Whiteshell Reactor #1 Decommissioning: Manitoba Métis Traditional Knowledge, Land Use, and Occupancy Study

Prepared for:
Manitoba Metis Federation

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Shared Value Solutions

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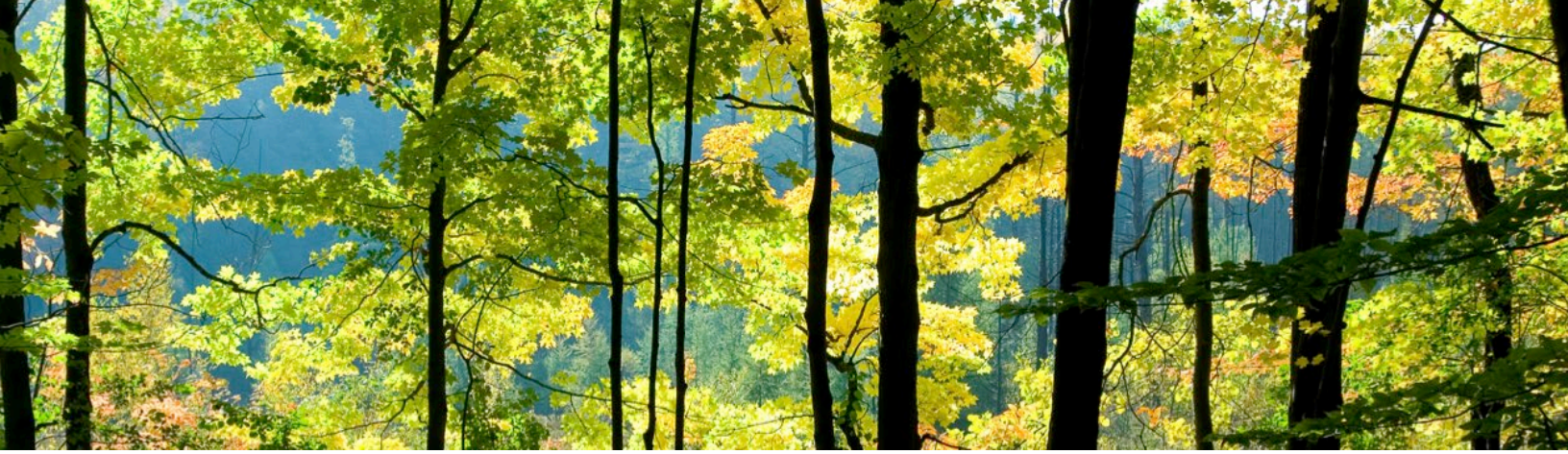

The Research Team

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The Project Director for this Study, Nichole Fraser MacDonald, has a B.A. in Psychology from Mount Allison University, and an M.Sc. in Rural Planning and Development from the University of Guelph. Nichole has more than 13 years of experience designing and conducting community-based research projects and has been carrying out land use and occupancy and oral history work with First Nation and Metis communities in Ontario and Manitoba for seven years. Her work has been used to identify community values and interests, determine potential impacts to way of life, and identify appropriate mitigation and accommodation for major infrastructure developments in the mining and energy sectors. Formerly an Aboriginal Consultation and Communication Specialist at AECOM, she left to establish Shared Value Solutions Ltd. in 2012. Nichole is a 2011 recipient of the Consulting Engineers of Ontario Award for Aboriginal Traditional Knowledge achievements.

Leah Culver, M.A., Project Manager and Traditional Land Use and Knowledge Researcher
Leah Culver is the Lead Researcher and Project Manager for this Study and main author of this report. Leah is a human-environment consultant and sociocultural anthropologist. Leah has a strong background in qualitative method design and research, project management, and community-based social research. Her experience with First Nation and Metis communities in Canada includes socio-economic impact assessments, Indigenous knowledge and land use mapping, oral history research, GIS, documentary film-making, evaluation of water stewardship strategies, and Aboriginal Community Energy Planning. Outside of Canada, she has done evaluation work for a small NGO in Kenya and research with small-scale farmers in Paraguay. Leah is a strong advocate for community-based and community-led participatory research and believes in the power of people's stories to bring broader meaning and change to current issues. Leah holds a B.A. in Rural and Agricultural Development and an M.A. in Public Issues Anthropology and International Development from the University of Guelph.

Leslie Sarapu, Traditional Land Use and Knowledge Researcher, GIS Specialist, and Map Developer
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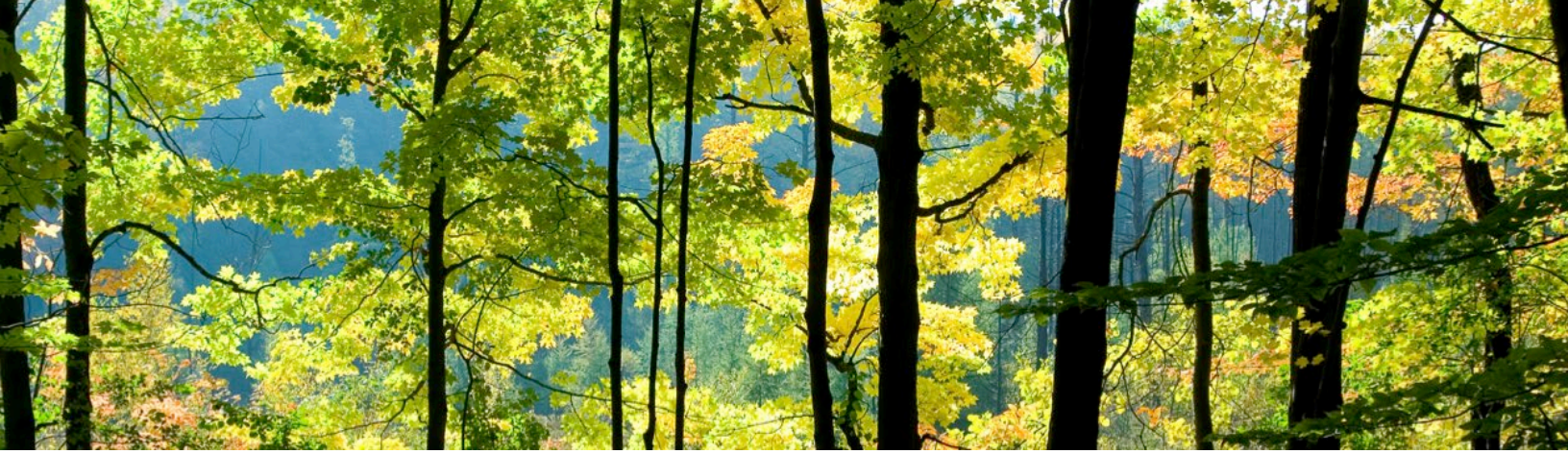

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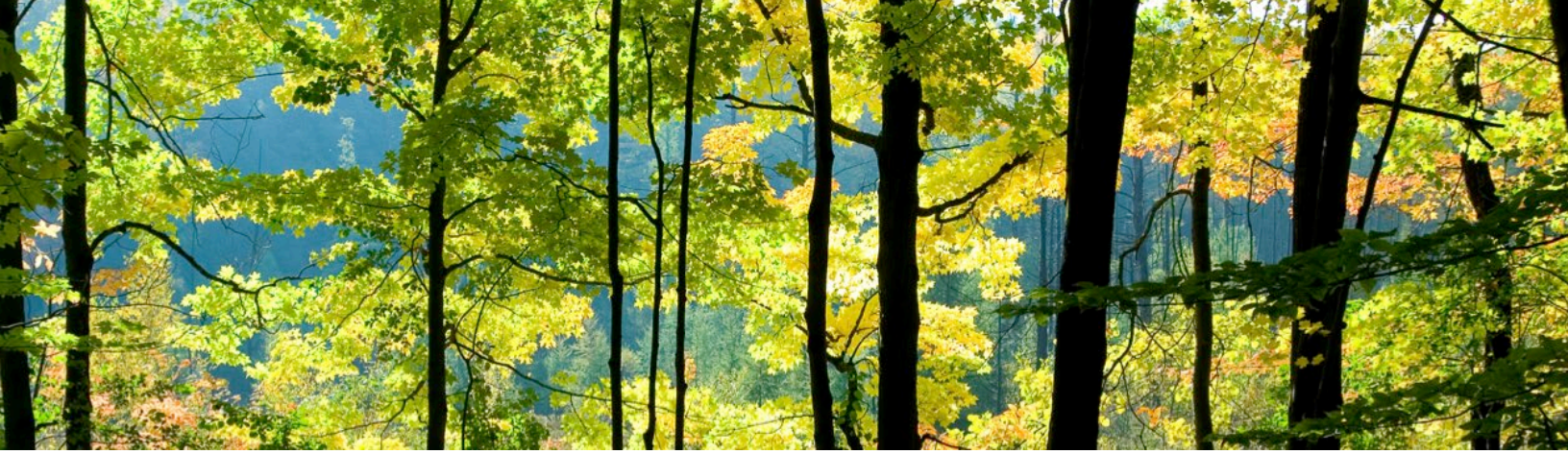
Jocelyn Maurice, Project Coordinator
Jocelyn Maurice has 16 years of experience in administration and project coordination. Jocelyn's experience includes document editing and formatting, logistics coordination, health and safety, and financial management. Jocelyn holds a B.A. from the University of Guelph and has extensive training in professional copy editing.

Shared Value Solutions Ltd. (SVS) prepared this report on behalf of the Manitoba Metis Federation (MMF). This Study may not be used or replicated for any other purpose without written authorization of the MMF.



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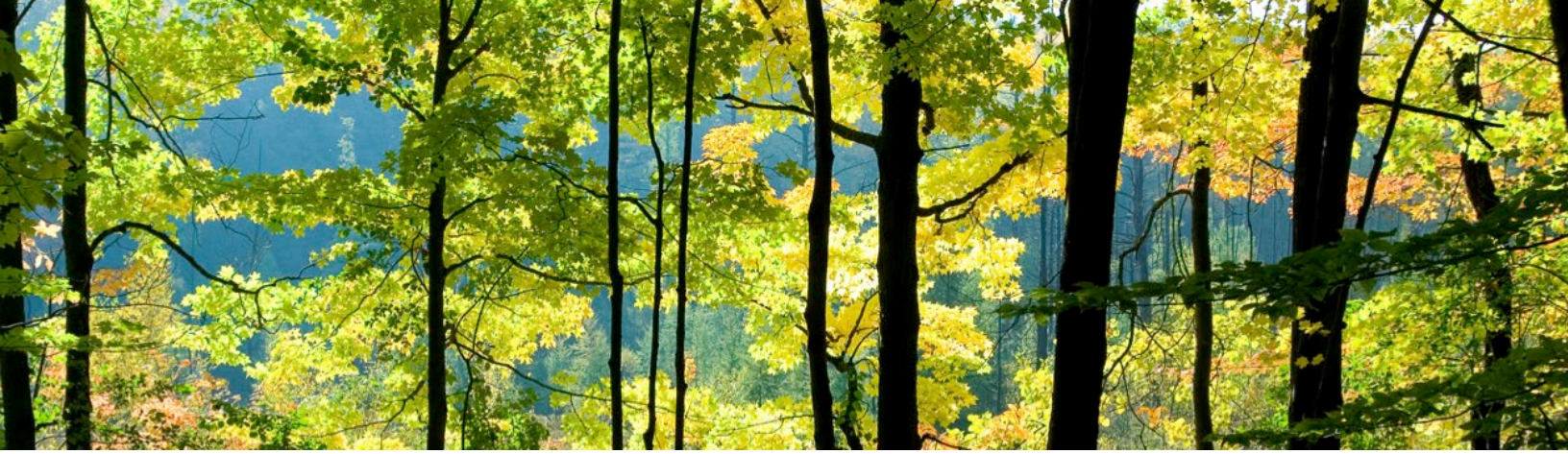

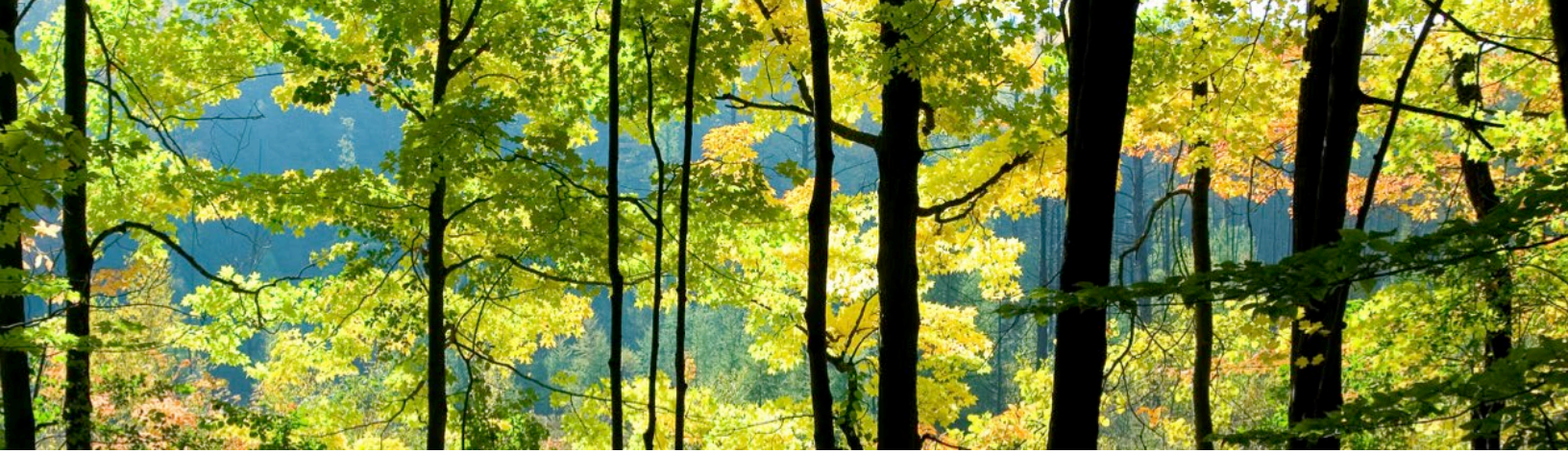

Acknowledgements

First and foremost, we would like to thank all those who participated in this Study and took the time to provide a glimpse into their lives as Manitoba Métis harvesters. We would like to acknowledge Marci Riel, Jade Dewar, Stephen Howatt and the rest of their team at the Manitoba Metis Federation for the time and effort they put into the coordination and organization of this Study. We would also like to thank Leslie Sarapu at the MMF for the maps created for this report.

Definition of Terms

Land use: defined generally as hunting, fishing, and gathering, and the use of sites and resources for cultural and ceremonial purposes.

Occupancy: defined generally as the settlements, movements, and sites associated with Indigenous peoples.

Indigenous Knowledge or Traditional Knowledge: (IK or TK) as the body of knowledge shared by Indigenous peoples and held by and transmitted between Indigenous representatives, which supports traditional land-use for the benefit and well-being of Indigenous peoples.

Traditional Ecological Knowledge: (TEK) refers generally to the knowledge and information by which people come to understand the ecology of their surrounding environment through years of firsthand experience and inherent cultural understandings of relationships between humans, animals, lands and waters. People also come to understand the ecology of their environment through teachings that have been passed down through relations or within a community.

Map Biography: The methodology for this TKLUS is based on the best-practice map biography technique pioneered by Terry Tobias in his manual *Living Proof: The Essential Data-Collection Guide for Indigenous Use and Occupancy Map Surveys* (2009). The map biography is the standard data collection method for land use and occupancy studies. A map biography is an interview process in which a person provides an account of their life on the land and water, including places they have travelled, stayed and gathered resources. In some cases, as with some of the Traditional Ecological Knowledge data provided in this TKLUS, participants indicate places that they have not used personally, but about which they have knowledge from family or other members of the community (Tobias, 2009).

Oral History: Oral history is commonly collected as complimentary material to a map biography. This is essentially the participant's qualitative land use and occupancy knowledge that doesn't lend itself as well to being recorded on a map. It could include details about the social, economic, cultural or environmental importance of a location, species, or land-based activity, as well as legends and stories that have been passed down. Oral history is used to bring depth to land use and occupancy research and increase shared understanding about the values of the participants.

Country Foods: Country foods, or wild foods, are foods from wild animals or plants.

Executive Summary

The Whiteshell Reactor No 1 (WR-1) is located at the Whiteshell Laboratories (WL) site in southeastern Manitoba, near Pinawa. WR-1 was constructed in the early 1960s by Atomic Energy of Canada Limited (AECL) and reached full operation in 1965. The Project Proponent, Canadian Nuclear Laboratories (CNL), is a private-sector company, contracted by AECL (a Crown corporation) to decommission the WL site, including WR-1. The decommissioning approach previously approved for WR-1 (Licence No NRTEDL-W5-8.04/2018) included the removal and remediation of all activated and contaminated components of WR-1 and associated facilities, including the reactor core.

Citizens, including harvesters, of the Manitoba Métis Community use the lands and waters around the WR-1 Reactor site for various land use activities, including the harvesting of plants and animals. To understand better how Métis harvesters may be impacted, the Manitoba Metis Federation (MMF) engaged Shared Value Solutions to undertake a Manitoba Métis Traditional Knowledge Land Use and Occupancy Study (MMTKLUOS or the Study). The following is a high-level summary of the results of this Study.

Study Findings

A total of ten Métis harvesters participated in a Land Use and Occupancy mapping interview with the research team. The research team used two Study Areas, the first is a 100 m Study Area that includes 100 m on either side of the Winnipeg River from Seven Sisters Generating Station to the mouth of the Winnipeg River, Lac du Bonnet, and the Lee River. The second is a 25 km radial Study Area around the WR-1 Reactor site.

The ten participants in this Study identified 424 locations of Land Use and Occupancy (LUO) which relate to the exercise of or collectively-held Aboriginal s. 35 rights and interests. Of these, a total of 192 LUO locations were mapped within 25 km of the WR-1 Reactor site, and of these, 75 were located within the 100 m Study Area. Locations mapped within 25 km of the WR-1 Reactor site include the following:

- 23 access routes, 12 of which were mapped within the 100 m Study Area
- 44 fishing locations, 38 of which were mapped within the 100 m Study Area
- 3 trapping/snaring locations
- 18 gathering locations
- 3 commercial guiding or other commercial land use locations
- 32 locations of TEK, 15 of which were mapped within the 100 m Study Area

- 8 locations where participants have noticed changes to the environment, 2 of which were mapped within the 100 m Study Area
- 41 hunting locations, 2 of which were mapped within the 100 m Study Area
- 11 demographic[1] locations, 2 of which were mapped within the 100 m Study Area
- 7 locations of cultural significance, 2 of which were mapped within the 100 m Study Area
- 2 locations of other land use (ice-fishing huts), both mapped within the 100 m Study Area

Study Conclusions

The data presented in this report represents a snapshot of the LUO information gathered from a small sample of the Manitoba Métis Community. While this is a relatively small Study compared to the number of Métis harvesters in Manitoba, the Study results provide an indicative representation of Métis knowledge and use of the lands and waters surrounding the WR-1 Reactor Decommissioning Site. From the results listed above, it can be said with confidence that members of the Manitoba Métis Community rely on and use the lands and waters around the WR-1 Reactor site for various cultural and traditional purposes, including actively exercising their s. 35 harvesting and other Aboriginal rights. The following conclusions were found based on the results of this Study:

- Métis harvesters have relied on the lands and waters around the WR-1 Reactor site for sustenance since before the reactor was built and continue to do so to the present day. Based on this, it is assumed that Manitoba Métis Community's s.35 rights and interests have the potential to be impacted by WR-1 decommissioning activities.
- Métis are consuming wild foods, for some in relatively large quantities, from the lands and waters around the WR-1 Reactor site. As such, any contamination of surrounding lands, waters, and species, would have a greater effect on members of the Manitoba Métis Community.
- Métis who participated in this Study are concerned about the potential impacts on human and environmental health from the WR-1 Reactor site, including as related to the decommissioning activities and both short and long-term monitoring and safety measures.
- Métis who participated in this study have unanswered questions that need to be addressed before moving forward with the WR-1 decommissioning plan in order for the MMF to consider that meaningful consultation has occurred with the Crown.

Study Recommendations

[1] For privacy reasons, we have not shown demographic locations or reported on them in detail in this report

There are some clear next steps and recommendations for moving forward that need to be pursued by both CNL and CNSC:

- Moving forward, there needs to be consideration of the exposure to contaminants to those who regularly consume wild foods from the area. This is especially true for contamination of the aquatic environment in the Winnipeg River, Lac du Bonnet, and the Lee River. Specifically, testing of radioactive contaminants in wild rice, birds, fish, and places where participants identified drinking water need to be undertaken to ensure Métis harvesters are not at risk for exposure to radioactive contaminants. Metis-specific mitigations need to be put in place to eliminate, minimize and avoid any risks. These measures must be developed in consultation with the MMF.

- Accommodation measures need to be put in place by the Crown in any cases where mitigations cannot be developed to avoid impact to the Manitoba Metis community's rights and interests from the WR-1. Measures could include, among others, options for collaborative management, stewardship, monitoring; involvement of the MMF in decommissioning activities; education and employment opportunities for MMF Citizens who rely on harvesting (commercial and/or subsistence) that will be impacted by the decommissioning activities; financial compensation for impacts that cannot be avoid or where residual impacts remain following mitigation and other measures, etc. Accommodation measures must be developed in consultation with the MMF.

- Develop in consultation with the MMF, in terms that can be understood by those who are not experts in the field of nuclear energy, a plan for how and when Métis harvesters will be contacted if there are contaminants found in the environment and what alternative measures need to be put in place to accommodate or response to contaminants in food / resources that members of the Manitoba Métis Community rely on for their subsistent or exercise of their rights.

- CNL should commit to developing a communication strategy with the MMF to help ensure that all Métis harvesters are aware of the decommissioning activities. Members of the Manitoba Métis Community are highly mobile, and harvesters travel long distances to use the lands and waters in areas where they do not necessarily live. It may be that a Métis harvester spends considerable time and money to travel to the lands and waters in the area of the WR-1 Reactor site to harvest. For this reason, all Métis people in Manitoba need to be aware of what is happening around the WR-1 Reactor site, including adequate notice of any activities that may disrupt harvesting activities or harvesting success, and can make decisions about whether they will continue to travel to the area to harvest (where Métis harvesters are unwilling or unable to harvest in the area of the WR-1 Reactor site due to the decommissioning activities, consideration would need to be given to whether there are adverse effects of having to travel to other areas that would require accommodation or compensation to offset any infringement of Métis s. 35 rights through these activities).

- CNL and CNSC should continue to engage with the MMF about the concerns expressed by and impact on members of the Manitoba Métis Community, including harvesters. There are clear unanswered questions and concerns that need to be addressed. For example, Métis harvesters need to be informed as to whether it is safe to consume wild foods, especially fish, from the area in light of the more extensive Métis consumption of fish than the general public. Ongoing engagement may also help to reduce any mis-informed concerns.

- In addition to a communication strategy, CNL should commit to having a clear timeline of decommissioning activities, developed through collaboration with the MMF to avoid particular harvesting times, locations, and periods of significance. This timeline needs to consider the Métis laws of the harvest and ensure that activities do not limit access to harvesting areas. The Métis laws of the harvest can be found here: http://www.mmf.mb.ca/docs/Metis-Laws-of-the-Harvest_FINAL.pdf

- CNL should work with the MMF to develop a Métis Technical Working Group to ensure that all aspects of the decommissioning process are in-line with Métis values and respects Métis rights and laws, especially as they relate to potential impacts to the environment. This is especially important for developing a monitoring plan to ensure that Métis values are included, and Métis rights are upheld.

- CNL should work with the MMF to develop a plan for how the MMF can continue to exercise its stewardship rights and responsibilities, as an Indigenous people, for the WR-1 Reactor site and decommissioning activities. As part of this, the MMF will require having Métis monitors on the ground with CNL during all stages of the decommissioning activities. This would require providing capacity funding for Métis people to participate in monitoring training and providing capacity for monitoring jobs.

- Given the significance of the concerns and the continued stewardship responsibilities of the MMF, the MMF should be provided capacity funding to hire a WR-1 Decommissioning project coordinator. This person would be the main point of contact at the MMF for CNL for anything related to the WR-1 Reactor decommissioning process and would coordinate any future studies, communication, community meetings, monitoring programs etc.

- This report is also carrying forward recommendations made in the EIS technical review put forward by the MMF, including:

    - using the information provided in this report to update and inform the risk assessment of potential exposure pathways, and
    - providing rationale for whether the long-term storage of high-level waste in this form is acceptable, given the information provided in this report and the knowledge that radioactivity will be released to the Winnipeg River in the future.

1.0 Introduction

1.1 Background and Context

The purpose of this report is to identify how the Manitoba Métis Community may be impacted by the decommissioning of the Whiteshell Reactor (WR-1). The Manitoba Metis Federation (MMF) undertook a small Traditional Knowledge, Occupancy, and Land Use study to identify where members of the Manitoba Métis Community are using the lands and waters near the WR-1 Reactor decommissioning site. The following provides a more detailed breakdown of the goals and objectives of the Study, the rationale for the geographic and temporal scope of the Study, a description of how the maps and tables should be interpreted, a description of the Study team, a description of the decommissioning project, and a discussion of the Manitoba Métis Community.

1.2 Study Goals and Objectives

The Manitoba Métis Traditional Knowledge and Land Use Study (MMTKLUS or the Study) was conducted to document and understand how and where members of the Manitoba Métis Community are or have been using the lands and waters around the WR-1 Reactor.

There were three main goals of the Study:

1. Provide the MMF with evidentiary data of how Métis harvesters who participated in the Study are using the lands and waters around WR-1 Reactor site in a format that is useful for the MMF's negotiations and discussions with CNL and CNSC around the proposed decommissioning of the WR1 Reactor.

2. Provide the MMF with information on consumption frequency and quantity as it relates to harvested country foods within a 50 km area around WR1 Reactor site.

3. Provide information in a format that is consistent with the current Manitoba Métis Land Use and Occupancy catalogue data.

The objectives of the Study were as follows:

- Establish where participants identified as part of the Manitoba Métis Community use or have knowledge of the lands and waters near the WR-1 Reactor site to exercise their constitutionally protected Aboriginal rights, including areas where participants:
    - hunt, trap, fish, and gather plants or natural materials,
    - identify culturally significant locations to the Manitoba Métis Community,
    - stay overnight on the land,

- use access routes and trails,
- identify areas of ecological importance, and/or
- identify areas of demographic importance (e.g., places of current or past residences, birth places, and burial sites).

- Understand participants concerns and thoughts about the WR-1 Reactor decommissioning project, including any unanswered questions that they identified.

- Contribute to past Traditional Land Use and Knowledge studies that the MMF has undertaken and continue to build up Manitoba Métis Community LUO data.

- Use an oral history interview methodology (i.e., have people explain their family and community stories, in some cases out on the land) combined with a desktop mapping interview.

1.3 Geographic and Temporal Scope of the Study

Geographic Scope

SVS, in collaboration with the MMF, have identified two Study Areas that are relevant for assessing potential impact to harvesters and land users.

The first Study Area follows the Winnipeg River from Seven Sisters to the mouth of Lake Winnipeg and stretches to the west to include Lac du Bonnet and the Lee River. This Study Area includes these waterbodies and a 100 m riparian buffer on either side of the waterbody. This Study Area will be referenced throughout the report as the 100 m Study Area.

The second Study Area is a 25 km buffer around the WR-1 Reactor site. The rationale for this Study Area is to include wildlife that may travel through the 100 m Study Area but not necessarily be in this area when harvesting occurs, as well as reflect a larger area potentially subject to contamination through the decommissioning activities. This Study Area will be referenced throughout the report as the 25 km Study Area. Figure 1 displays these Study Areas.

Temporal Scope

This Study focused heavily on the current land use and occupancy of the Manitoba Métis Community, but also included some more historic land use and occupancy when participants identified areas that were significant to their Métis family or other members of the Manitoba Métis Community.

The definition of “current use” for this Study includes any use that occurred within a participant’s lifetime. To try and establish a temporal scope for use, participants were asked whether this use happened within the last 10 years, prior to the last 10 years, or occurred both within and prior to the last 10 years (e.g., a fishing spot that a participant may have used for more than the last 10 years).

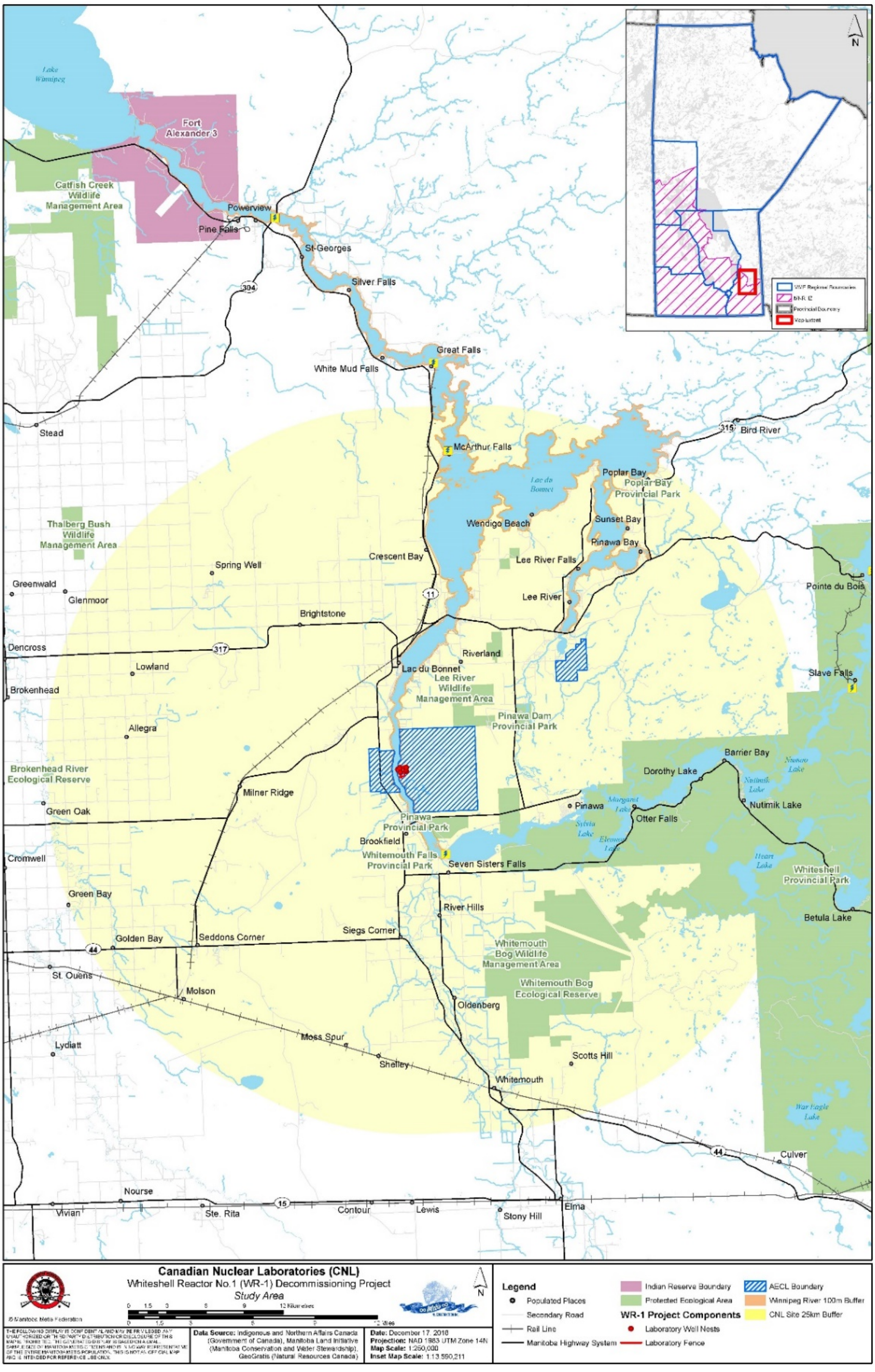

Figure 1. Study Areas (25 km and 100 m)

1.4 Interpreting the Maps and Tables

There are three types of maps that are used in this report. The first is a comprehensive map that displays all data that participants have shared during the mapping interviews. The second type are maps that display all data shared during mapping interviews that fall within the 100 m Study Area. The third type are maps that display all data shared during mapping interviews that fall within the 25 km Study Area. For the last two sets of maps, data is displayed with GISID leaders which directly correspond with tables that provide the attribute data for each point. This attribute provides more contextual information for each land use feature mapped. The tables include information on the category of land use, the time period of use, and where necessary, the species and the season in which the activity occurred.

