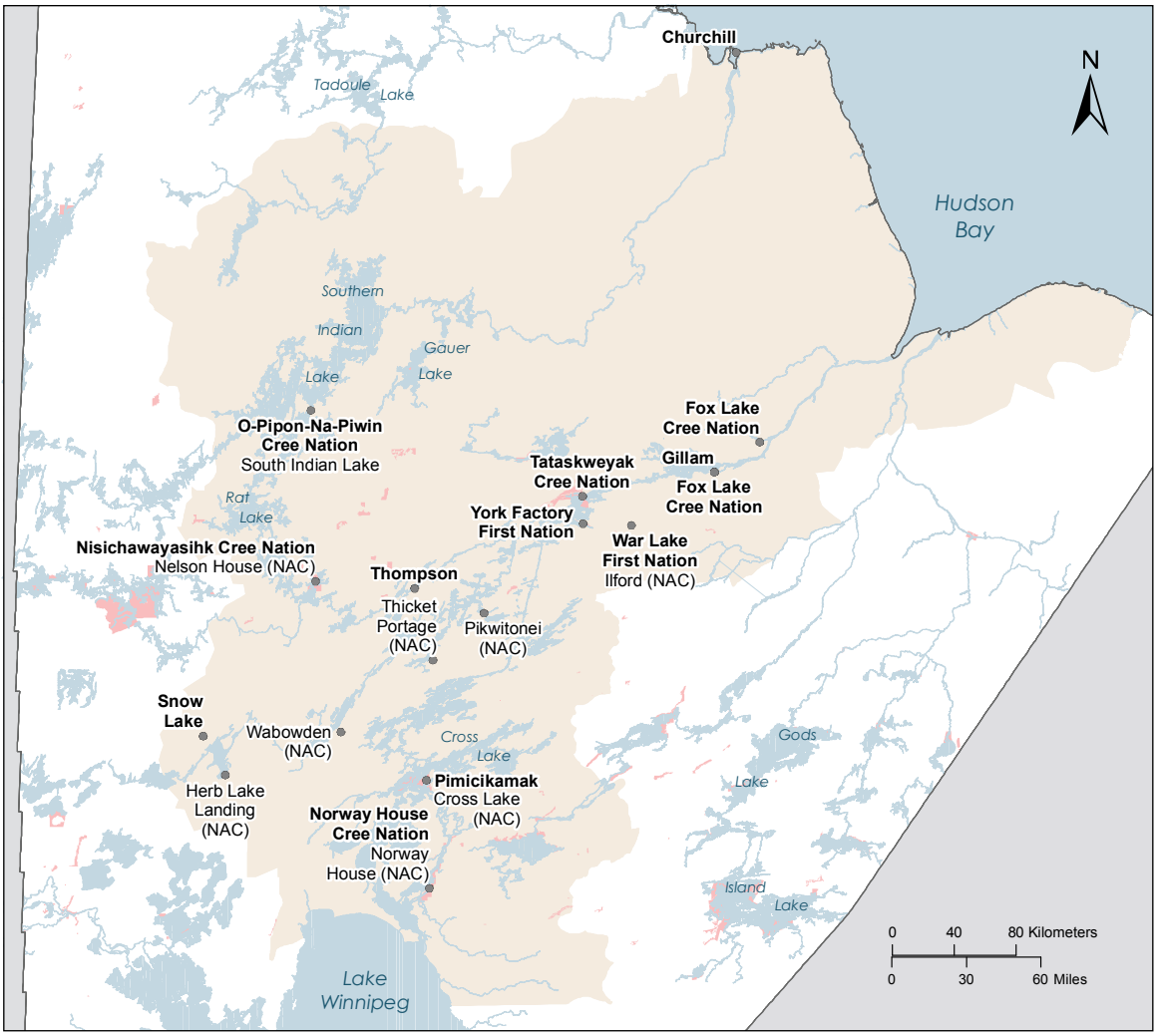
The Phase II report indicated that a final RCEA document, entitled Next Steps, will be published following the completion of the Manitoba Clean Environment Commission review.

6. First Nations and community submissions

In accordance with its terms of reference, the commission invited First Nations, communities, and resource user groups in the assessment study area, and the Manitoba Metis Federation to provide written submissions. Through its Participant Assistance Program, just over $250,000 was provided to 12 parties to facilitate their participation. The commission also solicited submissions from the general public on its website. The commission panel travelled to northern Manitoba on two occasions and met with members of O-Pipon-Na-Piwin Cree Nation, Tataskweyak Cree Nation, and York Factory First Nation. In addition, it held separate meetings with Fox Lake Cree Nation members and the Consumers Association of Canada – Manitoba in Winnipeg. (See Map 6.1 for communities in the RCEA region of interest.) In addition to these meetings, Manitoba Hydro and the Manitoba government provided two presentations to the commission: one on the RCEA and one on the Co-ordinated Aquatic Monitoring Program.

6.1 Recurrent themes

There was no single issue that was raised by every submission. There were, however, a number of issues and comments that were raised in a variety of ways on more than one occasion. They can be divided



Map 6.1 Communities in the RCEA Region of Interest.

- RCEA Commnity
- First Nation Reserve
- RCEA Region of Interest

Note: NAC stands for Northern Affairs Community

into comments about the RCEA terms of reference, comments regarding the RCEA itself, and comments about the commission review process.

6.1.1 The RCEA Terms of Reference

The RCEA terms of reference were criticized for the instruction that the assessment:

- be retrospective in nature
- be based on a review and synthesis of past and ongoing studies and monitoring programs

The decision not to examine future impacts was seen not to be in keeping with best practices. The decision to base the RCEA on past and ongoing studies placed limitations on what could be assessed.

6.1.2 The RCEA

Several submissions noted that the RCEA constituted an important contribution to analysis of the cumulative effects of northern hydroelectric development through its extensive literature review and initial analysis. However, there were four regularly recurring and interrelated concerns raised

by participants, both in their submissions and in meeting with the commission. These were:

- an underestimation of the impact of development on Indigenous communities
- the lack of engagement with First Nations, northern communities, the Manitoba Metis Federation, and the public in general in the region of interest as part of the RCEA process
- the limited use of Indigenous knowledge to estimate pre-development baselines
- the limited manner in which Indigenous worldviews were incorporated into the report

As a result of this approach, there was no public vetting of the selected RSCs. Communities that raised these issues expressed strong reservations as to the adequacy of the RCEA. A number of presentations identified these as departures from CEA best practices.

Concerns were also raised by certain aspects of the scoping of the assessment. For example, the community of Leaf Rapids stated that it should have been included in the geographic scope. The Manitoba Metis Federation stated it should have been treated as the representative of the Manitoba Metis Community, which, in turn, should have been recognized as a rights-bearing Aboriginal community. The decision not to include non-hydroelectric development in analysis was also described as not being in keeping with best practices. Two yet-to-be-completed projects, the Keeyask Generating Station and Bipole III, fall within the region of interest. Due to the retrospective nature of the review, the cumulative effects of these projects were not captured in the RCEA.

The lack of community consultation and the decision to rely on existing and ongoing research led participants to raise concerns about the types and numbers of RSCs that were selected for evaluation. A number of presenters observed that the analysis did not capture the significance of the impact of hydroelectric development on riparian and littoral zones (river and lake shores). Numerous presenters spoke of how changes in the water regime and the resulting loss of shoreline stability and increases in sedimentation and erosion have led to declines in:

- fish catches, fish quality, fish health, fish palatability, and species composition
- water quality, potability, and clarity
- natural productivity and diversity of shorelines
- access to shorelines (reducing ability to harvest berries and medicinal plants and to engage in recreational activities such as swimming and using beaches)
- physical attractiveness of the shoreline
- transportation safety (due to deadheads and reefs in open water, unpredictable ice conditions after freeze-up, and rapid changes in water levels)
- community economic sustainability
- ability to engage in and pass on knowledge of traditional lifestyles
- presence of migratory wildlife

Concerns caused by mercury levels in fish have led many people to eliminate fish from their diet. Community presenters also stressed the links between a variety of emerging physical health problems and changes to the water supply. Similarly, links were drawn between hydroelectric development and mental health problems.

A recurrent message from the presentations was that the significance of these effects was not captured in the RCEA.

The panel heard that these changes in the physical environment have an impact at the cultural, social, and economic levels. Communities that were once able to support themselves from the land are now dependent

on transfer payments. Physical health problems are on the rise, and young people, questioning whether they have a future, are victims of depression and suicide. Despite the role that traditional lands play in the generation of electricity, these communities find themselves served by inadequate water and sewer connections, often poorly housed, and paying very high electric bills.

In light of these concerns, a number of submissions concluded that the RCEA was seriously flawed. Central to any rectification of the RCEA would be consultation with communities, particularly for input in scoping; the incorporation of Aboriginal Traditional Knowledge; the development of community profiles; and assessment of the significance of effects. They proposed that the RCEA more closely conform to best practices by being both retrospective and prospective in nature, make greater use of scientific thresholds and pathways of effects, and provide more extensive analysis of the effectiveness of mitigation measures.

Given that many communities did not believe the current mitigation efforts to be effective, they called for measures that they believed should be put in place to increase personal and community safety, improve productivity, and hasten the environment's return to a state of equilibrium. These included changes in the operation of the generating system to reduce impacts.

A number of communities identified what, in their view, is a social justice gap: their communities remain impoverished and marginalized, while their traditional lands are the source of power and profits that accrue to residents of southern Manitoba. This gap, they suggested, should be addressed in a broad spirit of reconciliation in keeping with Canada's commitment to the United Nations Declaration on the Rights of Indigenous Peoples.

6.1.3 The Commission Process

Either in submissions or community meetings, concerns were raised about the following aspects of the commission's review process:

- the absence of Indigenous people on the panel
- the limited amount of funding made available through the Participant Assistance Program, particularly in light of the size of the RCEA report
- the fact that communities had the opportunity to provide input only after the RCEA was completed and accepted
- the commission's instruction to participants not to comment on the Northern Flood Agreement (or other such agreements) in their submissions
- doubts about whether the commission's report would have any impact or would simply be shelved

6.2 Community Association of South Indian Lake

The Community Association of South Indian Lake (CASIL) submission requested that the RCEA process be ended and that the RCEA report be rejected. The CASIL submission stated that the diversion of the Churchill River turned the cultural, economic, and environmental lives of community members upside down. The flooding of the lake forced them to leave their homes and their communities. Although Manitobans as a whole may have benefited from the project, the people of South Indian Lake have experienced an incalculable, continuing, and mounting loss. While numerous studies have been undertaken of the impact of the Churchill River Diversion on the community, the submission stated that, aside from studies in which the community was directly involved, the main goal of the studies has been simply to leave the impression that Manitoba Hydro

and the government actually cared about the impact of development.

The community association maintains this is not the case. It stated that in 2013, it presented scientific evidence that could have led to positive change. The government's reaction, it stated, was to walk away and stay away from the table.

CASIL stated that the RCEA did not do justice to the reality of the impact of hydro development on South Indian Lake in large measure because the report was conceived and prepared without community input. The community had applied for funding to participate in the RCEA. Since the amount approved was significantly less than the community had concluded would be required to allow for meaningful input, the community declined to accept the funding.

The submission pointed to the fact that when the team preparing the RCEA had requested the right to use certain materials from previous studies on the impact of the CRD on the community, CASIL had stipulated that the material could not be used unless the study engaged with the community in a consultation process. The community requested that if such a process was not established, its reasons for withholding permission for publishing material from past reports be contained in the RCEA. It also made the point that a Clean Environment Commission-directed public outreach program, conducted after the finalization of the RCEA, was an inadequate process for capturing and reporting community perspectives.

The submission also criticized the community meeting process, stating that CASIL was not informed of the meeting that the panel held with the O-Pipon-Na-Piwin Cree Nation in Thompson.

The submission also addressed the RCEA's treatment of the Augmented Flow Program (AFP), which allows for lake levels to be increased and decreased beyond levels established in the interim CRD Water Power Act licence. These changes in lake levels (and other relaxations in the provisions of the licence) have had a negative impact on the commercial fishery of South Indian Lake. The community association described the flow program as a violation of the licence, as opposed to a simple deviation. CASIL also stated that the effects of the flow program are not fully mitigated, as is required in the annual AFP permission letter. By ignoring the social and economic impacts of the flow program, CASIL stated, the RCEA is serving as a stepping stone towards its legitimization in a future licence.

6.3 Consumers Association of Canada – Manitoba

6.3.1 Consumer Association of Canada – Manitoba Submission

The Consumers Association of Canada – Manitoba Branch (CAC) submission critiqued the RCEA's methodology and proposed that the work be revisited from a Regional Strategic Environmental Assessment perspective. It described such an approach as an RCEA set within a strategic assessment context. Employing such a perspective in this context would provide an opportunity to debate the significance of past, present, and future impacts; address cumulative impacts on Indigenous and northern communities; and examine northern hydroelectric development within what was termed an energy portfolio approach.

The submission acknowledged that the RCEA met a number of expectations for a regional cumulative effects assessment, but its overall finding was that the RCEA fell "short of good practice." The CAC presented two overarching criticisms: the lack of any prospective analysis; and the lack of public engagement in scoping, analysis, and the determination of significance.

The submission credited the RCEA for:

- addressing both environmental and socio-economic effects
- consistently reporting changes and trends over time for the RSCs

- consistently attempting to summarize impacts to RSCs and assessing the health of RSCs (and acknowledging sources and data limitations)
- providing high-level overviews of predominant pathways of effects in the Physical Environment, Water, and Land sections of the report
- comparing pre-development conditions with conditions during development (where data are available)
- comparing on-site/on-system conditions with off-site/off-system conditions (where data are available; "on system" refers to lakes and waters that are regulated by Manitoba Hydro)
- adjusting the scope of analysis to suit the specific RSC under consideration
- using indicators, metrics, and benchmarks to assess impacts in the Land and Water sections of the report
- identifying driver and response indicators for each RSC in Physical Environment, Land, and Water sections of the report

The CAC submission identified the following as areas where improvement was needed:

- temporal scoping (The decision to limit the assessment to a retrospective analysis was described as a missed opportunity.)
- the treatment of the impacts of the Keeyask Generating Station and Bipole III (The cut-off date for the RCEA was 2013. Since these projects were not yet in operation, their effects were not assessed in what was a retrospective analysis.)
- the lack of public engagement beyond the review of existing documentation
- the limited number of RSCs that were assessed (While rationales were provided for the selections, the selection process should have been subject to independent, public vetting.)
- the limited use of environmental thresholds
- the limited discussion of the management and mitigation of environmental impacts
- the dominant focus on the assessment of additive effects as opposed to synergistic effects
- the decision not to qualify cumulative effects on any sub-region (This is a matter of significance due to the impacts on sub-regions such as the Nelson River and its estuary.)
- the exclusion of the southern portions of Bipoles I and II and all of Bipole III
- the exclusion of the issue of significance (While benchmarks are used to assess the seriousness of impacts, there are no findings in relation to the societal significance of cumulative effects throughout the region.)
- inconsistency in approach (The decision not to employ the approaches used in the Water and Land sections of the report in the Physical Environment and People sections means that the magnitude and pathways of impacts in the latter two sections are not assessed.)
- the tendency to qualify the impact of hydroelectric development in relation to other developments in the region as opposed to focusing on total impacts

Based on this critique, the CAC recommended that the following steps be taken to strengthen the RCEA:

- Issue a clear statement of purpose for the RCEA.
- Subject the RSC list to a public and independent vetting.

- Include prospective analysis (including the impacts of Keeyask and Conawapa).
- Include the entire Bipole III transmission line in the ROI and extend the analysis of the impacts of transmission lines.
- Facilitate independent scientific review of the use of thresholds in the RCEA and develop scientific environmental thresholds to assist in future assessments in northern Manitoba.
- Describe synergistic effects affecting RSCs in the region of interest and total cumulative effects on RSCs on an area-by-area basis, with a particular focus on highly stressed regions such as the Nelson River system and estuary.
- Use linkage diagrams to provide a more explicit depiction of other developments that have been taken into account in the RCEA analysis.
- Implement public engagement to assist in scoping RSCs and reinstate planned public hearing.
- Facilitate a gap analysis by providing a complete list of past and current monitoring and remediation programs and initiatives.
- Develop the People and Physical Environment sections of the report so that they include retrospective and prospective analysis of change trends and significance.

On a broader level, the CAC submission recommended that the RCEA be transformed into a forward-looking strategic document by incorporating a regional strategic environmental assessment approach. Such an assessment is meant to be strategic, oriented toward the future, and focused on cumulative effects. Such an approach could assist in the development of strategic plans for a region and facilitate multi-tiered decision making. Recommended steps were to:

- Revisit the RCEA initiative, with the goal of turning it into an objectives-led, strategic exercise.
- Use the results of such a strategic analysis to inform future hydroelectric development approvals in northern Manitoba.
- Explore the opportunity of having the RCEA region of interest designated as one of the pilot projects for regional impact assessment in Canada.