For some participants, this Study was the second time they participated in a map biography and oral history interview. These maps also include data from the MMF catalogue, which includes all data collected by the MMF from Manitoba Métis harvesters since 2003. The MMF has undertaken many LUO studies in previous years. These studies combined tell an in-depth story of Métis harvesting and citizens who use the land, waters, and resources. The data from past studies, what is referred to here as the "catalogue data," has been included in this Study to tell a more complete story of Métis connection to, reliance on and use of the land, waters, and resources in each Study Area.

1.5 Project Description

The Whiteshell Reactor No 1 (WR-1) is located at the Whiteshell Laboratories (WL) site in southeastern Manitoba, near Pinawa. WR-1 was constructed in the early 1960s by Atomic Energy of Canada Limited (AECL) and reached full operation in 1965. WR-1 is a 60 MW thermal nuclear reactor that was historically used as a research reactor to explore the feasibility of using an organic-cooled reactor, and to carry out a variety of engineering and scientific experiments (e.g., alternative fuel sources, fuel channels and reactor coolants). WR-1 was permanently shut down in 1985, and in the early 1990s, the reactor was defueled and underwent preliminary decommissioning.

The Project Proponent, Canadian Nuclear Laboratories (CNL), is a private-sector company, contracted by AECL (a Crown corporation) to decommission the WL site, including the WR-1 Reactor. The decommissioning approach previously approved for WR-1 (Licence No NRTEDL-W5-8.04/2018) included the removal and remediation of all activated and contaminated components of WR-1 and associated facilities, including the reactor core. At this time, however, there is no approved long-term nuclear waste disposal facility in Canada, and therefore, CNL is proposing to demolish the WR-1 building and decommission the nuclear waste in situ ("ISD" – In Situ Decommissioning). This will involve the demolition and removal of above-ground buildings and facilities (two stories). The below-ground structures and facilities, including the reactor and radiological hazards, will be permanently disposed of on-site. These will be protected with an engineered cover that is intended to prevent intrusion of soil and groundwater and allow the radioactive contaminants to decay to safe levels. All other previously

approved decommissioning activities (as provided for in Licence No NRTEDL-W5-8.04/2018) are assumed to be unchanged.

Upon completion of the decommissioning program, the WR-1 site will be under 300 years of Institutional Control, with active monitoring occurring for the first 100 years. Table 1.2-1 shows the proposed decommissioning phases and schedule (CNL, 2017).

Table 1.2-1: WR-1 Decommissioning Project Phases and Schedule

Phase	Activity	Duration
Closure	Preparation for In Situ Decommissioning	2019 to 2021
	Grouting of Below-grade Systems and Structures	2021
	Removal of Above-grade Structures	2021 to 2022
	Installation of Engineered Cover	2022 to 2023
	Final Site Restoration	2023
	Preparation for Institutional Control	2024
Post-closure	Institutional Control (Active)	2024 to 2124
	Institutional Control (Passive)	2024 to 2324
	Post-Institutional Control (Passive)	Beyond 2324

1.6 Regulatory Process

The Whiteshell Project is subject to a Federal environmental assessment (EA) by Responsible Authority, as a "designated project" under Section 35 (Regulations Designating Physical Activities) of CEAA, 2012 for "the construction, operation and decommissioning of a new nuclear fission or fusion reactor." For this decommissioning project, the Responsible Authority is the Canadian Nuclear Safety Commission (CNSC).

The Environmental Impact Statement (EIS) is CNL's submission to the CNSC, which, if approved, will subsequently result in the CNSC issuing its own summary report on the Project and EA process as a basis for a regulatory decision regarding the decommissioning program. If it is determined that there are no significant adverse residual effects as a result of the Project, the CNSC will issue a decision to support the Project. If it is determined that there are significant residual effects from the Project, then the CNSC will issue a recommendation to the Minister of Natural Resources including the findings of their review. The final decision regarding whether such Project effects are justified under the circumstances, and subsequently, if the Project should be approved, rejected or approved with conditions, will be made by the Minister and Governor-in-Council (Cabinet).

Other Federal and Provincial permits, licenses, and authorizations that may be required include:

- permits from Environment Canada for on-site petroleum storage tanks, and

- waste generator registration under the *Dangerous Goods Handling and Transportation Act* from Manitoba Conservation and Water Stewardship.

All EA and permit processes for the WR-1 Reactor decommissioning activities involve Crown conduct that has the potential to trigger the Crown's duty to consult and, where appropriate, accommodate the Manitoba Métis Community, as a s.35 rights-holding Aboriginal community. CEAA 2012 also has specific requirements under Section 5 (c) of the Act for assessing the effects of changes to the biophysical environment on Aboriginal peoples—including the Manitoba Métis Community—which may be caused by a project, including

- effects on current use of lands and resources for traditional purposes,
- effects on health or socio-economic conditions, and
- effects on archaeological or cultural heritage.

As such, a review of the Draft EIS was conducted through the lens of existing or potential impacts to the Manitoba Métis Community's s. 35 rights, claims, and interests. This review can be found in Appendix C.

1.7 History and Identity

The Métis Nation—as a distinct Indigenous People—evolved out of relations between European men and First Nations women who were brought together as a result of the early fur trade in the Northwest. In the eighteenth century, both the Hudson Bay Company and the Northwest Company created a series of trading posts that stretched across the upper Great Lakes, through the western plains, and into the northern boreal forest. These posts and fur trade activities brought European and Indigenous peoples into contact. Inevitably, unions between European men—explorers, fur traders, and pioneers—and Indigenous women were consummated. The children of these families developed their own collective identity and political community so that "[w]ithin a few generations the descendants of these unions developed a culture distinct from their European and Indian forebears" and the Métis Nation was born—a new people, indigenous to the western territories *(Alberta (Aboriginal Affairs and Northern Development) v. Cunningham*, [2011] 2 SCR 670 at para. 5; *R. v. Goodon*, 2008 MBPC 59 at para. 25; *Manitoba Metis FederationInc. v. Canada (Attorney General)*, [2013] 1 SCR 623 at para. 2).

The Métis led a mixed way of life. "In early times, the Métis were mostly nomadic. Later, they established permanent settlements centered on hunting, trading and agriculture" (*Alberta v. Cunningham*, at para. 5). The Métis were employed by both of the fur trades' major players, the Hudson's Bay and Northwest companies. By the early 19th century, they had become a major component of both firms' workforces. At the same time, however, the Métis became extensively involved in the buffalo hunt. As a people, their economy was diverse; combining as it did, living off the land in the Aboriginal fashion with wage labour (*MMF Inc. v. Canada*, at para. 29).

It was on the Red River, in reaction to a new wave of European immigration, that the Métis Nation first came into its own. Since the early 1800s, the Manitoba Métis Community—as a part of the larger Métis Nation—has asserted itself as a distinct Indigenous collective with rights and interests in its Homeland. The Manitoba Métis Community shares a language (Michif), national symbols (infinity flags), culture (i.e., music, dance, dress, crafts), as well as a special relationship with its territory that is centered in Manitoba and extends beyond the present-day provincial boundaries.

The Manitoba Métis Community has been recognized by the courts as being a distinctive community, with rights that are protected in section 35 of the *Constitution Act, 1982*. In *Goodon*, the Manitoba courts held that:

> The Métis community of Western Canada has its own distinctive identity […] the Métis created a large inter-related community that included numerous settlements located in present-day southwestern Manitoba, into Saskatchewan and including the northern Midwest United States. This area was one community […] The Métis community today in Manitoba is a well-organized and vibrant community (paras. 46-47; 52).

This proud independent Métis population constituted a historic rights-bearing community in present day Manitoba and beyond, which encompassed "all of the area within the present boundaries of southern Manitoba from the present-day City of Winnipeg and extending south to the United States" (*R. v. Goodon*, at para. 48).

The heart of the historic rights-bearing Métis community in southern Manitoba was the Red River Settlement; however, the Manitoba Métis also developed other settlements and relied on various locations along strategic fur trade routes. During the early part of the 19th century, these included various posts of varying size and scale spanning the Northwest Company and the Hudson Bay Company collection and distribution networks.

More specifically, in relation to the emergence of the Métis—as a distinct Aboriginal group in Manitoba—the Supreme Court of Canada wrote the following in the *MMF Inc. v. Canada* case:

> [21] The story begins with the Aboriginal peoples who inhabited what is now the province of Manitoba—the Cree and other less populous nations. In the late 17th century, European adventurers and explorers passed through. The lands were claimed nominally by England which granted the Hudson's Bay Company, a company of fur traders operating of out London, control over a vast territory called Rupert's Land, which included modern Manitoba. Aboriginal peoples continued to occupy the territory. In addition to the original First Nations, a new Aboriginal group, the Métis, arose—people descended from early unions between European adventurers and traders, and Aboriginal women. In the early days, the descendants of English-speaking parents were referred to as half-breeds, while those with French roots were called Métis.

> [22] A large—by the standards of the time—settlement developed at the forks of the Red and Assiniboine Rivers on land granted to Lord Selkirk by the Hudson's Bay Company in 1811. By 1869, the settlement consisted of 12,000 people, under the governance of Hudson's Bay Company.
>
> [23] In 1869, the Red River Settlement was a vibrant community, with a free enterprise system and established judicial and civic institutions, centered on the retail stores, hotels, trading undertakings and saloons of what is now downtown Winnipeg. The Métis were the dominant demographic group in the Settlement, comprising around 85 percent of the population [approximately 10,000 Métis], and held leadership positions in business, church and government.

The fur trade was vital to the ethnogenesis of the Métis and was active in Manitoba from at least the late 1770s, and numerous posts and outposts were established along cart trails and waterways throughout the province. These trails and waterways were crucial transportation networks for the fur trade (Jones 2014; Figure 2) and were the foundation of the Manitoba Métis Community's extensive use of the lands and waters throughout the province. In the early 20th century, the Manitoba Métis Community continued to significantly participate in the commercial fisheries and in trapping activities, which is well documented in Provincial government records.

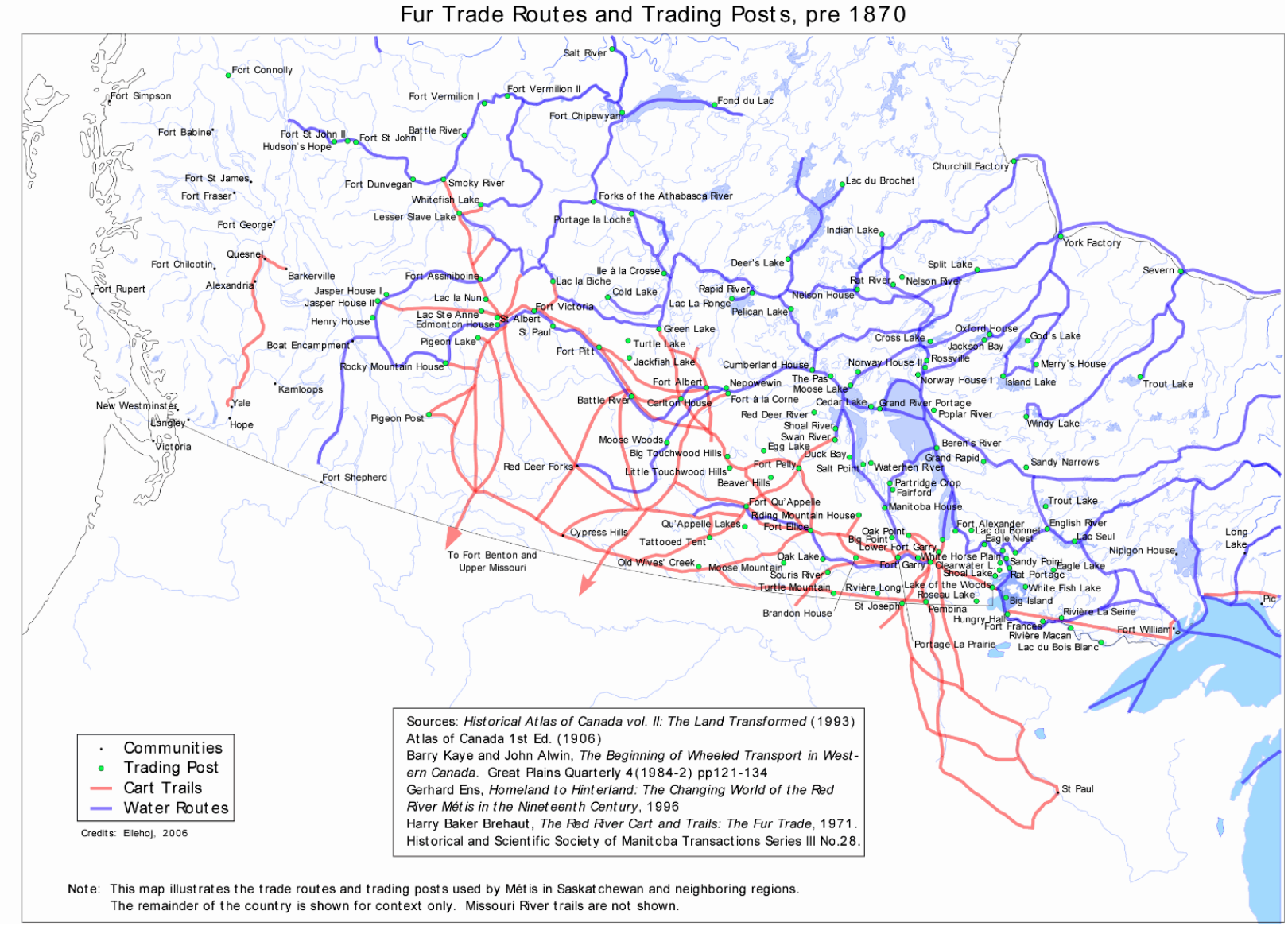

Figure 2. The Fur Trade Network: Routes and Posts Prior to 1870

1.8 Manitoba Métis Community

1.8.1 Manitoba Metis Federation

The Manitoba Metis Federation (MMF) is the democratically elected self-government of the Métis Nation's Manitoba Métis Community (Manitoba Métis Community). It is duly authorized by the members of the Manitoba Métis Community (also known as MMF Citizens) for the purposes of dealing with the Manitoba Métis Community's rights, claims, and interests, including conducting consultations and negotiating accommodations (as per MMF Resolution No. 8, see Section 2.3). While the MMF was initially incorporated in 1967, its origins lie in the 18th century with the birth of the Manitoba Métis Community and in the legal and political structures that developed with it. Since the birth of the Métis people in the Red River Valley in the early 1800s, the Manitoba Métis Community—as a part of the larger Métis Nation—has asserted and exercised its inherent right of self-government. Over the last 50 years, the MMF has represented the Manitoba Métis Community at the provincial and national levels.

During this same period, the MMF has built a sophisticated, democratic and effective Métis governance structure that represents the Manitoba Métis Community at the local, regional, and provincial levels throughout Manitoba. The MMF was created to be the self-government representative of the Manitoba Métis Community—as reflected in the Preamble of the MMF's Bylaws, which are agreed to by its members as a part of registering with the MMF:

> WHEREAS, the Manitoba Metis Federation Inc. has been created to be the democratic and self-governing representative body of the Manitoba Métis Community.

In addition, the purpose "to provide responsible and accountable governance on behalf of the Manitoba Métis Community using the constitutional authorities delegated by its members" is embedded within the MMF's objectives, as set out in the MMF Bylaws. These objectives mandate the MMF to advance the cultural, legal, constitutional, social, economic, and political rights and interests of the Manitoba Métis Community. The objectives of the MMF, as set out in the MMF Bylaws, are as follows:

i. To promote and instill pride in the history and culture of the Métis people.

ii. To educate members with respect to their legal, political, social and other rights.

iii. To promote the participation and representation of the Métis people in key political and economic bodies and organizations.

iv. To promote the political, legal, social and economic interests and rights of its members.

v. To provide responsible and accountable governance on behalf of the Manitoba Métis community using the constitutional authorities delegated by its members.

The Federation is organized and operated based on centralized democratic principles, some key aspects of which are described below.

President: The President is the Chief Executive Officer, leader and spokesperson of the Federation. The President is elected in a province-wide ballot-box election every four years and is responsible for overseeing the day-to-day operations of the Federation.

Board of Directors: The MMF Board of Directors, or “MMF Cabinet” leads, manages and guides the policies, objectives and strategic direction of the Federation and its subsidiaries. All 23 members are democratically elected by the membership.

Regions: The MMF is organized into seven regional associations or "Regions" throughout the province (Figure 3): The Southeast Region, the Winnipeg Region, the Southwest Region, the Interlake Region, the Northwest Region, the Pas Region, and the Thompson Region. Each Region is administered by a vice-president and two executive officers, all of whom sit on the MMF’s Cabinet.

Locals: Within each Region are various area-specific "Locals" which are administered by a chairperson, a vice-chairperson and a secretary-treasurer. There are approximately 140 MMF Locals across Manitoba.

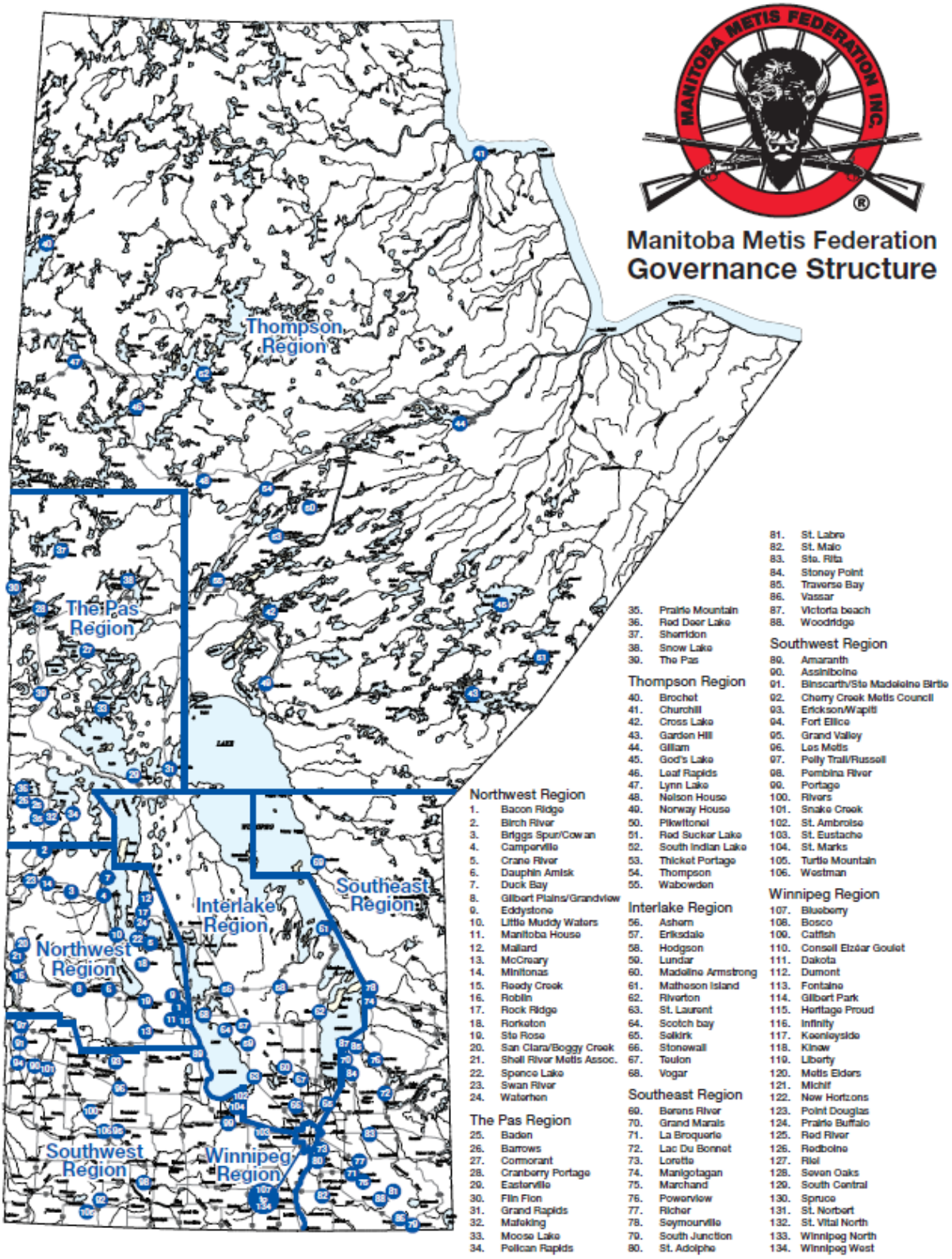

Figure 3. Manitoba Metis Federation (MMF) Regions

1.8.2 MMF Resolution No. 8

Among its many responsibilities, the MMF is authorized to protect the Aboriginal rights, claims and interests of the Manitoba Métis Community, including as related to harvesting resources, traditional culture, and economic development.

In 2007, the MMF Annual General Assembly unanimously adopted Resolution No. 8 in order to set out the framework for engagement, consultation and accommodation to be followed by Federal and Provincial governments, industry, and others when making decisions and developing plans and projects that may impact the Manitoba Métis Community. Under MMF Resolution No. 8, direction has been provided by the Manitoba Métis Community for the MMF Home Office to take the lead and be the main contact on all consultations affecting the Manitoba Métis Community. Resolution No. 8 reads, in part that:

> …this assembly continue[s] to give the direction to the Provincial Home Office to take the lead and be the main contact on all consultations affecting the Métis community and to work closely with the Regions and Locals to ensure governments and industry abide by environmental and constitutional obligations to the Métis…

The MMF Home Office works closely with the Regions and Locals to ensure the rights, interests and perspective of the Manitoba Métis Community are effectively represented in matters related to consultation and accommodation.

Resolution No. 8 has five phases:

Phase 1: Notice and Response

Phase 2: Funding and Capacity

Phase 3: Engagement or Consultation

Phase 4: Partnership and Accommodation

Phase 5: Implementation

Each phase is an integral part of the Resolution No. 8 framework and proceeds logically through the stages of consultation.

1.8.3 Manitoba Métis Community Rights and Interests

The Manitoba Métis Community possesses Aboriginal rights, including pre-existing Aboriginal collective rights and interests in lands protected by section 35 of the *Constitution Act, 1982*, throughout the area where the WR-1 Reactor is located. Indeed, Manitoba courts recognized these pre-existing, collectively-held Métis rights in *R. v. Goodon* (at paras. 58; 72):

> I conclude that there remains a contemporary community in southwest Manitoba that continues many of the traditional practices and customs of the Métis people.
>
> I have determined that the rights-bearing community is an area of southwestern Manitoba that includes the City of Winnipeg south to the U.S. border and west to the Saskatchewan border.

As affirmed by the Supreme Court of Canada, such rights are "recognize[d] as part of the special aboriginal relationship to the land" (*R. v. Powley,* 2003 SCC 43, at para. 50) and are grounded on a "communal Aboriginal interest in the land that is integral to the nature of the Métis distinctive community and their relationship to the land" (*MMF Inc. v. Canada*, at para. 5). Importantly, courts have also recognized that Métis harvesting rights may not be limited to unoccupied "Crown" lands (*R. v. Kelley*, 2007 ABQB 41, para. 65).

The Crown, as represented by the Manitoba government, has recognized some aspects of the Manitoba Métis Community's rights through a negotiated agreement: The *MMF-Manitoba Points of Agreement on Métis Harvesting (MMF-Manitoba Harvesting Agreement) (2012)*. This Agreement "recognizes that collectively-held Métis Harvesting Rights, within the meaning of s. 35 of the *Constitution Act, 1982*, exist within the [Recognized Métis Harvesting Zone], and that these rights may be exercised by Métis Rights Holders consistent with Métis customs, practices and traditions…" (*MMF-Manitoba Harvesting Agreement*, section 1). In particular, the *MMF-Manitoba Harvesting Agreement* recognizes that Métis rights include "hunting, trapping, fishing and gathering for food and domestic use, including for social and ceremonial purposes and for greater certainty, Métis harvesting includes the harvest of timber for domestic purposes" throughout an area spanning approximately 169,584 km² (the "Métis Recognized Harvesting Area") (*MMF-Manitoba Harvesting Agreement*, section 2; Figure 3 below). For clarity, the Project is situated entirely within the Métis Recognized Harvesting Area. As illustrated in the community meeting and feedback, MMF citizens exercise their Métis rights in the vicinity of the proposed Project and specifically in the rivers and watersheds that may be impacted by the decommissioning activities and contamination. The MMF further asserts rights and interests beyond this area, which require consultation and accommodation as well.

Beyond those rights already established through litigation and recognized by agreements, the Manitoba Métis Community has strong claims to commercial and trade-related rights. Courts have noted that Métis claims to commercial rights remain outstanding (*R. v. Kelley* at para. 65). These claims are strong and well-founded, and it is incumbent on the Crown and proponents to take them seriously.

The Manitoba Métis Community has its roots in the western fur trade (*R. v. Blais*, 2003 SCC 44 at para. 9 [*Blais*]; *R. v. Goodon* at para. 25). The Métis in Manitoba are descendants of early unions between Aboriginal women and European traders (*MMF Inc. v. Canada* at para. 21). As a distinct Métis culture developed, the Métis took up trade as a key aspect of their way of life (*R. v. Powley* at para. 10). Many Métis became independent traders, acting as middlemen between First Nations and Europeans (*R. v. Goodon* at para. 30). Others ensured their subsistence and prosperity by trading resources they themselves hunted and gathered (*R. v. Goodon* at para. 31, 33, & 71). By the mid-19th century, the Métis in Manitoba had developed the collective feeling that "the soil, the trade and the Government of the country [were] their birth rights." (*R. v. Goodon* at para. 69(f)). Commerce and trade are and always have been integral to the distinctive culture of the Manitoba Métis Community. Today, the Manitoba Métis have an Aboriginal, constitutionally protected right to continue this trading tradition in modern ways to ensure that their distinct community will not only survive, but also flourish.

Unlike First Nations in Manitoba, whose commercial rights were converted and modified by treaties and the *Natural Resources Transfer Agreement* ("*NRTA")* (*R. v. Horseman*, [1990] 1 SCR 901), the Métis' pre-existing customs, practices, and traditions—including as they relate to commerce and trade—were not affected by the *NRTA* (*R. v. Blais*) and continue to exist and be protected as Aboriginal rights.

RECOGNIZED AREAS FOR HARVESTING

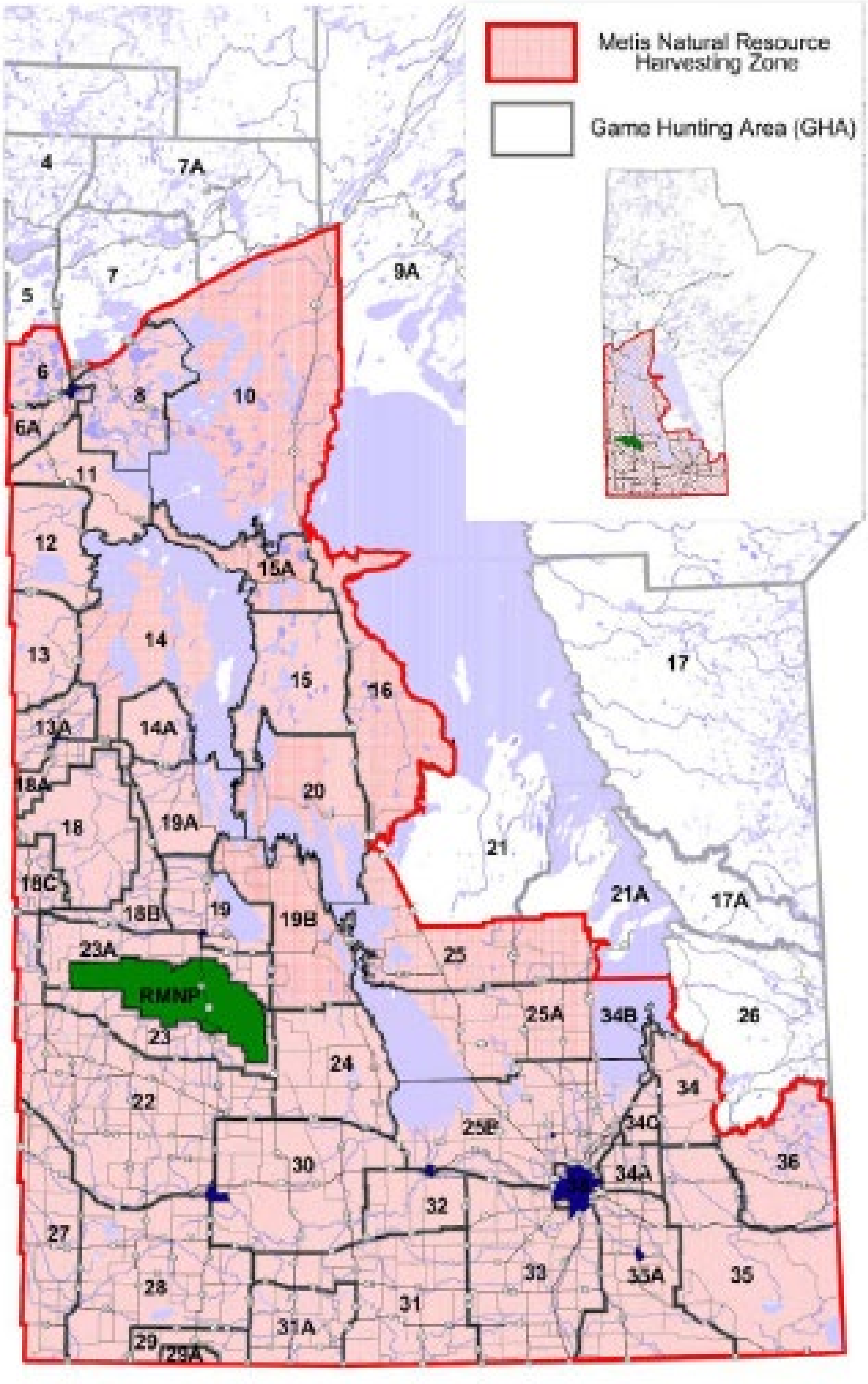

Figure 4. MMF-Manitoba Harvesting Agreement Recognized Manitoba Métis Harvesting Zones

2.0 Methodology

2.1 Map Biography and Oral History

The focus of the map biography and oral history interviews was on the collection of the following information:

- Current and childhood residences,
- Hunting and trapping sites,
- Fishing locations, including species and temporal scope of fishing activity,
- Gathering of plants for food, medicinal plants and natural materials, including use of gathered materials,
- Commercial fishing, trapping, and other land uses for income,
- Culture and heritage resources, sacred sites, archaeological sites, areas of economic importance, other special sites, and contemporary gathering places,
- Locations of overnight sites including cabins, other types of structures and camping sites,
- Land and water access routes,
- Traditional Ecological Knowledge, including locations of fish spawning areas, seasonal mammal habitats and migration routes, bird habitat, wetlands, salt licks, important plant habitat and other significant ecological features,
- Thoughts, perceptions, concerns, and unanswered questions about the WR-1 Reactor decommissioning project,
- Hopes for the future of the Manitoba Métis Community.