6.4 Churchill Community

6.4.1. Churchill Community Submission

The Town of Churchill, in its submission, observed that the RCEA differed from the normal structure of a cumulative effects assessment in that it was carried out after the project's completion and took a retrospective, rather than prospective, approach. As a result, the submission suggested, it was better to think of it as an accumulated impacts review. Overall, it was felt that the RCEA had identified, described, and acknowledged the impact of hydroelectric development and described the current state of the affected environment. However, the interpretation of some of the fish data failed to present a clear picture of seasonal and annual fluctuations.

The Churchill submission contained additional information, based on ongoing community research, on the impact of the Churchill Weir.

The community submission pointed out that the 83 per cent to 85 per cent reduction of the flow in the Churchill River impeded boat navigation on the river and reduced fish catches. Construction of the Churchill Weir in 1999 was intended to create a reservoir that would improve navigation and increase fish populations, but, the submission reported, the weir has not had the positive impacts that had been anticipated. A series of studies and reviews undertaken since 2014 under the direction of a committee of representatives

of the Town of Churchill and Manitoba Hydro reported that with the exception of an improved shore-based fishery in one location, boating remains difficult and fish populations low.

6.5 Leaf Rapids

6.5.1 Leaf Rapids Submission

In its submission, the Town of Leaf Rapids objected to the decision to exclude Leaf Rapids from the region of interest (ROI). This decision had been made on the basis of conclusions that Leaf Rapids was geographically located outside the ROI, and that hydroelectric development within the ROI had not had discernible effects on Leaf Rapids or negatively impacted the residents' use of the Churchill River. The Leaf Rapids submission contended that the town had been affected by hydroelectric development and that its residents' use of the river had also been negatively affected by hydroelectric development.

Leaf Rapids is upstream of South Indian Lake on the Churchill River, located between Granville Lake and Opachuanau Lake. The submission stated that the reach of the Churchill River from Leaf Rapids to the outlet of Opachuanau Lake, which is connected to the southwestern end of Southern Indian Lake, is of interest to town residents.

The submission started from the assumption that the level of Lake Opachuanau, due to its connection to Southern Indian Lake, underwent the same increase in water level as Southern Indian Lake. It also proposed that Lake Opachuanau also experienced erosion at levels similar to the northern portion of Southern Indian Lake due to the similarities of the shorelines for both areas. These changes have impacted wildlife habitat and the mobility of residents.

The submission stated that there had been large decreases in the walleye fishery on Lake Opachuanau once the Churchill River Diversion went into effect. These were attributed to flooding and the redistribution of fish populations. Declines were also noted in lake whitefish and northern pike. The RCEA stated that there was no history of a lake sturgeon population on the Churchill River from Leaf Rapids to Missi Falls, and concluded that the CRD could not have affected lake sturgeon in that reach of the river. According to the submission, local residents maintain that lake sturgeon were numerous in the Churchill River between Leaf Rapids and Lake Opachuanau prior to the CRD.

While the RCEA did not report on waterfowl on the reach of the Churchill River from Leaf Rapids to South Indian Lake, it did note that increasing water levels could negatively impact shoreline habitat used by waterfowl. In the same way, the RCEA did observe that the CRD could have negative impacts on habitat favoured by aquatic furbearers and moose. The Leaf Rapids submission noted that these impacts have been experienced at Lake Opachuanau and over the reach of the Churchill River from Leaf Rapids to the lake's outlet. Residents have reported reductions in waterfowl, furbearers (particularly aquatic furbearers), and moose.

In interviews conducted for the submission, long-time residents identified the following as post-CRD issues: increased shoreline erosion, increased debris, flooding of the town of Leaf Rapids, and the presence of difficult-to-cross slush ice.

In summary, the impact of the CRD on the habitat of fish, waterfowl, furbearers, and moose had led to a decline in harvesting, while erosion and slush ice had increased the difficulty people experience in gaining access to the land. The result had undermined a central element in people's well-being.

6.6 Makeso Sakahikan Inninuwak – Fox Lake Cree Nation

6.6.1 Makeso Sakahikan Inninuwak – Fox Lake Cree Nation Submission

The Makeso Sakahikan Inninuwak – Fox Lake Cree Nation submission on the RCEA stated that the Phase II report did not fully capture certain local cumulative effects and Cree worldview details. It sought to address this limitation with information from community meetings and community studies that drew on *aski keskentamowin* (traditional knowledge).

Among the issues that community members raised regarding the impact of hydroelectric development were: change for the worse in fish taste and colouration; reduction in water quality; the negative impact of changes in the annual, seasonal, and daily water regime; disruption in migration patterns of certain wildlife; disruption in breeding habitat; fragmentation of the river, which affects availability and movement of certain fish; reduction in community members' ability to harvest natural resources due to changes in water regime; and the loss of traditional skills.

Water studies had identified declines in water quality and potability; destruction of fish spawning areas; and an increase in difficulty in on-water travel, due to both fluctuations in water levels and limitations in access to shoreline. Declines in the sturgeon population and the fishery were attributed to the impact of hydroelectric development: the generating stations fragment the river, increased turbidity and fluctuations in water level affect fish rearing and population numbers, and debris and shifting water levels make fishing more difficult. In particular, the submission observed that the RCEA did not capture "what the true effect of high volume water fluctuations due to hydroelectric development on the lower Nelson River is on resource users from Fox Lake." These fluctuations cannot only increase danger and difficulty, they can disrupt access to land, creating situations where harvesters cannot reach game at times when game is present.

Other effects identified included a shift in resource use to areas closer to the Hudson Bay (and a potential increase in stress on the species in those areas), changes in migratory patterns, and negative impacts on locations traditionally used for hunting. The submission noted a decline in caribou populations in the region and increased hunting (including increased hunting by non-Indigenous people). There was also a concern over the number of caribou that drown as a result of weak ice conditions.

The submission also noted the RCEA did not fully address earlier developments such as the Hudson Bay line, the manner in which hydroelectric development disrupted the Nelson River as a traditional transportation route, the possibility that the granting of band status to the Fox Lake Band was delayed until hydro development was underway, and the relocation of Fox Lake Band members living in the town of Gillam during the early years of development. These disruptions have created a need to strengthen community heritage programs.

The submission called for:

- a sturgeon recovery program for the Lower Nelson River
- a role for Elders in monitoring illegal fishing
- improvements in distribution of water-level forecast information to community members
- mitigation for changes in geese flight paths
- noise-dampening measures along transmission lines
- Aboriginal Traditional Knowledge studies of the impact of development on caribou

- the moving of caribou habitat-use boundaries northward
- increased protection for brook trout
- enhanced heritage programming

The submission also noted that the level of financing it received from the public participation program (Participant Assistance Program) constrained significantly the review that the community was able to undertake of the RCEA.

6.6.2 Makeso Sakahikan Inninuwak – Fox Lake Cree Nation Meeting

At the request of the community, the commission met with members of the Makeso Sakahikan Inninuwak – Fox Lake Cree Nation in Winnipeg on January 19, 2018. In a formal presentation at the start of the meeting, a Fox Lake Cree Nation Elder observed that four generating stations, converter stations, and portions of Bipoles I, II, and III all lie along a 100-kilometre stretch of the Nelson River in Fox Lake Cree Nation territory. The Fox Lake Cree have a history with hydroelectric development that dates back over half a century. Aside from the flooding that other northern Indigenous communities experienced as a result of hydroelectric development, he said, the Fox Lake home community of Gillam was taken from them and redeveloped to Manitoba Hydro's corporate needs. Prior to the arrival of Manitoba Hydro, he said, the Fox Lake Cree Nation had been able to adapt to the various changes in the northern economy. He cited from various reports that indicated that the community had been swamped and shattered by the arrival of 4,000 workers. He—and other people who spoke at the presentation—referred to the consequential social breakdown as a Hydro-triggered atrocity.

Following this presentation, three groups of community members—Elders, adults, and youth—spoke of the impact that development had had on them and their community.

Several of the Elders described the pre-development community as being one where people felt a sense of mutual responsibility. They cared for children, built homes, harvested resources, and cooked meals together. They also supported each other in times of crisis. One woman spoke of how she used to help her father chop wood and haul it by dogsled. The Nelson River constituted a major transportation route and a source of clean water, and the land was a source of medicinal plants.

They spoke of how the transformation of Gillam, from a small rail town with a population of a few hundred people to a major Manitoba Hydro construction and service centre with a population of several thousand, was swift and dramatic. Indigenous people living in the community found themselves categorized as squatters. Their homes were destroyed to make way for trailer courts and homes of senior Hydro officials. Local game and fish were dramatically reduced by Hydro workers engaged in recreational hunting and fishing. Another Elder said that, over time, most of the trapline rights came to be held by Hydro employees.

People felt marginalized and discriminated against: they recalled being termed "dirty Indians" and "wagon burners" at school. Indigenous children felt excluded from the new amenities such as the recreation centre and subjected to harsh discipline at school. Adults and children felt helpless, ashamed, and threatened: some felt compelled to fight back.

The arrival of a largely male construction workforce led to the sexual abuse of Indigenous women: people spoke of construction workers getting them inebriated and then taking advantage of them. People spoke of witnessing rape and being unable to interfere. Some spoke of instances of institutions intended to protect people, particularly the Royal Canadian Mounted Police, brutalizing men, permitting the exploitation of women, and failing to take local complaints seriously, although

there were also instances of these complaints being addressed. Indigenous children felt themselves to be the target of racial violence and discrimination. The nature of other institutions was transformed: Indigenous people found they now constituted a small minority of church congregations, where, in the past, they had formed the core of the membership.

Hydro was not the only disruptor of cultural life. Many of the Elders spoke of having been sent to residential schools where they were punished for speaking their language, subjected to harsh discipline, and sexually abused. While the Elders retained their ability to speak Cree, the language has not been passed down to younger generations. None of the younger people present at the meeting were fluent in Cree. People also spoke of how traditional values had been lost as a result of residential schooling and development. One Elder stressed that the impact of hydro development on the community had been as significant as that of the residential schools. Another drew attention to the skirt she had worn to the meeting to signify that she was a proud Cree woman.

A feeling of inferiority was passed on from generation to generation. People grew up envying the non-Indigenous residents of the town and ashamed of their homes and poverty. Family breakdown led to children starting to drink at an early age. Some of the people spoke of years that they had lost to addictions and how they had worked to regain control over their lives. Others spoke of family members who had been lost to addictions and the legal system, or had died young: victims of suicide and accidental death.

Some of the people who spoke had worked on the Manitoba Hydro projects. They were angered by the way the people of Gillam had been treated. One man spoke of how a woman's home had been bulldozed in front of her. He also spoke of how, in order to make way for the hospital, a graveyard was relocated. When he married, this man decided to move his family to escape the racism he experienced in Gillam.

People who stayed in Gillam found their lives circumscribed by a set of new and restrictive rules: they needed permits to build houses and build open fires. It was no longer possible to walk to the edge of town and collect firewood or hunt game. Increasingly, people needed money to purchase the necessities of life. Although the newcomers made significant investment in the lands, they did not stay. Many workers remained in the North only for a few months, while most of the people who spent their working lives in the North retired to the South. People also spoke with affection of individuals who had been open and fair in their dealings with them: these included officials who listened to their version of events, parents and families who incorporated them into their lives, and contractors who objected to the bulldozing of homes.

Institutionally, the people said, they felt at a disadvantage. While they now form the Fox Lake Cree Nation and have their own land base, in the early years of development, they had no reserve. Even though they were at one of the central points of hydroelectric development, they were not included in the initial Northern Flood Agreement.

Hydro development transformed the landscape. People spoke of how, prior to development, the Nelson River was a major transport route; now it is disrupted by the presence of Hydro dams. Forested areas have been cleared to make way for construction sites and transmission lines. Access to the land became, and remained, limited as Hydro consumed ever greater portions of the landscape.

Drugs, alcohol, community violence, and suicide remain problems. Economic and educational opportunities are limited in the Cree community of Bird.

Those who continue to harvest natural resources face numerous problems: disturbances mean that they have to travel further to find game and to trap furbearing

animals. People are also worried about the potential health hazards of eating fish. The cost of living in the North remains high. People wondered why electricity was so expensive when the hydroelectric dams were in their own backyard.

Younger people also recalled growing up in a community marked by racism, division, and inequality. One spoke of seeing parents and grandparents battling with addictions. They also grew up hearing stories from their grandparents about a world that had been lost. Many of them had started a process of reclaiming that culture, and identified their colours, protectors, and traditional names. One presenter said that if she could be granted one wish, it would be to speak Cree. Another spoke of how difficult it was to challenge a Hydro perspective in a meeting. One young person spoke of how his father had worked for Manitoba Hydro and he had grown up in a family that was economically privileged compared with other Fox Lake families. He grew up grateful to Manitoba Hydro. Through his involvement as a junior band councillor, he heard, at first with disbelief, about the way that other community members had experienced hydroelectric development. While he recognized that recent agreements had led to greater Indigenous involvement in, and protection from, development, the current projects continue to generate social tensions and environmental disruption.

Younger people also spoke of the work that they were doing as a result of various agreements that the Fox Lake Cree Nation has reached with Manitoba Hydro and the Manitoba government. These have included community development work and environmental stewardship. They were proud of the work they were doing as they develop and apply Aboriginal Traditional Knowledge. But they were also saddened, since it reminded them of the impacts of development on both the land and the people. It is often the case, for example, that they can access what used to be traditional Fox Lake land only by travelling in the company of Manitoba Hydro employees. In their work, they see how treed land has been cleared and is surrounded by hydro towers. In the process, they see the permanent nature of the change that development has brought to the landscape. They also recognize that just as their generation did not experience the traditional world of life on the land, it will not experience the land's recovery. As a result of these experiences, several people said, they would oppose any future development on traditional Fox Lake land.

6.7 Manitoba Metis Federation

6.7.1 Manitoba Metis Federation Submission

The Manitoba Metis Federation (MMF) submission identified four deficiencies with the RCEA, which, it argued, led to a series of inadequacies. The submission organized these under four additional headings.

The four deficiencies were:

6.7.1.1 Methodology

These criticisms focused on two issues: the treatment of the human environment and the scoping of the assessment. It was noted that in its treatment of the human environment, the RCEA did not make use of the standard tools of environmental assessment, such as benchmarks, thresholds, or other indicators. The result was less a cumulative effects assessment than a summary of effects, mitigation, and compensation measures; current socio-economic conditions; and community profiles. The MMF noted that it is expected that there be public participation in the scoping process. In the case of the RCEA, the MMF was not asked to participate in the scoping exercise.

6.7.1.2 Rights and Representation of the Manitoba Metis Community

The MMF submission stated that "Manitoba Hydro does not clearly and consistently recognize the Manitoba Metis Community as a rights-bearing Aboriginal community and

do not clearly and consistently recognize the MMF as the duly-authorized and sole representative of the Manitoba Metis Community." Instead, the Metis who live in the ROI are simply addressed as individuals. As a result, the RCEA does not address the Manitoba Metis Community as an affected community that has been impacted by hydroelectric development. This has led Manitoba Hydro to take the position that Metis concerns can be dealt with through arrangements with resource user groups or Northern Affairs Communities.

6.7.1.3 Assumption of Adequate Existing Information

The MMF submission states that many of the key components of an adequate assessment of the human environment impacts indicate there is a lack of adequate publicly available information. This applies, in particular, to information about the Metis.

6.7.1.4 Lack of Metis-Specific Sources

The decision to rely on existing information exacerbated the lack of attention that was given to Metis-related issues. A review of selected bibliographies from all three RCEA reports identified 109 reports that were either produced by First Nations or exclusively about First Nations, and only three produced by Metis organizations or exclusively about the Metis.

As a result of these deficiencies, the submission concludes that:

- The RCEA provides only limited acknowledgement of the impact of hydroelectric development on the Metis people.
- Mitigation and compensation measures have not been equitably distributed between First Nations and the Metis. This is an issue that has caused unnecessary conflict between First Nations and Metis people, created division within the Metis community, and led some people to abandon their Metis identity.
- It is not accurate to assume that the appropriate level of benefits has flowed through Northern Affairs Communities or resource user groups to the appropriate members of the Manitoba Metis Community.
- Because the Manitoba Metis community has not been recognized as a rights-bearing Aboriginal community, it has yet to be compensated for the past effects of hydroelectric development.

The submission recommended that:

- A comprehensive strategic regional cumulative effects assessment be carried out under new terms of reference.
- The Manitoba government and Manitoba Hydro recognize:
  - the Aboriginal rights of the Manitoba Metis Community to harvest for subsistence purposes throughout the province
  - the Manitoba Metis Community as a rights-bearing Aboriginal community
  - the MMF as the sole representative of the Aboriginal rights, claims, and interest of the Manitoba Metis Community
- The Manitoba government, Manitoba Hydro, and the Manitoba Metis Federation engage in negotiations related to the impacts of previous hydroelectric development and that these discussions include the completion of a socio-economic and cultural impact assessment of hydroelectric development on the Manitoba Metis Community.
- The Manitoba government, Manitoba Hydro, and the Manitoba Metis Federation implement a comprehensive mitigation and compensation program to address the cumulative effects of hydroelectric development on the Manitoba Metis Community.

6.8 Norway House Fishermen's Co-operative

6.8.1 Norway House Fishermen's Co-operative Submission

The Norway House Fishermen's Co-operative (NHFC) represents members of the Norway House Cree Nation who engage in commercial fishing on Lake Winnipeg and Playgreen Lake. Their specific concerns in relation to hydroelectric development are the impacts of Lake Winnipeg Regulation on their commercial fishing operations; shoreline erosion, sedimentation, and increased debris in the water; reductions in fish stock and changes in the relative composition of fish stocks; changes in the navigability and quality of water; and impacts on lifestyles and livelihoods of fishers.

The NHFC submission concluded the RCEA did not reflect the cumulative impacts of the last 50 years of hydroelectric development in relation to the NHFC. The submission identified the following concerns with the RCEA methodology:

- RCEA's assertions regarding the lack of baseline (pre-construction) data
- division of the RCEA's region of interest into subdivisions
- Manitoba Clean Environment Commission's direction to the NHFC and other community organizations not to comment on the Northern Flood Agreement and other such agreements in their submissions to the commission
- limited treatment of issues such as the loss of wetlands and fish catch data
- treatment of Indigenous culture

It recommended that the RCEA be revisited to address these issues.

In many areas, the RCEA stated that its analysis is limited by a lack of baseline data. The NHFC noted that such data could have been developed through work with Indigenous knowledge keepers. Instead of such consultation, the submission stated, the RCEA treated Indigenous knowledge in a cursory fashion, categorizing it as perception and opinion rather than knowledge. While the RCEA indicated that it did make use of Aboriginal Traditional Knowledge, the submission noted that there appeared to be little to no use of the evidence in the report. To address this issue, the submission recommended that independent researchers supervise the development of Indigenous knowledge of baseline and post-development conditions. This knowledge should then be integrated into the RCEA.

The submission also noted that the RCEA made limited use of archival sources such as fur-trade records, residential school records, and geographical survey records that could have assisted in developing an environmental, social, and economic baseline. It also recommended that a systematic review of such records be conducted to develop such a baseline and that the result of such research be integrated to the RCEA. The submission also called for studies that compared socio-economic conditions in communities affected by hydroelectric development with those in communities that were not affected by development.

In making the case that an understanding of the integrated nature of the generating system and its operations is required to assess impacts on the Norway House region, the submission noted that Norway House is located in a region that is affected by both the Churchill River Diversion and Lake Winnipeg Regulation. It called for research on how the system's overall dynamic affects issues of local concern and how the Norway House region is affected by both the Churchill River Diversion and Lake Winnipeg Regulation.

The submission noted that while the commission had requested that communities not address the Northern Flood Agreement and other compensation agreements,

the RCEA made frequent reference to such agreements. It also noted that the commission's terms of reference instruct it to seek community input on the accuracy of the RCEA and additional information relevant to the assessment. The NHFC recommended that either the references to the NFA and related agreements be removed from the RCEA or funding be provided to First Nations to conduct assessments of the RCEA's claims relating to these agreements.

While the RCEA noted the loss of riparian wetlands due to hydroelectric development and the shifting of wildlife from on-system to off-system environments, the submission contended that the analysis does not adequately reflect the importance of riparian lands to the health of the river system.

The submission rejected the RCEA conclusion that Playgreen Lake fish populations were generally healthy and catches high compared with other on- and off-system water bodies. It questioned the appropriateness of comparing a lake that was once a highly desired location for commercial fishing with other lakes. It pointed to data suggesting that fish catches have been declining. The submission also disputed the RCEA assertion that declines in whitefish production are related to fishers' responses to changes in market prices. The submission quoted fishers who stated that the decline in production is due to a decline in the whitefish population. The fishers attributed the decline to the destruction in spawning grounds and changes in water flows—both of which they associated with hydroelectric development. In light of this, the submission recommended that the RCEA give attention and value to the concerns expressed by the NHFC in assessing the impact of hydroelectric development on the fishery.

The submission concluded that the RCEA's treatment of cultural issues was cursory and often amounted to little more than "lip service." It noted that Elders had not been consulted and that although terms reflective of an Indigenous worldview are provided and defined, the impact of hydroelectric development upon the relationships that this worldview implies are not investigated. The changes in the use of land and in the interactions among community members are interrelated (to cite two examples) and have led to a loss of culture, with deleterious consequences. Specific discussions of culture tended to focus on archaeological work that Manitoba Hydro has supported to protect material culture. This is an example of what the submission identifies as a lack of attention to non-material culture.

The submission recommended that the RCEA be revised to address the impacts of Manitoba Hydro operations on intangible cultural heritage and to develop programs that mitigate those impacts.

6.9 Northern Association of Community Councils

6.9.1 Northern Association of Community Councils Submission

Wabowden, Pikwitonei, Herb Lake Landing, Ilford, and Thicket Portage, as members of the Northern Association of Community Councils (NACC), prepared a joint submission to the commission. The submission identified, without comment, those portions of the RCEA Phase II report that made reference to members of the NACC in relation to settlement agreements and adverse effects. It also included similar information on the Integrated Summary Report.

The submission provided additional information on the location, economic activity, and presence of a Metis Local in each of the five NACC communities. The submission relayed the views of residents of Pikwitonei that although a "take it or leave it deal" had been offered to the community of Pikwitonei 20 years ago, Manitoba Hydro has not addressed the issue of the impacts that its operations in northern Manitoba have had on the community.

6.10 O-Pipon-Na-Piwin Cree Nation

6.10.1 O-Pipon-Na-Piwin Cree Nation Submission

The O-Pipon-Na-Piwin Cree Nation (OPCN) submission concluded that the RCEA was not conducted in a manner that complied with best practices for cumulative effects assessment. It argued that many of the shortcomings were rooted in the original terms of reference.

It drew particular attention to the fact that the RCEA:

- had not been mandated to consult with communities
- was limited to a retrospective assessment
- looked solely at the effects of hydroelectric development
- had been limited in the RSCs (regional study components) that it chose to study because it was restricted to working with existing information

These measures, the submission contended, were not in keeping with best practices for cumulative effects assessment as set out in the Canadian Environmental Effects Guidelines.

The lack of community consultation meant that the community was not able to identify issues and approaches it expected to be taken in an RCEA.

The submission noted that the RCEA often indicated that its work was limited by a lack of pre-development data. However, Southern Indian Lake was the subject of considerable pre- and post-development research. In addition, OPCN's traditional knowledge could have been used in helping to develop pre-, post-, and current development cases that could be projected into the future.

The submission made the case that, given the nature of the impact of hydroelectric development on the region of interest in general and Southern Indian Lake in particular, the RCEA should have given shorelines and near-shore areas a separate consideration. Concern was also raised about the fact that the RCEA did not evaluate the various pre-development predictions about the potential impact of the development to determine which may have been proved correct.

The O-Pipon-Na-Piwin Cree Nation submission focused on the impact of hydroelectric development at Southern Indian Lake. The Churchill River Diversion transformed Southern Indian Lake from a series of interconnected basins that lay along the flow of the Churchill River into a reservoir from which the primary flow drains into the Nelson River. The diversion had four major impacts on the lake: it raised water levels, it disrupted fish movement, it increased the annual fluctuations of water levels, and it changed the flow patterns of water in the lake. These changes increased erosion, decreased water clarity, increased mercury levels in fish, changed the nutrient levels in the various lake basins, and lowered water temperature. From the perspective of the O-Pipon-Na-Piwin Cree Nation, a major outcome of these changes has been the destruction of a once successful commercial fishery. This collapse has been accompanied by a general decline in environmental productivity, with community members reporting the decline and disappearance of many plants and animals in the region. In addition, community members are confronted with numerous transportation hazards as operation of the Churchill River Diversion affects shorelines and ice thickness.

The submission's critique of the RCEA assessment process identified weaknesses in the assessment of the physical environment, water regional study components, and land regional study components. These included concerns about the approach to assessing the water regime, ice conditions, erosion and sedimentation, water quality and fish communities, intactness (extent of disturbance), waterfowl, aquatic furbearers, and moose.

The submission recommended that the RCEA be reopened and conducted in a manner that would be consistent with best practices. It also included a number of mitigation measures that it believed should be given consideration in such a review. These included modifying annual fluctuations in water levels to protect shorelines, constructing a fish ladder at Missi Falls to allow fish to re-enter the lake from the Lower Churchill River, and modifying flow patterns by increasing the outflow at Missi Falls into the Lower Churchill River. It also called for the modification of monitoring plans to allow for comparison of current data with previously collected data.

6.10.2 O-Pipon-Na-Piwin Cree Nation Meeting

At their meeting with the commission panel in Thompson on December 7, 2017, members of the O-Pipon-Na-Piwin Cree Nation stressed the transformation that their community had undergone as a result of hydroelectric development. At the time that the decision was made to raise the level of Southern Indian Lake and divert the flow of the Churchill River into the Nelson River, the First Nations people who lived at the community of South Indian Lake were self-supporting. They were, in fact, engaged in a very successful commercial fishery. Various community members stressed that the Churchill River Diversion and the attendant flooding of Southern Indian Lake destroyed that way of life. People had to abandon their homes and relocate portions of their community, often in ways that disrupted traditional community relations. Residents said that when the project was first proposed, Hydro officials assured people that their economic future was not threatened and that their livelihoods and the fishery they depended upon would improve. Instead, catches have declined in quantity, quality, and variety: the commercial fishery has collapsed. People said that some fish, such as sturgeon, can no longer be found in the lake.

The flooded lake is not only less productive; it is dangerous. Floating logs and deadheads are a constant risk. People spoke of losing parents and family members when people fell through the ice (which was much thinner due to the operation of the CRD) or their boat struck a submerged reef or log (also a common result of flooding).

Due to changes in migration patterns and shorelines, people have to go much further afield to hunt and trap, thereby increasing the cost of these activities. People have also seen their expertise comprised. People once knew the lake, the water, and the shorelines intimately. Flooding remade the lake, and, and the lake continues to be remade every year due to erosion and sedimentation. People spoke of how it was much more dangerous for them to go out trapping. Where once they knew the landscape, now they do not know what is safe and what is not.

People spoke of the loss of a beautiful environment and the loss of sense of community sustained by that environment. The lake water had been clear, and the shorelines were clean, accessible, attractive, and inviting for a variety of activities. People spent much of the year at fish camps; they would harvest berries and medicinal plants from the shorelines, collect eggs from birds that nested on remote islands, and hunt and trap animals that lived along or travelled across those waterways. Now the water is dirty; the shoreline, inaccessible. Because water levels rise and fall in response to the needs of Manitoba Hydro, islands can disappear and shorelines shift rapidly, with disastrous implications for animals that live and reproduce along those shorelines. The flooding also led to an increase in mercury levels in the water. This has left people reluctant to eat fish from the lake, which, they said, had lost its taste, and, in some cases, even reluctant to eat the meat of animals, such as moose, that drink from the lake.

People were told that the diversion would introduce the benefits of modern life to

their community. Today people live in substandard housing, haul their water by truck, and lack sewage connections. Sewer and water hookups are, however, provided for southerners who come to South Indian Lake to teach or work for other government agencies.

Much of the community is dependent on social assistance. The decline of the fishery has led to social disruption; unemployment, drugs, and alcohol have had a devastating impact on the community. The community felt that its members were not offered the same employment opportunities on recent hydroelectric development projects as were available to other First Nations. When there was work, it was said to be of a menial nature. Educational opportunities are also limited. The message being sent to young people is that welfare represents their only economic future. As a result, one person said, children are killing themselves, they are killing each other. A number of the people told of their children and nieces and nephews who had committed suicide. One community member spoke of how, when he told his grandchildren about what life used to be like in South Indian Lake, they would ask if he grew up in a dream. Children, he said, had been pulled up by their roots; people no longer knew where they came from.

One of the messages that community members delivered was that the interests, opinions, and knowledge of the community members had been ignored throughout the entire period of the development of the hydroelectric potential of the region. One community member noted that the waterways that South Indian Lake is located along have been the subject of government planning for over a century. At the time of the diversion, one person noted, the government treated them as having no more rights than squatters.

In this vein, the RCEA represented another example of the community exclusion. Community members objected to the community profile in the RCEA, stating that it did not accurately describe the impact of development on the community and had been written without community consultation. They also questioned the scientific conclusions in the report; for example, they said there were no shoreline studies that substantiated the RCEA findings on erosion.

The community members said that they felt embattled. It was noted that it was the people of South Indian Lake who played a leading role in establishing the Northern Flood Committee, but the community was excluded from the initial flood agreement. The community members feel that, with little in the way of resources, they have been left with the responsibility of forcing various levels of government to live up to their legal commitments. Why, they asked, are water regulations and Fisheries Act regulations not being followed? As a First Nation, the community feels that it is very much subject to a host of rules and regulations established by the federal government.

The community members noted that at the time the diversion was put into operation, researchers did not have a clear idea of what its impact would be or how long it would take for the environment to return to some form of equilibrium. And, although research was undertaken at the time, there was no effort to engage local people in the research to gain from their knowledge. During the pre-development period, some research led to predictions that the flooding would cause social disruption, yet nothing was done to address this issue. Other issues, such as traditional land use or the overall impact of relocation, have never been studied. People also spoke of a variety of health impacts, including changes in the pigmentation in people's hair, that need to be studied.

Community members said they still wished to see the fulfillment of the promises that were made to the community when the diversion was first proposed. When they visit other communities in Manitoba, they see that people are better housed, have

access to better services, and are benefiting from electricity that is generated by the destruction of South Indian Lake. They want more employment. They pointed to the need for extensive shoreline development. The current shoreline clearance programs, they said, provide only a few weeks of work and allow the cleanup of only a small portion of the shore. They want reduction in their hydroelectric bills, which can run to $400 or $500 per month. There is also a wish to see an end to the augmented flow program and a reduction in the level of flooding. Community members would like to see Manitoba Hydro take some responsibility for deaths that occur on the lake. They also requested the introduction of fish ladders that would allow fish from the Lower Churchill to enter South Indian Lake at Missi Falls.

Some people spoke of being told that the lake would return to an equilibrium in 30 years' time. Nearly 50 years after the diversion commenced, the process of reshaping the shoreline and the lake is ongoing—one person said that, in places, 0.61 metres (two feet) of shoreline were falling in every year. People also spoke of being offended by Manitoba Hydro's marketing of hydroelectricity as being clean and green. It is, they suggested, power from dirty water. An underlying message from the meeting was the lack of social justice; people felt a community had been destroyed and a lifestyle lost in order to enrich people who lived elsewhere.

6.11 Pimicikimak Okimawin

6.11.1 Pimicikimak Okimawin Submission

The Pimicikimak Okimawin (PO) submission on the RCEA questioned the decision not to commission new research and the decision not to consult with communities until the final report had been prepared. As a result, it was felt, while the RCEA represented "a strong beginning on a technical level," many of its overall conclusions were "based on weak evidence" and failed "to reflect what many northern Manitoba Aboriginal people anticipated." Because of the data limitations and lack of collaboration with northern communities in the design of the assessment, the PO report concluded, Manitoba is in an early stage of regional cumulative effects assessment of the impact of hydroelectric development in northern Manitoba.

The PO submission took issue with the statement in the RCEA terms of reference that holds that the impacts of hydroelectric development are either irreversible or have been adapted to by the environment. It preferred an approach that contemplated the possibility of long-term decisions to be made in regard to ways to mitigate effects and determine if environmental adaptations could be improved. It also noted that due to data gaps, the RCEA fell short of meeting its stated goals of describing and acknowledging the cumulative impacts of development and of describing the current state of the affected environment. Beyond describing existing research and monitoring programs, the report did not outline a future research and monitoring program.

The PO submission noted that the RCEA report leaves the impression that while hydroelectric development has had serious negative impacts, these were now either under control or tolerated. This, the submission suggests, underestimated the impacts of a process that involved "multiple forms of discrimination, dominance over decision-making, and exploitation of resources for the benefit of distant interests coupled with a lack of understanding and/or disregard for the long-term health of the local people and the land." The submission stated that it had hoped that the RCEA would be a step in the development of a more collaborative form of development that effectively balanced the interests of those whose homelands are being developed and of those who, living in more distant locations, benefit from that development.

Such an approach would incorporate a spirit of reconciliation.

In its review of the RCEA, the submission noted:

- There has been much more research and study into fish and water than into terrestrial wildlife, birds, and their habitat.
- There are still considerable gaps when it comes to pre- and post- development knowledge of fish and fish habitat. As a result, mitigation measures proposed for current developments are largely experimental in nature.
- While the integrated summary recognizes that hydroelectric development has had a number of major impacts on the North, the conclusions are vague and often uncertain. In this, it differed from the Phase I and Phase II reports, which were more objective and qualified.
- There was a need for studies that focused on how beaver responded to various water regimes and how their survival rates could be improved.
- More fieldwork is warranted to document the characteristics of wetland and shoreline habitats in the less studied regions of the affected river systems.
- Due to the lack of data, the RCEA conclusions for colonial waterbirds were necessarily vague.