2.1.1 Participants

Participants were identified in two ways for this Study. The first was through self-identification on a consumption survey that was mailed to all attendees of an information and engagement meeting held in Lac Du Bonnet by the MMF. The second was through phone calls by the MMF to harvesters who live near the WR-1 site and who have their Métis harvesting cards.

Participants were also required to:

- be Métis citizens,

- have historic and/or current connection to the Study Area(s),
- be hunters, fishers, trappers, plant harvesters, and other land users (e.g., for education, personal enjoyment, etc.), and
- be from a variety of age groups and equal distribution of genders.

The MMF scheduled all interviews and all interviews took place at the MMF home office in Winnipeg. A total of 10 people took part in map biography and oral history interviews between November 19, 2018 and November 23, 2018. In total, there were 9 males and 1 female who participated in the Study. Four participants had completed map biography interviews for past studies. In these instances, they were given the same PIN that was used for their data in previous studies, and all their collected land use and occupancy data has been included in this Study.

2.1.2 Procedure

The methodology for the map biography and oral history interviews was adapted from the work of Terry Tobias (2009), as well as from discussions with MMF staff about the needs for this Study.

Map biography interviews were completed with one individual at a time, though in some cases, the participant brought a family or friend with them to observe. At the beginning of each interview, the Study team briefed the participant on the decommissioning of the WR-1 Reactor Site, the Study's objectives, and how the data would be used. The Study team then reviewed the permission form with the participants and, if they agreed, invited them to provide their written consent to being audio and video recorded and to allow their information to be used for the purposes of this Study (see Appendix B).

Interview teams consisted of SVS staff members and Leslie Sarapu, an N4 Construction staff member. The interviewers followed an interview guide to help in consistently applying a standard map biography process with each participant (see Appendix B).

During the Map Biography, one interviewer would mark locations of features (points, lines, and polygons) identified by participants on the map directly on the computer using an ESRI Arc GIS (Geographical Information System). Enlarged wall maps were also hung up on the walls of the interview room for reference. The second interviewer entered descriptive data for each feature (point, line, or polygon) into a customized Microsoft Access database that was developed for this Study. The GIS computer screen was video recorded to allow for post-interview verification and a redundant back up of the interview. Each interview was audio recorded for the purposes of transcribing interview sessions.

A series of oral history questions were also posed to each participant, related to Métis identity, family stories of land use, perceptions of the current harvesting areas, participant's hopes for the future of the Métis in Manitoba, and stories of their connection to the Study Area(s). This portion of the interview

allowed participants time to provide their thoughts and perceptions the proposed WR-1 Reactor decommissioning process.

All participants received a $150 honorarium and travel reimbursement if they were travelling outside of their home community to take part in the interview.

Quality assurance measures were taken in data gathering, back-up, and analysis. Data gathering procedures incorporated best practices in social science research methods and SVS's methodological approach to Map Biography and Oral History. SVS staff performed quality assurance on data collected in each interview session. Senior SVS staff reviewed all tools and deliverables.

Geographic data was processed to create maps that depict land use and knowledge of the participants. These maps have been used throughout the report, raw data and information used remains the property of the MMF and will be returned to the MMF.

2.1.3 Tools for Map Biography and Oral History Interviews

SVS's data collection toolkit included the following components (see Appendix B for the complete toolkit):

- A project overview
- A permission form
- An interview record form
- A Map Biography Interview Guide

Other tools included two laptops that were used for a direct-to-digital mapping process using ArcGIS software and a Microsoft Access database, video cameras and audio recorders for data back-up, a large-scale map of the Study Area(s) that was placed on the wall to help participants orient themselves, notepads of paper and pens.

2.2 Consumption Survey

At the start of each interview, each of the ten participants completed a consumption survey that asked them about the frequency, quantity and type of "country foods" that they have consumed from within 25 km of the WR-1 site.

The survey was originally designed to ask participants to recall the country foods they consumed within the last five years. In piloting the survey with the first few participants, the researchers found that for those who consume a large quantity of country foods, it was difficult for these participants to recall everything they consumed in the last five years. Based on this finding, the researchers adjusted the recall timeframe to the last year. The results of the consumption survey are provided in the results section of this report.

2.3 Confidentiality and Informed Consent

SVS understands and respects the importance of confidentiality and informed consent of our research participants. To ensure confidentiality and informed consent of participants SVS researchers took all reasonable measures to safeguard personal and confidential information. Some of these measures taken included not communicating to other MMF members the identity of participants who were being interviewed for the Study, using PIN numbers to represent participants instead of names, and storing data in a safe and secure location. Confidentiality and informed consent was communicated to the Study participants in writing through the permission forms and verbally by researchers.

2.4 Data Management

To protect the data collected, the research team put measures in place to create redundancies in the methods of gathering and storing information. Interview data was collected using multiple modes simultaneously, including GIS files, Microsoft Access database entries, video recordings of the GIS screen and the participant and back-up audio recordings of each session.

To achieve the safe storage of data throughout the research process, the team developed and followed a data management and storage protocol while in the field and back in the office. This protocol involved having a team member back up of all documents and files.

At the end of each day audio recordings and GIS and Access files were collected and backed up to an external hard drive. A copy of all files was backed up to a second external hard drive. Audio files were also uploaded to a cloud storage host as an additional back-up measure. Information collected on the interview record form (name, PIN, SD Card #, first and last GISID, deviations from standard procedure, interview date and location) were recorded on a Master Data Management Excel sheet and updated daily.

2.5 Study Limitations

2.5.1 Sample Size

A total of 10 interviews were completed as part of this Study with a focus on completing interviews with citizens who have used the lands and waters around the WR-1 Reactor. This number provided a relatively small sample size of the overall Métis population that has used and occupied the land in these areas.

Due to the limited size, and short duration of the Study, participants were strategically identified by the MMF to provide a cross-section of the Métis population that has used and/or lived in the Study's Geographic Scope specifically.

Despite the noted limitations set out in this report, SVS is of the position that the Study provides a reasonable representation of the Manitoba Métis Community's patterns of LUO within the Study Areas.

The Study is not, however, a statistically representative sample of the population of Métis land users across the Province of Manitoba or within the Study Areas and cannot be relied upon as such.

2.5.2 Mapping and Data Collection Consistency Issues

Digital maps were displayed to participants on laptop computers using Geographic Information System (GIS) software called ArcMap (v. 10.5). Participants were asked to look at the computer screen with the interviewer and identify the location(s) of LUO sites as prompted by each interview question. Most of the participants were able to recall specific locations, direct the interviewer to that location on the map, and verify that the interviewer had recorded the location correctly.

Some participants had difficulty reading and verifying locations using the computer-based map software due to vision problems, difficulty communicating, or difficulty understanding and/or relating to the maps. In these cases, the research team assisted participants with perspective on the digital map by providing a large paper map with town names and the boundaries of the Study Area for cross-referencing. Those with vision problems were assisted by the interviewer through pointing to locations on the map and reading the surrounding place names to orient the participant. Some participants brought a friend or family member to assist them if they had difficulty with vision or communication.

It should also be stated that slight inaccuracies may be found on the maps. For example, in a few cases, a fishing point may appear to be on land, or a hunting point to be in the water. This is a common mapping issue that can occur when data is mapped using one scale and/or one set of base maps and reported using another scale and/or set of base maps. Any such inconsistencies or inaccuracies should not be interpreted as undermining or invalidating the underlying information about LUO provide by participants.

2.5.3 Interviewer, Participant, and Study Biases

Both the interviewer and the Interviewee have inherent biases that can impact a research study. This is the case in all studies and interviews conducted, no matter what context or circumstance. Interview bias can stem from the social setting of the interview, perceived power imbalances between interviewer and Interviewee, the comfort of the interviewer or Interviewee, or the physical location of the interview. SVS and MMF took the following steps to decrease interviewer bias and mitigate the effects that it may have on the research project:

- MMF staff conducted interview scheduling and explained Study objectives to MMF Citizens in advance,
- Informed participants of the interview process again at the beginning of the interview,
- Provided opportunity for questions to be asked and answered,

- Made conscious choices of the plain language wording of questions asked and used a standard interview methodology and questionnaire,
- Limited the use of leading questions or statements,
- Where possible, conducted interviews in MMF community spaces to offer a familiar setting,
- Took breaks when needed to ensure interviewer and Interviewee stayed alert and focused.

In addition to the strategies above, SVS also applied methodologies of Terry Tobias (2009). This methodology is discussed further in the Methodology section of this report. An important aspect of the Tobias approach to note here, however, is the Data Diamond. The Data Diamond is a mapping approach that ensures the map biography survey focuses on facts. To ensure that mapping data is as accurate as possible, a total of four use-and-occupancy facts need to be collected for the areas mapped (Tobias, 2009:47). These facts are:

1. By a participant and/or others (Who)
2. Engaged in an activity (What)
3. At some point in time (When)
4. At a specific location (Where)

The Data Diamond can be used to improve map accuracy by helping participants recall as many details as possible. SVS used detailed maps to help participants orient themselves and thereby be more accurate with their mapping data, and to support participant recall.

2.5.4 Data Validation

At the time of writing this report, the data collected in this Study has not yet been validated. The MMF plans to carry out a data validation process in the future.

3.0 Results of the MMTKLUO Study

The map biography and oral history interviews indicated that participants are intimately connected to the lands and waters around the WR-1 Reactor Site. Participants expressed both personal and ancestral connections to the area, especially related to LUO. Many participants expressed that this area, and specifically the Winnipeg River, Lee River, and Lac du Bonnet, provide sustenance to participants and their families.

In some interviews, participants expressed how the area is historically important to the Manitoba Métis Community, expressing that their family ties to the Métis voyagers and fur trade era, and especially the Winnipeg River as a main travel route, have influenced their own connection to the area. These are

important ties to Métis traditions and culture. Another participant noted that their family has strong ties to Pine Falls, just upstream of the WR-1 Reactor site.

One participant expressed that the Métis have deep connections to the land and waters and a distinct Métis traditional knowledge that is specific to their culture and use of the lands and waters. For this reason, they said, they would like to be involved with projects that impact the lands and waters so that they can provide their expertise.

> Interviewee: *"I mean my family history—I come from the fur trade on my dad's side, and we come from Red River here—my great-great-great grandfather through Hudson Bay—were part of the fur trade. So, we were trappers and fur-traders, and same thing on the mother's side; they were as well voyageurs and stuff. So, my connection to it is very strong; I'm very proud of that, and that's the lifestyle that I live. I mean when I'm out there, I was raised out that—raised to trap, hunt, fish—and I've been very fortunate to have that. Same as my history, and as I look back and do it, it's such a colourful past that we were here. So, I mean there are very strong ties to the land there, and like I say, I live in between it—it was Dawson Trail and the Winnipeg River. It's the homeland."*
> Interviewer: *"And also, who did you learn to harvest from—well you mentioned your dad; you'd go with your dad. Were there other people who were influential in teaching you to harvest?"*
> *Interviewee: "Mainly my dad. And that was the direction he took with his background and stuff like that. So, it mainly would be my father, the one that-- my son has hunted and trapped with my dad as well, so right from when he was a little guy, so he's right there as well."*
>
> *"Yeah the majority of his childhood he probably would have spent in Pine Falls. Because I remember my grandfather had a logging, teamster, like with horses, and they hauled wood out of camp 24, which is east side of, east side of the Winnipeg River. Towards Manigotagan, in those camps."*
>
> *"**Well, we've been here, we're not going anywhere, we'll be here till the end of time, and we're people of the land. And if you care about mother nature, care about his earth, sit down and talk with us, together we can make a difference. A lot of us still have the old knowledge in our heads, and we'll share with you. Because a lot of the ideas that you have, if you don't know the land, don't know the Earth,** how can you heal something if you're not a doctor, that doesn't you know. A doctor goes through a lot of education to learn how to be a doctor, if you don't know anything about living off the land, or the animals, how are you going to fix it? If you don't know what you, you know, if you don't have the education. I think the government and everybody else have to sit down with the aboriginal, with the Métis people, and we'll share our knowledge with you, make this a, give the animals and this planet a chance to get out of the damage we've done to it already."*

The discussions that follow this section focus more on the MMTKLOU mapped data collected for this Study.

3.1 Study Areas and Participant Land Use

The ten participants in this Study identified 424 locations of LUO. Of these, a total of 192 LUO locations were mapped within 25 km of the WR-1 Reactor site and of these 192 locations, 75 were located within the 100 m Study Area. Locations mapped within 25 km of the WR-1 Reactor site include:

- 23 access routes, 12 of which were mapped within the 100 m Study Area
- 44 fishing locations, 38 of which were mapped within the 100 m Study Area
- 3 trapping/snaring locations
- 18 gathering locations
- 3 commercial guiding or other commercial land use locations
- 32 locations of TEK, 15 of which were mapped within the 100 m Study Area
- 8 locations where participants have noticed changes to the environment, 2 of which were mapped within the 100 m Study Area
- 41 hunting locations, 2 of which were mapped within the 100 m Study Area
- 11 demographic[2] locations, 2 of which were mapped within the 100 m Study Area
- 7 locations of cultural significance, 2 of which were mapped within the 100 m Study Area
- 2 locations of other land use (ice-fishing huts), both mapped within the 100 m Study Area

Figure 5 displays all data collected for this Study. The following two sections provide more detail on the data collected within each Study Area.

[2] For privacy reasons, demographic locations have not been shown on the maps or reported on in detail in this report

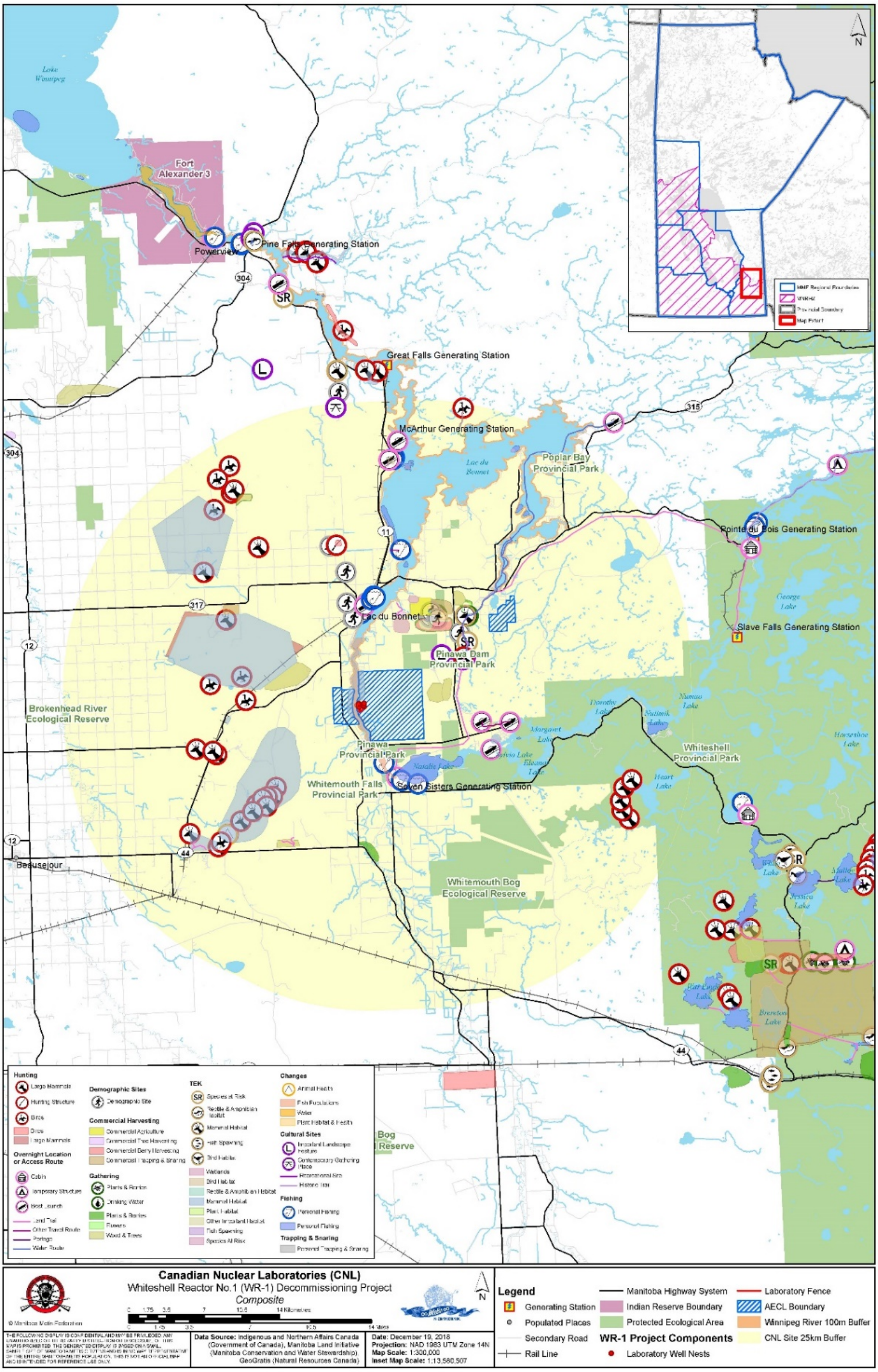

Figure 5. Composite Data of all Map Biography Interviews

3.1.1 100 m Study Area

The 100 m Study Area includes the waters of the Winnipeg River, as well as 100 m on either side of the waters (from Seven Sisters Generating Station to the mouth of the Winnipeg River), the whole of Lac du Bonnet, and the Lee River. This Study Area was used to show where the Métis participants have and continue to use the areas that could be impacted by contaminants from the decommissioning of the WR-1 Reactor. The following is an in-depth discussion of the 100 m Study Area, followed by maps of the area. Tables with attribute data for each mapped location of LUO is provided in Appendix A.

In total, participants mapped 75 locations of LUO that fell within the 100 m Study Area. Participants were able to describe in detail their knowledge of the area, especially those who use the Winnipeg River, Lac du Bonnet, and the Lee River for fishing. For example, many participants who have used the area for their whole lives were able to share places of ecological significance that can only be known by travelling through and using an area throughout multiple seasons. The familiarity that participants had with the lands and waters in this area has provided important details that should be considered in moving forward with the EA process (which as previously noted in MMF's comments on the EIS, there were concerns raised regarding the extent of sampling and monitoring of the river systems of WR-1 area). Descriptions of these areas, including the PIN GISID that can be cross-referenced on the maps, as well as qualitative quotes that correspond with each these areas, are provided below:

- Fishing occurs by at least one participant directly east of the WR-1 Reactor site on the Winnipeg River (PIN GISID 5204-18), and more than one participant identified fishing spots north (downstream) of the WR-1 Reactors site (PIN GISID 5201-13; 5204-19; 5204-20; 5204-26; 5204-27; 5204-28; 5204-29; 5204-30; 5204-31; 5204-32; 5204-37; 5206-37; 7502-85). Additional fishing sites in the 100 m Study Area can be found in Table 3.

- Important marsh habitat for jackfish and waterfowl south of McArthur Falls. In these areas the participant described habitat for wild rice, which they see as the main attraction for waterfowl. This participant also noted that they hunt here for waterfowl (re: PIN GISID 5204-13; 5204-52; 5204-53; 5204-54).

- Participants identified that there is a strong current in the water toward McArthur Falls that create strong back eddies. They said that this provided good fish habitat, specifically for jackfish and that they have used this area both within and prior to the last 10 years for fishing jackfish and pickerel (re: PIN GISID 5204-28;5204-29;5204-30; 5204-31).

- One participant mapped sturgeon habitat in the Winnipeg River just north of the WR-1 Reactor Site. The participant said that the water is deeper here and provides good habitat for sturgeon. They also mentioned that sturgeon populations have been increasing in this area (re: PIN GISID 5204-24; 5204-25]. A second site was mapped in the 25 km Study just north of Pinawa Dam in the Pinawa Channel (re: PIN GISID 7502-89).

- One participant who fishes the Winnipeg River identified deer habitat in and around the WR-1 Reactor site. This participant mentioned that they often see deer on the banks of the River in front of the WR-1 Reactor site in the summertime. They noted that there is not a fence around the site that they could see from the water, and that the deer are often seen coming from the wooded area to drink from the Winnipeg River (re: PIN GISID 5204-55; 5204-56).

- One participant who has used the area for most of their life identified place they felt were important landscape features and another location where they use the river for tubing (re: PIN GISID 5206-38; 5206-41).

- Participants mapped areas where they use the access trails or boat launches within the 100 m Study Area. Some of these were public boat launches. (re: PIN GISID 5201-9; 5201-11; 5202-23; 5202-24; 5204-33; 5204-34; 5204-35; 5304-36; 5206-31; 5306-32; 5206-33; 7502-95).

The quotes below have been taken directly from the interview transcripts. They provide more context to the mapped features that have been described above. Where relevant, the PIN GISIDs that correspond with each quote have been provided.

> Interviewer 1: *"So, you think this little bay is somewhere that you would typically go?"*
> Interviewee: *"Hard to tell you. Probably farther up, maybe right close to the [reactor] there. Right in front of it. […] Yeah, I haven't fished there in a few years, but… a lot of people do. It's a good spot."*
> Interviewer 2: *"What makes it a good spot?"*
> Interviewee: *"The current, the way the river is, all the way along there is a lot of current in that stretch. Good back eddys and different spots."*
> Interviewer 2: *"Are there any places that are kind of like blackwater, like really deep?"*
> Interviewee: *"Yeah, like that stretch of river is pretty deep. […] Yeah that's a good one for goldeye and mooneye that's for sure."*
> **(Reference to PIN GISID 5204-18)**

> Interviewee: *"That's the area. Yeah because there's really deep water here, and really fast water and on the edges it's"*
> Interviewer 1: *"[…] So deep water, lots of current."*
> Interviewee: *"Yeah lots of current. Cause it really goes over this…"*
> Interviewer 1: *"The whole area kind of thing?"*
> Interviewee: *"Yeah, it really… well it's shallower on these sides that's why the fish are in there."*
> Interviewer 1: *"Oh, right down the centre?"*
> Interviewee: *"Yeah, the middle is deep."*
> Interviewer 1: *"[…] How far- do you know how long this stretch is deep for?"*
> Interviewee: *"I don't know, for the most part the river in the middle is usually pretty deep but I mean it can go anywhere from 40 feet, there's 60 feet, holes along the river, it depends, you never know."* **(Reference to PIN GISID 5204-21)**

Interviewee: *"I'll mention that it's all very good sturgeon habitat too. We don't harvest it. But the population was depleted, but the population is coming back up and hopefully someday we can start harvesting again."*
Interviewer 2: *"In that same area?"*
Interviewee: *"Oh yeah, in that same area right from CNL upstream, downstream, anywhere there." […]*
Interviewee: *"Even right here, I have caught sturgeon there. Can't stop them from grabbing your hook. That whole river you fish long enough you're going to see one jump. There's lots there, they're coming back and they're doing well. […] Yeah, like you see the sturgeon come up a lot right in the middle too, because those are deep, deep places. And right up the river to Seven Sisters Falls. You hear of people catching them all the time and I've caught a few. […] Sturgeon really is actually a good story, they are coming back."* **(Referencing PIN GISID 5204-24;5204-25)**

Interviewer 1: *"Is there anywhere of that you know of that is good mammal habitat near the site?"*
Interviewee: *"For deer? Oh yeah, all along the river pretty well, there's a lot of, there's some brush, good places for them to hide. And I know, you see them with their young a lot, in those places. Actually, right around the ACL here too, I know, I don't hunt there but I know there's- you aren't really supposed to, there is a lot of deer in that area."*
Interviewer 2: *"Why don't we map that as well?"*
Interviewee: *"On each side of the river."*
Interviewer 1: *"On both sides, like right in, their property almost?"*
Interviewee: *"Yeah"*
Interviewer 2: *"Is there a fence around the property?"*
Interviewee: *"I don't think so. Maybe closer, but, I haven't really seen anything from the river at all. […] I'm pretty sure there are signs, there might be… there was signs. I know there is along the highway here telling you not to go in there…*
Interviewer 1: *"So you said there's deer right on both sides of the river here?" […]*
Interviewee: *"Maybe close to it because sometimes when I'm fishing in the summer time you see them coming down the banks to drink or whatever from the river."*
Interviewer 1: *"[…] Do you think they stay pretty close to the water?"*
Interviewee: *"Yeah I think they do. In the hot months too, I think they come to the water to drink. Maybe get a breeze or get away from the flies a little bit too […]."*
Interviewer 2: *"Have you noticed that your whole life?"*
Interviewee: *"Yeah, as long as I've been going, we've always seen deer along the river in that area."* **(Referencing PIN GISID 5204-55; 5204-56)**

Interviewee: *"And then one time we were fishing there, and I see this thing coming across, just past the end of the rocks in the water swimming, and it turns, and it come right at us, and here's this huge six-point buck deer swimming, right across the river. And it was like a monster, he went*

right past the front the, I guess he thought we were land, he went around the front of the boat and right to the shore, what a gorgeous."

Interviewee: *"Before, in my first marriage I lived on the Lee River as well and we used to drink it right from, we have no filters, nothing, open the tap, your line was out there. You could can with it and everything. Now you can't can with it."*
Interviewer: *"How come?"*
Interviewee: *"I don't know why, the water, what would you call it? Is changed. You can't can with it. Everything goes bad. So I have to get spring water from my brother's place to can, and it is so dirty [our] water. We have put, how many filters do we have in our house? 5, 8? […] You know, and all these filters, they cost, they really cost all those filters. And you have to change them about every week and a half." […]*
Interviewer: […] "So the change to that water, you were saying, you can't use it for canning anymore."
Interviewee: *"No I can't use it. Like before, when I lived here in 1980, I could, when I lived there on the Lee River in 1980, I was canning it right from the tap. It was good water! Now you can't do it. […] I don't know why, why I can't. But I can't do it. […] The balance is not the same or something. Everything spoils."* **(Referencing PIN GISID 5202-16)**

It is evident that this area is used by some members of the Manitoba Métis Community for subsistence harvesting, and that some of these harvesters intimately know the landscape and can identify places of ecological importance and change. Figure 6 below identifies all LUO identified by participants within the 100 m Study Area. Table 3 through to Table 12 in Appendix A provides the corresponding attribute data.

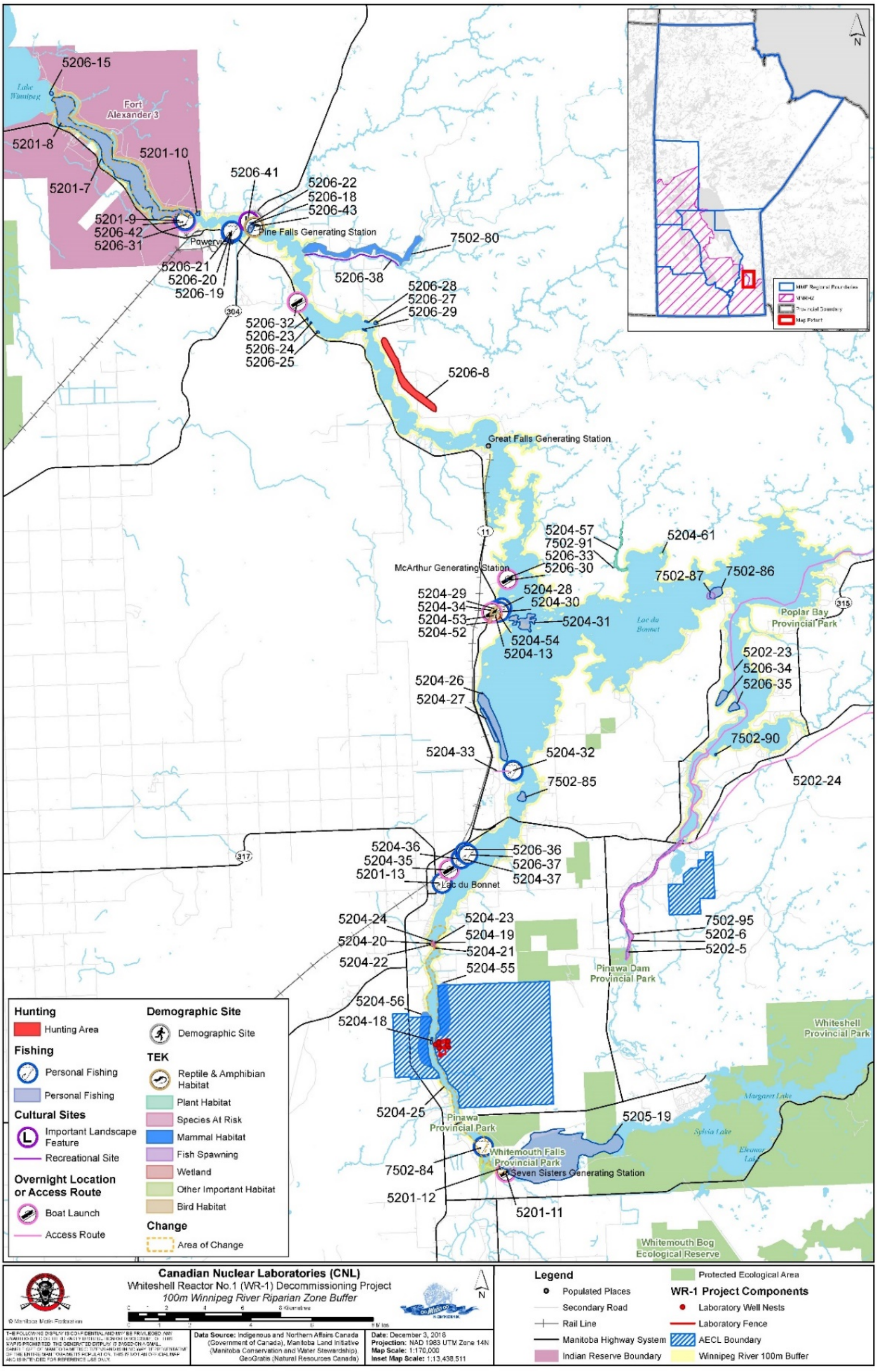

Figure 6. All Data Mapped within the 100 m Study Area

3.1.2 25 km around CNL Study Area

The 25 km Study Area consists of a 25 km radius around the WR-1 Reactor Site. This Study Area was used to include animals with habitat that ranges through the 100 m Study Area and beyond. Study participants identified a total of 117 locations of LUO within the 25 km Study Area. The following describes in more details some of the sites of LUO that were identified in the 25 km Study Area:

- Participants fish for mooneye, walleye/pickerel, yellow perch, jackfish/Northern pike, and goldeye in the 25 km Study Area. Most fishing sites are located east and southeast of WR-1 Reactor site. Two fishing sites were mapped close to the Seven Sisters Generating Station (PIN GISID 5205-62 and 5205-63), two other sites were mapped close to the Pinawa Dam (PIN GISID 7502-88, 7502-94) (See Figure 7 and Table 8).
- Participants identified hunting grouse, geese, and ducks in the 25 km Study Area. Most bird harvesting activities were identified west of WR-1 Reactor site. The bird hunting sites closest to WR-1 Reactor site were identified near Milner Ridge (PIN GISID 5204-15, 5204-16, 5204-17). One duck hunting site (PIN GISID 5204-60) was identified north of WR-1 Reactor site, close to the McArthur Generating Station (see Figure 8 and Table 9).
- Participants identified White-tailed deer as the only large mammal that they hunt in the 25 km Study Area. There are large clusters of deer kill sites located at Milner Ridge (PIN GISID 5204-7, 7210-138, 7313-153, 7313-154, 7313-155, 7313-156, 7313-57, 7313-58, 7313-59, 7313-60, 7313-61, 7313-62, 7313-168, 7402-127, 7402-128, 7402-129, 7402-130, 7402-133) and Heart Lake (PIN GISID 5205-14, 5205-15, 5202-16, 5205-17, 5205-18). See Figure 8 and Table 9.
- Participants reported gathering firewood for personal use within the 25 km Study Area (PIN GISID 5202-7, 5203-7, 5203-8, 5203-9, 5204-39, 7402-139). Species harvested for firewood included poplar, spruce, jack pine, and birch. One site of commercial tree harvesting was identified (PIN GISID 5203-17) that indicated harvesting evergreens for sale as Christmas trees more than 10 years ago. One participant also reported gathering flowers for personal use in the area between the Underground Research Lab and the Winnipeg River (PIN GISID 5205-13, 5202-14, 5202-15). See Figure 10 and Table 11.
- Within the 25 km Study Area seven gathering sites for food or medicine were identified. Species gathered include blueberries, cranberries, pin cherries, Saskatoon berries, strawberries, choke cherries, raspberries, wild plums, fiddleheads, hawthorn nuts, and Labrador tea. Four food gathering sites are located between the Underground Research Lab and the Winnipeg River (PIN GISID 5205-8, 5202-12, 5202-17, 7502-92). See Figure 10 and Table 11.
- One commercial gathering of food or medicine identified was a location north of Pinawa Dam where the participant would gather blueberries, pin cherries, cranberries, and Saskatoon berries as a child to sell to road workers (PIN GISID 5205-9). See Figure 9 and Table 11.
- One participant noted two drinking water sources from within the 25 km Study Area. GISID 5202-16 indicates a pump in the Lee River which is the drinking water source for the participant's household. The participant explained that they used to drink water straight from

the Lee River, but since moving back to the area in 2003, they have had to install multiple filters and reverse osmosis on their water coming from the Lee River. These filters have to be changed roughly every week and a half. The participant noted the high cost of these filters as well as costs associated with ongoing water quality testing. See Figure 10 Table 11.