The submission questioned:

- the degree to which the system is run to meet Manitoba power requirements (as opposed to export commitments) and the degree to which environmental and community concerns are incorporated into the system's operating parameters
- whether the Cross Lake Weir had fully mitigated the impact of the regulation of water levels on Cross Lake and on the habitat of aquatic mammals

The PO submission also outlined community concerns related to the impact of hydroelectric development. Foremost among these were the:

- difficulties that resource harvesters have experienced in receiving compensation under the Northern Flood Agreement and other agreements
- increased erosion and sedimentation that have negatively affected water quality, fish and wildlife habitat, accessibility of shorelines for the launching of boats, travel by foot along riparian areas, and the cultural landscape; and that also have led to the exposure of human remains
- decline in the lake whitefish population and the lake sturgeon population
- impact of hydroelectric barriers on the fish population
- potential cumulative effects of heavy metal deposition from the Thompson smelter in combination with mercury increases due to reservoir creation
- decline in shoreline plant species (including medicinal plants), birds and amphibians, terrestrial furbearers such as mink (and including muskrats) that use riparian habitats, and moose that forage in wetlands and shorelines for succulent plants
- flooding of waterfowl and colonial water bird nests at on-system sites

The brief recognized that regional cumulative effects assessments are new and the issues that they are expected to address are complex. The PO submission stated that the literature review in the RCEA was extensive and useful. It also noted that the research work carried out by the Co-ordinated Aquatic Monitoring Program (CAMP) has provided useful information. However, the mandate did not allow the RCEA team to fully analyze existing data, collect new data, and establish thresholds

for assessing the significance of effects. As a result, it was felt that the RCEA did not meet the objectives of the commission's recommendation.

The submission identified the following three steps that needed to be taken in advancing positive regional cumulative effects in Manitoba, and indicated that it wished to be part of this process:

- Increase collaboration with affected Indigenous people. This is an essential element in determining priorities and approaches.
- Establish thresholds and benchmarks. This would require the development of a more comprehensive assessment of the existing environment and the development of thresholds based on that assessment.
- Conduct research and monitor to address data gaps. This should include interdisciplinary surveys that incorporate Aboriginal Traditional Knowledge.

The submission presented the following list of items to be considered for research, monitoring, and mitigation. It proposed that the items in the list be assessed in consultation with PO, affected Indigenous communities, resource harvesters, Indigenous holders of traditional knowledge, scientists, and Manitoba Hydro, and be implemented in a collaborative fashion that created education and employment opportunities for Indigenous youth.

The list proposed:

- development of site-specific interdisciplinary studies of areas of particular cultural significance
- exploration of studies examining how specific operating regimes affect habitat and human land use
- review of the overall operating regime for the northern hydroelectric system
- assessment of the conditions and ecological and cultural factors at sites affected by high levels of erosion
- development of habitat assessments of a sample of shorelines that have been artificially protected from erosion and consideration of whether other mitigation measures are feasible
- discussion of ways to design a more detailed cumulative assessment of the woody debris problem and the effectiveness of mitigation efforts
- consideration of more intensive site-specific water quality investigations over more limited time periods
- increase of community-based communications to share what is being learned through CAMP and to explore questions and concerns about water quality and cumulative effects
- sharing of the state of knowledge on fish communities in northern Manitoba-regulated rivers, and mitigation ideas based on Aboriginal Tradition Knowledge, regional fisheries science, and experiences in other regions
- exploration of the potential and limitations for work to investigate the decline of lake whitefish
- exploration of experimental habitat-enhancement projects at selected tributary streams
- review and evaluation of existing communications on the issue of methylmercury and fish and wildlife consumption in Pimicikamak and, if necessary, the establishment of a joint communications strategy
- development of a plan to conduct wetland surveys in targeted areas on- and off-system that have not been the focus of recent environmental assessment work

- development of a classification system for wetlands and riparian habitats within the regulated water regimes
- planning of a survey protocol to document waterfowl population trends in the upper Nelson
- development of a program of focused research and monitoring to describe current beaver populations and habitat use in regulated and unregulated areas and to test specific hypotheses
- inclusion of muskrat as a regional study component
- discussion of survey work and analysis on terrestrial furbearers that may be affected by degraded riparian habitats
- development of a research program to investigate habitat use by colonial waterbirds and nesting success, comparing regulated and unregulated water bodies
- exploration of an experimental program of colonial water bird habitat enhancement
- development of a plan for research and monitoring at Sipiwesk Lake and Duck Lake to develop a state of the environment report
- creation of a working group on communications to explore how environmental science and Aboriginal Traditional Knowledge can be best shared

6.12 South Indian Lake Fisher's Association

In its submission, the South Indian Lake Fisher's Association asked that the commission "scrap" the RCEA. The submission stated that the RCEA fails to describe the regional cumulative effects of hydroelectric development on Southern Indian Lake. A central element of this failure is the lack of meaningful consultation with the community. Given the lack of community consultation, the RCEA represents Manitoba Hydro's interpretation—and minimization—of those effects.

The submission noted that Southern Indian Lake was once home to the third-largest lake whitefish fishery in North America. Following the implementation of the CRD, the fishery went into a decline from which it has not recovered. Indeed, the submission stated that unless there is meaningful change, the end of the fishery is in sight. Where the fishery once employed 175 fishers, it is down to 40 or fewer, while the catch is 10 per cent of what it was at its height. As a result, a formerly self-sufficient community is dependent on public assistance.

The submission stated that the RCEA does not do justice to the nature and impact of the augmented flow program (AFP), which it views as being destructive to people and the environment.

The association stated that when the CRD was operated in accordance with the original licence, the fishery was healthy. However, when operated on the basis of the AFP, which, the association stated, was developed in a non-transparent fashion, fish catches dropped significantly.

The submission stated that from 2003 to 2013, harvesters, First Nations, and community representatives worked together with Manitoba Hydro and Manitoba government officials on the South Indian Lake Environmental Steering Committee (SILESC) in an inclusive and productive collaboration. However, the submission stated, when faced with evidence that the CRD contributed to the whitefish decline, Hydro and government officials abandoned the process. To the degree that the SILESC process continues, it continues in name only, according to the submission. As a result, the association did not provide permission to include documents, studies, and reports that reference the steering committee in the RCEA, since it concluded the RCEA does not reflect the underlying findings of those reports.

The submission referenced two scientists, including one who had carried out research on the whitefish population of South Indian Lake, who supported the Association's position.

While the association originally viewed the RCEA process as a potential step in the right direction, it was shocked to discover that a final report had been prepared without any community consultation. The fisher's association supported the Community Association of South Indian Lake decision not to accept the approved funding for participation in public outreach, since it was not sufficient to fund an adequate review of the RCEA. The association judged the public outreach program to have been a failure, since there had been no community meetings in South Indian Lake.

6.13 Tataskweyak Cree Nation

6.13.1 Tataskweyak Cree Nation Submission

The Tataskweyak Cree Nation (TCN) is located on the north shore of Split Lake. Split Lake is fed by two rivers that have been affected by upstream hydroelectric development. The flow of the Burntwood River is affected by the Churchill River Diversion, while the Nelson River is affected by Lake Winnipeg Regulation. The construction and operation of these two developments have led to significant changes in water levels, water quality, flow patterns, shorelines, and community life at Split Lake. In addition, the reduction in flows on the Churchill River has affected TCN members who hunt and fish on the lower Churchill. TCN has also been affected over the years by the Kettle, Long Spruce, Limestone, and Wuskwatim generating stations and their associated transmission lines.

The Tataskweyak Cree Nation submission made the following findings about the RCEA:

- It did not follow the Canadian Environmental Assessment Agency's 2014 guidelines for cumulative effects assessment. In particular, the submission identified the decision not to seek input from First Nations and other public groups at the outset as a major failing. As a result, traditional knowledge and the Cree worldview were not considered in the scoping process. Consultation could have addressed data gaps and allowed for the development of some pre-development baselines. It would also have served to create a stronger relationship between Manitoba Hydro and the communities affected by hydroelectric development.
- It did not consider riparian and littoral habitats. These shoreline habitats are the cornerstones of northern ecosystems and have undergone major changes as the result of hydroelectric development. Most of the issues raised by TCN members—for example: erosion of shores and banks, sedimentation, destruction of beaches, lack of access to shores for harvesting, presence of debris, reduction in water quality, and impact on animals that live and are harvested along shorelines—are related to the disruption of riparian and littoral zones. Changes to these habitats should have been a priority for the RCEA and in all likelihood described as a regional study component.
- It did not establish a pre-development baseline or project a future scenario. These are essential in measuring change and impact. The submission identified a number of options that could have been adopted in developing a pre-development baseline, including use of traditional knowledge and computer modelling.
- It did not use suitable metrics for mercury in fish tissue. Fish mercury levels were measured on the basis of means (averages) that include fish of all ages. However, fish accumulate mercury over time, and TCN members consume older, larger fish. As a result, the metric does not represent the mercury level in the fish that are normally consumed. The submission also argued that the Health Canada mercury

benchmark of .05 parts per million (ppm) of mercury in fish tissue for sale is not an appropriate benchmark for members of a community where fish have formed a traditional part of their diet for centuries. A more appropriate benchmark for high consumers, the submission states, would be .004 ppm.

- It selected geographical divisions that did not line up, making it difficult to trace cause-and-effect pathways between divisions. The submission was critical of the decision to use different geographic divisions for analyzing different categories of RSCs: for example, using ecoregions in the analysis of Land and hydraulic zones for the Physical Environment and Water sections of the report. It was suggested that this could result in poor decision making.

- It did not examine the impact of a lower water regime on lake sturgeon in the Churchill River. TCN members are of the opinion that lake sturgeon are on the verge of extinction in the Churchill River. The submission suggests that this is because the CRD has reduced and fragmented lake sturgeon habitat in the river.

In light of these shortcomings, the submission identified two options:

- include public input from the commission review and other reviews, meetings, and sources

- restart the RCEA process and complete it in accordance with cumulative effects assessment guidelines, which would allow for improvements in consultation, data collection, analysis, and relationships

The TCN preference is for the second option.

6.13.2 Tataskweyak Cree Nation Meeting

At the request of the community, the commission met with representatives of the Tataskweyak Cree Nation in Split Lake on December 8, 2017. Tataskweyak Cree Nation community members contrasted the quality of life pre- and post-development of hydroelectric generating stations in the region in their meeting with the commission panel. One community member stated that in the pre-development era, residents had everything they needed. Fish were abundant, the water was healthy, and the land was teeming with wildlife. The community was self-sufficient. She recalled how community members had been promised that hydroelectric development would bring them low-cost electricity. Now, she said, the water is polluted; the cost of power, astronomical. She felt that Manitoba Hydro played with people like a "predatory animal." All it had brought was destruction and deceit. Others described what they viewed as Manitoba Hydro's bullying tactics in dealing with First Nations people.

Others spoke of the loss of natural recreation areas. Prior to development, there were natural beaches that families could visit and where children could learn to swim. Those beaches have been flooded and the shoreline is often dangerous, difficult to reach, and unattractive. Where once the water was clear and full of life, it was now murky, and many forms of water life had disappeared. Younger people spoke of how they had never swum in the local waters. Others spoke of how people developed rashes after swimming in local waters.

People who continued to use the land spoke of how releases of water through the Churchill River Diversion can rapidly transform a landscape. Overnight, a creek becomes a river, a pond becomes a lake.

People also spoke of increases in health problems and reduction in lifespans: once-rare health problems such as cancer and diabetes are becoming increasingly common.

The lakes and rivers had become stagnant and unhealthy. One person said that the water is killing the people. Others spoke of how people were reluctant to eat fish or moose. Several people spoke of the need for a new water treatment plant; in times of high water, they said, the local water treatment plant was overwhelmed. As a result, many people had taken to buying bottled water. One person said that his distrust of the quality of river water was so high, he wanted to see the community drawing its water from another source. People not only wanted to see improvements in the quality of the water in the community water system, they wished to see improvement in the quality of the water in the rivers and lakes affected by hydroelectric development. They also wished to see the shorelines cleaned.

One person spoke of how the community seemed to be surrounded by Manitoba Hydro: the signs of its presence included high water levels, construction camps, and transmission lines. Several people spoke of the impact of the construction of the Keeyask Generating Station. These included the increase in availability of drugs in the community, the fact that people from the community who work on the site have to live in the construction camp and are separated from their families, the racism that workers experience on the site, the observation of the despoliation of the landscape, and the violation of environmental rules. One speaker noted that the provincial road that links the Tataskweyak Cree Nation to Thompson and other outside communities is also used by trucks associated with the Keeyask project. The highway was not built for such heavy usage, and there was concern that the provincial government was not going to meet its commitments to maintaining the road. This would increase the risk that community members faced when using the road.

People also raised questions as to whether speaking to the Manitoba Clean Environment Commission panel would have any effect, and questioned the absence of Indigenous people on the panel. They wanted assurances that the decisions made by the panel would be brought back to the community. Some people observed that the commission should not give approval to any further development in the North. Others thought Manitoba Hydro should be instructed to make use of technologies that would slow the flow of water in the river and reduce erosion.

One community member spoke of the way that Cree views had been marginalized by Western society. He noted that traditional laws and practices have been denied and ignored: these laws and practices must be acknowledged and respected. People also expressed the view that governments had failed to live up to the provisions of past commitments, whether they be treaties or the Northern Flood Agreement. Instead, government focus was on continuing to assimilate people and reduce their ability to pursue traditional lifestyles. In this way, governments and their agencies were killing the people's spirit.

6.14 War Lake First Nation

6.14.1 War Lake First Nation Submission

The War Lake First Nation community submission observed that the public participation funding that it received through the Manitoba Clean Environment Commission was not sufficient to allow for a full review of the Phase II report. As a result, the community submission focused on the Integrated Summary Report, noting its assessment was being made on a global scale, not on the basis of detailed checking of the scientific accuracy of the report. The War Lake submission noted that, given the regional nature of the assessment, the summary report "acknowledges and describes in many respects the past and ongoing impacts that War Lake has suffered from hydroelectric development, as well as our community perspectives and concerns."

In assessing the Integrated Summary Report, the community submission raised the following concerns:

- the limited manner in which Cree worldviews had been incorporated into the report
- the decision not to include predicted impacts of the Keeyask Generating Station and Bipole III
- the limited attention paid to the impacts of transmission lines or the mitigation and protection measures associated with Bipole III
- the limited attention paid to non-hydroelectric development
- the limited information on traditionally harvested resources and on economic activities
- the need for tables and maps illustrating aggregate physical impacts and quantitative data on impacts on lands and people
- the manner in which assessments of impacts over the entire region mask and downplay impacts to the environment and communities along the Nelson River

The War Lake submission observed that there had been limited opportunities for communities to participate in the RCEA and requested that, in the future, community input "occur at the planning and development stage of such a review, rather than after the review has been completed."

6.15 York Factory First Nation

6.15.1 York Factory First Nation Submission

In its submission, the York Factory First Nation stated that it had anticipated that the RCEA would be a major stock-taking that would answer the question: "How has development affected the land, waters, peoples, and creatures of northern Manitoba?" Based on the RCEA's mandate, there was also an expectation that Aboriginal Traditional Knowledge would be considered in this assessment. The community submission indicates that these expectations were not met.

On the first point, the submission noted that while the RCEA did assess the numerous individual effects, it did not assess the combined impact of all effects. It also did not assess topics that were key to an *Ininiw* (Cree) conception of the environment. Fundamental to this would be an assessment of the way development has contributed to a disruption of *minopimatisiwin* (the existence of harmony and balance in the community). The submission also concluded that the RCEA had not adequately involved the York Factory First Nation in the RCEA process or sought out and incorporated Aboriginal Traditional Knowledge. Although the RCEA provided detail on the past and existing hydroelectric development in the region, the York Factory submission concluded that it could not be considered a "true cumulative effects assessment," since it was silent about the potential impacts of future projects and did not address how incremental effects might combine with past, present, and future non-hydroelectric developments. The York Factory First Nation submission took issue with RCEA assertions that analysis was limited due to the lack of pre-development data. First Nations members have knowledge of the pre-development environment. This traditional knowledge, however, was not sought or incorporated into the report. The RCEA references previous reports that incorporated Aboriginal Traditional Knowledge, but it was done on a topic-by-topic basis and failed to recognize the holistic nature of such knowledge.

The community submission took the position that hydroelectric development should be viewed as a part of the colonization of Canada's Indigenous people. Elements of that history include agreements that have not been fulfilled (including treaties and agreements such

as the Northern Flood Agreement) and measures that have eroded Indigenous culture. The submission noted that for years the community has had to conduct all interactions in relation to hydroelectric development in English. This has led to the adoption of non-Indigenous constructs and an erosion of the use of Cree. Instead of using the Cree word *Askiy*, for example, people must use the word environment (which has a more restrictive meaning). The community considered preparing its submission in Cree, but recognized that if it did so, the panel would not be able to understand it. From the community perspective, there is a long history of consultations that have not led to results. The community consultation process being carried out by the commission was appreciated, but comes at a time when the RCEA has already been completed. This led the submission to query whether the commission review was one more exercise in "going through the motions."

The legacy of colonialism, the submission argued, is best addressed through what it termed a reconciliation dialogue. This requires not just creating a list of effects (no matter how comprehensive), but creating a pathway to reconciliation that will address those effects.

The submission also identified significant and interrelated effects on the region, which, on a cumulative basis, are said to have devastated traditional lands and Cree communities. Fish quality has deteriorated, fish have moved from lakes to rivers, traditional trapping locations are no longer accessible, and traditional transportation routes are often dangerous or unpredictable. The shoreline is blocked, there is ongoing sedimentation, the river water is no longer drinkable, beaches are unreachable and unusable, and the water treatment plant is overwhelmed. There is worry that transmission-line projects have led to caribou adopting new, and more distant, migration routes. Travel has become more dangerous. The year 2017 was one of very high water levels: the ferry was submerged, the winter road had to be rerouted, a causeway and shoreline protection were overtopped, and hunting and fishing were disrupted.

The development of the hydroelectric potential of northern Manitoba assisted the provincial government in meeting environmental commitments regarding greenhouse gas emissions and climate change. But, it was observed, the economic benefits of hydro development have not been equally shared.

The RCEA spoke highly of the partnership model that Manitoba Hydro has adopted for recent developments, including the Keeyask Generating Station. York Factory is one of the First Nations involved in the Keeyask partnership. The submission described its experience in that partnership as mixed: while the community is receiving economic benefits, there is a feeling that the partnership is not a partnering of equals. Community members do not feel they have been able to gain access to the types of jobs they expected to and have experienced discrimination on the campsite. There has also been an increase in the availability of illegal drugs in the community since the start of construction on Keeyask.

The submission presented two main recommendations:

- Issue a commitment by the Manitoba government, Canada, and Manitoba Hydro to address the cumulative effects of northern hydroelectric development in a spirit of reconciliation and environmental stewardship.

- Create a process that brings Manitoba, Canada, Manitoba Hydro, and affected Indigenous people together to jointly determine a path towards reconciliation and remediation with respect to northern hydroelectric development.

The submission also sought protection for *Askiy*, Indigenous control over the development of lands and resources; the honouring of past commitments; the

remediation of past project sites; the accommodation of Indigenous language and culture in the regulatory process; the addressing of concerns regarding community access and safety; an enhanced system-wide environmental monitoring; improved harvesting, educational, and recreational opportunities; and a balanced sharing of the benefits of hydroelectric development.

6.15.2. York Factory First Nation Meeting

At the request of the community, the commission met with members of the York Factory First Nation in York Landing on November 8, 2017. At that meeting, community members addressed the lack of community consultation and the limited use of Aboriginal Traditional Knowledge in the RCEA. There was objection to the community profile that had been developed by the RCEA for York Factory without direct involvement of the community. One community member observed that it appeared that the RCEA treated traditional knowledge as a "second tier of knowledge."

When community members were relocated from York Factory to York Landing in the 1950s, they said, they found the new location to have abundant game and the river to contain clean water. People could hunt, fish, and pick berries along the shoreline or make use of a number of community beaches. Much of their food came from the land. The shoreline and water were sources of positive memories. One speaker objected to the argument that there was a lack of pre-development data, observing that, pre-development, the North was a veritable paradise of water, fish, and wildlife.

But now, one individual said, the rivers and lakes of the region have been transformed into reservoirs. Development-related changes continue to take place: shorelines still slump; trees still fall into the water, creating debris (one fisher said he refers to logs that get entangled in his nets as "hydro fish"); ducks no longer nest on local shorelines; and fluctuating water levels continue to lead to mercury building in the water.

Where once water was clean and free, people said, it is now full of sediment, and there are signs that the lake and river are experiencing algal blooms. There is a water treatment plant, but people now have to pay for water, and the treatment plant has, in recent years, been overwhelmed. There was, one person said, no reason for the younger generation to stay in York Landing.

Several members spoke of the significant transportation problems that are related to hydroelectric development. The regular changes in water levels create serious challenges for boating: due to high water, some islands have become hidden—and dangerous—reefs. One man spoke of how his brother died in a boating accident, and another spoke of a serious accident in which he was involved. Low water creates another set of problems as boats and paddles become stuck in the mud. When water levels fluctuate over days, weeks, and months, with limited notice of change, even the most experienced of boaters take to the water with uncertainty.

Constructing the portion of the winter road that crosses the Nelson River has become very expensive and very dangerous, and people expressed an unwillingness to use that portion of the road, in part because they believe that water released by Manitoba Hydro undermines the stability of the road. These concerns extend to general travel on frozen waterways during the winter. In the past, the local causeway was under water, and people told of their anxieties about using the ferry at certain times of year.

The decline in traditional means of transportation has contributed to a decline in resource harvesting: people are less able to reach locations where they would hunt, fish, and collect plant life. At the same time, they believe the development has changed the quality and quantity of available fish and game, leading, for example, to a collapse in commercial fishing. One speaker observed

that the Elders taste the impact of changes to the environment in the wild meat and the fish. Another spoke of how painful it was to see our animals, lands, and waters being destroyed for the benefit of people down South and in the name of progress. Animals such as squirrels and frogs have, it was said, largely disappeared. One speaker spoke of how once popular recreational beaches have been rendered inaccessible and of the disappearance of berry-picking locations along the shore. One individual spoke of the presence of *Helicobacter pylori*, a bacterium associated with stomach ulcers and cancer in the community.

The reduction in rail service is a transportation effect that has increased costs and reduced supplies coming into the community.

Interactions with Manitoba Hydro were described by some as unsatisfactory. People also spoke of their dissatisfaction with some of the impacts of the Keeyask construction project. They said First Nations members who worked there felt harassed and that the dismissal rate was high enough that it had an impact on community members' sense of self-worth.

Among the measures that community members requested were a review of the Churchill River Diversion and the Augmented Flow Program, effective environmental monitoring of the marking of reefs, delays in water releases when winter roads are under construction, a safer winter road route, an all-weather road, food subsidies, a commitment that there be no more development, construction of a swimming pool and recreation centre, free electricity, and a shortened ferry route to Split Lake. On a broader scale, people spoke of the need to turn commitments into meaningful action and to address the gap that exists between the northern and southern regions of the province.

6.16 Commission appreciation of the First Nation and Community Submissions

Panel members greatly appreciated the participation of First Nations, communities, the Manitoba Metis Federation, and community organizations in sharing their perspectives on the RCEA. The submissions and presentations provided the panel with a greater understanding of the impacts of hydro development at the community level. This information will be very valuable in guiding the next steps.

7. Commission Review

7.1 Introduction

The commission has been mandated to both report on public submissions on the RCEA and review the RCEA. The commission's review is based on its reading of the RCEA, Canadian and international cumulative effects guidelines, the advice of independent consultants, and the observations and input from communities and other participants. This review took into account previous commission reports and recommendations, and the RCEA terms of reference.

The commission recognizes that the RCEA is unique in that a typical cumulative effects assessment involves the assessment of a proposed project, as opposed to a series of projects that have been put into operation over the past 60 years. It is regional in nature, while most Canadian practitioners' guides focus on project-level proposals. It also recognizes that the policy and practice guidance provided at the federal and provincial level is limited.

The RCEA demonstrates a clear understanding of the links between hydroelectric development and the environment and gathers together a great deal of valuable information. During Phase I, the project team digitized a wide range of historical reports and data for the region of interest, which will serve as an invaluable resource for future research work in the

area, bringing a wealth of data together in one place. The report provides an extensive summary of available information and research on environmental matters in the region of interest. In carrying out its work, the RCEA synthesized information on RSCs at sub-regional and regional levels, employed pathways-of-effects analysis, compared on- and off-system conditions, employed a variety of spatial zones for analysis of different RSCs, used available metrics, and identified driver response issues. The task of carrying out a cumulative effects assessment was complicated, in many instances, by the lack of comparable historical data. The Phase II report constitutes a significant representation of the current state of knowledge of the environment in areas affected by Manitoba Hydro's system.

The following review focuses on the limitations or areas of endeavour for future work that the commission has identified. It takes its structure from the three topic areas involved in preparing a cumulative effects assessment (these steps were described in Section 2.3):

- scoping
- analysis of impacts
- management and monitoring

7.2 Scoping

The commission wishes to comment on the following specific scoping issues:

- engagement
- temporal scoping
- spatial scoping
- regional study components

7.2.1 Engagement

National and international practitioners' guides and academic literature all stress the importance of early and ongoing engagement with interested and affected publics as part of the assessment of cumulative effects (André et al. 2006; Cumulative Effects Assessment Working Group and AXYS Environmental Consulting 1999, 61; Blakeley et al., n.d.: Kale et al., n.d.; Noble 2015; Senécal et al., n.d.; Sinclair et al. 2017). Most submissions received by the commission raised this issue.

Public participation is important not simply for the information that it gathers about the public in general or specific communities. It is multi-purpose in that it:

- involves members of affected communities in the decision-making process
- educates members of the public
- gathers data about the environment and human relations with the environment
- serves to identify concerns
- improves analysis and legitimacy of the assessment
- contributes to mutual respect and understanding between participants

Engagement with the public is an integral part of cumulative effects assessment best practice.

Public engagement was originally planned for Phase II of the RCEA. The 2014 terms of reference for the RCEA stated:

> Early in Phase II, Manitoba and Manitoba Hydro will also determine the exact nature and design of any appropriate public engagement processes. Once determined, Manitoba Hydro will provide the funding required to undertake the agreed to public engagement process. (Appendix 2)

The preamble to the RCEA Phase I report stated:

> At the start of Phase II, Manitoba and Manitoba Hydro will describe the process for public engagement with Aboriginal and other communities in the Region of Interest, as well as other interested parties. (Manitoba Hydro 2014, ii)

During Phase II, it appears that a decision was reached that the public engagement process would be a review of the final report, carried out by the Clean Environment Commission (Manitoba – Manitoba Hydro 2015, 1.2-7). The report did not provide a rationale for this decision. The decision not to engage with the public until after the RCEA was published is a departure from best practice and, as previously noted, was a concern raised by most participants.

The RCEA includes many references to community viewpoints respecting environmental impacts, as captured in transcripts from community meetings that have been held in the ROI. That being said, communities did not have the opportunity to provide input into the planning of the RCEA, the vetting of RSCs, determination of the spatial and temporal scope, or other elements of the RCEA.

7.2.2 Temporal scoping

An RCEA can serve as an effective useful tool in a land-use planning process. As a result, it is expected that its temporal scope looks both to the past and to the future (Cumulative Effects Assessment Working Group and AXYS Environmental Consulting 1999, 61; Blakeley et al., n.d.; Kale et al., n.d.; Senécal et al., n.d.; Sinclair et al. 2017). This is in keeping with the commission's expectations.

The temporal boundaries for the RCEA, set out in a letter from Manitoba Hydro to the government of Manitoba, stated that the RCEA "will be retrospective in nature." The letter provided no rationale for this decision (Appendix 2). The RCEA terms of reference also noted that due to the fact that there were no environmental impact assessments at the time, many of the major elements of Manitoba Hydro's developments were established in northern Manitoba, "establishing a pre-development condition from which to evaluate cumulative impacts will be a challenge." As a result, the RCEA did not look to the future and had difficulty in determining past conditions.

There is no denying that determining pre-development conditions is challenging in this context. However, the commission was of the opinion that in some cases the descriptions of the pre-development condition could have been enhanced. It is likely that historical data exist with entities outside of Manitoba Hydro and the Manitoba government that could have been sought out. For example, it is the commission's understanding that pre-development data does exist for Southern Indian Lake on fundamental biophysical elements, such as fish populations and the state of shorelines, which might have been more effectively introduced into the analysis, especially if paired with equivalent, post-development data gathering. Aboriginal Traditional Knowledge might have been more effectively employed in developing an understanding of pre-development conditions throughout the system.

The decision not to extend the RCEA into the future is a departure from best practice. A prospective analysis is an essential part of a cumulative effects assessment and, as such, becomes a valuable planning instrument. In its 2013 report on the Bipole III Transmission Project, the commission stated that regional cumulative effects assessments should include an assessment of "effects during a longer period of time into the past and future" (Manitoba Clean Environment Commission 2013, 112).

Computer modelling may have provided the opportunity to extend the RCEA's temporal scope, both into the past and the future. The RCEA noted that consideration was given to using statistical software to model the effects of hydroelectric development on flow regimes throughout the region. It was decided not to employ this form of modelling because it was concluded that it could not account for short-term phenomena. The commission will return to the issue of modelling in its discussion of analysis.

7.2.3 Spatial scoping

Terrestrial RSCs (which included both species and concepts such as intactness) were analyzed on the basis of relatively large-scale terrestrial ecoregions (depicted and described as Terrestrial Regions and situated within larger terrestrial ecozones). This approach was defensible for vegetation, but it may have had the effect of minimizing the impact of development on other terrestrial RSCs, as most of the impacts of hydroelectric development largely takes place along the Nelson, Burntwood, Rat, and Churchill river systems or along transmission line corridors, which constitute only a small portion of each terrestrial region.

Terrestrial regions appear to be an inappropriate scale to use in assessing most terrestrial RSCs. For example, impacts on riparian areas can appear insignificant in the context of the much larger terrestrial zone under consideration. As a result, these effects tend to be categorized as local effects that are minimal at the regional level. In addition, the terrestrial regions are generally larger than the home range of most of the wildlife that were under review. It is also the case that data on many of these RSCs are not collected on a terrestrial region basis. It would have been more appropriate to use hydraulic zones as a part of the assessment of impacts on most terrestrial RSCs and even some aquatic RSCs, such as beluga and seals.

Intactness, or the extent of disturbance, was also analyzed on the basis of terrestrial regions. Given that most hydroelectric development and the impacts related to development were concentrated in hydraulic zones, a more appropriate spatial framework for analyzing intactness should have been chosen.

A change in how intactness was analyzed would have influenced the assessment of impacts on other RSCs, such as boreal caribou habitat. In particular, linear disturbance and loss of intactness are major drivers for impacts on boreal caribou. Increased fragmentation not only provides for impacts from humans but creates transit routes for other predators such as wolves. Boreal caribou habitat was appropriately analyzed on the basis of caribou population ranges, where data were available, but the effects of linear disturbance were not captured at an appropriate scale.

7.2.4 Regional Study Components

The RCEA identified 12 Regional Study Components (RSCs) for this assessment. They were selected on the basis of the following criteria:

- Overall importance/value to people as identified by residents in the ROI through various forums (e.g., Clean Environment Commission Hearings, Aboriginal Traditional Knowledge reports from the First Nations, Northern Flood Agreement Claims).
- Umbrella indicator (an indicator that represents changes for a broad group of species and one or more ecological pathways).
- Importance/value to overall ecosystem function.
- Known to be susceptible to direct or indirect effects from hydroelectric developments. (Manitoba – Manitoba Hydro 2015, 1.3-14)

Overall, the commission would concur that this list of criteria reflects important environmental elements in the region and their susceptibility to impacts from hydroelectric development. However, the list does not include the availability (or lack of availability) of data as a criterion, yet a number of potential RSCs, including, for example, forest birds and terrestrial furbearers, were excluded due to a lack of data (Manitoba – Manitoba Hydro 2015, 1.3-14). In other cases, no rationale was provided for the exclusion of RSCs that one might reasonably expect to see in the assessment of a hydroelectric development. These include: the presence of benthic invertebrates, muskrats, shorebirds, and

waterbirds; the health impacts of mercury on fish-eating wildlife; and shoreline ecosystems.

The decision not to include benthic invertebrates as an RSC left a gap in the pathway of effects. These organisms are at the base of the food chain, and their population abundance and composition can be highly affected by changes in the water regime and water quality. Changes in abundance and composition can have a cascading effect on other components of the ecosystem that depend upon them (such as fish, waterfowl, and some aquatic furbearers). They need to be an integral part of the monitoring regime.

The exclusion of riparian and shoreline habitats as an RSC results in a large gap in the regional analysis. There are 25,000 kilometres of shoreline in the ROI and rivers, and their associated shoreline habitats are by far the most impacted habitat. Analyzing this habitat on the basis of large ecozones minimized the impact of hydroelectric operations on the river and associated habitats.

The fact that there were no RSCs that reflected human use of the environment that has been impacted by development further limited the effectiveness of the analysis. RSCs might, for example, have been selected that allowed for the measurement of the way that changes in daily and seasonal water levels restricted access to shorelines for harvesting, created navigation hazards, and contributed to poor ice conditions.