- Two commercial trapping and snaring sites (PIN GISID 5204-14, 5202-4) and one personal trapping and snaring site (PIN GISID 5203-5) within the 25 km Study Area. Participants reported trapping primarily marten, rabbit, squirrel, and weasel in these locations. One commercial trapline was used during the participants childhood and is no longer active (PIN GISID 5202-4), the other, a community trapline, had been used within the last 10 years but the participant feels that the area is over-trapped and no longer harvests there (PIN GISID 5204-14). This illustrates clearly how participations view the importance of their stewardship responsibilities, as well as the ever-increasing pressures and limitations on Métis harvesting in southern Manitoba. See Figure 9 and Table 6.
- Participants shared TEK regarding bird, mammal, and reptile habitat; wetlands; and sturgeon (a species at risk) within the 25 km Study Area. Within the last 10 years, one participant saw a, roughly 7-foot, sturgeon breach near the Pinawa dam (PIN GISID 7502-89). Near to the WR-1 Reactor site (between the Underground Research Lab and the Winnipeg River), participants recorded wetlands (PIN GISID 5202-11, 5203-12), berry habitat (PIN GISID 5202-10), and snake habitat (PIN GISID 5203-15). See Figure 11 and Table 12.
- Participants indicated four contemporary gathering sites near the Pinawa Dam. Gathering places included a picnic area used currently as well as during the participants childhood (PIN GISID 5202-20), a family gathering place (PIN GISID 5203-19), and a swimming area (PIN GISID 7502-93). See Figure 12 and **Error! Reference source not found.**.
- Participants noted several land and water trails used within the 25 km Study Area. Most of these trails are still used today and have been used for more than ten years. See Figure 12 and Table 9.
- One participant identified four areas between the Underground Research Lab, the Whiteshell Reactor site, and the Winnipeg River, where berries (PIN GISID 5203-10, 5203-11, 5203-14) and plums (PIN GISID 5203-13) used to grow but no longer do. In the same area, another participant noted a change to water quality from the Lee River. They said in the 1980's they would can with unfiltered water from their tap running from the Lee River, but since returning to the area in 2003, they are no longer able to can with the water from the Lee River. Everything they can (e.g. preserve in cans or jars) with this water now spoils. Instead, the participant uses spring water from a relative's property to can (PIN GISID 5202-18). See Figure 13 and Table 10

Figure 7 through to Figure 13 provide a visual display of the data collected within the 25 km Study Area and Table 3 through to Table 12 in Appendix A provide the corresponding attribute data. These maps also include the data collected within the 100 m Study Area.

It should be noted that no data has been double counted in this report, that is, if the data fell into the 100 m Study Area, it was only counted in the write-up above and is not included as a part of the 25 km Study Area information.

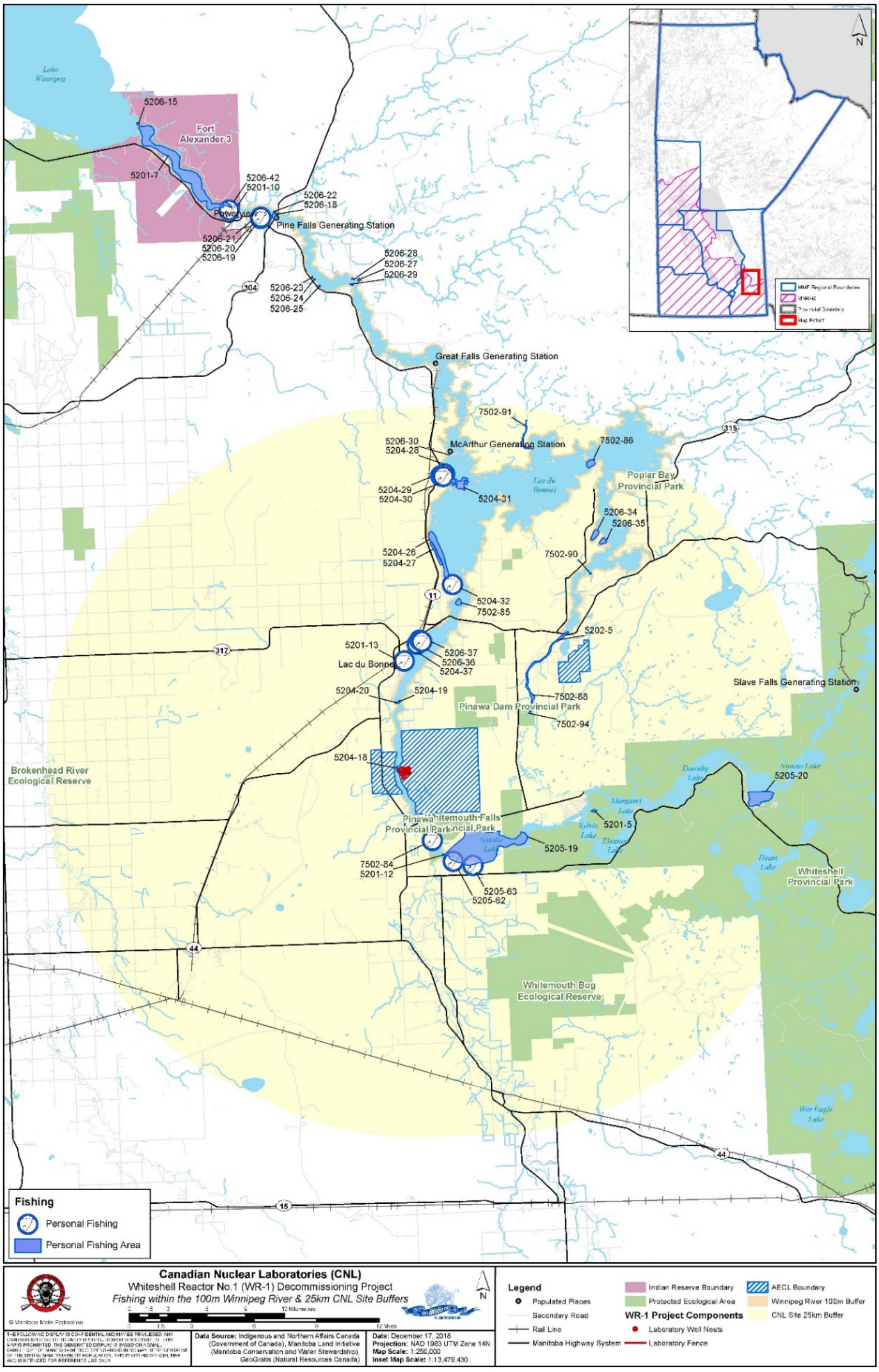

Figure 7. Personal Fishing Sites within 100 m and 25 km Study Areas

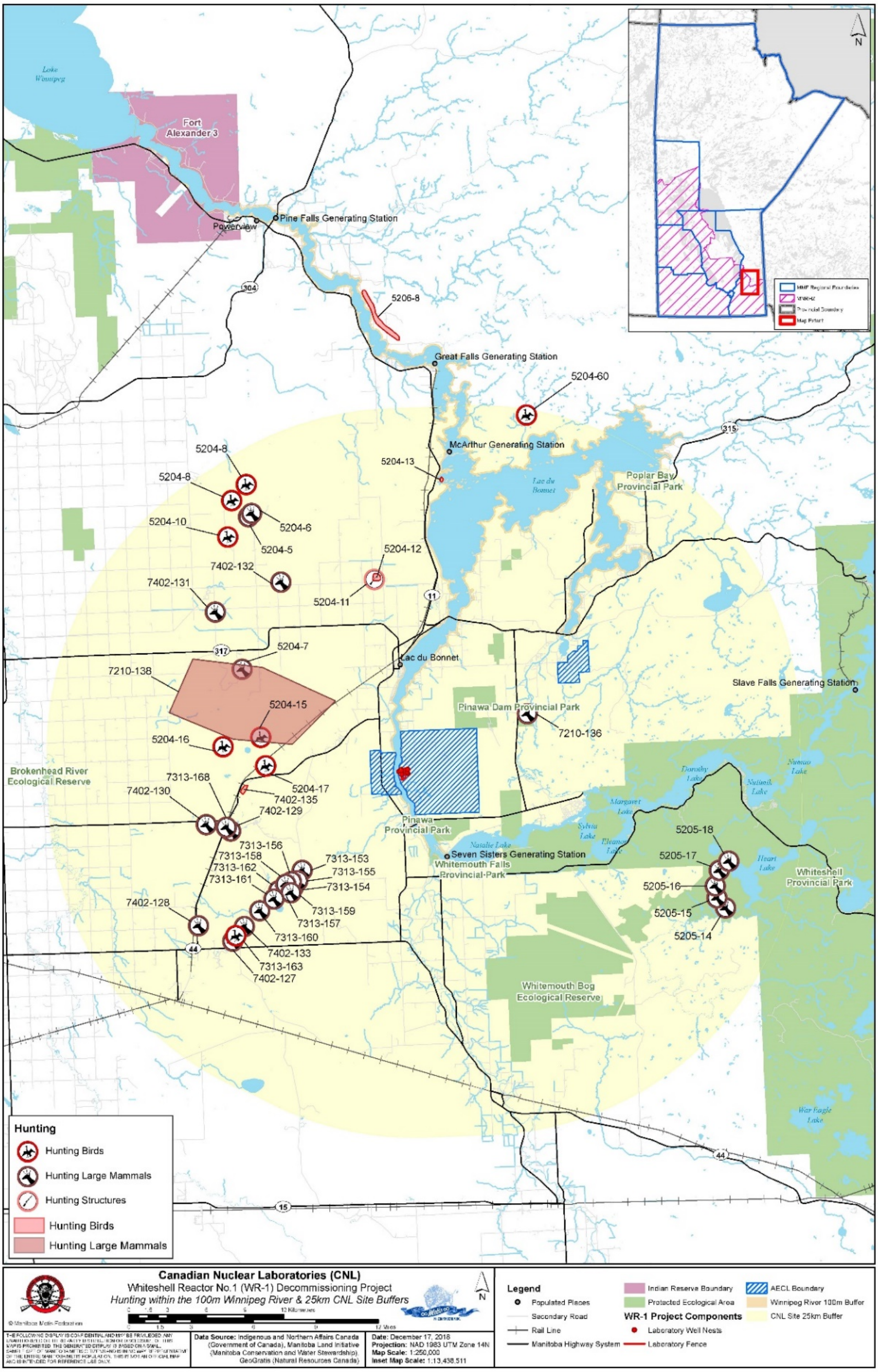

Figure 8. Hunting Mapped within the 25 km and 100 m Study Areas

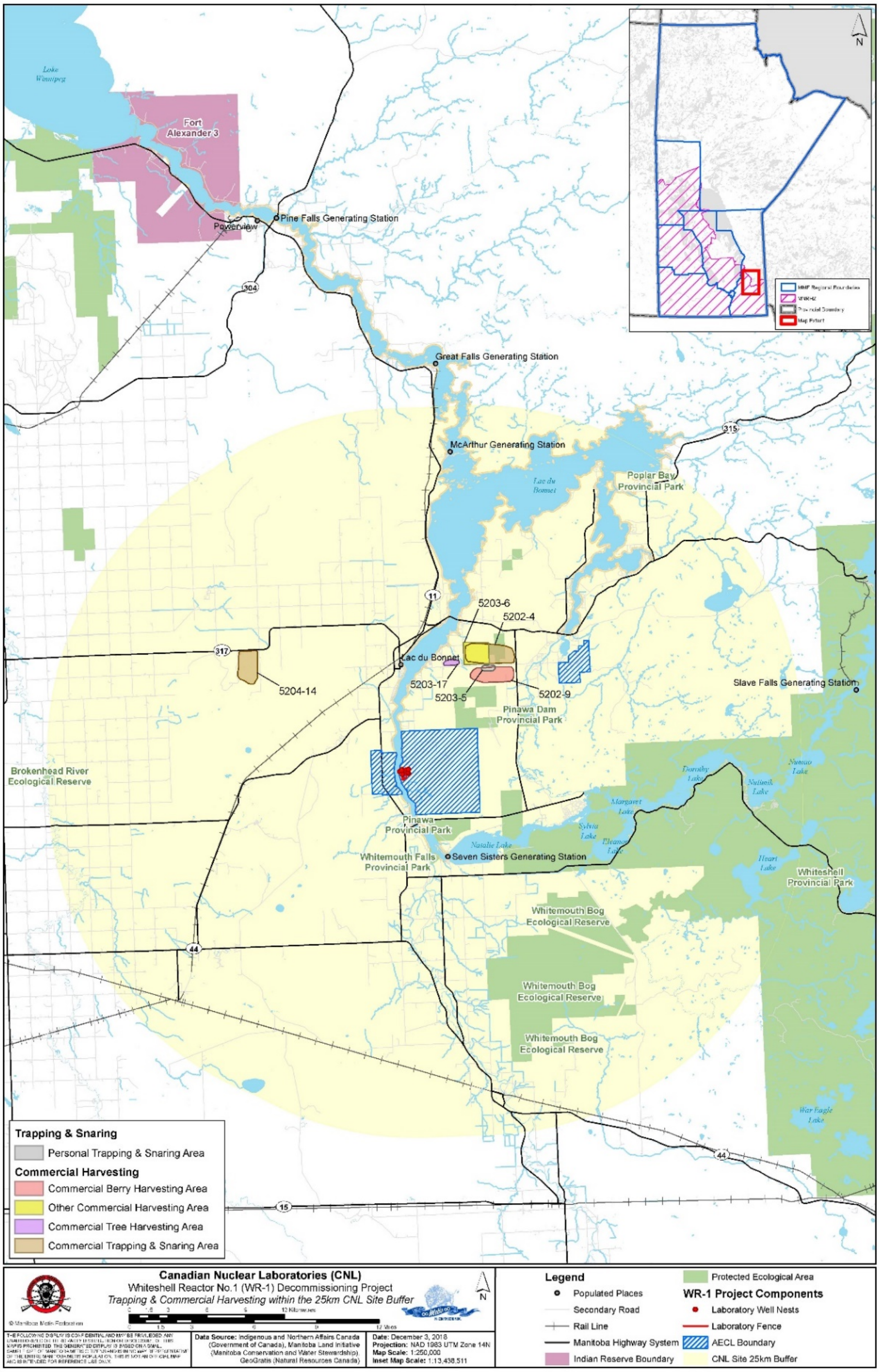

Figure 9. Trapping and Commercial Harvesting Mapped within the 25 km and 100 m Study Areas

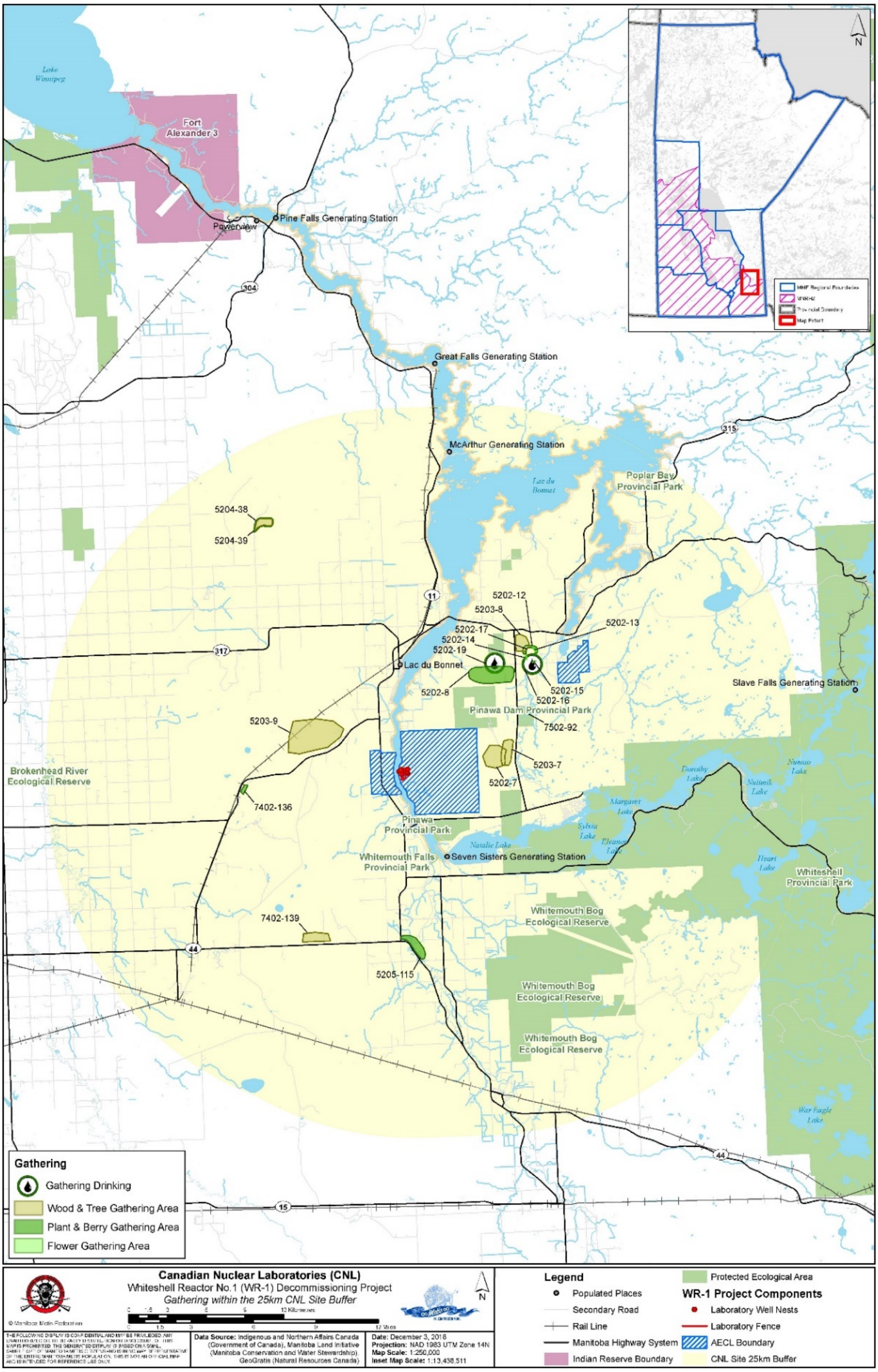

Figure 10. Gathering Mapped within the 25 km and 100 m Study Areas

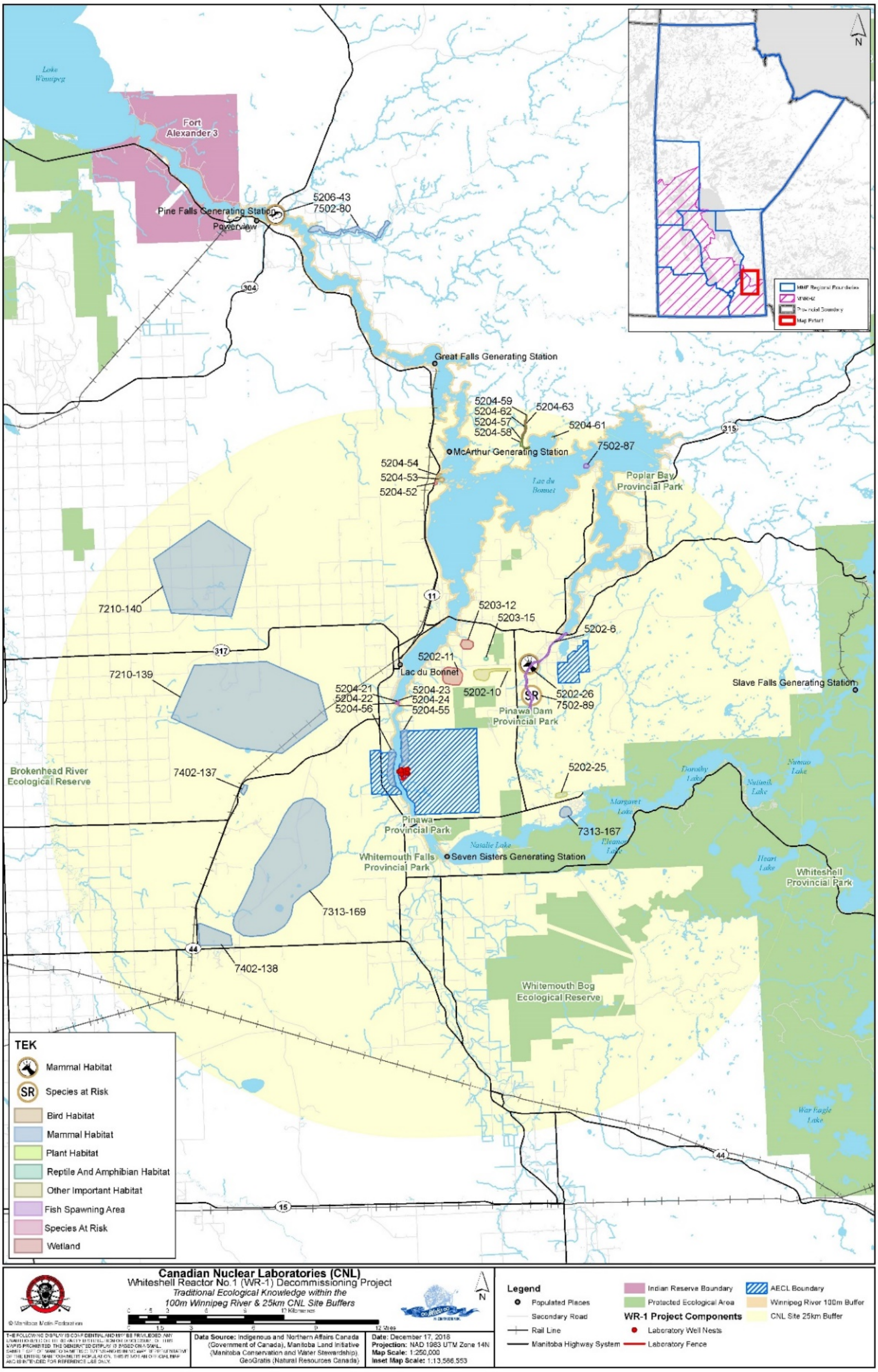

Figure 11. TEK Mapped within the 25 km and 100 m Study Area

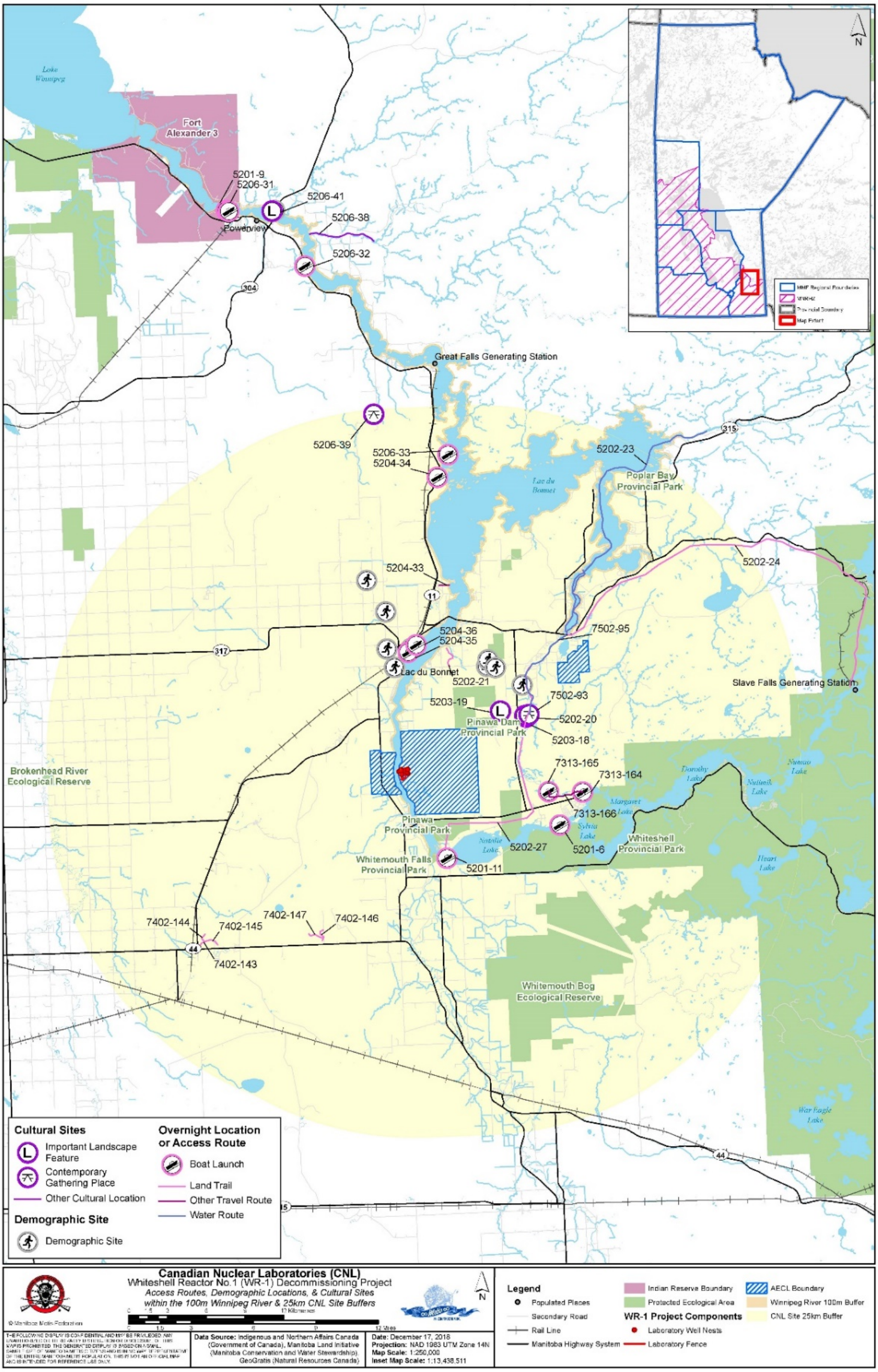

Figure 12. Cultural Sites, Overnight Locations, and Access Routes Mapped within the 25 km and 100 m Study Area

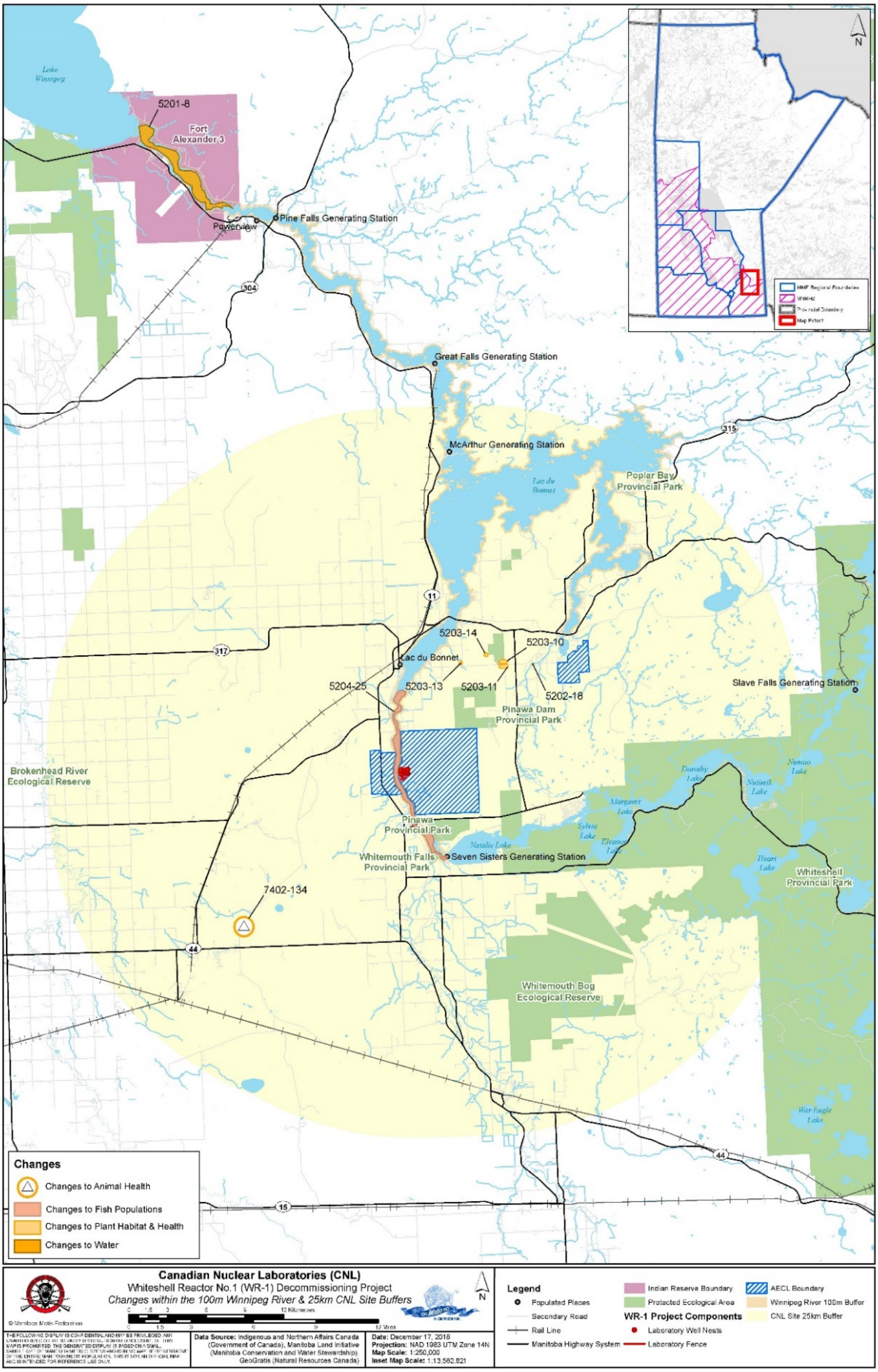

Figure 13. Changes Mapped within the 25 km and 100 m Study Areas

3.2 Consumption Survey Results

The maps provided in this report show that there is extensive land use within the 25 km Study Area by members of the Manitoba Métis Community. What the maps do not indicate, however, is the frequency of consumption of wild foods from the area. Understanding how often participants consume wild foods from this area is important to get a sense of potential exposure to contaminants, especially for wild foods that are consumed directly and frequently from the Winnipeg River. For frequency of consumption of wild foods, see Table 2.