7.2.5 Other Actions

It is standard in cumulative effects scoping to identify other actions that have or may cause effects or interact with effects caused by the project under assessment (Cumulative Effects Assessment Working Group and AXYS Environmental Consulting 1999, 18; Canadian Environmental Assessment Agency 2014, 28). In large measure, the RCEA limited its analysis to the effects of hydroelectric development in the ROI. Its general discussion on scoping does not include a section on other actions. While hydroelectric development is a major driver of environmental, social, and economic change in the region, it is not the only one. In the RCEA, where reference is made to other actions, it is often to minimize the impact of hydroelectric development.

7.3 Analysis

7.3.1 General Comments

Analysis involves assessing project effects on selected valued ecosystem components (in the case of the RCEA, regional study components (RSC)). Ideally, these effects are assessed against science-based thresholds in a clearly defined and scientifically defensible manner. Where sufficient data were available for an RSC, the Regional Cumulative Effects Analysis reached scientifically defensible conclusions. Given that the RCEA did not undertake new field studies, the analysis was stronger and more detailed when it addressed areas that have been subject to greater study. This unevenness is, in large measure, a reflection of the fact that, for a variety of historical reasons, certain portions of the region of interest have been the subject of greater study than other portions. Similarly, past research has been focused on the topics of water regime, water quality, and fish populations, as opposed to riparian and terrestrial RSCs.

The water quality analysis would have been strengthened if nutrient loadings were calculated at various points in the system in addition to the provision of only nutrient concentrations. The RCEA provided a defensible summary of the effects of hydroelectric operations on the fish community, but the analysis of the effect on the fish would have been enhanced by a synthesis based on the observed changes across the hydraulic zones. This could, for example, have identified whether certain changes were common to multiple geographic areas and whether larger-scale patterns indicate evidence of hydroelectric effects. The RCEA provided a detailed

overview of hydroelectric development and available mercury data in the region of interest. The conclusions for a number of terrestrial RSCs, such as barren-ground and coastal caribou, were defensible.

The analysis in other areas was complicated by the following factors:

- the lack of defined thresholds
- the lack of consistency in approach
- limited consideration of socio-economic impacts on communities
- limitations resulting from the decision not to use hydrodynamic modelling
- limited integration and synthesis
- limited use of Aboriginal Traditional Knowledge
- limitation of habitat models

7.3.2 Lack of thresholds

For most RSCs, there were no thresholds that were specific to the ROI. In these cases, Manitoba and Manitoba Hydro concluded that thresholds could not be developed within the assigned timeline. As a result, the analysis was completed on the basis of benchmarks. Benchmarks are often intended to identify the status of an RSC in relation to environmental pressures. They differ from thresholds in that thresholds identify the point beyond which an effect limits the long-term survival of an RSC.

Lack of data and reliance on benchmarks led to conclusions in some areas that are tentative and subject to qualification. To provide greater precision, a more robust and consistent method of evaluation is required across all elements of the RCEA. This may require research by academics along with Manitoba Hydro and the Manitoba government to determine thresholds for key RSCs in the region of interest.

7.3.3 Lack of consistency in approach

The RCEA employed different approaches in different sections of the report. For example, the RCEA provided network diagrams of predominant pathways of effects that illustrate the drivers, pathways, and effects for each RSC. However, RSCs were identified only in the Land and Water sections. While a rationale for the decision not to use pathways of effects for the People and Physical Environment sections is provided, this lack of consistency makes the assessment of overall effects difficult, since the same action may affect several RSCs in different ways. As a result, the summary of effects for any particular action is incomplete. In addition, the benchmarks used to assess the impact on intactness of terrestrial habitat were inconsistently applied.

7.3.4 Limited consideration of socio-economic impacts on communities

The People section reflects the difficulties that the practice of environmental impact assessment has in addressing socio-economic impacts. This section draws together a considerable body of information, including a series of detailed community profiles based on a comprehensive review of existing documents, summaries of a range of mitigation programs, and an extensive collection of relevant demographic socio-economic and human health and wellness data. It is, however, largely a description of conditions rather than an analysis.

For example, the RCEA identified a number of historical factors that have had significant and often serious and disruptive impacts on Indigenous communities throughout the North. These include the fur trade and commercial fishing, and governmental policies associated with the treaties, The Indian Act, and residential schools. These impacts were felt by all Indigenous communities and would have been present in all Indigenous communities in the ROI, even if there had been no hydroelectric development in the region. The RCEA did

not, however, investigate and attempt to identify the degree to which hydroelectric development would have exacerbated these existing effects. While it is true that hydroelectric development is only one of a number of drivers of socio-economic change, and its contribution to overall impacts may be difficult to identify, it is a driver and its impact has been significant, if incremental and therefore cumulative. It should also be noted that, certainly in the opinion of most of the communities the commission heard from, the impacts on communities were often overwhelming and largely negative. Involvement of communities in the preparation of the assessment would have resulted in this view being better reflected in the report.

While the Phase I report indicated that a pathways-of-effects approach would be used in the People section of Phase II, such a method was not employed. For example, the socio-economic and wellness status of communities directly affected by hydroelectric development was not compared with that of similar communities that experienced indirect or no effects from hydroelectric development. Neither, as noted above, were any socio-economic RSCs employed. The discussion of effects is to a large measure a description of mitigation and compensation measures that have been put in place in response to the impacts of development. A more complete analysis of the effects could have addressed such issues as the impact and longevity of the effects and the effectiveness and appropriateness of mitigation.

7.3.5 Limitations resulting from the decision not to use hydrodynamic modelling

As noted in the discussion on scoping, the RCEA did not use simulation software to model or characterize the effects of development on the flow regime. In large measure, the report compared pre- and post-development flow data (where available). This tends to treat development as a single event as opposed to a series of incremental changes, and does not trace changes back to their origins (either components of development or other natural or human-induced changes). Hydrodynamic, water quality, and erosion and sediment transport models can be linked with operational models to enable pre- and post- (incremental and cumulative) analysis of effects of hydro development.

The cumulative effects assessment in this section relied primarily on comparisons of historical pre- and post-hydro development statistics derived from environmental studies, monitoring programs, resource management studies, research reports, and community planning studies. This approach was limited, in part due to sparse pre-hydro development data. For example, some gauging stations that measure water levels were established during the 1950s and 1960s, only a few years before development occurred. Consequently, pre-development statistics were based on comparatively shorter periods of record than post-development statistics, with commensurately greater uncertainty in the statistics. In addition, earlier records contain data gaps due to accessibility and recording equipment issues. Where data were severely limited, effects of hydroelectric development on the water regime were described more qualitatively than quantitatively.

Sedimentation and erosion are directly influenced by the water regime. Manitoba Hydro's analysis of cumulative effects of hydro development follows a similar approach (that is, comparison of pre- and post-hydro development statistics) to that adopted for the water regime. The analysis of sedimentation and erosion is therefore subject to many of the same limitations (among others) imposed by lack of pre-development historical data and would similarly benefit from application of hydrologic and operational models developed for analysis of the water regime.

The statistical comparison approach to cumulative effects assessment that

was employed in the RCEA was generally appropriate, given availability of pre- and post-hydro development data. However, this approach has significant shortcomings. Hydrologic-operational modeling would enable comparison of effects of various stages of hydro development over extended and concurrent periods of hydrologic record with pre-development baseline conditions. Hydrologic data input to operational models may be historical, synthesized, or a combination of both.

Continuation and expansion of existing monitoring programs are essential to provide a more detailed and quantitative assessment of cumulative effects of hydro development (apart from other natural and anthropogenic influences on the water regime) in the future.

7.3.6 Limited integration and synthesis

While the RCEA drew upon work from a variety of disciplines, it did not always effectively integrate this material in its analysis. For example, within the Water Quality section, there was no integrative analysis of how physical, limnological, hydrologic, and water quality cumulative effects relate to one another or how they may affect fish communities. This also was noticeable for some terrestrial aspects of the RCEA.

On a broader scale, the Phase I and Phase II reports could have benefited from an executive summary that articulated the goals of the particular RCEA, highlighted its major conclusions, and synthesized the findings from the various report subsections. Summarizing such a large body of material would, it has to be recognized, be difficult. But without such a summary, it becomes difficult to use the RCEA to establish priorities for further action.

Manitoba Hydro and the Manitoba government did later prepare a separate document, titled the Regional Cumulative Effectives Assessment for Hydroelectric Developments on the Churchill, Burntwood and Nelson River Systems: Integrated Summary Report (RCEA-ISR), which took a more holistic approach. For example, the Integrated Summary Report looks at each hydraulic reach and summarizes impacts on water, shorelines, and fish communities in a more cohesive manner. A similar approach is taken for terrestrial impacts and impacts on people. While the Integrated Summary Report does not stand as an executive summary for the Phase II report, it helped to address the question of how the major categories of impacts are linked. The Integrated Summary Report also drew conclusions regarding the state of fish and wildlife habitat and populations in the region of interest.

7.3.7 Limited use of Aboriginal Traditional Knowledge

The RCEA does reference the views of community members regarding pre-development conditions related to a number of RSCs. However, it is the view of the commission that where pre-development information was absent or limited, a more systematic inclusion of Aboriginal Traditional Knowledge would have been helpful in choosing, developing, and verifying baseline information for many of the RSCs. For example, while riparian habitat (that would include marshlands) was not included as an RSC, this habitat supports a variety of fish and wildlife. The historical presence, location, and importance of this habitat could be estimated by incorporating Aboriginal Traditional Knowledge. Greater use of Aboriginal Traditional Knowledge may have also helped to more accurately determine the effects on shorebirds, colonial and other waterbirds, moose, beaver, muskrat, fish, belugas, and seals.

It is recognized that sturgeon populations in the ROI were highly impacted by commercial harvests prior to hydroelectric development in the region. However, there are likely to have been hydro-specific impacts on the remaining population and on its recovery. These impacts may have been more fully captured with the more

extensive inclusion of Aboriginal Traditional Knowledge.

7.3.8 Limitations of habitat models

For a number of terrestrial RSCs, habitat models were used that have not been tested with field data in the region of interest to see if the model accurately reflects the suitability of the habitat.

In the case of beaver, this led to the conclusion that suitable habitat remains plentiful on and off the system. The model, however, did not take into account potential impacts from changes in hydrologic regimes on the suitability of this habitat. Information from trappers reported in the RCEA indicated that the hydrologic regime may well be a primary factor in determining habitat suitability.

Regional and on-system habitat models were used to assess potential impacts of hydroelectric development on waterfowl. Since the habitat models were untested in the region, there may be other factors, such as vegetation cover and availability of suitable food sources, that deter waterfowl use of these habitats. Without verification, it cannot be concluded that these habitats are actually used. The RCEA acknowledged that hydroelectric development had flooded many islands historically used by colonial waterbirds for nesting sites. The RCEA, after identifying off-system islands, concluded that birds that had lost their primary nesting sites would go elsewhere. The report did not verify whether birds were using off-system islands at an increased rate or whether these islands constituted suitable nesting habitat for the species concerned. In addition, no mention was made of nests of colonial and other waterbirds flooded out by water-level fluctuations on-system after they initiated nesting.

The habitat modelling used in the RCEA for moose was not tested for the region, and neither was the importance of the riparian habitat to the moose population addressed in the RCEA.

In these cases, reliance on untested models means that the RCEA conclusions for these RSCs should be viewed as speculative.

7.3.9 Limited quantitative analysis of Intactness

The RCEA analysis of intactness was based upon a qualitative evaluation of the spatial distribution of effects from linear features and human footprints, and a quantitative assessment on a limited number of metrics of intactness. A broader quantitative assessment that employed widely used metrics for the amount and spatial distribution of intactness would have provided additional rigour to the analyses, as would have comparison with other jurisdictions or reference areas. Alternative mapping approaches (e.g., density maps) could also have been used to better visualize the cumulative impacts of anthropogenic features, especially given the small size of many features relative to the large size of terrestrial ecoregions used for mapping and analysis.

7.4 Management

In a standard cumulative effects assessment, analysis is followed by management. The first step involves identifying ways in which effects can be mitigated. Mitigative measures can involve the avoidance of the impact, minimization of it (mitigation), or repair of the impact (remediation), or can provide some form of offset or compensation. These actions can form the basis of an environmental management plan. A formal determination is then made of the persistence of residual effects (effects that are anticipated to occur despite mitigative actions) and how much impact they may continue to have (significance). Typically, the following factors are taken into account when making a determination of significance:

- magnitude (size of the effect)
- geographic range (how much of the area it affects)

- duration (how long it lasts)
- reversibility (whether it can be fixed)
- frequency (how often it occurs)
- ecological and social significance (how it affects the functioning of the environment and the socio-economics of the project area)

Effects are typically classified as "not significant," "potentially significant," or "significant." A follow-up plan is then put in place to monitor the impacts of development and the effectiveness of the environmental management plan. This work can identify unexpected effects, identify the results of changes to operating systems, and lead to changes in system operations or improvements in mitigation measures.

The RCEA does not address the management of effects in a formal, systematic manner. The rationale for this decision is contained in the RCEA terms of reference:

> Regional cumulative assessments are typically used as a government's tool to facilitate broad, long-term planning decisions regarding a range of development options for a prescribed area or basin. In the case of the Nelson River sub-watershed, such planning decisions were made over forty (40) years ago and any impacts that may have resulted are largely irreversible at this point in time and/or the environment has now adapted. (Appendix 2)

It should be noted that there is considerable material in the RCEA relating to mitigative actions. Description of various infrastructure mitigation works, such as the Cross Lake Weir, the Churchill Weir, the Manasan Falls Ice Control Structure, and the remediation of the Two-Mile and Eight-Mile channels, is found in Part II (Hydroelectric Development Project Description in the Region of Interest). In specific cases, data are provided that are indicative of the impact of these mitigative measures. Various compensation programs, including the Northern Flood Agreement and the various comprehensive implementation agreements related to the NFA, are discussed in Part III (People). According to this section, Manitoba Hydro has spent in excess of $800 million on mitigation, remediation, and compensation (Manitoba – Manitoba Hydro 2015, 3.4-2).

Although there is considerable material in the RCEA describing mitigative actions, including discussions regarding structural works and various compensation programs, there is little formal determination as to:

- whether the stated actions have had their intended effects
- whether residual effects remain and, if so, how significant they are
- whether there are further mitigative actions that could be taken or existing actions could be modified

Without such assessment, the statement in the RCEA terms of reference that impacts are irreversible and/or that the environment has adapted remain speculative.

8. Conclusions

The RCEA compiled a very significant amount of historical information, provided an extensive overview of current conditions, and identified gaps that help to set an agenda for future study. Through the RCEA, Manitoba Hydro and the Manitoba government have taken a significant step towards identifying the cumulative effects of hydroelectric development in the Nelson, Burntwood, Rat, and Churchill river systems. As noted in community submissions and the commission's assessment, the RCEA departed from best practices in a number of areas. These include limitations in the scoping process (including a lack of community engagement), limitations regarding pre-development conditions, and the lack of a prospective analysis.

In light of these limitations, a number of community submissions recommended that the RCEA be redone. The commission does not view this as an effective use of time and resources. Instead, the commission proposes that the RCEA serve as a basis for further, future-oriented systemic monitoring, research, analysis, and planning. Such a contribution could:

- lead to improved planning and sustainable development decisions in the North
- support the Look North Strategy

- strengthen relationships with First Nation, Metis, and other northern communities
- streamline environmental reviews of future developments and relicensing of existing facilities
- guide appropriate mitigation measures

A first step would be to integrate into the RCEA record the future impact projections from the Bipole III and Keeyask Generating Station environmental impact assessments, including those conducted by the communities, as well as any potential impacts from future development in the region.

The following areas need to be addressed to help fill gaps in the analysis to date:

- community engagement
- monitoring
- environmental assessment policy

8.1 Community Engagement

The history of relations between northern Indigenous communities and Manitoba Hydro and the Manitoba government has, for much of the past 60 years, been marked with considerable conflict. The Northern Flood Agreement and subsequent additional agreements have been put in place. In recent years, as the RCEA noted, partnerships have been developed with a number of First Nations in relation to new generating stations. Meanwhile, the environmental and associated socio-economic changes caused by hydroelectric development persist throughout the ROI.

The community submissions and the individual presentations made to the commission make it clear that many communities and individuals view Manitoba Hydro and the Manitoba government with suspicion and, in some cases, hostility. It is clear that, in the eyes of many affected community members, hydro development is seen as the source of many, if not most, of the negative community impacts that have occurred over the past years and decades. The RCEA process could have played a role in bridging this divide by allowing the parties to work together. However, many community submissions indicate that the decision not to engage communities prior to the completion of the Phase II report may have widened rather than helped close this gap.

The commission suggests that in any monitoring, assessment, relicensing, or planning that is ongoing or to be initiated in the future must address this participation deficit. Community involvement should:

- Start early and be ongoing.
- Be inclusive.
- Allow for community input into setting goals and objectives.
- Accommodate collaboration and inclusion of local and Aboriginal Traditional Knowledge.
- Include two-way communication.
- Provide information in a form and format that is accessible to all.
- Allow for review of completed projects and an opportunity to provide recommendations for future actions.