At the beginning of each interview, the participants completed a consumption survey which was administered by the interviewer. Participants were asked to recall their consumption of foods that were harvested, to the best of their knowledge, from within the 25 km Study Area in the last year and the parts of the animal or plant that they consume.

The findings of the survey show that some participants consume wild foods that are harvested by others and shared with them. Many families share their harvest, and while there were only 10 Métis harvesters who participated in this Study, it can be assumed that many more Métis people consume wilds foods from within from within the 25 km Study Area. In addition, other wild foods not identified may be consumed by members of the Manitoba Métis Community where, for example, those foods are harvested by and / or shared with others are part of Métis traditions or are no longer harvested as part of exercising Métis rights and traditions of stewardship and conservation. Table 1 shows the number of participants who identified consuming wild foods and the range of quantity of each species they harvested, however it should not be interpreted as an exhaustive list or representative of the full species harvested pursuant to the Manitoba Métis Community's s. 35 harvesting rights.

The consumption survey results are as follows:

Consumption of Moose Harvested from within the 25 km Study Area

One out of ten participants reported that they consume moose that has been harvested, to the best of their knowledge, from within the 25 km Study Area. The participant reported that they consume moose from the area once every two months, generally as steaks or moose sausage. The participant was unsure as to whether the sausage contains organ meat.

Consumption of Deer Harvested from within the 25 km Study Area

Nine out of ten participants reported that they consume deer harvested from within the 25 km Study Area. Participants consume deer meat, organs (heart and liver), tongue, and sausage which may contain organ meat. Harvesters harvest between two and ten deer each from this area per year. Two participants who said they used to harvest deer from the area frequently reported a harvest of zero in the last year because they have recently moved and now harvest deer closer to their new home. The harvester with the highest number of deer harvests per year (ten) said that he shares the majority of the meat with others.

Consumption of Geese Harvested from within the 25 km Study Area

Three out of ten participants consume geese from within the 25 km Study Area. Participants reported consuming goose meat, gizzards, and heart. One participant reported eating goose in the form of pepperettes, which may contain organ meat. Harvesters harvest between 20 and 60 geese each from this area per year. Regarding frequency of consumption, two participants noted that their consumption of goose fluctuates seasonally. One participant reported consuming goose daily in the first part of the season (early fall) and weekly for the rest of the year; another participant reported consuming goose weekly in the season (fall) and monthly the rest of the year.

Consumption of Ducks Harvested from within the 25 km Study Area

Two out of ten participants consume ducks from within the 25 km Study Area. Participants report consuming duck meat, gizzards, and heart. Harvesters harvest between 20 and 30 ducks each from this area per year. Regarding frequency of consumption, two participants noted that, like geese, consumption of duck fluctuates seasonally. Both participants reported eating duck weekly in the fall and monthly throughout the rest of the year.

Consumption of Other Birds Harvested from within the 25 km Study Area

Other birds consumed by participants are ruffed grouse, spruce grouse, and partridge. Five out of ten participants consume these birds from within the 25 km Study Area. Participants report consuming grouse and partridge meat (specifically breast meat), gizzards, and heart. Harvesters harvest between eight and 30 grouse and roughly 24 partridge each from this area per year.

Consumption of Fish Harvested from within the 25 km Study Area

Eight out of ten participants consume at least one type of fish from within the 25 km Study Area. Participants report consuming Walleye, Lake Whitefish, Smallmouth Bass, Northern Pike, Suckers, Goldeye, Mooneye, Perch, Sturgeon, and Catfish. Participants report harvesting between one and 75 pounds of fish per year, depending on the species. Walleye is the most commonly consumed species of fish, and Lake Whitefish, Suckers, Perch, and Sturgeon are the least commonly consumed.

Consumption of Wild Rice Harvested from within the 25 km Study Area

Wild rice was the only aquatic plant that participants reported consuming from within the 25 km Study Area. Three out of ten participants consume wild rice from within the area. Not all participants harvest wild rice themselves, but they reported consuming between 3 and 10 pounds each year from this area.

Consumption of Berries and Fruit Harvested from within the 25 km Study Area

Six out of ten participants consume berries and/or fruit from within the 25 km Study Area. Participants report consuming blueberries, pin cherries, cranberries, saskatoon berries, chokecherries, gooseberries, and wild plums. Harvesters harvest between a few handfuls and 60 liters each from this area per year. Some participants who gather larger amounts make preserves and so consume berries year-round.

Consumption of Other Plants Harvested from within the 25 km Study Area

Three out of ten participants consume plants other than wild rice, berries, and fruit. Other plants consumed by participants from within the 25 km Study Area are Labrador tea (2–3 lbs. annually), fiddleheads (2–3 lbs.), and hawthorn nuts (2–3 gallons). The participants reported consuming two to three meals worth of fiddle heads (roughly 2–3 lbs.), two pounds of Labrador tea, and two to three gallons of hawthorn nuts annually.

Table 1. Consumption Survey Results: Number of Harvesters who Consume Species Identified and Range of Harvest Quantity

Species Consumed	Number of Participants who Consumed Identified Species	Range of Quantity Harvested Annually Per Harvester
Moose	1	0[3]
Deer	9	2-10
Geese	3	20-60
Duck	2	20-30
Other Birds	5	8-30
Walleye	7	5-75 lbs.
Lake Whitefish	1	20-25 lbs.
Smallmouth Bass	3	1-10 lbs.
Northern Pike	4	5-50 lbs.
Suckers	1	50 lbs.
Goldeye/Mooneye	5	10-50 lbs.
Perch	1	5-10 lbs.
Sturgeon	1	10 lbs.
Catfish	2	20 lbs.
Wild Rice	3	3-10 lbs.

[3] This participant consumed moose that was harvested by their brother-in-law

Species Consumed	Number of Participants who Consumed Identified Species	Range of Quantity Harvested Annually Per Harvester
Berries & Fruit	6	1-60 L
Other Plants (fiddle heads; hawthorn nuts; and Labrador tea)	3	

Table 2. Frequency of Consumption of Wild Foods

Species	Daily	Weekly	Less than Weekly, More than Monthly	Monthly	Less Than Monthly, More than Once Per Year	Once Per Year
Moose	0	0	0	0	1	0
Deer	0	3	2	2	0	1
Geese[4]	1	2	0	1	0	1
Duck[5]	0	2	0	2	0	0
Other Birds[6]	1	2	0	2	0	2
Walleye	0	3	1	2	1	1
Lake Whitefish	0	0	0	0	1	0
Smallmouth Bass	0	0	0	1	0	2
Northern Pike	0	1	1	1	0	1
Other Fish	0	2	0	2	3	2
Wild Rice	0	0	0	1	1	1
Berries & Fruit	1	2	0	0	0	2

[4] Goose consumption was reported to fluctuate seasonally for two participants.
[5] Duck consumption was reported to fluctuate seasonally for two participants.
[6] Grouse and partridge consumption was reported to fluctuate seasonally for two participants.

Species	Daily	Weekly	Less than Weekly, More than Monthly	Monthly	Less Than Monthly, More than Once Per Year	Once Per Year
Other Plants	0	1	0	1	1	0

3.3 Participants' Perceptions, Concerns, and Questions about the Decommissioning Process

3.3.1 Perceptions and General Thoughts

Participants were asked about their thoughts regarding the proposed decommissioning of the WR-1 Reactor site, including anything they thought would be positive or negative about the decommissioning, its activities, and any outstanding questions they had.

Participants expressed that the lands and waters around the whole of Manitoba have been used by Métis in the past and are still being used by Métis harvesters currently. One participant expressed that the Métis homeland (which they said includes the whole of Manitoba) has been used for hundreds of years by the Manitoba Métis Community and continues to be used today. Their hope was that the lands and waters would be taken care of so that future generations of Métis citizens and harvesters will be able to use them in the same way that harvesters do today.

> Interviewee: *"I think what we're doing here [land use and occupancy mapping] is great. We're finally showing, showing, companies and government that yes, the Métis are here, and yes, we do, we're not just in our communities [e.g. specific towns/locations]. We hunt, and we harvest all over this province, wherever we are, that's where we harvest, tomorrow we'll be in a different place. You know, like, this is the way it goes, like, I was born in Pine Falls, five years old, next thing I know we're in Brandon, then we're up in Gillam, and when I was in Gillam I was harvesting there, and I did some trapping when I was there. And next thing I know I'm in Grand Rapids, you know? We move, we go where we have to go, but wherever we are, we're harvesting, we always harvest, and we still go back to our traditional areas, and still hunt those areas as well. They're just not areas that our ancestors use that we forget about, we still use them, they're still ours. This whole province of Manitoba, that's our, that's our, our Metis' homeland, this is our harvesting area, you know. This where we've been for hundreds and hundreds of years, so we're not going anywhere and we're still going to be using this land, my great-grandchild will be using it far as I have a say in it."*

Some participants expressed that while they do have concerns, they will continue to return to the LUO locations that they mapped because of its significance to them and as a part of their harvesting territory and traditions. One participant noted that they will continue to harvest as they have been doing, despite not knowing if there will be long-term health impacts, illustrating the significance of the harvest to their way of life as Métis. One participant also expressed their desire to be kept informed about the decommissioning process, mentioning that they feel there is not always a clear and truthful line of communication from the government and/or its agents.

> Interviewer: *"Would you go back there to harvest?"*
> *Interviewee: "Oh yes, definitely. More likely I will once we retire next year, I'll probably be looking at getting back into that area again, get permission to hunt back there."*
>
> Interviewee: *"I think I'll continue harvesting how I have been. You don't really know if there is long-term health effects. If there are, well, I guess I'll find out one day."*
>
> Interviewee: *"As long as it's done safely and environmentally friendly then I have no issues about it at all."*
>
> Interviewee: *"That stuff up by Bissett—they're putting like four feet of concrete on top of these tiny little mines. So what are they going to put on that [Whiteshell Reactor 1]? It's probably like ten feet or something right? […] So, I don't know—I think they probably know what they're doing right? You hope."*
>
> Interviewee: *"No [concerns or questions], as long as they're open about the process, but a lot of stuff like that the government they're sneaky about, right?"*

3.3.2 Concerns to Human and Environmental Health

Many participants reported their concerns regarding the potential impact the decommissioning process could have on human and environmental health, specifically with respect to water quality and the impacts this could have on fish and drinking water. As noted above, participants and members of the Manitoba Métis Community rely on the fish, lands, and waters for their personal consumption and as a part of exercising their s. 35 Métis rights.

Multiple participants were concerned about the proximity of the WR-1 Reactor to the river and what this might mean if there is a leak or seepage. One participant noted erosion of the river bank over their lifetime and were concerned that this might compromise the safety of the decommissioned reactor in the future where it is decommissioned in-situ. Some participants were also concerned about the impact of severe weather, natural disasters, or a dam breach (e.g., flooding, earthquake) and how this could interact with the decommissioned site. They mentioned concerns about whether there was an emergency plan in place if water levels were to rise. There was also mention of the potential impact of an earthquake on the concrete, and whether this would cause cracks that would allow for contaminants to leak out.

Interviewee: *"[A major concern is] erosion, because along that river there is a lot of erosion on the shore, on the banks."*
Interviewer: *"Has that been more recent that you've noticed [the erosion]?"*
Interviewee: *"I don't know, [there has been erosion] for my whole life for sure. Kind of seems to be an ongoing argument about that, because the water levels changed with the hydroelectric dams. I don't know."*

Interviewee: *"I'm not a scientist, but one thing I was thinking about too is that you ever did have an emergency flood situation, if the rate of that would go up… the rate of how much pollution is there […] Because there are, I know this for a fact, emergency plans for the dams if there's ever a breach of a dam like Seven Sisters, they do have maps of how high the water would get. And if that would make any difference [to the reactor] or if there would be something that could happen, I don't know. But that's my major concern."*

Participants expressed concerns regarding the effect of radiation or contamination on the health of fish, birds, and mammals (specifically deer), both from seepage over time and in the event of a spill or leak. One participant recalled a time when they shot what appeared to be a healthy buck in the area, but when they were processing the meat, they noticed that the buck's testicles were enlarged, and its hind leg was yellow. The participant did not know what caused this but did note that they shot the buck 15 miles from the WR-1 reactor site and suspected that it may have been related.

Interviewee: *"I think there's a lot of unknowns. For me, there's a lot of unknowns, and most of it is, I'm worried about water quality and for the fish, and for migrating birds, drinking water too. And whether or not, I'm not sure if the decommissioning will put more pollution into the water, or if it's kind there already and we're stuck with it no matter what happens. Because really that reactors been there since the, I don't know, 50s or something."*

Interviewee: *"Well two years ago we shot a deer, and he didn't look injured. Like I don't think he was shot, but like, like his testicles, like you know, they're about the size of dog testicles, one was the size of a football. And I'm like looking at him like what the hell. And he was walking normal and he was actually chasing a doe so he was, which means he was healthy. So, we shot him and then so when I went to gut him I'm like what the fuck is that? You know what I mean? So, opened him up, cleaned him up and then his one back leg was all like yellow, like yellow like this. So that part of him I threw away, I thought well I don't want to chance it, you know what I mean? Cause I don't know what was wrong with him, like, if it was a cancer or…but he, that was, he had an ab...like abnormality or whatever the word is. Like, and I don't know if it was because of the area, so. But it kind of you know, raised some awareness. So I, we actually contacted the CO's game wardens and they're like "oh, you know, they're like us. They can have a disease, they can be sick", and I'm like well yeah but there's a fucking nuclear reactor 15 miles*

away, like maybe that has something to do with it, you know? Ground leaching you know. But they didn't seem too concerned."

Interviewee: *"Well, that [decommissioning] would affect everything, won't it? Any kind of nuclear radiation, […] if it got away, would affect the whole system all the way down. Like they said for 200 years. As soon as that leaks into the groundwater, it leaks out and it goes into your rivers because they cement those things over and then they keep them cemented over but if you ever had an earthquake or something and it cracked, you never know how the world's going. If they crack that, that thing, that radiation leaks out of there, look at all the trouble we're having. [...] See, if that got into the Winnipeg river system, it'd go right out Lake Winnipeg and it affects everybody and that whole system all the way up there, north of the lake."*

Those who consumed wild foods expressed uncertainty and concern regarding the potential human health impacts of nuclear waste through bioaccumulation in harvested foods, spill of transported waste or a leak at the decommissioned site. The intimate relationship of the ecosystem in the area, and the potential for contaminants making their way up the food chain was mentioned as a concern. One participant also expressed that they felt it could be too late and that if they had not come to the interview and learned about the decommissioning, they would have continued to harvest without being aware of project.

Interviewee: *"It [contamination] affects your animals and everything because they still eat off everything. The deer eat the grass and the timber wolves eat the deer and the foxes and whatever, the coyotes and the, the marten and things like that. Just like they did when they were poisoning them, only on a bigger scale. Because that's a pretty big plant there. And where do they got the other plant, right here. It's right on the river too, isn't it?"*

Interviewee: *"If that stuff's going to get in the deer, it's not [just] going to impact the deer; it's going to impact the people eating the deer, right? So by the time we figure that out it's going to be too late. I don't know, like I'm still going to shoot them; I'm not going to lie. Because there's lots, you know what I mean? Every time you go you would get them. But I wouldn't have known anyway if I didn't do this [interview]; I would think twice but I wouldn't have known. I mean, we get lots out of there."*

Interviewee: *"I think I'll continue harvesting how I have been. You don't really know if there is long term health effects. If there are, well, I guess I'll find out one day. […] I know what they would explain is that it does slowly go through the groundwater towards the river, the radiation or whatever."*

One participant noted that their drinking water comes from the Pinawa Channel. This person mentioned that they have experienced issues with the water quality not being adequate for canning (discussed in

Section 3.1.2). They also felt that water testing should occur for those who live near to the underground research facility or the WR-1 reactor site.

> Observer: *"Are you worried about radiation leaking into the water?"*
> Interviewee: *"Well, I have thought about that, like too bad we can't—I guess we could get it tested time to time, but we would have to pay for it. For sure. I mean, I think since that they put that thing, the underground research lab, actually both ways from us. There is something going on both sides of us, if we felt like we wanted every two years to run a sample, they should pay for that for us. And provide us with stuff like that, really […] I mean I definitely do it, but you have to bring all the sample to the city. I know that. And it is not cheap. Probably 60-75 dollars to test it."*

For some participants, there were concerns and uncertainties expressed regarding the technology and materials that are proposed to be used to decommission the reactor. These concerns included:

- the decay of the infrastructure materials, specifically the cap, over time or in the event of severe weather,
- corners being cut to save costs on the decommissioning leading to lower quality infrastructure and higher risk for failure and contamination,
- questions about the long-term monitoring program and how the public would be alerted in the event of a leak or other emergency, and
- a lack of information at present regarding the WR-1 site, underground research lab, and decommissioning activities.

All these concerns regarding the approach to long-term monitoring and the decommissioning technology point to a need for more engagement with the MMF Citizens and harvesters in the area.

> Interviewee: *"I'm kind of concerned about like, the proper disposal of [nuclear waste], cause you're mentioned that they're just going to cap it off, so like what happens in 100 years if it starts to sink into the water system, you know what I mean? Cause nuclear waste doesn't break down, cause, I don't think. And if it does it's going to be a couple lifetimes yet, after us, so. Yeah, it's one of my main concerns, just proper disposal. And even if they bring it up what do they do with it then? You know? Like, I have no idea what the process is for that kind of."*
>
> Interviewee: *"My main concern was, I asked them too, how long are you going to monitor this, cause you're not just going to cap it and walk away, because there can be problems that come up later on, and who's going to be there to pick up the mess, grandkids?"*

Interviewee: *"Yeah I'd be worried about that [technology used to cap the reactor]. Cut back on prices of material when they're doing the job and yeah it looks all nice on top but what it actually is, is something that's going to last for 10 years compared to a 100 years."*

Interviewee: *"Well yeah, like especially where the underground research lab is. Like I would prefer that would have never happened. But what can you do, it is there. And as living there, we are all living there, and we don't know what is going on. They don't let people in and there is a big gate and it is locked. You don't get no information, what happens if something goes wrong? You wouldn't hear from it. It would leak all over the rivers and streams. And it doesn't take long. It is really close to the river. What do you do then?"*

Interviewee: *"I don't know if that [radiation] has any effect on that, or if that stuff might have leaked out from some containers they probably have underground. How far are the containers and what are the containers made of? Apparently they're made of concrete or something like that, but still—does that mean that it's safe? My brother found some kind of funny taste in his water. I've tasted it once too—it tastes kind of funny."*

3.3.3 Questions Asked by Participants About the Decommissioning of the WR-1 Reactor

The majority of participants had unanswered questions about the proposed WR-1 decommissioning. Some felt that there has been a lack of information shared regarding both the active reactor and the decommissioning process. There is a desire for more information regarding the closure procedures, technology being used, and the risks and behavior of nuclear waste. Some of the questions brought forward by participants included the following:

- Exactly what materials are going to be used for the cap?
    - How will the materials used behave overtime or in the event of severe weather?
    - Have these materials been used before?
    - How thick will the cap be?
- Could the reactor, and materials contained within, contaminate the soil? Water? Etc.
- What are the long-term health effects of exposure to radiation?

- If there were a dam breach, how high would the water rise, and would it impact the decommissioned reactor?
- Is the underground research station still active? Did it stop operating when the reactor stopped operating?
- Is the underground research station also being decommissioned?
- Has nuclear waste ever been transported from the site as part of the decommissioning or otherwise?
- How long does it take for nuclear waste to break down? Will it ever break down and be safe for humans and animals to be exposed to?
- If waste were to be removed from the site, where could it be taken?
- If there is a leak or some other kind of emergency at the site in the future, how will residents be informed and how quickly will they be informed?

Below are some examples of these questions, in the words of participants:

> Interviewee: *"And even if they bring it [nuclear waste] up what do they do with it then? You know? Like, I have no idea what the process is for that kind of-"*
> Interviewer: *"And where do they store it you mean?"*
> Interviewee: *"Yeah, like what do they, what do they do? What can you do with it, like what do they, with nuclear waste? From what I understand from when we were in school was like you couldn't, there's, there's no way to get rid of it."*
>
> Interviewer: *"You know the way that I described how they're planning to clean it up at the beginning? Are there are any questions you have about that?"*
> Interviewee: *"What are they going to cap—doesn't that stuff [radiation] go right through concrete and everything, or are they going to lead line it?"*
> Interviewer: *"So, you're curious about what material they're going to use – "*
> Interviewee: *"Yeah, they'd have to use something that would, so it doesn't radiate through."*
>
> Interviewee: *"Americans got a lot [of nuclear waste], had lots of them [nuclear reactors] for a while there, they figured that's the way they were going to go but they found out you can't control the demons, you know. It can get away on you! […] There're so many things you don't know about it [nuclear], even guys that study it and work with it. They can make a bomb with it but outside of that, they don't know the repercussions down the road."*
>
> Interviewee: *"Like I said, my biggest concern would be if there was some sort of freak flood, or high-water level. Like I said, I know there is, maps stating if there is a dam*

breach where the water would go, but I've not seen them, and I don't know and I just get concerned that everything's being looked after. Us as humans have impacted the earth a lot, especially with you know the Winnipeg River area with dams and all these changes. It's good that you gotta protect and watch it, keep an eye."

Interviewee: *"I kind of wonder what the aftereffects are, when they cap this or whatever—I don't know how many years that's good for or what effect it will have on the environment. We haven't heard a whole lot about the decommissioning to really educate the people as to really what's going to take place, and what the effects are down the road or whatever […] I don't know, I guess it would be nice for them to educate everybody as to what's happening and what the long term is, and what it's going to be like. Because it's there, and it's going to be there."*

Interviewee: *"Just more information to the people about what's happening and what's going to happen. The site is still there, you know. I mean they can't just close it up and walk away from it; there's more to that. But it would be nice if they did give the public more information about the whole system; it just seems like it's decommissioning but it seems to be quiet as it's progressing."*

Interviewee: *"Well on the MMF's behalf, I would think if they could—if they're consulting with them—if they could have something like an open house or whatever, have a representative from there come down and answer questions and give us the information that that's what's going to happen, the direction, and how it'll be left and stuff—would be great; I think, anyway."*

Interviewee: *"If they are going to level everything to the ground, they are going to seal things like they say, it would be interesting to know more about that. What did they use, how far deep did they go, is it concrete? What is it?"*

3.3.4 Hopes for the Future

Participants were asked what they wanted to see moving forward, both regarding the proposed WR-1 decommissioning and more generally for the Métis in Manitoba. Participants highlighted how it was critical that the approach, techniques and materials used included the best and safest approach for decommissioning the WR-1 site and that that those who are responsible for the decommissioning are making the correct decisions to ensure the health and safety of the environment, including the lands, waters, species and land-users in the area. Participants linked the importance of these decisions on their hopes for the future, that included the ability to continue to use the land as it is being used currently, and that Métis peoples will be equal partners in problem solving and decision-making regarding land use and decommissioning activities and decisions.

Interviewee: *"Something sustainable that we could pass onto our grandchildren and they can pass that on, keep it. Make sure we all remember where we came from, spend*

time with family on the land. It's all about preserving something for the future. […] I think the Métis federation has done a really good job with our harvesting. Not just making everything a free for all but Métis people usually do care about the land, not overuse. One thing, I would like to see would maybe be, something with ducks unlimited, maybe preserve a few more wetlands. […] There has been a lot of wetland lost in the last few years and it would be nice to see a few more places being looked after. It's just one thing that I've seen over, I like to hunt ducks and ducks and geese have been keeping a lot of people fed. And they're threatened."

Interviewee: *"Well I'd like to see the government sit down, and I'd like to see the Metis have more control, sit down with the board, have First Nations, Metis, government, and the provincial and federal government. Sit down equally, not just say well we just invite the Metis because we have to, you know. We got to be equal partners if we're going to fix this, because we're all part of the problem, so we all have to be together for the solution. Otherwise it's never going to work, you can't exclude one member and think you're going to make things work […] So if we all have an equal share, sit down have one committee, pick one problem and say ok, what are we going to do about it, then we'll get things done. But you got to include the Metis people, because government hasn't been doing it, they're still not doing it. But they're going to have to sooner or later."*

Interviewee: *"I would imagine that they're probably going to do it the correct way instead of just putting a band aid on a big giant hole in the bucket. Hopefully everything should be done right and up to code and as good as what can be done."*

Interviewee: *"Well I hope it [the decommissioning] doesn't affect it [the Study Area] obviously, but I think they're doing a pretty good, I have some friends that actually are working at the plant and they've seen that its going down pretty easily, so no concerns. […] So I would really hope that that [a leak or spill from the reactor] doesn't happen. Because it's a real good, beautiful area to live in and to fish in and recreation in and wherever. I hope nothing happens to it."*

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4.0 Discussion and Conclusions

The data presented in this report represents a snapshot of the LUO information gathered from a small sample of the Manitoba Métis Community. While this is a relatively small Study compared to the number of Métis harvesters in Manitoba, the Study results provide an indicative representation of Métis knowledge and use of the lands and waters surrounding the WR-1 Reactor Decommissioning Site. From the results listed above, it can be said with confidence that members of the Manitoba Métis Community rely on and use the lands and waters around the WR-1 Reactor site for various cultural and traditional purposes, including actively exercising their s. 35 harvesting and other Aboriginal rights. The following conclusions were found based on the results of this Study:

- Métis harvesters have relied on the lands and waters around the WR-1 Reactor site for sustenance since before the reactor was built and continue to do so to the present day. Based on this, it is assumed that Manitoba Métis Community's s.35 rights and interests have the potential to be impacted by WR-1 decommissioning activities.

- Métis are consuming wild foods, for some in relatively large quantities, from the lands and waters around the WR-1 Reactor site. As such, any contamination of surrounding lands, waters, and species, would have a greater effect on members of the Manitoba Métis Community.

- Métis who participated in this Study are concerned about the potential impacts on human and environmental health from the WR-1 Reactor site, including as related to the decommissioning activities and both short and long-term monitoring and safety measures.

- Métis who participated in this study have unanswered questions that need to be addressed before moving forward with the WR-1 decommissioning plan in order for the MMF to consider that meaningful consultation has occurred with the Crown.

There are some clear next steps and recommendations for moving forward that need to be pursued by both CNL and CNSC:

- Moving forward, there needs to be consideration of the exposure to contaminants to those who regularly consume wild foods from the area. This is especially true for contamination of the aquatic environment in the Winnipeg River, Lac du Bonnet, and the Lee River. Specifically, testing of radioactive contaminants in wild rice, birds, fish, and places where participants identified drinking water need to be undertaken to ensure Métis harvesters are not at risk for exposure to radioactive contaminants. Metis-specific mitigations need to be put in place to eliminate, minimize and avoid any risks. These measures must be developed in consultation with the MMF.

- Accommodation measures need to be put in place by the Crown in any cases where mitigations cannot be developed to avoid impact to the Manitoba Metis community's rights and interests from the WR-1. Measures could include, among others, options for collaborative management,

stewardship, monitoring; involvement of the MMF in decommissioning activities; education and employment opportunities for MMF Citizens who rely on harvesting (commercial and/or subsistence) that will be impacted by the decommissioning activities; financial compensation for impacts that cannot be avoid or where residual impacts remain following mitigation and other measures, etc. Accommodation measures must be developed in consultation with the MMF.

- Develop in consultation with the MMF, in terms that can be understood by those who are not experts in the field of nuclear energy, a plan for how and when Métis harvesters will be contacted if there are contaminants found in the environment and what alternative measures need to be put in place to accommodate or response to contaminants in food / resources that members of the Manitoba Métis Community rely on for their subsistent or exercise of their rights.

- CNL should commit to developing a communication strategy with the MMF to help ensure that all Métis harvesters are aware of the decommissioning activities. Members of the Manitoba Métis Community are highly mobile, and harvesters travel long distances to use the lands and waters in areas where they do not necessarily live. It may be that a Métis harvester spends considerable time and money to travel to the lands and waters in the area of the WR-1 Reactor site to harvest. For this reason, all Métis people in Manitoba need to be aware of what is happening around the WR-1 Reactor site, including adequate notice of any activities that may disrupt harvesting activities or harvesting success, and can make decisions about whether they will continue to travel to the area to harvest (where Métis harvesters are unwilling or unable to harvest in the area of the WR-1 Reactor site due to the decommissioning activities, consideration would need to be given to whether there are adverse effects of having to travel to other areas that would require accommodation or compensation to offset any infringement of Métis s. 35 rights through these activities).

- CNL and CNSC should continue to engage with the MMF about the concerns expressed by and impact on members of the Manitoba Métis Community, including harvesters. There are clear unanswered questions and concerns that need to be addressed. For example, Métis harvesters need to be informed as to whether it is safe to consume wild foods, especially fish, from the area in light of the more extensive Métis consumption of fish than the general public. Ongoing engagement may also help to reduce any mis-informed concerns.

- In addition to a communication strategy, CNL should commit to having a clear timeline of decommissioning activities, developed through collaboration with the MMF to avoid particular harvesting times, locations, and periods of significance. This timeline needs to consider the Métis laws of the harvest and ensure that activities do not limit access to harvesting areas. The Métis laws of the harvest can be found here: http://www.mmf.mb.ca/docs/Metis-Laws-of-the-Harvest_FINAL.pdf

- CNL should work with the MMF to develop a Métis Technical Working Group to ensure that all aspects of the decommissioning process are in-line with Métis values and respects Métis rights

and laws, especially as they relate to potential impacts to the environment. This is especially important for developing a monitoring plan to ensure that Métis values are included, and Métis rights are upheld.

- CNL should work with the MMF to develop a plan for how the MMF can continue to exercise its stewardship rights and responsibilities, as an Indigenous people, for the WR-1 Reactor site and decommissioning activities. As part of this, the MMF will require having Métis monitors on the ground with CNL during all stages of the decommissioning activities. This would require providing capacity funding for Métis people to participate in monitoring training and providing capacity for monitoring jobs.