A number of traditional knowledge or land-use studies have been compiled as part of licensing processes in the region of interest. The commission notes that such studies have provided important and useful information regarding the Indigenous worldview and relationships with the land and water. The completion of similar reports for remaining communities in the ROI should be considered to more fully understand the use of the land and the impacts of hydro and other developments on these lands and the communities. These reports would be valuable documents in moving to the next phase of engagement and the upcoming relicensing process of Lake Winnipeg Regulation, Churchill River Diversion, and the generating stations on the Lower Nelson

River (Kettle, Long Spruce, and Limestone). Information gathered from these studies should be integrated into the resulting reports and environmental assessments.

Manitoba Hydro and the Manitoba government should act upon the opportunity to improve the relationships with the region's First Nations, the Metis, and others communities in the region.

8.2 Monitoring

While the RCEA did not propose new monitoring programs, it did describe the Co-ordinated Aquatic Monitoring Program (CAMP), which was established by Manitoba Hydro and the Manitoba government as a long term, systematic, system-wide monitoring program for water bodies affected by Manitoba Hydro's operating system (along with some off-system water bodies). CAMP commenced as a pilot program in 2008 and became a full program in 2011. It coordinated existing monitoring programs and was intended to represent a move away from an earlier issue-driven, site-specific approach to study and research. The RCEA did not, however, report on CAMP and its findings or analyze the program's effectiveness. As its name suggests, CAMP is limited to monitoring environmental parameters in the aquatic environment, leaving terrestrial components of the ROI without systematic, coordinated, science-based monitoring. In the following section, the commission discusses its proposal for future monitoring.

The Co-ordinated Aquatic Monitoring Program constitutes an important step forward in the systemic monitoring of the environmental impact of hydroelectric development on aquatic components.

Manitoba Hydro and the Manitoba government set CAMP's goals and objectives, select parameters, conduct the sampling, analyze the data, and undertake the reporting of results. CAMP is an important initiative; however, environmental monitoring is most useful when it is well coordinated, when the right partners participate, when quality is built in from the beginning, when reports are designed to be useful to the receiving audiences, and when resources are used efficiently. As in scoping, including other participants, particularly community participants, in establishing which parameters are to be monitored, how the elements of the various disciplines are to be integrated, who is to do the monitoring, the monitoring program's goals, and how results will be used and reported improves a program's effectiveness and legitimacy. A broader level of participation should not dilute the core, science-based principles required to achieve effective and coordinated monitoring; rather, it will help the initiative to achieve relevance for a range of participants, including citizens most affected by the development.

The RCEA and community submissions and presentations make it clear that there is a need for such monitoring to be enhanced in two important ways:

- the monitoring of terrestrial/riparian parameters
- the inclusion of participation from outside of Manitoba Hydro and the Manitoba government in the expansion and operation of future monitoring

Currently, there is little systematic and ongoing monitoring for riparian and littoral habitats or for erosion and sedimentation. Furthermore, terrestrial monitoring is limited to work that is being carried out to meet the licence conditions for recent projects.

An enhanced monitoring program should arise from a process of co-operation and debate that involves Manitoba Hydro, government departments and agencies, communities, and technical experts.

The commission would recommend that the following elements be considered for inclusion in developing an enhanced monitoring program:

- a process that includes community representatives as well as Manitoba Hydro and the Manitoba government
- creation of collaborative and peer-review opportunities with academics and other relevant agencies and organizations
- incorporation of historical data from researchers who previously worked in the region of interest
- investigation of monitoring programs in other jurisdictions such as the monitoring program co-operatively carried out by Hydro Quebec and the Cree in Quebec
- development of metrics that measure human interaction with the environment and address identified community needs
- development of clear monitoring goals and expected outcomes
- community participation in the operation of the monitoring program, including the use of Aboriginal Traditional Knowledge and local knowledge
- monitoring of mitigation measures and adaptive environmental management in response to monitoring results
- provision of information to the public in a clear, accessible, and regularly updated fashion about the purpose and structure of the program, the rationale for the selected parameters, methodology, and interpretation of findings

In conjunction with enhanced monitoring and data collection, system models could provide further insight regarding the interrelated impacts on the system. In its report on Lake Winnipeg Regulation, the commission recommended that Manitoba Hydro develop operational models that would allow for evaluation of alternative approaches to system management. It is the commission's understanding that such models are used by utilities in other watersheds and basins to guide the operations of the system. Such a model could not only be used to compare pre-development conditions with current conditions, but it could also simulate future conditions that may impact water quality and sediment deposition. The ability to create potential scenarios may be useful in anticipating the effects on the system of climate change and the impacts on communities. It would allow for adaptation to address changing conditions. These models can also be used to identify outcomes that would arise from alternate modes of system operation.

Such a model(s) would be useful in the relicensing process for Lake Winnipeg Regulation, Churchill River Diversion, and the generating stations on the Lower Nelson River, or any further development in the region. Such models would allow for better understanding of the implications of the water management decision associated with each licence, and increase the transparency of the process and provide information that would be of value to people using the waterways.

8.3 Environmental Assessment Policy

Community presentations and the commission's review have identified a number of ways in which the RCEA departed from best practice for environmental impact assessment (EIA), particularly in the scoping of the RCEA. These departures underscore an issue that the commission raised in previous reports: the need for the Manitoba government to provide greater clarity as to the expected approach to be taken in cumulative effects assessment. The review also identified the limited nature of the analysis of socio-economic impacts in the RCEA. This limitation is significant, given the degree to which a number of communities have concluded that these projects have, and continue to have, deleterious impacts on the lives of their residents.

The Manitoba government could make a significant contribution to the environmental assessment process by:

- establishing policies and guidance for the conduct of environmental assessment and cumulative and regional assessments
- providing comprehensive and clear guidance for proponents, consultants, and practitioners for cumulative and regional assessments
- establishing protocols for best professional practice that includes cumulative effects assessment

These initiatives would provide clarity to the process and guidance on public engagement, the use of traditional and local knowledge, selection of appropriate valued environmental components, selection of baseline conditions, the development and use of thresholds, and the use of best practices for socio-economic assessment in the conduct of environmental assessments and cumulative effects assessments. The protocols should reduce uncertainty, enhance effectiveness, and improve predictability of future environmental assessments.

In developing policy guidance, the Manitoba government should consider the adoption of a higher order, strategic approach to environmental impact assessment. As noted in Section 2.4, a regional strategic environmental assessment would assess the potential effects of different initiatives, policies, plans, or programs for a particular region. Such an approach would engage community members, focus on sustainability, facilitate planning, and provide clarity to project proponents, allowing for a smoother and more focused approach to the assessment of specific projects. Regional strategic environmental assessment could address the need for effective evaluation of the cumulative environmental impact of all significant development activities in a region. The foundations for this broader and earlier assessment approach may be set out in government environmental impact assessment legislation, reflected in policies, and tied to land-use planning. While regional strategic environmental assessment is rarely exercised in Canada, it may well prove key to environmental sustainability in Canada and Manitoba.

8.4 Going Forward

Manitoba Hydro and the Manitoba government have committed to producing a Next Steps document, taking into consideration the results of the outreach activities. It is hoped that the feedback from communities and the guidance provided by the commission will inform the Next Steps and the management of the Nelson, Burntwood, Rat, and Churchill river systems in the future.

Works Cited

André, P., B. Enserink, D. Connor, and P. Croal. 2006. *Public Participation International Best Practice Principles*. Special Publication Series No. 4. Fargo, ND: International Association for Impact Assessment.

Blakeley, Jill, Peter Duinker, Lorne Grieg, George Hegman, and Bram Noble. n.d. "Cumulative Effects Assessment." International Association for Impact Assessment.

Canada. Expert Panel Review of Environmental Assessment Processes. 2017. *Building Common Ground: A New Vision for Impact Assessment in Canada: The Final Report of the Expert Panel for the Review of Environmental Assessment Processes*. Ottawa, ON: Canadian Environmental Assessment Agency.

Canadian Council of Ministers of the Environment. 2009. *Regional Strategic Environmental Assessment in Canada: Principles and Guidance*. Winnipeg, MB: Canadian Council of Ministers of the Environment.

Canadian Council of Ministers of the Environment. 2014. *Canada-Wide Definitions and Principles for Cumulative Effects*. Winnipeg, MB: Canadian Council of Ministers of the Environment.

Canadian Environmental Assessment Agency. 2014. *Technical Guidance for Assessing Cumulative Effects under the Canadian Environmental Assessment Act, 2012*. Draft. Ottawa, ON: Canadian Environmental Assessment Agency.

Cumulative Effects Assessment Working Group and AXYS Environmental Consulting for the Canadian Environmental Assessment Agency. 1999. *Cumulative Effects Assessment Practitioners Guide*. Hull, QC: The Agency.

Kale, Heikki, and Lea den Broeder, with input from Charlotte Bingham, Peter Croal, Richard Fuggle, Raphael Mwalysoi, and Mario and Rosário Partidário. n.d. *Effective Stakeholder Engagement*. Fargo, ND: International Association for Impact Assessment.

Manitoba – Manitoba Hydro. 2015. *Regional Cumulative Effects Assessment for Hydroelectric Developments on the Churchill, Burntwood and Nelson River Systems: Phase II Report*. Winnipeg, MB: Manitoba Hydro.

Manitoba – Manitoba Hydro. n.d. *Regional Cumulative Effects Assessment for Hydroelectric Developments on the Churchill, Burntwood and Nelson River Systems: Integrated Summary Report*. Winnipeg, MB: Manitoba Hydro.

Manitoba Clean Environment Commission. 2004. *Report on Public Hearing: Wuskwatim Generation and Transmission Projects*. Winnipeg, MB: Manitoba Clean Environment Commission.

Manitoba Clean Environment Commission. 2005. *Report on Public Hearing: Red River Floodway Expansion*. Winnipeg, MB: Manitoba Clean Environment Commission.

Manitoba Clean Environment Commission. 2013. *Bipole III Transmission Project: Report on Public Hearing*. Winnipeg, MB: Manitoba Clean Environment Commission.

Manitoba Clean Environment Commission. 2014. *Keeyask Generation Project: Report on Public Hearing*. Winnipeg, MB: Manitoba Clean Environment Commission.

Manitoba Hydro. 2014. *Regional Cumulative Effects Assessment for Hydroelectric Developments on the Churchill, Burntwood and Nelson River Systems: Phase I Report*. Winnipeg, MB: Manitoba Hydro.

Noble, Bram. 2015. *Introduction to Environmental Assessment*. 3rd ed. Oxford: Oxford University Press.

Senécal, Pierre, Bernice Goldsmith, Shirley Conover, Barry Sadler, and Karen Brown. n.d. *Principles of Environmental Impact Assessment Best Practice*. Fargo, ND: International Association for Impact Assessment in cooperation with Institute of Environmental Assessment.

Sinclair, A. J., M. Doelle, and P. N. Duinker. 2017. "Looking Up, Down, and Sideways: Reconceiving Cumulative Effects Assessment as a Mindset." *Environmental Impact Assessment Review* 62: 183–94.

Therivel, Riki, and Bill Ross. 2007. "Cumulative Effects Assessment: Does Scale Matter?" *Environmental Impact Assessment Review* 27, no. 5: 365–85.

Therivel, Riki, and Graham Wood. 2018. *Methods of Environmental and Social Impact Assessmen*t. New York, NY: Taylor and Francis.

World Commission on Environment and Development. 1987. *Our Common Future*. Oxford: Oxford University Press.

Appendix 1: CEC Terms of Reference

MINISTER OF
SUSTAINABLE DEVELOPMENT

Legislative Building
Winnipeg, Manitoba, CANADA
R3C 0V8

Mr. Serge Scrafield
Chair
Clean Environment Commission
Room 305 – 155 Carlton Street
Winnipeg MB R3C 3H8

MAR 0 2 2017

Dear ~~Mr. Scrafield~~ Serge,

On August 20, 2015, the Clean Environment Commission was requested to conduct a series of public outreach meetings on the final report of the Regional Cumulative Effects Assessment completed by Manitoba and Manitoba Hydro for the Nelson, Burntwood and Churchill River systems. Since that time, the final report has been completed, and there has been an opportunity for all involved parties to consider the very large amount of information in the final report.

Upon this consideration, I am amending the Commission's Terms of Reference to more closely focus the public outreach on information that will supplement the final report and assist in future steps. I have enclosed updated Terms of Reference to guide your review.

Following the review, please provide me with a report summarizing the input received through the public outreach program.

For any information needed on the Regional Cumulative Effects Assessment, you may contact Ms. Tracey Braun, the Director of the Environmental Approvals Branch, at (204) 945-7071.

Yours sincerely,

Cathy Cox

Cathy Cox
Minister

c. Tracey Braun

Terms of Reference

Clean Environment Commission

Regional Cumulative Effects Assessment of the Nelson, Burntwood and Churchill Rivers System (the project)

Background

In its 2013 report on the Bipole III Project, the Clean Environment Commission (the Commission) made the following recommendation:

> "Manitoba Hydro, in cooperation with the Manitoba Government, conduct a Regional Cumulative Effects Assessment for all Manitoba Hydro projects and associated infrastructure in the Nelson River sub-watershed; and that this be undertaken prior to the licensing of any additional projects in the Nelson River sub-watershed after the Bipole III project."

This recommendation was accepted by Manitoba and a Terms of Reference for a regional cumulative effects assessment of hydroelectric developments was agreed to in May 2014. It should be noted the scope was expanded to include areas beyond that identified in the Commission's recommendation to include the Churchill, Burntwood and Nelson River systems. The study was completed in two phases. The first phase was completed in May 2014, and included a compilation of available data and a description of the assessment approach to be used to analyze the data in the second phase. The second phase report was completed in December 2015.

The second phase report analysed available data and studies and documented what is known from a technical perspective about the cumulative effects of hydro-electric development on the land, water and people within the region. The report is deemed to have met the Commission's recommendation as noted above.

There was considerable public interest in the regional cumulative effects assessment and limited opportunities for affected study area residents and communities to participate in the completion of either of the phases of the assessment. Therefore, a public outreach program should be implemented to supplement the findings of the second phase report. These terms of reference describe the work expected from this review which will be conducted by the Commission.

Terms of Reference

Pursuant to Section 6 (5.1) of the Act, the Minister has determined that the Terms of Reference the Commission shall follow for this public outreach are:

- To review the final Phase I and Phase II reports on the regional cumulative effects assessment;
- To carry out a Participant Program with limited funding available;
- To invite all affected First Nations, and communities identified in the assessment study area and the Manitoba Metis Federation to provide written input on the regional cumulative effects assessment and its accuracy in presenting past effects and community perspectives and concerns, and to provide any additional information relevant to the assessment;
- To facilitate a web-based review of the final Phase II report for interested parties outside the Region of Interest;
- To write back to the communities who have already responded to the CE inviting them to once again provide written comments, and offering a small amount of funding to facilitate their participation. If a community really expresses a desire to meet in person with the CEC, it could be accommodated. and

- To prepare and file a separate report with the Minister of Sustainable Development summarizing what was received from participants during the course of the public outreach program, including any comments received through the web-based review. The report should be filed within four months from the date of completion of the review.

Meetings

Where determined by the Commission to be necessary, meetings may be conducted by the Commission with affected First Nations and communities in the study area. Any meetings should be conducted in a manner that encourages inclusiveness and minimizes formality.

Review and Clarification

The Commission may, at any time, request that the Minister of Sustainable Development review or clarify these Terms of Reference.

February 15, 2017

Appendix 2: RCEA Terms of Reference

Manitoba Hydro

360 Portage Ave • Winnipeg Manitoba Canada • R3C 0G8
Telephone / *N° de téléphone :* (204) 360-3690 • Fax / *N° de télécopieur :* (204) 360-6135
wabrown @hydro.mb.ca

2014 05 27

Environmental Assessment & Licensing Branch
Manitoba Conservation and Water Stewardship
Suite 160 - 123 Main Street
Winnipeg MB R3C 1A3

Attention: Ms. Tracey Braun

Dear Ms. Braun:

Re: Letter of Confirmation for Regional Cumulative Effects Assessment

By way of this letter, both Manitoba and Manitoba Hydro confirm that they are in agreement with the attached final Terms of Reference to conduct a Regional Cumulative Effects Assessment (RCEA) of hydro-electric developments that includes the Nelson, Burntwood, and Churchill River systems, as defined below and in the Terms of Reference.

The RCEA is being conducted in two phases and is designed to address Recommendation 13.2 of the Clean Environment Commission Report on Public Hearing for the Bipole III Project. In his letter of August 14, 2013, the Minister of Conservation and Water Stewardship specifically committed to implementing this recommendation, which states:

> *"Manitoba Hydro, in cooperation with the Manitoba Government, conduct a Regional Cumulative Effects Assessment for all Manitoba Hydro projects and associated infrastructure in the Nelson River sub-watershed; and that this be undertaken prior to the licensing of any additional projects in the Nelson River sub-watershed after the Bipole III project."*

It is planned that the final RCEA report will be available in late fall 2015. It will be retrospective in nature and will:

- identify, describe and acknowledge the cumulative effects of past Hydro developments;
- describe the current state of the environment in areas affected by Manitoba Hydro's system; and,
- describe a process for continued monitoring of and reporting on the state of the environment into the future.