- Given the significance of the concerns and the continued stewardship responsibilities of the MMF, the MMF should be provided capacity funding to hire a WR-1 Decommissioning project coordinator. This person would be the main point of contact at the MMF for CNL for anything related to the WR-1 Reactor decommissioning process and would coordinate any future studies, communication, community meetings, monitoring programs etc.

- This report is also carrying forward recommendations made in the EIS technical review put forward by the MMF, including:

    - using the information provided in this report to update and inform the risk assessment of potential exposure pathways, and
    - providing rationale for whether the long-term storage of high-level waste in this form is acceptable, given the information provided in this report and the knowledge that radioactivity will be released to the Winnipeg River in the future.

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Appendix A – Attribute Data Mapped within 25 km and 10 m Study Area

Table 3. Personal Fishing Identified within the 25 km and 100 m Study Area

Study Area	PIN_GISID	Species	Harvesting Time Period	Spring	Summer	Fall	Winter
100m	5201-10	Pickerel/Walleye, Sauger, Yellow Perch	Both Within And Prior To The Past 10 Years	X	X	X	
100m	5201-12	Jackfish/Northern Pike, Mooneye, Pickerel/Walleye, Sauger	Within the Last 10 Years		X		
100m	5201-13	Jackfish/Northern Pike, Pickerel/Walleye	Within the Last 10 Years				X
25km	5201-5	Mooneye, Pickerel/Walleye, Yellow Perch	Both Within And Prior To The Past 10 Years		X		
100m	5201-7	Pickerel/Walleye, Sauger, Yellow Perch	Both Within And Prior To The Past 10 Years	X	X	X	
100m	5202-5	Goldeye, Pickerel/Walleye	Both Within And Prior To The Past 10 Years		X		
100m	5204-18	Goldeye, Mooneye	Within the Last 10 Years		X		
100m	5204-19	Pickerel/Walleye	Within the Last 10 Years	X			
100m	5204-20	Pickerel/Walleye	Within the Last 10 Years	X			
100m	5204-26	Jackfish/Northern Pike	Within the Last 10 Years				X
100m	5204-27	Jackfish/Northern Pike	Within the Last 10 Years				X
100m	5204-28	Jackfish/Northern Pike	Within the Last 10 Years				X
100m	5204-29	Jackfish/Northern Pike	Within the Last 10 Years				X
100m	5204-30	Jackfish/Northern Pike	Within the Last 10 Years				X
100m	5204-31	Pickerel/Walleye, Sauger	Both Within And Prior To The Past 10 Years		X		
100m	5204-32	Pickerel/Walleye	Both Within And Prior To The Past 10 Years				X
100m	5204-37	Pickerel/Walleye, Sauger	Both Within And Prior To The Past 10 Years		X		
100m	5205-19	Jackfish/Northern Pike, Pickerel/Walleye	Both Within And Prior To The Past 10 Years	X	X		

Study Area	PIN_GISID	Species	Harvesting Time Period	Spring	Summer	Fall	Winter
25km	5205-20	Jackfish/Northern Pike, Pickerel/Walleye	Both Within And Prior To The Past 10 Years	X	X		
25km	5205-62	Goldeye	More Than 10 Years Ago		X		
25km	5205-63	Goldeye	More Than 10 Years Ago		X		
100m	5206-15	Pickerel/Walleye	More Than 10 Years Ago	X	X	X	
100m	5206-18	Carp, Catfish (Channel and Brown Bullhead), Jackfish/Northern Pike, Other Fish (Sun bass), Pickerel/Walleye, Yellow Perch,	Both Within And Prior To The Past 10 Years	X	X	X	
100m	5206-19	Carp, Catfish (Channel and Brown Bullhead), Jackfish/Northern Pike, Pickerel/Walleye, Yellow Perch	Within the Last 10 Years	X	X	X	
100m	5206-21	Carp, Catfish (Channel and Brown Bullhead), Jackfish/Northern Pike, Other Fish (Sun bass), Pickerel/Walleye, Yellow Perch	Within the Last 10 Years				X
100m	5206-22	Carp, Catfish (Channel and Brown Bullhead), Jackfish/Northern Pike, Other Fish (Sun bass), Pickerel/Walleye, Yellow Perch	More Than 10 Years Ago	X	X	X	
100m	5206-23	Carp, Catfish (Channel and Brown Bullhead), Jackfish/Northern Pike, Other Fish,	Both Within And Prior To The Past 10 Years	X	X	X	

Study Area	PIN_GISID	Species	Harvesting Time Period	Spring	Summer	Fall	Winter
		Pickerel/Walleye, Yellow Perch					
100m	5206-24	Carp, Catfish (Channel and Brown Bullhead), Jackfish/Northern Pike, Other Fish, Pickerel/Walleye, Yellow Perch	Both Within And Prior To The Past 10 Years	X	X	X	
100m	5206-25	Carp, Catfish (Channel and Brown Bullhead), Jackfish/Northern Pike, Pickerel/Walleye, Yellow Perch	Both Within And Prior To The Past 10 Years	X	X	X	
100m	5206-27	Carp, Catfish (Channel and Brown Bullhead), Jackfish/Northern Pike, Other Fish (Sunbass), Pickerel/Walleye, Yellow Perch	More Than 10 Years Ago	X	X	X	
100m	5206-28	Carp, Catfish (Channel and Brown Bullhead), Jackfish/Northern Pike, Other Fish (Sunbass), Pickerel/Walleye, Yellow Perch	More Than 10 Years Ago	X	X	X	
100m	5206-29	Carp, Catfish (Channel and Brown Bullhead), Jackfish/Northern Pike, Other Fish (Sunbass), Pickerel/Walleye, Yellow Perch	More Than 10 Years Ago	X	X	X	
100m	5206-30	Carp, Catfish (Channel and Brown Bullhead), Jackfish/Northern Pike, Other Fish	More Than 10 Years Ago	X	X	X	

Study Area	PIN_GISID	Species	Harvesting Time Period	Spring	Summer	Fall	Winter
		(Sunbass), Pickerel/Walleye, Yellow Perch					
100m	5206-34	Catfish (Channel and Brown Bullhead), Jackfish/Northern Pike, Pickerel/Walleye	More Than 10 Years Ago	X	X	X	
100m	5206-35	Catfish (Channel and Brown Bullhead), Jackfish/Northern Pike, Pickerel/Walleye	More Than 10 Years Ago	X	X	X	
100m	5206-36	Catfish (Channel and Brown Bullhead), Jackfish/Northern Pike, Pickerel/Walleye	Within the Last 10 Years	X	X	X	
100m	5206-42	Bait Fish	More Than 10 Years Ago	X			
100m	7502-84	Pickerel/Walleye	Within the Last 10 Years		X		
100m	7502-85	Pickerel/Walleye	More Than 10 Years Ago		X		
100m	7502-86	Pickerel/Walleye	More Than 10 Years Ago		X		
25km	7502-88	Goldeye	Both Within And Prior To The Past 10 Years		X		
100m	7502-90	Bass, Jackfish/Northern Pike, Pickerel/Walleye, Sauger	Within the Last 10 Years	X			
100m	7502-91	Jackfish/Northern Pike	Within the Last 10 Years		X		
25km	7502-94	Pickerel/Walleye	Within the Last 10 Years		X		

Table 4. Personal Subsistence Hunting Identified within the 25 km and the 100 m Study Area

Study Area	PIN_GISID	Species Harvested	Harvesting Time Period	Spring	Summer	Fall	Winter
25km	5204-10	Grouse	Within the Last 10 Years			X	
25km	5204-11	Goose Blind	Both Within And Prior To The Past 10 Years			X	
25km	5204-12	Goose	Both Within And Prior To The Past 10 Years			X	
100m	5204-13	Duck	Within the Last 10 Years			X	
25km	5204-15	Grouse	Within the Last 10 Years			X	
25km	5204-16	Grouse	Within the Last 10 Years			X	
25km	5204-17	Grouse	Within the Last 10 Years			X	
25km	5204-5	White-Tailed Deer	Within the Last 10 Years			X	
25km	5204-6	White-Tailed Deer	Within the Last 10 Years			X	
25km	5204-60	Duck	Both Within And Prior To The Past 10 Years			X	
25km	5204-7	White-Tailed Deer	Within the Last 10 Years			X	
25km	5204-8	Grouse	Within the Last 10 Years			X	
25km	5204-8	Grouse	Within the Last 10 Years			X	

Study Area	PIN_GISID	Species Harvested	Harvesting Time Period	Spring	Summer	Fall	Winter
25km	5205-14	White-Tailed Deer	Within the Last 10 Years			X	
25km	5205-15	White-Tailed Deer	Within the Last 10 Years			X	
25km	5205-16	White-Tailed Deer	Within the Last 10 Years			X	
25km	5205-17	White-Tailed Deer	Within the Last 10 Years			X	
25km	5205-18	White-Tailed Deer	Within the Last 10 Years			X	
100m	5206-8	Grouse , Partridge	More Than 10 Years Ago			X	
25km	7210-136	White-Tailed Deer	More Than 10 Years Ago			X	
25km	7210-138	White-Tailed Deer	More Than 10 Years Ago			X	
25km	7313-153	White-Tailed Deer	Within the Last 10 Years			X	
25km	7313-154	White-Tailed Deer	Within the Last 10 Years			X	
25km	7313-155	White-Tailed Deer	Within the Last 10 Years			X	
25km	7313-156	White-Tailed Deer	Within the Last 10 Years			X	
25km	7313-157	White-Tailed Deer	Within the Last 10 Years			X	
25km	7313-158	White-Tailed Deer	Within the Last 10 Years			X	

Study Area	PIN_GISID	Species Harvested	Harvesting Time Period	Spring	Summer	Fall	Winter
25km	7313-159	White-Tailed Deer	Within the Last 10 Years			X	
25km	7313-160	White-Tailed Deer	Within the Last 10 Years			X	
25km	7313-161	White-Tailed Deer	Within the Last 10 Years			X	
25km	7313-162	White-Tailed Deer	Within the Last 10 Years			X	
25km	7313-163	Grouse	Within the Last 10 Years			X	
25km	7313-168	White-Tailed Deer	Within the Last 10 Years			X	
25km	7402-127	White-Tailed Deer	Within the Last 10 Years			X	
25km	7402-128	White-Tailed Deer	Within the Last 10 Years			X	
25km	7402-129	White-Tailed Deer	Within the Last 10 Years			X	
25km	7402-130	White-Tailed Deer	More Than 10 Years Ago			X	
25km	7402-131	White-Tailed Deer	More Than 10 Years Ago			X	
25km	7402-132	White-Tailed Deer	More Than 10 Years Ago			X	
25km	7402-133	White-Tailed Deer	Within the Last 10 Years			X	
25km	7402-135	Goose	Both Within And Prior To The Past 10 Years			X	

Table 5. Gathering Identified within the 25 km and 100 m Study Area

Study Area	PIN_GISID	Gathering Category	Species	Harvesting Time Period	Spring	Summer	Fall	Winter
25km	5202-12	Food	Cranberries, Saskatoon Berries	Both Within And Prior To The Past 10 Years		X		
25km	5202-13	Other	Buttercup; Honey Suckle; Daisy	Both Within And Prior To The Past 10 Years		X		
25km	5202-14	Other	Buttercup; Honey Suckle; Daisy	Both Within And Prior To The Past 10 Years		X		
25km	5202-15	Other	Buttercup; Honey Suckle; Daisy	Both Within And Prior To The Past 10 Years		X		
25km	5202-16	Drinking Water		Both Within And Prior To The Past 10 Years				
25km	5202-17	Food	Fiddleheads	Within the Last 10 Years	X			
25km	5202-19	Drinking Water	Spring Water	Both Within And Prior To The Past 10 Years				
25km	5202-7	Firewood	Firewood	Both Within And Prior To The Past 10 Years		X	X	
25km	5202-8	Food	Blueberries, Cranberries, Pin Cherries, Saskatoon	Both Within And Prior To The Past 10 Years		X		

Study Area	PIN_GISID	Gathering Category	Species	Harvesting Time Period	Spring	Summer	Fall	Winter
			Berries, Strawberries					
25km	5203-7	Firewood	Poplar; Spruce; Jack Pine;	Within the Last 10 Years				X
25km	5203-8	Firewood	Poplar; Spruce; Jack Pine;	Within the Last 10 Years				X
25km	5203-9	Firewood	Jack Pine; Poplar; Birch	Within the Last 10 Years			X	
25km	5204-38	Food	Blueberries	Within the Last 10 Years		X		
25km	5204-39	Firewood	Specify Type	Within the Last 10 Years				X
25km	5205-115	Food	Choke Cherries	Both Within And Prior To The Past 10 Years	X	X	X	
25km	7402-136	Food	Blueberries	Both Within And Prior To The Past 10 Years		X		
25km	7402-139	Firewood	Jackpine	Within the Last 10 Years			X	
25km	7502-92	Food	Choke Cherries, Hazel Nut, Raspberries	Within the Last 10 Years		X		

Table 6. Personal and Commercial Trapping Identified within the 25 km and 100 m Study Area

Study Area	PIN_GISID	Trapping Type	Species	Harvesting Time Period	Spring	Summer	Fall	Winter
25km	5202-4	Trapping - Commercial	Rabbit, Squirrel, Weasel	More Than 10 Years Ago				X
25km	5203-5	Trapping - Non-Commercial	Rabbit	Within the Last 10 Years				X
25km	5204-14	Trapping - Commercial	Marten	Within the Last 10 Years				X

Table 7. Guiding and Commercial Harvesting Identified within the 25 km and 100 m Study Area

Study Area	PIN_GISID	Type of Commercial Land Use	Type of Resource Harvested	Land Use Time Period	Spring	Summer	Fall	Winter
25km	5202-9	Food/Flowers to Sell	Blueberries; Pin Cherries; Cranberries; Saskatoon Berries	More Than 10 Years Ago		X		
25km	5203-6	Other (Please Specify)	Agriculture - Farm	More Than 10 Years Ago				
25km	5203-17	Tree/Tree Product Harvesting	Christmas Trees	More Than 10 Years Ago			X	

Table 8. Traditional Ecological Knowledge Identified within the 25 km and 100 m Study Area

Study Area	PIN_GISID	Tek Type	Species
25km	5202-10	Other Important Habitat	
25km	5202-11	Wetland	Wetland
25km	5202-25	Ponds for Fish Nursery	
25km	5202-26	Mammal Habitat	Bear
100m	5202-6	Fish Spawning Areas	Goldeye
25km	5203-12	Wetland	Wetland

Study Area	PIN_GISID	Tek Type	Species
25km	5203-15	Reptile and Amphibian Habitat	Snake
100m	5204-21	Deep Water/Black Water	Please Specify
100m	5204-22	Fish Habitat Areas	Pickerel/Walleye
100m	5204-23	Fish Habitat Areas	Pickerel/Walleye
100m	5204-24	Species at Risk	Lake Sturgeon
100m	5204-52	Wetland	Wetland
100m	5204-53	Plant Habitat	Wild Rice
100m	5204-54	Bird Habitat	Duck , Goose
100m	5204-55	Mammal Habitat	Deer
100m	5204-56	Mammal Habitat	Deer
100m	5204-57	Plant Habitat	Wild Rice
25km	5204-58	Bird Habitat	Duck , Goose
25km	5204-59	Bird Habitat	Duck , Goose
100m	5204-61	Plant Habitat	Wild Rice
25km	5204-62	Wetland	Wetland
25km	5204-63	Wetland	Wetland
100m	5206-43	Reptile and Amphibian Habitat	Snake
25km	7210-139	Mammal Habitat	Deer
25km	7210-140	Mammal Habitat	Deer
25km	7313-167	Mammal Habitat	Deer
25km	7313-169	Mammal Habitat	Deer
25km	7402-137	Mammal Habitat	Bear
25km	7402-138	Mammal Habitat	Bear
100m	7502-80	Mammal Habitat	Bear
100m	7502-87	Fish Spawning Areas	Pickerel/Walleye
25km	7502-89	Species at Risk	Lake Sturgeon

Table 9. Cultural and Recreation Areas Identified within the 25 km and 100 m Study Area

Study Area	PIN_GISID	Location Type
25km	5202-20	Contemporary Gathering Place
25km	5203-18	Contemporary Gathering Place
25km	5203-19	Important Landscape Features
100m	5206-38	Recreational Tubing Area
25km	5206-39	Contemporary Gathering Place
100m	5206-41	Important Landscape Features
25km	7502-93	Contemporary Gathering Place

Table 10. Changes Identified within the 25 km and 100 m Study Area

Study Area	PIN_GISID	Type of change identified	Change Noticed
100m	5201-8	Lower water levels in the Winnipeg River	Low water levels in the Winnipeg River - participant thinks it may from hydro. Lived in area all life - use to put dam in spring and pull out in fall - water control dam - last couple of years the water has been really low.
25km	5202-18	Other changes	Participant has noticed that for the last 15 years the water in this area is not good for canning. They used to use this water when preserving, and the water had started to spoil the preserves. The water they used to use was from the Lee River.
25km	5203-10	To plant habitat/health	Change to berry habitat - used to be many more berries in the area and no longer berries.
25km	5203-11	To plant habitat/health	Change to berry habitat - used to be many more berries in the area and no longer berries.
25km	5203-13	To plant habitat/health	Place where plums used to grow in abundance and no longer grow there. Perhaps climate change is the reason - but participant was not sure.
25km	5203-14	To land use	Changes to strawberries and raspberries - but used to be many more - sons sometimes harvested here but there was only enough to taste this year.
100m	5204-25	Sturgeon population are coming back in this area.	Sturgeon population are coming back in this area.
25km	7402-134	To animal health	Place where participant harvested a deer was moving like it was healthy. When the participant was gutting the deer, they saw that one testicle was the size of a football and that one hind leg was yellow. The participant threw that meat away because they "didn't want to chance it" by eating it.

Table 11. Access Trails Identified within the 25 km and 100 m Study Area

Study Area	PIN_GISID	Type of Access Route	Time Period of Access Route Use	Spring	Summer	Fall	Winter
100m	5201-11	Boat Launch/Landing	Within the Last 10 Years		x		
25km	5201-6	Boat Launch/Landing	Both Within And Prior To The Past 10 Years		x		
100m	5201-9	Boat Launch/Landing	Both Within And Prior To The Past 10 Years				

Study Area	PIN_GISID	Type of Access Route	Time Period of Access Route Use	Spring	Summer	Fall	Winter
25km	5202-21	Land Trail	Both Within And Prior To The Past 10 Years		x		
100m	5202-23	Water Route	Both Within And Prior To The Past 10 Years				x
100m	5202-24	Land Trail	Both Within And Prior To The Past 10 Years				x
25km	5202-27	Land Trail	More Than 10 Years Ago				x
100m	5204-33	Winter Travel Route					x
100m	5204-34	Boat Launch/Landing	Within the Last 10 Years	x	x	x	x
100m	5204-35	Boat Launch/Landing	Within the Last 10 Years		x		
100m	5204-36	Boat Launch/Landing	Both Within And Prior To The Past 10 Years		x		
100m	5206-31	Boat Launch/Landing	Both Within And Prior To The Past 10 Years	x	x	x	
100m	5206-32	Boat Launch/Landing	Both Within And Prior To The Past 10 Years	x	x	x	
100m	5206-33	Boat Launch/Landing	More Than 10 Years Ago	x	x	x	
25km	7313-164	Boat Launch/Landing	Both Within And Prior To The Past 10 Years		x		
25km	7313-165	Boat Launch/Landing	Both Within And Prior To The Past 10 Years		x		
25km	7313-166	Other Travel Route	Both Within And Prior To The Past 10 Years		x		
25km	7402-143	Land Trail	Both Within And Prior To The Past 10 Years			x	
25km	7402-144	Land Trail	Both Within And Prior To The Past 10 Years			x	
25km	7402-145	Land Trail	Both Within And Prior To The Past 10 Years			x	
25km	7402-146	Land Trail	Both Within And Prior To The Past 10 Years			x	
25km	7402-147	Land Trail	Both Within And Prior To The Past 10 Years			x	
100m	7502-95	Water Route	Within the Last 10 Years		x		

Table 12. Other Land Use Areas Identified within the 25 km and 100 m Study Area

Study Area	PIN_GISID	Other Land Use Area Type	Time Period of Use	Spring	Summer	Fall	Winter
100 M	5206-20	Ice Fishing Hut	Within the Last 10 Years				X
100 M	5206-37	Ice Fishing Hut	Within the Last 10 Years				X

Appendix B – MMTKLUO Study Tool Kit

Whiteshell Reactor 1 Decommissioning Project: Manitoba Metis Traditional Knowledge and Land Use Study

Map Biography Interview Guide

Prepared by

Shared Value Solutions

PREAMBLE (after you review and sign the project overview and permission form)

[Introduce yourself]. I work with Shared Value Solutions (SVS) and have been hired by the Manitoba Metis Federation to interview members of the Manitoba Metis Community who use the land in and around the Whiteshell Nuclear Reactor No1 (WR1) Site that is being decommissioned by the Canadian Nuclear Laboratories (CNL). We hope to understand how the Manitoba Metis Community's current and historic land use interacts with the closure plan of the WR1 site. This information will be used to help to inform the MMF about your land use and cultural heritage that could be impacted by the decommissioning and may be used in negotiation with Canadian Nuclear Laboratories.

We recognize that mapping a lifetime of land use could take days, and because we only have a short time together we are asking that we focus first on the land and water around the WR1 site, and then later other areas that are significant to you.

START-MARKER
Start audio & video recorders and read following statement for the transcript.

My name is _____ and today is _____, 2018.

[Primary Interviewer's name] [E.g. February 4th]

It is _____o'clock.

I have just reviewed the permission form with _____ and they have signed.
[Name of Interviewee]

We are doing a land use and occupancy and oral history survey in _____. [Location of interview]

Other interviewers present include _____, _____, and _____.

Observing the session are _____, _____.

Geographic locations will be recorded using GIS software and descriptive information will be recorded in a Microsoft Access Database.

Personal Information and Residences

Use [ACCESS] to record responses.

Interviewer does the following prior to asking the first question:

1. *On Interview Record Form: Interviewee name, Interview #, Date, Interviewee PIN and Location of interview. Interviewer Name and PIN.*
2. *In GIS, record the Interviewee PIN and name.*
3. *In ACCESS enter the Interviewee PIN and Interviewer PIN, birthdate, confirmation of consent, and whether or not the interview is being audio/video recorded.*

I am going to start this interview by asking you some questions about yourself and your family. The reason I am asking you the following questions is to help us understand Metis community connections to different areas across Manitoba.

If there is a question that you do not feel comfortable answering or don't know the answer, please let me know by just saying "can we move on to the next question".

Residences

1. What is your full name?
2. What year you were born?
3. Where are you currently living? (closest town or city)
    a. How many years have you lived at the place you just mentioned?
4. Can you show me on the map where you spent most of your childhood?
5. Which side of your family can you trace your Metis lineage on? (NOTE: Only map the next two questions of the parent(s) who is Metis)
6. What is your Mother's name and where did she spend most of her childhood years?
7. What is your Father's name and where did he spend most of his childhood years?
8. Do you have any Metis family members or ancestors who have lived anywhere near the Whiteshell Site? Can you show me on the map where they lived? (NOTE: map for maternal and paternal grandparent or other family member)
9. Who do you normally go out on the land with? Are they family or friends? Are they Metis?

Preamble to Personal Land Use Activities, Culture, and Traditional Ecological Knowledge

We are now going to start documenting your personal land use over the course of your lifetime, as well as any knowledge or information you have about the historic or current Metis way of life. This may include knowledge about the land, waters, animals, fish, and plants in the landscapes that you are familiar with. We will begin with the areas in and around the WR1 site identified, and then move to other areas that you use or occupy the land.

Some of the kinds of land use activities we'd like to hear about if they apply to you include:

- harvested animals to feed yourself or your family;
- trapped furbearers for sale or personal use;
- gathered plants or natural materials for food, medicine, arts/crafts, heating, construction, etc.;
- Places where you overnight while on the land (e.g. cabin, campsite);
- How you access the places you go to for your land use activities, such as portages, trails, etc.

Some of the other kinds of information we'd like you to share with us include:

- Historic or cultural sites or places (e.g. historic trails or portage routes, places where Metis citizens historically would gather together, Metis burial sites, historic residences, trading posts, or perhaps sacred/spiritual sites)
- Important animal, fish or plant habitats (e.g. fish spawning place, moose calving place, rare plant growing area)
- Changes to the land over time

We are interested in the seasons that you have done these activities in and at what general point in your lifetime you have done these activities.

Each time you identify a place on the map we will be asking you to show us exactly where to draw the boundaries, line or point and then asking you a series of questions about that place we've just drawn on the map because we need to be as specific as possible in understanding Metis use around the WR1 site.

Individual's Hunting

I am going to ask you questions about where you have harvested different kinds of animals –mammals and birds. For this part of the interview we only want to map places where you killed animals to feed your family or community, not for any type of commercial or barter purposes unless you took some home to eat (those we will map later). We are going to map these specific locations using points on the map.

1. Do you hunt? Which of the following animals do you hunt (not trap or snare) to feed yourself or your family?

NOTE: Note: use the following list as prompt only if the participant cannot think of any examples

Birds
- Crane
- Duck
- Goose
- Grouse
- Ptarmigan
- Other Bird (*record species in Access)*

Large Mammals
- Black Bear
- Moose
- Mule Deer
- Elk
- White-Tailed Deer
- Woodland Caribou
- Other Mammal (*record species in Access)*

Small Furbearers
- Beaver
- Coyote
- Muskrat
- Rabbit
- Other furbearer (*record species in Access)*

REMEMBER: Large Game sites can only have one time-period associated with them! You can ask questions that make data entry more efficient – e.g. asking if participants harvest an animal the same time every year will decrease interviewee burnout from having to answer a question repeatedly.

For each point mapped ask the following questions:

a. When was the first time you remember harvesting here? When was the last time you harvested here?
b. What season did you harvest here?
c. NOTE: If this is in the WR1 Study Area ask the following:
    i. Do you have any concerns for this area in relation to the decommissioning of the Whiteshell Reactor No1? And if so, can you tell me more about that?
    ii. Have you noticed any changes to the quality or quantity of these species? Do you know what might have caused this change? Has this affected how you use or are on the land?

<u>Probing Questions (map these additional features if relevant)</u>

How do you access this area? Do you stay out on the land overnight when you hunt here? (Note: map a separate point for land and water routes and for overnight and choose relevant tab in Access. Be sure to ask about season, time period, and who they were with – page 15 and 16 for more detail)

Trapping and Snaring

2. Do you ever trap or snare animals commercially for income?

For the commercial trapping questions, we are only mapping locations you have used personally as a trapper or trapper helper. Note: Multiple species can be entered in the same trapline.

NOTE: Note: use the following list as prompt only if the participant needs a prompt

Bear	Otter
Beaver	Rabbit
Coyote	Raccoon
Fisher	Squirrel
Fox	Weasel
Lynx	Wolf
Marten	Wolverine
Mink	Other furbearer
Muskrat	

For each trapping feature mapped ask the following questions:

a. When was the first time you remember harvesting here? When was the last time you harvested here?
b. What season did you harvest here?
c. NOTE: If this is in the WR1 Study Area ask the following:
    i. Do you have any concerns for this area in relation to the decommissioning of the Whiteshell Reactor No1? And if so, can you tell me more about that?
    ii. Have you noticed any changes to the quality or quantity of these species? Do you know what might have caused this change? Has this affected how you use or are on the land?

Probing Questions (map these additional features if relevant)

a. How do you get to this area? Where do you stay when you are trapping? (Note: map a separate point for land and water routes and for overnight and choose relevant tab in Access. Be sure to ask about season, time period, and who they were with – page 15 and 16 for more detail)

3. Do you ever trap or snare animals for personal use (i.e. not for income)? (NOTE: re-ask the questions above and choose non-commercial trapping in Access).

Individual's Fishing

4. Have you ever done personal fishing or commercial fishing? **(Note: if they fished for commercial purposes, click "Harvesting for Cash/Wage Income" in Access otherwise will default to personal use)**

<u>Commercial Fishing:</u>

Have you ever fished commercially for income? ***(if no, skip to next section)***

For the commercial fishing questions, we are only mapping locations you have used personally.

5. Where do you commercially fish and which species do you fish there?

NOTE: Note: use the following list as prompt only if the participant cannot think of any examples

Bass	Lake Whitefish
Burbot	Mooneye
Bait Fish	Pickerel/Walleye
Cisco	Sauger
Carp	Sucker (Longnose and White)
Catfish (Channel and Brown Bullhead)	Trout (Rainbow and Lake)
Goldeye	Yellow Perch
Jackfish/Pike	Other Fish
Lake Sturgeon	

Ask for each commercial fishing point mapped:

a. When was the first time you remember harvesting here? When was the last time you harvested here?
b. What season did you harvest here?
c. **NOTE: If this is in the WR1 Study Area ask the following:**
    i. Do you have any concerns for this area in relation to the decommissioning of the Whiteshell Reactor No1? And if so, can you tell me more about that?
    ii. Have you noticed any changes to the quality or quantity of these species? Do you know what might have caused this change? Has this affected how you use or are on the land?

Probing Questions (map these additional features if relevant)

d. How do you get to this area? Where do you stay when you are commercial fishing? (**Note: map a separate point for land and water routes and for overnight and choose relevant tab in Access. Be sure to ask about season, time period, and who they were with – page 15 and 16 for more detail**)

Personal Fishing:

I am now going to ask you about personal fishing, not for sale. For this part of the interview we want to map only places where you caught fish to feed yourself, family or community. We are going to map these specific locations use areas on the map.

6. Where do you fish for yourself or to provide for your friends and family? Which species do you fish?

NOTE: Note: use the following list as prompt only if the participant cannot think of any examples

Bass	Lake Whitefish
Burbot	Mooneye
Bait Fish	Pickerel/Walleye
Cisco	Sauger
Carp	Sucker (Longnose and White)
Catfish (Channel and Brown Bullhead)	Trout (Rainbow and Lake)
Goldeye	Yellow Perch
Jackfish/Pike	Other Fish
Lake Sturgeon	

Ask for each personal fishing spot:

a. When was the first time you remember harvesting here? When was the last time you harvested here?
b. What season did you harvest here?
c. NOTE: If this is in the WR1 Study Area ask the following:
    i. Do you have any concerns for this area in relation to the decommissioning of the Whiteshell Reactor No1? And if so, can you tell me more about that?
    ii. Have you noticed any changes to the quality or quantity of these species? Do you know what might have caused this change? Has this affected how you use or are on the land?

Probing Questions (map these additional features if relevant)

a. How do you get to this area? Where do you stay when you are fishing for personal use? (Note: map a separate point for land and water routes and for overnight and choose relevant tab in Access. Be sure to ask about season, time period, and who they were with – page 15 and 16 for more detail)

Gathering

For this part of the interview we want to map Gathering you've done for non-commercial purposes only. We will map any Gathering you've done for commercial purposes in the next section

7. Do you ever gather plants or other natural materials including rocks or minerals? (*If no, move onto the next section)*
8. Which species have you harvested and what you use them for? Can you show me some of these places on the map? (NOTE: see use types below)

NOTE: Note: use the following list as prompt only if the participant cannot think of any examples

○ Apples	○ Leeks	○ Spruce
○ Balsam Fir	○ Mint	○ Strawberries
○ Bird Eggs	○ Mushrooms (chaga; morels; chanterelle)	○ Sumac
○ Birch		○ Sweet Grass
○ Blueberries	○ Mountain Ash	○ Sweet Flag (rat root)
○ Bloodroot	○ Nuts	○ Maple or Birch Syrup
○ Burdock	○ Poplar	○ Thistle
○ Cattails	○ Raspberries	○ Wild Ginger
○ Cedar	○ Red Willow	○ Wild Onion
○ Pin Cherries	○ Rocks and minerals	○ Wild Rice
○ Choke Cherries	○ Roots (other)	○ Other Wood/Trees
○ Cranberries	○ Sage	○ Other Plant (e.g. roots)
○ Drinking water	○ Sarsaparilla Root	
○ Fiddleheads	○ Saskatoon Berries	
○ Goldthread	○ Seneca Root	
○ Labrador Tea	○ Soil	

Ask for each mapped feature:

USE TYPES

○ Arts/Craft	○ Clay/Soil/Rocks (Earthen Material)
○ Construction Plant/Natural Material	○ Edible or Food Plants
○ Ceremonial/Medicinal Plant	○ Fire Wood
○ Drinking Water	○ Other Plant or Natural Material

a. When was the first time you remember harvesting here? When was the last time you harvested here?
b. What season did you harvest here?
c. NOTE: If this is in the WR1 Study Area ask the following:
    i. Do you have any concerns for this area in relation to the decommissioning of the Whiteshell Reactor No1? And if so, can you tell me more about that?
    ii. Have you noticed any changes to the quality or quantity of these species? Do you know what might have caused this change? Has this affected how you use or are on the land?

Probing Questions (map these additional features if relevant)

a. How do you access this area? Where do you stay when you are gathering? (Note: map a separate point for land and water routes and for overnight. Be sure to ask about season, time period, and who they were with – page 15 and 16 for more detail)

Additional Commercial Harvesting Practices

9. Have you ever done guiding or outfitting for income within or near the WR1 site? By guiding and outfitting we are referring to any direction, assistance or expertise you have provided to another person in relation to tourism, fishing or hunting in exchange for a fee or income. Where have you done this?

Ask for each mapped feature select the appropriate tab in Access:

   a. When was the first time you guided here? When was the last time you guided here?
   b. What season did you guide here?
   c. NOTE: If this is in the WR1 Study Area ask the following:
      i. Do you have any concerns for this area in relation to the decommissioning of the Whiteshell Reactor No1? And if so, can you tell me more about that?
      ii. Have you noticed any changes to the quality or quantity of these species? Do you know what might have caused this change? Has this affected how you use or are on the land?

10. Have you ever collected food plants or flowers to sell (e.g. nuts, berries, aquatic plants, etc.) within or near the WR1 site?

Ask for each mapped feature select the appropriate tab in Access:

   a. When was the first time you collected here? When was the last time you collected here?
   b. What season did you collect here?
   c. NOTE: If this is in the WR1 Study Area ask the following:
      i. Do you have any concerns for this area in relation to the decommissioning of the Whiteshell Reactor No1? And if so, can you tell me more about that?
      ii. Have you noticed any changes to the quality or quantity of these species? Do you know what might have caused this change? Has this affected how you use or are on the land?

11. Have you ever collected trees or tree products (e.g. sap, pinecones) for any commercial purposes within or near the WR1 site? This could include gathering wood to sell for firewood, maple syrup production, building or arts and crafts.

Ask for each mapped feature select the appropriate tab in Access:

   a. When was the first time you remember harvesting here? When was the last time you harvested here?
   b. What season did you harvest here?
   c. NOTE: If this is in the WR1 Study Area ask the following:
      i. Do you have any concerns for this area in relation to the decommissioning of the Whiteshell Reactor No1? And if so, can you tell me more about that?
      ii. Have you noticed any changes to the quality or quantity of these species? Do you know what might have caused this change? Has this affected how you use or are on the land?

12. Are there other areas where you use the land that we haven't talked about yet? (E.g. for Agricultural purposes, for cattle ranching, raising horses, etc.?)

Ask for each mapped feature select the appropriate tab in Access:

a. When was the first time you remember doing that activity here? When was the last time you were here?
b. What season did you do that activity in?
c. NOTE: If this is in the WR1 Study Area ask the following:
    i. Do you have any concerns for this area in relation to the decommissioning of the Whiteshell Reactor No1? And if so, can you tell me more about that?
    ii. Have you noticed any changes to the quality or quantity of these species? Do you know what might have caused this change? Has this affected how you use or are on the land?

Probing Questions (map these additional features if relevant)

13. How do you access this area? Where do you stay when you are gathering? (Note: Be sure to ask about season, time period, and who they were with – page 15 and 16 for more detail)

Cultural Sites

14. Let's talk about sites that are important to you, your family, or others in the Metis community. Can you show me where these sites are on the map? **(Note: use the following list as prompt only if the person cannot think of any examples themselves, do not need to ask every question)**

    - **Buffalo jump sites**: By this I mean a cliff formation that Metis people historically used to hunt and kill bison.
    - **Burial Sites:** What I mean by this is places where Metis people were buried, either in church cemeteries or elsewhere, perhaps places where Metis people were buried in the bush.
    - **Contemporary gathering place and Recreational areas**: By this I mean places currently used by Metis community members to gather together for recreation, feasts, annual events, etc.?
    - **Historic Trails or Access Routes**: Any trails/access routes that are significant to the Metis people.
    - **Important landscape features:** By this I mean places that are especially valued because of their beauty, their elevation, unique plant or rocks etc.
    - **Metis current or historic significant sites:** What I mean by this is places where large numbers of Metis people would congregate and live out on the land, places where Scrip signings or battles occurred, original homesteads, or any other specific locations that have been used for generations by Metis people.
    - **Spiritual/Ceremonial/Sacred site:** By this is mean any sites used by Metis people for spiritual, ceremonial or sacred purposes such as fasting camps or sweat lodges.
    - **Trading post:** By this I mean any historic trading posts used by Metis people (e.g. Hudson Bay or Northwest Company Posts or other company trading posts?)
    - **Other cultural site:** By this I mean any other cultural sites used by or that are important to Metis people.

15. Do you remember visiting any special areas when you were a child? Can you tell me more about that? (**Note: map features and ask all the same questions above for each mapped feature**)

16. Do you take your children out on the land? Where do you go? Can you tell me more about that? (**Note: map features and ask all the same questions above for each mapped feature**)

NOTE: If any of these are in the WR1 Study Area ask the following:

- Do you have any concerns for this area in relation to the decommissioning of the Whiteshell Reactor No1? And if so, can you tell me more about that?
- Have you noticed any changes to this place? Do you know what might have caused this change? Has this affected how you use or are on the land?

Overnight Locations

17. Besides the places you have already shared with us, have you ever stayed out on the land overnight? If so, what type of structure have you stayed in? **(NOTE: use the following list as a prompt only if the participant cannot think of any examples**

    - Active Cabin/Bush Camp
    - Commercial Accommodation (including commercial camp grounds)
    - Temporary Structure (e.g. tent, lean to)
    - A trailer
    - Other overnight site

Ask for each overnight location:

a. When was the first time you remember staying here? When was the last time you stayed here?
b. What season did you stay here?
c. **NOTE: If this is in the WR1 Study Area ask the following:**
    i. Do you have any concerns for this area in relation to the decommissioning of the Whiteshell Reactor No1? And if so, can you tell me more about that?
    ii. Have you noticed any changes to this place? Do you know what might have caused this change? Has this affected how you use or are on the land?

Land and Water Routes

18. Besides the places that you have already shared with us, are there any other land or water routes that you use? (NOTE: Note: use the following list as prompt only if the participant cannot think of any examples
    - Boat Landing
    - Historic Access Routes/Portage
    - Portage
    - Land Route/Trail (including ATV trail)
    - Water Route/Trail
    - Other Access Feature

Ask for each mapped feature:

a. When was the first time you remember using this route? When was the last time you used it?
b. What season did you use it in?
c. NOTE: If this is in the WR1 Study Area ask the following:
    i. Do you have any concerns for this area in relation to the decommissioning of the Whiteshell Reactor No1? And if so, can you tell me more about that?
    ii. Have you noticed any changes to this access point? Do you know what might have caused this change? Has this affected how you use or are on the land?

Traditional Ecological Knowledge

We'd like you to show us the locations of important animal, fish and/or plant habitat that you have personal knowledge about. **(NOTE: Focus on the WR1 site first and then move to other areas)**

Spawning Areas:

19. Are you aware of any fish spawning habitat areas near the WR 1 site? These are areas where fish usually come together at a particular time of year to reproduce. If so, where are they located?

Ask for each feature mapped:

a. Which fish species use this spawning area?
b. Which season is this a spawning ground?
c. What year was this habitat here?
d. NOTE: If this is in the WR1 Study Area ask the following:
    i. Do you have any concerns for this area in relation to the decommissioning of the Whiteshell Reactor No1? And if so, can you tell me more about that?
    ii. Have you noticed any changes to this area? Do you know what might have caused this change? Has this affected how you use or are on the land?

Wetlands

20. Are you aware of any wetlands near the WR1 site? These are areas on the land that are either permanently or seasonally wet or saturated. If so, where is this place located?

Ask for each feature mapped:

a. Which season is this wetland is most important?
b. What year was this habitat here?
c. NOTE: If this is in the WR1 Study Area ask the following:
    i. Do you have any concerns for this area in relation to the decommissioning of the Whiteshell Reactor No1? And if so, can you tell me more about that?
    ii. Have you noticed any changes to this area? Do you know what might have caused this change? Has this affected how you use or are on the land?

Mammal Habitat:

21. Are you aware of any habitat for mammals near the WR1 site (e.g. moose, elk, deer, caribou, bear, bats etc.)? Can you show me where this place is located? For example, a place where animals go to calve or give birth, a yarding area, a wintering area, a migration route, or a rutting area?

Ask for each feature mapped:

a. Which species is this place/area important for?
b. Which season is this important habitat?
c. What year was this habitat here?
d. NOTE: If this is in the WR1 Study Area ask the following:
    i. Do you have any concerns for this area in relation to the decommissioning of the Whiteshell Reactor No1? And if so, can you tell me more about that?

ii. Have you noticed any changes to this area? Do you know what might have caused this change? Has this affected how you use or are on the land?

Bird Habitat:

22. Are you aware of any waterfowl, upland bird habitat or other bird areas Near the WR1 site? (e.g. migration stop-overs, nesting, staging, mating areas) Please show me on the map where these places are?

Ask for each feature mapped:

a. Which species of bird use this area?
b. Why do you think this place is good for stop-over, nesting, staging or mating?
c. Which season is this an important bird habitat?
d. What year was this habitat here?
e. NOTE: If this is in the WR1 Study Area ask the following:
    i. Do you have any concerns for this area in relation to the decommissioning of the Whiteshell Reactor No1? And if so, can you tell me more about that?
    ii. Have you noticed any changes to this area? Do you know what might have caused this change? Has this affected how you use or are on the land?

Reptiles & Amphibians:

23. Are you aware of any important reptile or amphibian areas near the WR1 site? (E.g. nesting, mating areas for turtles, frogs, salamanders, snakes, and/or tadpole areas, etc.)

Ask for each feature mapped:

a. Which species are you discussing?
b. Which season is this place used by the species?
c. What year was this habitat here?
d. NOTE: If this is in the WR1 Study Area ask the following:
    i. Do you have any concerns for this area in relation to the decommissioning of the Whiteshell Reactor No1? And if so, can you tell me more about that?
    ii. Have you noticed any changes to this area? Do you know what might have caused this change? Has this affected how you use or are on the land?

Salt Licks:

24. Are you aware of the locations of any salt or mineral licks that animals use near the WR1 site? If so, can you show me where the salt lick is?

Ask for each feature mapped:

a. What species of animal use this salt lick?
b. What season is this place used?
c. What year was this habitat here?
d. NOTE: If this is in the WR1 Study Area ask the following:
    i. Do you have any concerns for this area in relation to the decommissioning of the Whiteshell Reactor No1? And if so, can you tell me more about that?

ii. Have you noticed any changes to this area? Do you know what might have caused this change? Has this affected how you use or are on the land?

Plant Habitat:

25. Are you aware of the locations of any important plant habitat (e.g. flowers, grasses, medicinal/ceremonial plants trees, wild rice etc.) that you DON'T harvest? If so, can you show me where these are/were located?

Ask for each feature mapped:

a. What type of plant(s) is in this area?
b. What season is this the most important in?
c. What year was this habitat here?
d. NOTE: If this is in the WR1 Study Area ask the following:
    i. Do you have any concerns for this area in relation to the decommissioning of the Whiteshell Reactor No1? And if so, can you tell me more about that?
    ii. Have you noticed any changes to this area? Do you know what might have caused this change? Has this affected how you use or are on the land?

Other Important Habitat:

26. Is there any other kind of important habitat for animals/fish/plants that we haven't discussed? If so, where?

Ask for each feature mapped:

a. What type of species use this area?
b. What season is this the most important in?
c. What year was this habitat here?
d. NOTE: If this is in the WR1 Study Area ask the following:
    i. Do you have any concerns for this area in relation to the decommissioning of the Whiteshell Reactor No1? And if so, can you tell me more about that?
    ii. Have you noticed any changes to this area? Do you know what might have caused this change? Has this affected how you use or are on the land?

CLOSING QUESTIONS FOR MAP BIOGRAPHY INTERVIEW

27. Is there anyone else who is Metis who you go out on the land with that you haven't mentioned yet?

28. Do you feel that the data shown here represents everything that we've talked about today? Is every area that we've discussed actually shown on the map? (Note: Show the participant the full map. If no and you have time, map more features. If you don't have more time, make note of the gap for future interview)

29. IF we had more time or returned another time, would you have more knowledge and land use you would want to map?

Oral History and Personal Opinions

NOTE: BREAK AND RESET THE ROOM FOR ORAL HISTORY

Key Questions to the WR1 Site (10 min)

30. Considering all that you now know about the WR1 site, what are your initial thoughts about the decommissioning process? (NOTE: don't lead this question, be open to positive and negative impacts)
31. I'd like to ask you about your family's connection to the areas around the WR1 site -
    a. What does this area mean to you?
    b. Can you tell me about any traditions that you or your family have participated in near this site? (E.g. are there gatherings that you go to? Ceremonies that you participate in?)
32. How the area around the WR1 site used by Metis People if at all? How do other non-Metis people use this area?
33. Are there any stories or legends about the area on or near the WR1 site that you can share with me? Is this legend or story specific to the Metis?
34. Can you share with me your thoughts on how the area around the site has provided for the Metis people in the past?
35. Have you noticed a change in the animals or plants that you harvest near the WR1 site? Has there been any changes from the time you first started harvesting near there to now? Can you tell me about this?
36. Do you have any questions about the WR1 site and the decommissioning process that you would like answered? We can bring questions forward.
37. In an average season, about how much do you harvest near this site? (e.g. ask about animals and plants for consumption and prompt for specific numbers, if possible)?

Identity (if you have time)

38. Did you always know you were Metis when you were growing up?
    a. Why or why not?
39. Can you tell us about what the land means to you as a Metis person?

Land Use (if you have time)

40. Can you tell me how you learned about being out on the land?
    b. a. Do you have a favorite story about being out on the land (hunting, fishing, gathering, or otherwise being on the land)? Can you share this with us?
    c. Did your parents or other relatives or ancestors use the land as part of their way of life or livelihood? And can you share some stories you may know with us?
41. Would you like to share any other story about being out on the land?
42. Imagine it is the future, can you tell me what you would like to see with regards to land use and Metis people? For your Metis family? For other Metis?
43. Who else do you think we should interview for this study? Can you tell me their names?

END-MARKER

When interview is over read the statement below before turning off audio and video recorders.

My name is_____and today is_____, 2017.
[Primary Interviewer's name] *[E.g. February 25th]*

I have just completed the land use and occupancy survey with_____.

It is _____ o'clock.

Other interviewers who were present include__, _____. Observing the session were____,

PIN:_____

To being, please look at the map attached to this survey.

1. Do you consume **moose** that you have harvested from within the buffer zone (the light brown area on the map)? Yes ☐ No ☐

If yes, how often do you consume **moose** that you harvested from within this zone? (please circle one)

Moose----------daily----------weekly----------monthly----------once a year----------other:_____

How about how many **moose** have you harvested within the last five years from this area:_____

What parts of the **moose** do you consume? (e.g. organs, muscles, etc.) Please list:

_____
_____
_____

2. Do you consume **deer** that you have harvested from within the buffer zone (the light brown area on the map)? Yes ☐ No ☐

If yes, how often do you consume **deer** that you harvested from within this zone? (please circle one)

Deer----------daily----------weekly----------monthly----------once a year----------other:_____

How about how many **deer** have you harvested within the last five years from this area:_____

What parts of the **deer** do you consume? (e.g. organs, muscles, etc.) Please list:

_____
_____
_____

3. Do you consume **other large game animals** that you harvested from within the buffer zone (the light brown area on the map)? Yes ☐ No ☐

Please specify species_____

If yes, how often do you consume **large game** that you harvested from within this zone? (please circle one)

Other Large Game----------daily----------weekly----------monthly----------once a year----------other:_____

How about how many have you harvested within the last five years from this area:_____

What parts of the animal do you consume? (e.g. organs, muscles, etc.) Please list:

_____
_____
_____

PIN:_____

4. Do you consume **geese** that you have harvested from within the buffer zone (the light brown area on the map)? Yes ☐ No ☐

If yes, how often do you consume **geese** that you harvested from within this zone? (please circle one)

Geese----------daily----------weekly----------monthly----------once a year----------other:_____

How about how many **geese** have you harvested within the last five years from this area:_____

What parts of the **goose** do you consume? (e.g. organs, muscles, etc.) Please list:

_____
_____
_____

5. Do you consume **ducks** that you have harvested from within the buffer zone (the light brown area on the map)? Yes ☐ No ☐

If yes, how often do you consume **duck** that you harvested from within this zone? (please circle one)

Duck----------daily----------weekly----------monthly----------once a year----------other:_____

How about how many **ducks** have you harvested within the last five years from this area:_____

What parts of the **duck** do you consume? (e.g. organs, muscles, etc.) Please list:

_____
_____
_____

6. Do you consume **other birds** that you have harvested from within the buffer zone (the light brown area on the map)? Yes ☐ No ☐

Please specify species?_____

If yes, how often do you consume this animal that you harvested from within this zone? (please circle one)

Other birds----------daily----------weekly----------monthly----------once a year----------other:_____

How about how many have you harvested within the last five years from this area:_____

What parts of the animal do you consume? (e.g. organs, muscles, etc.) Please list:

_____
_____
_____

7. Do you consume **walleye** that you have harvested from within the buffer zone (the light brown area on the map)? Yes ☐ No ☐

PIN:_____

If yes, how often do you consume **walleye** that you harvested from within this zone? (please circle one)

Walleye----------daily----------weekly----------monthly----------once a year----------other:_____

About how many pounds of fish would you estimate you harvest from this area and consumed in the last five years? _____Lbs.

What parts of the **walleye** do you consume? Please list:

_____
_____
_____

8. Do you consume **lake whitefish** that you have harvested from within the buffer zone (the light brown area on the map)? Yes ☐ No ☐

If yes, how often do you consume **lake whitefish** that you harvested from this area? (please circle one)

Lake whitefish----------daily----------weekly----------monthly----------once a year----------other:_____

About how many pounds of fish would you estimate you harvest from this area and consumed in the last five years? _____Lbs.

What parts of the **whitefish** do you consume? Please list:

_____
_____
_____

9. Do you consume **smallmouth bass** that you have harvested from within the buffer zone (the light brown area on the map)? Yes ☐ No ☐

If yes, how often do you consume **smallmouth bass** that you harvested from within this zone? (please circle one) (please circle one) (please circle)

Smallmouth bass ----------daily----------weekly----------monthly----------once a year----------other:_____

About how many pounds of fish would you estimate you harvest from this area and consumed in the last five years? _____Lbs.

What parts of the **smallmouth bass** do you consume? (e.g. organs, muscles, etc.) Please list:

_____
_____
_____

10. Do you consume **northern pike** that you have harvested from within the buffer zone (the light brown area on the map)? Yes ☐ No ☐

PIN:_____

If yes, how often do you consume **northern pike** that you harvested from within this zone? (please circle one) (please circle one) (please circle)

Northern Pike ----------daily----------weekly----------monthly----------once a year----------
other:_____

About how many pounds of fish would you estimate you harvest from this area and consumed in the last five years? _____Lbs.

What parts of the **northern pike** do you consume? Please list:

_____
_____
_____

11. Do you consume **other fish** that you have harvested from within the buffer zone (the light brown area on the map)? Yes ☐ No ☐

Please specify species: _____

If yes, how often do you consume **other fish** that you harvested from within this zone? (please circle one) (please circle one) (please circle)

Other fish ----------daily----------weekly----------monthly----------once a year----------
other:_____

About how many pounds of fish would you estimate you harvest from this area and consumed in the last five years? _____Lbs.

What parts of the **fish** do you consume? Please list:

_____
_____
_____

12. Do you consume **aquatic plants** that you have harvested from within the buffer zone (the light brown area on the map)? Yes ☐ No ☐

Please specify species_____

If yes, how often do you consume **aquatic plants** that you harvested from within this zone?

Aquatic plants ----------daily----------weekly----------monthly----------once a year----------
other:_____

About how many pounds of **aquatic plants** would you estimate you harvest from within this area and consumed within the last five years? _____Lbs.

What parts of the plant do you consume? Please list:

PIN:_____

_____
_____
_____

13. Do you consume **berries** that you have harvested from within the buffer zone (the light brown area on the map)? Yes ☐ No ☐

Please specify species_____

If yes, how often do you consume **berries** that you harvested from within this zone?

Berries ----------daily----------weekly----------monthly----------once a year----------other:_____

About how many pounds of **berries** would you estimate you harvest from within this zone? _____Lbs.

14. Do you consume **other plants** that you have harvested from within the buffer zone (the light brown area on the map)? Yes ☐ No ☐

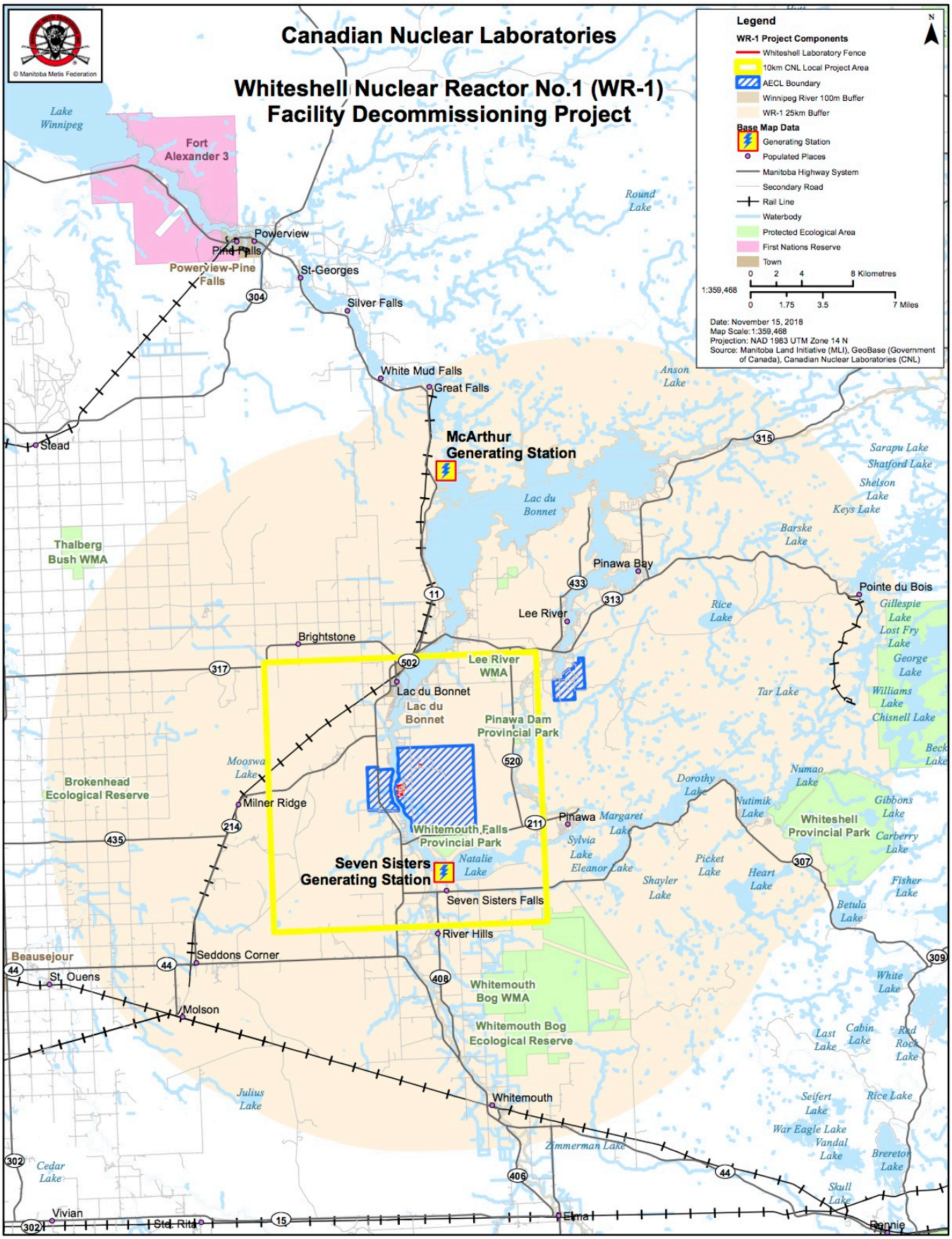
Please specify species_____

If yes, how often do you consume this **plant** that you harvested from within this zone?

Other plant ----------daily----------weekly----------monthly----------once a year----------other:_____

About how many pounds of this plant would you estimate you harvest from within this zone? _____Lbs.

PIN:_____


Canadian Nuclear Laboratories
Whiteshell Nuclear Reactor No.1 (WR-1)
Facility Decommissioning Project
© Manitoba Metis Federation
Legend
WR-1 Project Components
Whiteshell Laboratory Fence
10km CNL Local Project Area
AECL Boundary
Winnipeg River 100m Buffer
WR-1 25km Buffer
Base Map Data
Generating Station
Populated Places
Manitoba Highway System
Secondary Road
Rail Line
Waterbody
Protected Ecological Area
First Nations Reserve
Town
0 2 4 8 Kilometres
1:359,468
0 1.75 3.5 7 Miles
Date: November 15, 2018
Map Scale: 1:359,468
Projection: NAD 1983 UTM Zone 14 N
Source: Manitoba Land Initiative (MLI), GeoBase (Government of Canada), Canadian Nuclear Laboratories (CNL)
N
Lake Winnipeg
Fort Alexander 3
Powerview
Pine Falls
Powerview-Pine Falls
St-Georges
Silver Falls
White Mud Falls
Great Falls
McArthur Generating Station
Stead
Round Lake
Anson Lake
Sarapu Lake
Shatford Lake
Shelson Lake
Keys Lake
Barske Lake
Lac du Bonnet
Thalberg Bush WMA
Pinawa Bay
Pointe du Bois
Lee River
Rice Lake
Gillespie Lake
Lost Fry Lake
George Lake
Brightstone
Lee River WMA
Lac du Bonnet
Lac du Bonnet
Pinawa Dam Provincial Park
Tar Lake
Williams Lake
Chisnell Lake
Beck Lake
Mooswa Lake
Brokenhead Ecological Reserve
Milner Ridge
Whitemouth Falls Provincial Park
Pinawa
Dorothy Lake
Numao Lake
Nutimik Lake
Gibbons Lake
Whiteshell Provincial Park
Carberry Lake
Margaret Lake
Sylvia Lake
Eleanor Lake
Natalie Lake
Seven Sisters Generating Station
Seven Sisters Falls
Picket Lake
Heart Lake
Shayler Lake
Fisher Lake
Betula Lake
River Hills
Beausejour
Seddons Corner
St. Ouens
Molson
Whitemouth Bog WMA
Whitemouth Bog Ecological Reserve
White Lake
Last Lake
Cabin Lake
Red Rock Lake
Julius Lake
Whitemouth
Seifert Lake
Rice Lake
War Eagle Lake
Vandal Lake
Zimmerman Lake
Brereton Lake
Cedar Lake
Skull Lake
Vivian
Std. Rita
Elma
Bennie

Appendix C – *Manitoba Metis Community Feedback Report to the Proposed WR-1 Decommissioning* and *Manitoba Metis Federation WR-1 Technical Report*

Whiteshell Reactor Decommissioning Community Feedback Report

Prepared for:
Manitoba Metis Federation

November 1, 2018

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Shared Value Solutions

Contents

1. Overview

This section of the Community Feedback Report for the Whiteshell Reactor Decommissioning includes a background on the Project, information about the Manitoba Metis Community's Rights, Claims and Interests related to the project, and a description of the purpose of this report.

1.1 Whiteshell Reactor No 1 Decommissioning (the Project)

The Whiteshell Reactor No 1 (WR-1) is located at the Whiteshell Laboratories (WL) site in southeastern Manitoba, near Pinawa. WR-1 was constructed in the early 1960s by Atomic Energy of Canada Limited (AECL) and reached full operation in 1965. WR-1 is a 60 MW thermal nuclear reactor that was historically used as a research reactor. WR-1 was permanently shut down in 1985 and in the early 1990s, the reactor was defueled and underwent preliminary decommissioning.

The Project proponent, Canadian Nuclear Laboratories (CNL), is a private-sector company, contracted by AECL (a crown corporation) to decommission the WL site, including WR-1. The decommissioning approach previously approved for WR-1 (Licence No NRTEDL-W5-8.04/2018) included the removal and remediation of all activated and contaminated components of WR-1 and associated facilities, including the reactor core. However, there is no approved long-term nuclear waste disposal facility in Canada, and therefore, the Proponent is proposing to demolish the WR-1 building and decommission the nuclear waste in situ (ISD – In Situ Decommissioning). This will involve the demolition and removal of above-ground buildings and facilities (two stories). The below-ground structures and facilities, including the reactor and radiological hazards, will be permanently disposed of on-site. These will be protected with an engineered cover that is intended to prevent intrusion of soil and groundwater and allow the radioactive contaminants to decay to safe levels. Upon completion of the decommissioning program, the Whiteshell site will be under 300 years of Institutional Control, with active monitoring occurring for the first 100 years.

1.2 Manitoba Metis Community Rights, Claims & Interests[1]

The Manitoba Metis Federation (MMF) is the democratically elected self-government representative of the Metis Nation's Manitoba Metis Community. The MMF's unique Metis governance structure is composed of seven Regions: The Southeast Region, the Winnipeg Region, the Southwest Region, the Interlake Region, the Northwest Region, the Pas Region, and the Thompson Region. Within each Region are a series of 'Locals'.

The WR-1 is located within MMF's Southeast Region and is in proximity to the following MMF Locals:

- Lac Du Bonnet

[1] For additional information about the MMF, its governance structure and the history of the Manitoba Métis Community please see section 2 of the Whiteshell Reactor Decommissioning Project Technical Review Report, attached as Appendix D.

- Powerview
- Ste. Rita
- Traverse Bay

The MMF is duly authorized by the members of the Manitoba Metis Community (also known as MMF Citizens) for the purposes of dealing with their collective Metis rights, claims, and interests, including conducting consultations and negotiating accommodations. In MMF Resolution No. 8, direction has been provided by MMF Citizens for the MMF Home Office to take the lead and be the main contact on all consultations affecting the Manitoba Metis Community. Resolution No. 8 states that "in keeping with prior MMF AGA resolutions, this assembly continue[s] to give the direction to the Provincial Home Office to take the lead and be the main contact on all consultations affecting the Metis community and to work closely the Regions and Locals to ensure governments and industry abide by environmental and constitutional obligations to the Metis." The MMF works closely with the Regions and Locals to ensure the rights, interests and perspective of the Manitoba Metis Community are respected.