The final RCEA report will be based on a review and synthesis of past and ongoing studies and monitoring programs, and will include both technical science and Aboriginal Traditional Knowledge to the extent that each is available.

It is intended that an interim product will be available in late May 2014 to demonstrate progress towards the overall RCEA and to provide an early identification of the studies and information being gathered to undertake the final RCEA, and the methods to be employed for the assessment.

Manitoba and Manitoba Hydro are further committed to implementing an appropriate public engagement process. This engagement process will be determined following submission of the interim report and will include opportunities for Aboriginal and other communities in the Region of Interest, as well as other interested parties, to provide their perspectives on the cumulative effects of hydroelectric development in the Region of Interest.

Confirmed this day of May, 2014:

Manitoba Hydro
Per: William Brown
Manager, Environmental Licensing and Protection

Confirmed this 27 day of May, 2014:

Government of Manitoba
Per: Director
Environmental Approval
Conservation and Water Stewardship

Regional Cumulative Effects Assessment Terms of Reference

Joint Approach to Undertaking a Regional Cumulative Effects Assessment for Hydro Developments as per Recommendation 13.2 of the Clean Environment Commission (CEC) Bipole III Report

Manitoba Conservation and Water Stewardship and Manitoba Hydro

Background

The 2013 Clean Environment Commission (CEC) Bipole III Report included a list of non-licensing recommendations to be carried out jointly by Manitoba Hydro (MH) and the provincial government. On behalf of government, the Minister of Conservation and Water Stewardship (CWS) committed to implementing these recommendations.

These Terms of Reference provide a proposed approach to addressing one of the CEC's non-licensing recommendations, specifically number 13.2, which states:

> "Manitoba Hydro, in cooperation with the Manitoba Government, conduct a Regional Cumulative Effects Assessment for all Manitoba Hydro projects and associated infrastructure in the Nelson River sub-watershed; and that this be undertaken prior to the licensing of any additional projects in the Nelson River sub-watershed after the Bipole III project."

The CEC report details the rationale for this recommendation. In short, during the Bipole III hearings, some communities expressed concerns regarding effects they have experienced, and continue to experience, as a result of existing MH projects. The CEC noted that "…it became apparent that past hydro-electric developments in northern Manitoba have had a profound impact on communities in the area of these projects, as well as on the environment upstream and downstream." Similar concerns were identified in the CEC's 2004 "Wuskwatim Generation and Transmission Projects" hearing report.

On October 17, 2013, the CEC heard motions from participants in the Keeyask CEC process who were requesting that the Keeyask Generation Project hearing be delayed until the recommended regional cumulative effects assessment is complete. As part of this motions hearing, the CEC noted the volume of study that has been completed to date by Manitoba Hydro in the Nelson River region and suggested that Recommendation 13.2 could readily be satisfied by pulling together and analyzing this information, rather than undertaking new field work or seeking new information.

Consistent with the Recommendation 13.2 and comments made by the CEC on October 17, 2013, these terms of reference will:

- identify the challenges ahead in making such an assessment decades after the developments have occurred;
- identify the scope of the study to address recommendation 13.2;
- describe the approach to be used to address the challenges while still meeting the intent of the recommendation;
- outline the work tasks to be done, who will have the accountability for each task and the timelines for completion;
- describe the desired end product; and,
- set out how the process will be managed between the Manitoba government and MH.

Challenges and Scope

Manitoba Hydro's major northern developments include the Churchill River Diversion (1976), Lake Winnipeg Regulation (1976), Kelsey Generating Station (G.S.)

(1961), Kettle G.S. (1974), Long Spruce G.S. (1979) Limestone G.S. (1992) and Bipole I and II (1971 and 1978). These developments were assessed, designed, and constructed to meet the environmental assessment (EA) requirements of the time. Over the many ensuing years, EA practices and assessment procedures have evolved to where they are today.

The key differences between past and current EA practices are: the analysis of whole ecosystems; cumulative effects/ impacts assessment; and, the collection of pre-development data that would be used to provide the context from which to measure future environmental impacts. As a result, establishing a pre-development condition from which to evaluate cumulative impacts will be a challenge in addressing the CEC's recommendation. This is not uncommon in cases where areas were developed many decades past.

In addition to assessing cumulative impacts over time, the CEC's recommendation refers to assessing these impacts over space, i.e., regionally. Regional cumulative assessments are typically used as a government's tool to facilitate broad, long-term planning decisions regarding a range of development options for a prescribed area or basin. In the case of the Nelson River sub-watershed, such planning decisions were made over forty (40) years ago and any impacts that may have resulted are largely irreversible at this point in time and/or the environment has now adapted.

Notwithstanding these challenges, the Manitoba government and MH will provide the best information possible to satisfy the objectives of the CEC's Bipole III recommendation 13.2. Also in terms of scope, it is proposed to include areas beyond that identified in the CEC recommendation to include the Churchill, Burntwood and Nelson river systems.

Work Steps, Approach to the Study and Accountability

Given the above, Manitoba and Manitoba Hydro believe that the best option to address Recommendation 13.2 is the development of a plain language "Regional Cumulative Effects Assessment for Hydro Developments on the Churchill, Burntwood and Nelson River Systems" that describes environmental change over time as a result of previous hydro development, including impacts, mitigation measures, community issues, compensation and the current quality of the environment. The report will be based on a review and synthesis of past and ongoing studies and monitoring programs. The proposed region of study is greater than that identified in the CEC report.

Specifically, the final report would:

- identify, describe and acknowledge the cumulative impacts of past Hydro developments;
- describe the current state of the environment in areas affected by Manitoba Hydro's system; and,
- describe a process for continued monitoring of and reporting on the state of the environment into the future.

The report would use and incorporate, to the extent possible, attributes of contemporary environmental effects assessment and post-project assessment methodology. This type of assessment would be very similar to the approach taken from the documents currently being prepared by Manitoba Hydro at the CEC's request for the review of the application for finalization of the Water Power Act licence for Lake Winnipeg Regulation.

Phase One

The first phase will be to develop a plain language report entitled "A Response to Recommendation 13.2 – Phase 1: A Summary of Environmental Results" that summarizes and describes what is known about the environment in areas affected

by hydroelectric developments that are associated with the lake Winnipeg Regulation and Churchill River Diversion areas. Using text and matrices, it would include:

- A description of all projects/facilities and key points such as area flooded, area of land affected, etc.
- A discussion of the history of Settlement Agreements.
- The preparation of a bibliography of all existing information on the environmental effects associated with hydro development in the Nelson River basin area including effects associated with CRD, LWR, Kelsey, Kettle, Long Spruce, Limestone, Radisson, Henday, Bipole I and II and other transmission components, and all related infrastructure such as water control structures and roads.
- A compilation, synthesis and summary of this information in text format and in matrices. This will essentially provide an organized (by topic and region) summary of all available environmental effects from existing studies.
- A summary of current monitoring information collected since 2008 by Manitoba and Manitoba Hydro's Coordinated Aquatic Monitoring Program (CAMP) and the long term monitoring program associated with Bipole III.
- Development of metrics, where feasible, of ecosystem health (by Manitoba) to enhance the assessment of information and data during Phase II and based on jointly agreed to regional study components.
- Preparation and submission of an interim report.
- Manitoba and Manitoba Hydro will work together to collect, summarize and document what has been learned through past and current consultation and Aboriginal Traditional Knowledge processes.

The consolidation, organization and synthesis of the vast amount of information and data that have been collected over the last several decades will provide the foundation for assessing the current quality of the environment in areas affected by hydroelectric developments associated with the Lake Winnipeg Regulation and Churchill River Diversion areas – primarily the Churchill, Burntwood and Nelson River systems.

To the extent possible, attributes of contemporary environmental effects assessment and post-project assessment methodology will be used which will be consistent with the approach currently being requested by the CEC for the review of the application for the finalization of the Water Power Act Licence for the Lake Winnipeg Regulation.

Accountability for the preparation of the Phase I report will be with MH; but Manitoba will participate jointly in collecting, summarizing and documenting what has been learned through past and current consultation and Aboriginal Traditional Knowledge processes. The Phase I "Summary of Knowledge Acquired: Phase I of a Regional Cumulative Effects Assessment for Hydro Developments on the Churchill, Burntwood and Nelson River Systems" will be completed by May 31, 2014 and submitted to the Minister of CWS on behalf of the Manitoba government. The initial Phase I report will provide the basis for the Phase II work.

Upon receipt of the Phase I report from MH, CWS will facilitate an internal review by departmental experts who will be expected to provide technical expertise and recommendations for the assessment. It is expected that Manitoba government will provide input where appropriate to be considered for the enhancement of the Phase II report and will communicate this to MH in a consultative and collaborative manner throughout the summer and fall of 2014.

Phase II

Phase II would include an assessment of the environmental effects of hydro development based on all available existing information, and utilizing to the degree possible the attributes of methodologies for environmental effects assessment and post-project assessment. This assessment would be undertaken by MH and would include:

- Pathways-of-effects diagrams to provide a visual representation of the possible linkages between the projects and the environment.
- An assessment (to the extent possible) of the environmental and socio-economic effects to identified regional study components of previous Hydro development (based on available information and, wherever possible, based on pre-hydro development information);
- A determination of the current quality of the environment in areas affected by Hydro development based on more current monitoring and assessment data and in consideration of available thresholds and benchmarks, as well as conditions in off-system areas, where applicable;
- The identification of gaps in information; and,
- Preparation of an Environmental Assessment and State of Knowledge Report.

The report prepared at the end of Phase II by Manitoba Hydro entitled "Regional Cumulative Effects Assessment for Hydro Developments on the Churchill, Burntwood and Nelson River Systems: Final Report" is to be provided to Manitoba in October, 2015, and submitted to the Minister of CWS on behalf of the Manitoba government. Upon receipt of the Phase II report from MH, as with the Phase I report, CWS will facilitate an internal review by departmental experts who will be expected to provide technical expertise and recommendations prior to finalizing the report.

Early in Phase II, Manitoba and Manitoba Hydro will also determine the exact nature and design of any appropriate public engagement processes. Once determined, Manitoba Hydro will provide the funding required to undertake the agreed to public engagement process.

Beyond Phase 2

CWS and MH will continue long term monitoring efforts managed under the Coordinated Aquatic Monitoring Program (CAMP) and the Bipole III monitoring and reporting programs to ensure that the environment is sustainably managed and protected well into the future.

Desired End Product

The desired end product will be a final report that addresses the intent of the CEC's Bipole III hearing report Recommendation 13.2, but that also provides a consolidated, vast, and comprehensive collection of environmental data and community knowledge about the region. It is fully intended that the report will be a resource for government and all Manitobans on the state of the environment in this resource and heritage-rich part of the province.

Process for Collaboration

The CEC recommended that the assessment be done in cooperation between MH and the Manitoba government. Although the major portion of report preparation will be the responsibility of MH, CWS, on behalf of the Manitoba government, will facilitate regular and ongoing input from internal experts as needed throughout each phase of the study (e.g., wildlife, fisheries, Heritage resources, forestry, etc.) and will contribute available information from its records to complete the study.

It is anticipated that a small project management team consisting of representation of both MH and CWS will be established and will meet on a regular basis to check milestones, schedules, and to

discuss/resolve issues that may arise. The management team will be co-chaired by MH and CWS.

The management team, through their CWS members, shall request issue-specific technical meetings be held as needed with representatives from the relevant program areas to discuss findings, review technical options, interpret monitoring data, and discuss analyses and recommendations and seek government support/direction as necessary. As mentioned above, CWS will formally facilitate an internal review of both the Phase I and Phase II reports.

Timeline

The total length of the study is anticipated to be from January 2014 through October 2015. Work going beyond the submission of the final Phase II report can be determined outside of these Terms of Reference. An estimated summary of the timelines is provided below. It is possible that these dates may change based on the outcomes of Phase I and implementation experience during the course of Phase 2.

TASK	ACCOUNTABILITY	BY WHEN
Finalize Terms of Reference	MH and CWS	Jan. 24, 2014
Submit Phase I report to CWS	MH	May 31, 2014
Facilitate TAC review of Phase I report	CWS	Jul. 31, 2014
Project progress/management meetings (monthly)	CWS and MH	Ongoing
TAC meetings	CWS and MH	As needed
Public Engagement	TBD	TBD
Submit Phase II report to CWS	MH	Oct. 31, 2015
Facilitate TAC review of Phase II report	CWS	Nov. 30, 2015
Finalize Phase II report		Dec. 31, 2015

March 20, 2014

Appendix 3: Relevant recommendations from previous Manitoba Clean Environment Commission Reports

Wuskwatim Generation and Transmission Projects Report (2004)

Recommendation 7.9

The practice of environmental assessment in Manitoba be enhanced by requiring higher standards of performance. In this regard, the Government of Manitoba should

- enact environmental assessment legislation,
- provide guidance for proponents, consultants and practitioners,
- establish protocols for best professional practice that includes cumulative-effects assessment.

The process should include use of traditional scientific knowledge, selection of appropriate VECs, establishment of baseline conditions, and establishment of thresholds in the conduct of environmental assessments. The protocols should reduce uncertainty, enhance effectiveness and improve predictability of future environmental assessments.

Recommendation 7.11

Future environmental impact statement submissions for large-scale hydroelectric developments should directly address the Government Manitoba's Sustainable Development Code and its Financial Management Guidelines. The submissions should also develop appropriate sustainability indicators for use in identifying and assessing environmental effects, and conducting environmental monitoring.

Red River Floodway Expansion Report (2005)

Recommendation 4.1

Guidelines for projects seeking a license under The Manitoba Environment Act be more prescriptive as to what would constitute an acceptable cumulative effects assessment.

Recommendation 4.2

The practice of environmental assessment in Manitoba be enhanced by requiring higher standards of performance. In this regard, the Government of Manitoba should:

- Enact environmental assessment legislation.
- Provide comprehensive and clear guidance for proponents, consultants and practitioners.
- Establish protocols for best professional practice that includes cumulative effects assessment.

The environmental assessment process shall include use of traditional and local knowledge, selection of appropriate valued environmental components, establishment of baseline conditions, and establishment of thresholds in the conduct of environmental assessments. The protocols should reduce uncertainty, enhance effectiveness and improve predictability of future environmental assessments.

Recommendation 4.3

The Government of Manitoba facilitate a mandatory cumulative effects workshop with proponents and potential interveners, especially for projects likely to end up in a public hearings process.

Bipole III Transmission Project Report (2013)

Recommendation 11.1

Manitoba Hydro implement a cumulative effects assessment approach that goes beyond the minimal standard of the 1999 CEAA guidelines [The Cumulative Effects Assessment Practitioners Guide of 1999, which is discussed below] and is more in line with current "best practices." At a minimum, this approach would:

- assess effects in close vicinity to the Project as well as in the regional context;
- assess effects during a longer period of time into the past and future;
- consider effects on VECs due to interactions with other actions, and not just the effects of the single action under review;
- in evaluating significance, consider other than just local, direct effects; and
- include all past, current and reasonable foreseeable actions.

Recommendation 13.1

The Government of Manitoba enhance the practice of environmental assessment by requiring higher standards of performance.

In this regard, the government should:

- Develop environmental assessment standards by whatever means necessary – legislation, regulation, practice directions, protocols or other policy measures.
- Provide comprehensive and clear guidance for proponents, consultants and practitioners.
- Establish protocols for best professional practice.

The new environmental assessment process must, at a minimum, address: use of traditional and local knowledge, selection of appropriate valued environmental components, establishment of baseline conditions, and establishment of thresholds in the conduct of environmental assessments.

The protocols should reduce uncertainty, enhance effectiveness and improve predictability of future environmental assessments.

Recommendation 13.2

Manitoba Hydro, in cooperation with the Manitoba Government, conduct a Regional Cumulative Effects Assessment for all Manitoba Hydro projects and associated infrastructure in the Nelson River sub-watershed; and that this be undertaken prior to the licensing of any additional projects in the Nelson River sub-watershed after the Bipole III Project.

Keeyask Generation Project Report 2014

Recommendation 12.1

The Manitoba Government establish provincial guidelines for cumulative effects assessment best practices and include specific direction for proponents in project guidelines.

Lake Winnipeg Regulation Report

Recommendation 9.1

The Government of Manitoba evaluate the current licensing regime for hydro projects and ensure that legislation and regulation is consistent with modern legislative, consultation and environmental standards.

Appendix 4: Regional Study Components

For Water

- Water Quality
- Fish Community
- Lake Sturgeon
- Mercury in Fish and Fish Quality
- Beluga and Seals

For Land

- Terrestrial Habitat
- Intactness
- Birds (waterfowl and colonial waterbirds)
- Furbearers
- Caribou
- Moose
- Polar bear