The Manitoba Metis Community possesses Aboriginal rights, including, pre-existing Aboriginal collective rights and interests in lands protected by section 35 of the *Constitution Act, 1982*, throughout the area of the Project. Indeed, Manitoba courts have recognized these pre-existing, collectively-held Metis rights in *R. v. Goodon* (2008 MBPC 59, at paras. 58; 72) as follows:

> I conclude that there remains a contemporary community in southwest Manitoba that continues many of the traditional practices and customs of the Metis people. …
>
> I have determined that the rights-bearing community is an area of southwestern Manitoba that includes the City of Winnipeg south to the U.S. border and west to the Saskatchewan border.

As affirmed by the Supreme Court of Canada, such rights are "recognize[d] as part of the special aboriginal relationship to the land" (*R. v. Powley,* 2003 SCC 43, at para. 50) and are grounded on a "communal Aboriginal interest in the land that is integral to the nature of the Metis distinctive community and their relationship to the land" (*Manitoba Metis Federation Inc. v. Canada (Attorney General),* 2013 SCC 14, at para. 5). Importantly, courts have also recognized that Metis harvesting rights may not be limited to unoccupied 'Crown' lands (*R. v. Kelley*, 2007 ABQB 41, para. 65).

The Crown, as represented by the Manitoba government, has recognized some aspects of the Manitoba Metis Community's rights through a negotiated agreement—the MMF-Manitoba Points of Agreement on Metis Harvesting (the MMF-Manitoba Harvesting Agreement). In particular, the MMF-Manitoba Harvesting Agreement recognizes s.35 Metis rights to "hunting, trapping, fishing and gathering for food and domestic use, including for social and ceremonial purposes and for greater certainty, the ability to harvest timber for domestic purposes" throughout an area spanning approximately 169,584 km² (the "Metis Recognized Harvesting Area"). For clarity, the Project is situated entirely within the Metis Recognized Harvesting Area. As illustrated in the community meeting and feedback, MMF citizens exercise their Metis rights in the vicinity of the proposed Project and specifically in the rivers and watersheds that may be impacted by the decommissioning activities and contamination.

Beyond those rights already established through litigation and recognized by agreements, the Manitoba Metis Community claims commercial and trade related rights. Courts have noted that Metis claims to commercial rights remain outstanding (*R. v. Kelley* at para. 65). These claims are strong and well-founded, and it is incumbent on the Crown and proponents to take them seriously.

The Manitoba Metis Community has its roots in the western fur trade, prior to Canada's westward expansion (*R. v. Blais*, 2003 SCC 44 at para. 9 [*Blais*]; *R. v. Goodon* at para. 25). The Metis in Manitoba are descendants of early unions between Aboriginal women and European traders (*Manitoba Metis Federation Inc. v. Canada (Attorney General)* at para. 21). As a distinct Metis culture developed, the Metis took up trade as a key aspect of their way of life (*R. v. Powley* at para. 10). Many Metis became independent traders, acting as middlemen between First Nations and Europeans (*R. v. Goodon* at para. 30). Others ensured their subsistence and prosperity by trading resources they themselves hunted and gathered (*R. v. Goodon* at para. 31, 33, & 71). By the mid-19th century, the Metis in Manitoba had developed the collective feeling that "the soil, the trade and the Government of the country [were] their birth rights." (*R. v. Goodon* at para. 69(f)).

Commerce and trade is, and always has been, integral to the distinctive culture of the Manitoba Metis Community. Today, the Manitoba Metis have an Aboriginal, constitutionally protected right to continue this trading tradition in modern ways to ensure that their distinct community will not only survive but also flourish.

Unlike First Nations in Manitoba, whose commercial rights were converted and modified by treaties and the *Natural Resources Transfer Agreement* ("*NRTA")* (*R. v. Horseman*, [1990] 1 SCR 901), the Metis' pre-existing customs, practices, and traditions—including as they relate to commerce and trade—were not affected by the *NRTA* (*Blais*) and continue to exist and be protected as Aboriginal rights.

The Whiteshell Project site falls within lands to which the Manitoba Metis Community has recognized s.35 harvesting rights, strong and credible assertions to trade related Aboriginal rights, and significant Aboriginal-collective interests. The Manitoba Metis Community has and will continue to exercise its inherent and Aboriginal rights around and downstream of the Project area without limitation. This must be factored into any long-term decommissioning plan for the Project and site. In addition, potential risks (such as leaks of radioactive contaminants) associated with the Project would occur within the Traditional Territory of the Manitoba Metis Community and have the potential to affect the exercise of the Manitoba Metis Community's constitutionally protected Aboriginal rights and impact their ongoing stewardship rights and obligations. Based on land use and occupancy data held by the MMF, it is well-known that the Project site is within a region where the Manitoba Metis Community has a longstanding and well-established record of historic use and occupancy and ongoing current use.

Given this longstanding connection and continuing current use of the area, feedback from the Manitoba Metis Community is being sought by Canadian Nuclear Laboratories (CNL) about the potential impacts of the WR-1 Decommissioning activities. Preliminary feedback was gathered from the Manitoba Metis Community about the decommissioning of the Whiteshell Reactor No 1 through a community

consultation meeting and a community consumption survey, the methodology and results of which are described below.

2.0 Methodology

This section of the Report describes the methodology used to gather community feedback on the Whiteshell Reactor Decommissioning Project. Feedback from MMF Citizens, including harvesters, was gathered through two activities:

i) A Community Consultation Meeting; and

ii) A Preliminary Community Consumption Survey.

The methodology for each activity is set out briefly below.

2.1 Community Consultation Meeting

Staff from the Manitoba Metis Federation's Energy and Infrastructure department facilitated a Community Consultation Meeting in Lac du Bonnet, Manitoba on February 12, 2018. Between 45 and 50 MMF Citizens, including harvesters, attended the meeting.

The objectives of the meeting were:

- to present the results of the Whiteshell Reactor Decommissioning Technical Review that had been completed by Shared Value Solutions Ltd. on behalf of the Manitoba Metis Federation (see Appendix A)
- to gather input from the MMF Citizens about the Technical Review findings
- to gather community feedback in general about the Whiteshell Reactor Decommissioning Project

Shared Value Solutions Ltd. prepared a PowerPoint presentation that was presented by MMF staff to the Community Consultation Meeting participants. MMF staff recorded the comments, feedback and opinions of the participants about the technical review and the project in general. The results of this dialogue can be found in Section 3.

2.2 Consumption Survey

A four question Preliminary Consumption Survey was distributed for participants to fill out at the Community Consultation Meeting. It was also sent to some members of the Manitoba Metis Community who could not attend the meeting. A copy of this survey can be found in Appendix B.

The Preliminary Consumption Survey asked participants whether they had used or occupied the land in the area surrounding the WR-1 and to indicate on the map provided where this use was located. It also asked participants to describe how they used or occupied the land. The survey also had a series of questions about how frequently people consumed a variety of wild foods and products. Finally, as the survey was preliminary in nature and designed to gather high-level feedback, the survey asked respondent's whether they would consider taking part in a Traditional Knowledge and Land Use study as input to the WR-1 Decommissioning.

The Survey was mailed to a total of 45 households with some being completed at the Lac du Bonnet Community Consultation Meeting and the MMF Annual General Assembly (AGA) that took place September 21-23, 2018 in Winnipeg.

MMF Citizens who attended the Community Consultation Meeting and who did not complete a survey were sent the survey in the mail to complete. Those who were mailed a survey were given 1 month to complete and mail back the survey. A total of 21 surveys were completed.

The results of the Consumption Survey can be found in Section 3.

3.0 Results

This section summarizes the feedback gathered from the Manitoba Metis Community through the Lac du Bonnet Community Consultation Meeting and the Preliminary Consumption Survey.

3.1 Community Consultation Meeting Findings

Multiple participants at the Community Consultation Meeting stressed the importance of ongoing monitoring and accountability for the WR-1. As outlined further below, the majority of questions and concerns raised by MMF Citizens and harvesters focused on health and safety concerns related to individuals living near the site and also continuing to exercise their constitutionally-protected Metis rights in the area.

MMF Citizens and harvesters rely on the lands and waters to feed themselves and their families, maintain their distinct Metis connection with their traditional territory, and pass on their Metis traditions to future generations. It is critical to the Manitoba Metis Community that such practices be able to continue. As such the health of the environment, species relied on for harvesting activities, and the risk to people in the area of the Project site is of great concern to the Manitoba Metis Community. These outstanding concerns and questions raised by the participants remain to be addressed by CNL.

Manitoba Metis Community Concerns with the WR-1

Participants at the Community Consultation Meeting voiced several concerns about the WR-1 Project. A list of the questions raised at the Community Consultation Meeting is included in Appendix C.

In particular, there was a fair amount of dialogue about whether the site is contaminated above ground currently and whether contamination would remain after decommissioning. Questions were asked regarding remediation plans for any existing contamination and individuals raised concerned about health risks associated with asbestos for workers on site and other risks with asbestos in general. Questions were asked about restrictions on access to the site, how the disposal would occur and what safety measures would be put in place both short and long-term. These concerns relate directly to the health and safety of the individuals of the Manitoba Metis Community living near and using the lands in the Project area and require answers from CNL prior to decommissioning activities taking place.

Participants also voiced concerns about the potential for contamination of wildlife, movement of those contaminated wildlife causing contamination further afield (e.g. to fisheries in Lake Winnipeg, and about impacts to their groundwater (local drinking water in particular). These concerns were particularly prevalent given the reliance of the Manitoba Metis Community on harvesting, including hunting, fishing, gathering and use of the lands and rivers to sustain themselves and their families. People voiced concerns about the likelihood of any contamination to the rivers/waterways, if so what the extent would be (i.e. how far downstream contamination would spread), what the plans for preventing any leakage would be and how often monitoring and testing would be done.

A number of questions were asked regarding the ongoing monitoring and testing as well, including what species would be tested, how often, for what distance from the site. Specifically, these concerns overlap with the Manitoba Metis Community's ongoing stewardship rights and responsibilities. Ensuring a healthy and sustainable environment for future generations of the Manitoba Metis Community is a vital concern. Individuals raised the question of whether other species would be sampled, or other factors / information could be collected as part of the monitoring to reflect a more holistic perspective of the health of the species found in the Project area. One MMF Citizen specifically asked whether annual Metis monitoring tours could be arranged of the site, as an exercise of the Manitoba Metis Community's stewardship.

There was also concern voiced about potential future changes to the land and whether erosion would occur, or the ground would shift in the area, and what impacts that would have. Many people were concerned by the length of time for the Project decommissioning and how effective monitoring and containment measures could be ensured over 300 years. MMF Citizens asked questions about how the material would be stored, how ongoing testing would be possible, and what the risks are for various contamination concerns over time.

Another main area of concern was around potential emergency scenarios, specifically if Seven Sisters Dam was breached and what emergency plans and measures would be in place. Included within this were questions about what measures there would be for contacting the MMF and informing the Metis Citizens through their government of any emergency situation or response.

Outstanding Questions about the WR-1

The focus of the dialogue at the Community Consultation Meeting was largely on outstanding questions about the Project. The extensive list of questions demonstrates a high level of concern by MMF Citizens, including harvesters, with the WR-1 Project and a need for further engagement of the community to ensure the Manitoba Metis Community is adequately informed, their rights respected, and traditional knowledge and information included, as possible, within the plan for the Project and site.

The questions raised were about: access to the Project area, by locals and Indigenous people specifically; contamination, radiation, and asbestos; human health concerns; risks, risk scenarios, and contingency plans in case risks occur; research and testing in the past and future, as well as requests for specific studies to be completed; the approvals process; communication of issues to the MMF and MMC; and a request for a tour to the site.

The full list of outstanding questions can be found in Appendix C.

3.2 Preliminary Consumption Survey Findings

A total of 21 Consumption Surveys were completed. A summary of the findings is provided below. A copy of the Consumption Survey can be found in Appendix B.

Evidence of Manitoba Metis Community Use of the WR-1 Surrounding Area

The Consumption Survey focused on the use of the lands and waters of the Project area by the Manitoba Metis Community, and specifically on the use for harvesting, hunting, fishing and gathering by MMF Citizens, including harvesters. The Survey asked whether respondents had ever used the land in the Lac du Bonnet, Pinawa, Seven Sisters or Winnipeg River areas for fishing, hunting, trapping, gathering, non-road travel or staying out overnight (i.e. in a tent or cabin). A total of 15 of the 21 respondents had used the Winnipeg River, 16 of the 21 used the land around Lac du Bonnet, 10 of the 21 used the area around Seven Sisters, and 11 of the 21 used the Pinawa area. These findings demonstrate the Manitoba Metis Community's existing use of and interest in the area around the Whiteshell Reactor No 1 Decommissioning.

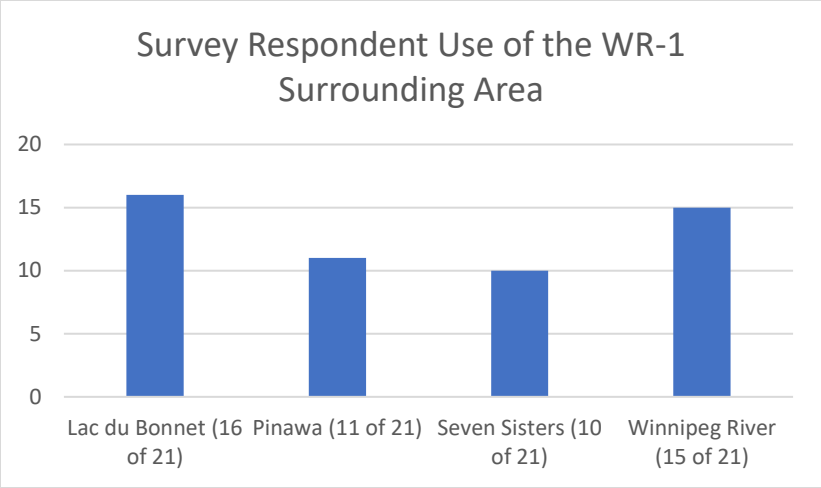


Figure 1 Evidence of Manitoba Metis Community Use in the WR-1 surrounding area

Type of Metis Harvesting Occurring Near WR-1

Respondents were asked to indicate the ways they use the area to harvest. A total of 15 of the 21 said that they use the area for fishing, 15 of the 21 for gathering, 8 of the 21 for hunting and 2 of the 21 have trapped in the area.

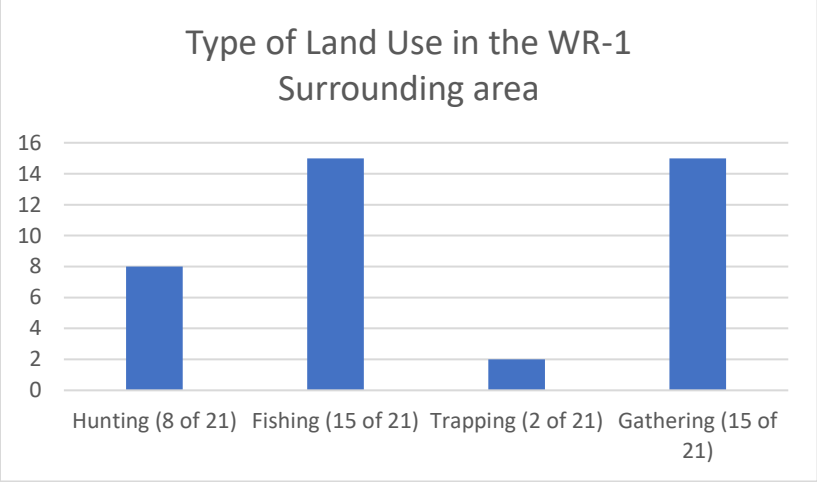


Figure 2 Type of Metis Harvesting Occurring Near WR-1

Metis Consumption of Wild Game and Other Products

The Manitoba Metis Community, as a distinct Indigenous community, holds harvesting rights that are protected by s.35 of the *Constitution Act, 1982*. These rights, as Aboriginal rights, have been integral to the unique and distinctive Metis culture and traditions since the birth of the Manitoba Metis Community. MMF Citizens and harvesters continue to rely on the exercise of these s. 35 harvesting

rights to sustain themselves and their families, and to continue their connection to these Metis traditions. These rights have been recognized in the MMF-Manitoba Harvesting Agreement by the provincial Crown.

The above all indicates the prevalence of Metis harvesting. This prevalence of consumption of wild foods harvested near to the WR-1 Reactor site was discussed at meetings between CNL and the Manitoba Métis Community, and as a follow up to those previous dialogues, the MMF undertook a consumption survey to gather some preliminary information about the consumption patterns of the Manitoba Metis Community for consideration by CNL. To start to look at this further, respondents were asked how often they consume wild game, fish, plants / berries or use firewood. The options were daily, weekly, monthly, once a year or other and opportunity was provided to comment.

As outlined in Table 1, each species of wild game is consumed at least once a year by multiple respondents. Also of note is that at least 5 of 17 people are consuming grouse on a monthly basis, 2 people are consuming deer and grouse weekly, and deer and moose are both consumed daily by at least one respondent. While a relatively large number of respondents selected 'other' as their frequency, none provided a description of what that was.

Table 1 Survey Respondent Frequency of Consumption of Wild Game

	Deer	Moose	Geese	Ducks	Grouse	Other Birds
Daily	1	1				
Weekly	2			1	2	
Monthly	3	1	2	1	5	
Once a year	4	6	5	5	4	
Other	3	7	4	4	6	5

Table 2 shows that each of the species of fish, plants and firewood are consumed at least once a year by multiple respondents. Fish is consumed monthly by several respondents (e.g. walleye/pickerel is consumed by at least 11 of the 21 respondents, other fish is consumed by 7, and pike/jackfish by 3 of the respondents monthly). Berries and plants are consumed on a weekly basis by 6 respondents each, firewood is gathered weekly by 3 respondents, and 5 people are consuming walleye/pickerel weekly. There is one person each consuming or using walleye/pickerel, medicinal plants and firewood daily. While a relatively large number of respondents selected 'other' as their frequency, none provided a description of what that was.

Table 2 Survey Respondent Frequency of Consumption of Fish, Plants & Firewood

	Pike / Jackfish	Walleye / Pickerel	Other Fish	Berries	Medicinal Plants	Firewood
Daily		1			1	1
Weekly	2	5		6	6	3
Monthly	3	11	7	4	2	6
Once a year	3	3	4	5	5	3
Other	3		5	5	4	4

While the survey did not ask participants to clarify where they harvested the wild foods and products that they consumed, it can be inferred that some of the foods and products come from the area surrounding the WR-1 based on their responses to the previous questions and the focus of the Community Consultation Meeting and maps on the Project site.

Clearly based on the above results and indication by the Manitoba Metis Community of harvesting activities on and nearby the Project site additional follow-up is required. In light of the greater than average consumption of wild game and other products for subsistence by the Manitoba Metis Community, community-specific mediation plans may be required to address any loss or change in harvesting opportunities or patterns or to account for greater contamination risks.

Participation in Future Metis Traditional Knowledge and Land Use Study for the Project

As indicated above, the Consumption Survey was intended as an initial response to discussion at a meeting between CNL and the Manitoba Metis Community about frequency and extent of reliance on wild game and other products for subsistence by the Manitoba Metis Community. The results are there preliminary and indicate that additional information about harvesting and subsistence patterns through undertaking a Metis Traditional Knowledge and Land Use Study is recommended. A total of 11 of the 21 survey respondents said that they would consider taking part in a Traditional Knowledge and Land Use study as input to the WR-1 Decommissioning.

4.0 Analysis & Recommendations

The findings of the community feedback activities indicate that there are outstanding questions and concerns among members of the Manitoba Metis Community about the WR-1 decommissioning. These findings are in-line with the findings of the MMF Technical Review of the Draft Environmental Impact Statement, this document can be found in Appendix D.

It is recommended that the CNL / AECL follow up to address each of the questions raised by MMF Citizens and harvesters outlined in Appendix C of this report) in writing in a timely manner (within 2 months of receipt of this report is proposed). It is also recommendation that CNL / AECL coordinate with the MMF to host a further Community Information Session with CNL / AECL staff present to address some of the outstanding comments in person (within 6 months of receipt of this report is proposed).

The findings also provide further support for and evidence of the Manitoba Metis Community exercising their harvesting rights and having strong interests in and around the WR-1 Project area. It is recommended that a Metis Traditional Knowledge and Land Use study be developed to gather additional specific information about Metis land use, occupancy, and traditional ecological knowledge in the area surrounding the WR-1. Through a fulsome study, site-specific information can be collected, analyzed and factored into the decommissioning activities and lifecycle plan for the Project, including long-term monitoring. In addition, a study would allow for additional Manitoba Metis Community members information to be gathered, and specifically others who were not able to participate in the survey or Community Consultation Meeting, but who have extensive knowledge or use of the Project site and area could be sought for an interview.

The Technical Review of the Draft Environmental Impact Statement included the following high-level recommendations to CNL and CNSC:

- Continue to engage with the MMF to identify and evaluate current land-use and potential future land use impacts associated with the Project on the rights and interests of the MMC. Metis Knowledge of land-use activities must also be used to inform the risk assessment of potential exposure pathways.
- The CNSC must provide guidance on whether the long-term storage of high-level waste in this form is acceptable, given the knowledge that radioactivity will be released to the Winnipeg River in the future. CNL has the expertise to move the material to another site safely.

While the Community Consultation Meeting and Preliminary Consumption Survey are steps towards fulfilling some of these recommendations, this Community Feedback Report has illustrated that there is still much information that needs to be collected on specific areas of land use within the Project area and in particular outstanding questions and concerns that need to be addressed by CNL.

The findings of this Community Feedback Report provide an initial indication that Metis people are consuming wild foods and using firewood from the area near the WR-1. Given these findings, it is recommended that CNL/AECL fund a more fulsome consumption study and a Metis Traditional Knowledge and Land Use Study to investigate any human health risk potential. In addition, given that harvesting by members of the Manitoba Metis Community is an Aboriginal right that is recognized and protected by s.35 of the *Constitution Act, 1982*, further information about ongoing harvesting activities, Metis harvesting practices and preferences, as well as identifying options to mitigate impacts to the Manitoba Metis Community's use of the lands and waters is required.

Appendix A – Community Meeting Presentation on the WR1 Technical Review

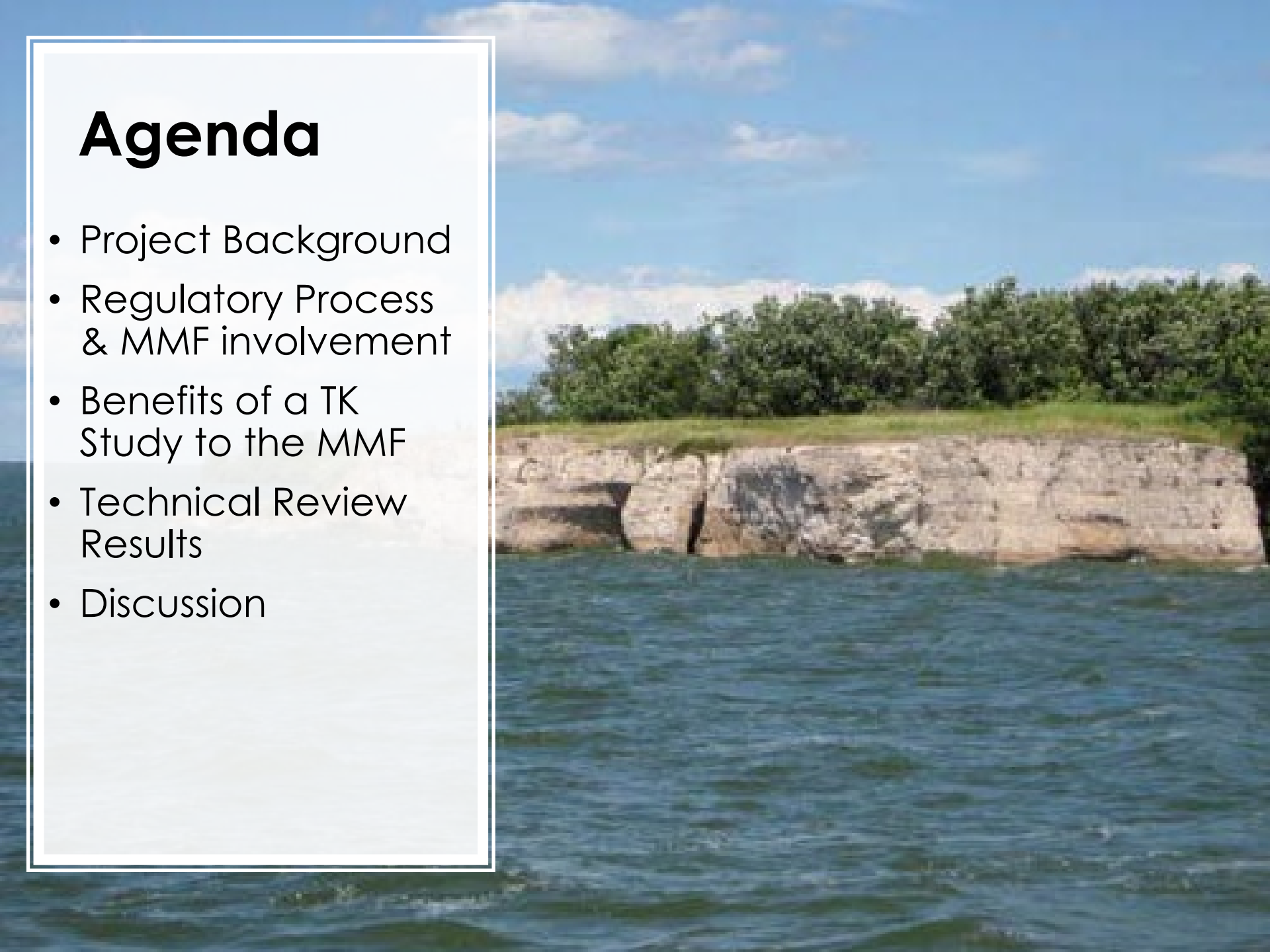
Whiteshell Reactor Decommissioning Technical Review

MANITOBA METIS FEDERATION

Shared Value Solutions

Agenda

- Project Background
- Regulatory Process & MMF involvement
- Benefits of a TK Study to the MMF
- Technical Review Results
- Discussion



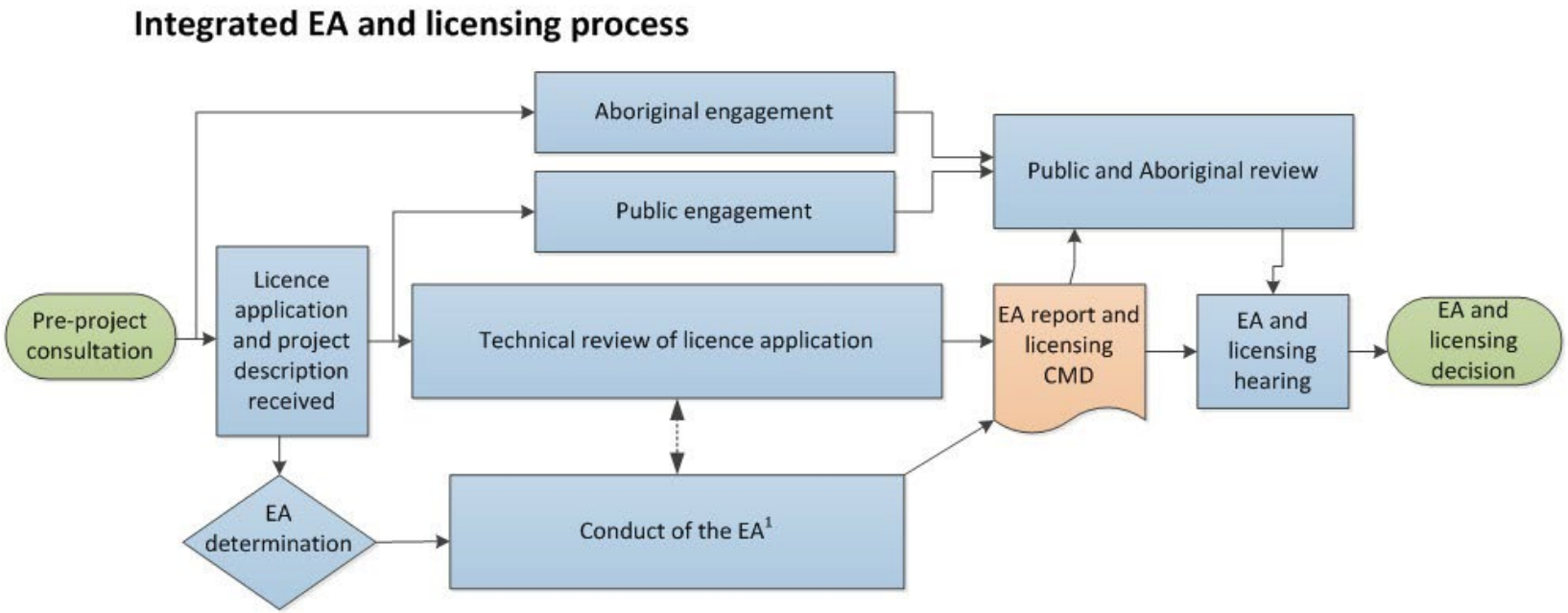
Project Background

- Whiteshell Reactor No 1 (WR-1) is located at Whiteshell Laboratories near Pinawa, MB
- Was constructed in 1960; fully operational in 1965
- WR-1 was permanently shut down in 1985 and in the early 1990s, the reactor underwent initial closure
- After decommissioning the site will be managed for 300 years and actively monitored for the first 100 years

Regulatory Process

The Whiteshell Project is subject to Federal Environmental Assessment (EA); the responsible authority for the EA is the Canadian Nuclear Safety Commission (CNSC)

The following process diagram outlines the CNSC process:



Regulatory Process

The Regulatory process for Whiteshell consists of the following steps:

Step	Date
CNL submitted a Project Description	June 2, 2016
Public Comment period on the Project Description	June 2, 2016 until July 4, 2016
The MMF submitted comments on the Project Description	July 4, 2016
Participant Funding was made available for Indigenous groups and members of the public interested in participating	Applications were accepted from July 6, 2016 to September 30, 2016 and was awarded on April 12, 2017

Regulatory Process

Step	Date
CNL submitted an Environmental Impact Statement to CNSC	October 5, 2017
Public comments on the EIS are accepted for 75 days	October 5, 2017 to December 19, 2017
The MMF submitted comments on the EIS	December 19, 2017
Review of the draft EIS was deemed completed by CNSC	January 5, 2018

Next Steps in Regulatory Process

- CNL must address all comments received and submit a final EIS (expected in April 2018).
- CNSC will then complete an EA Report with a decision recommendation on the project.
- There will be a 60 day comment period on the EA Report and hearing to follow.
- The CNSC hearing is expected to take place in October 2018.

Regulatory Process

- Additional permitting may include:
  - Permits from Environment Canada for on-site petroleum storage tanks; and
  - Waste generator registration under the *Dangerous Goods Handling and Transportation Act* from Manitoba Conservation and Water Stewardship.


Questions about the regulatory process and the MMF's involvement?

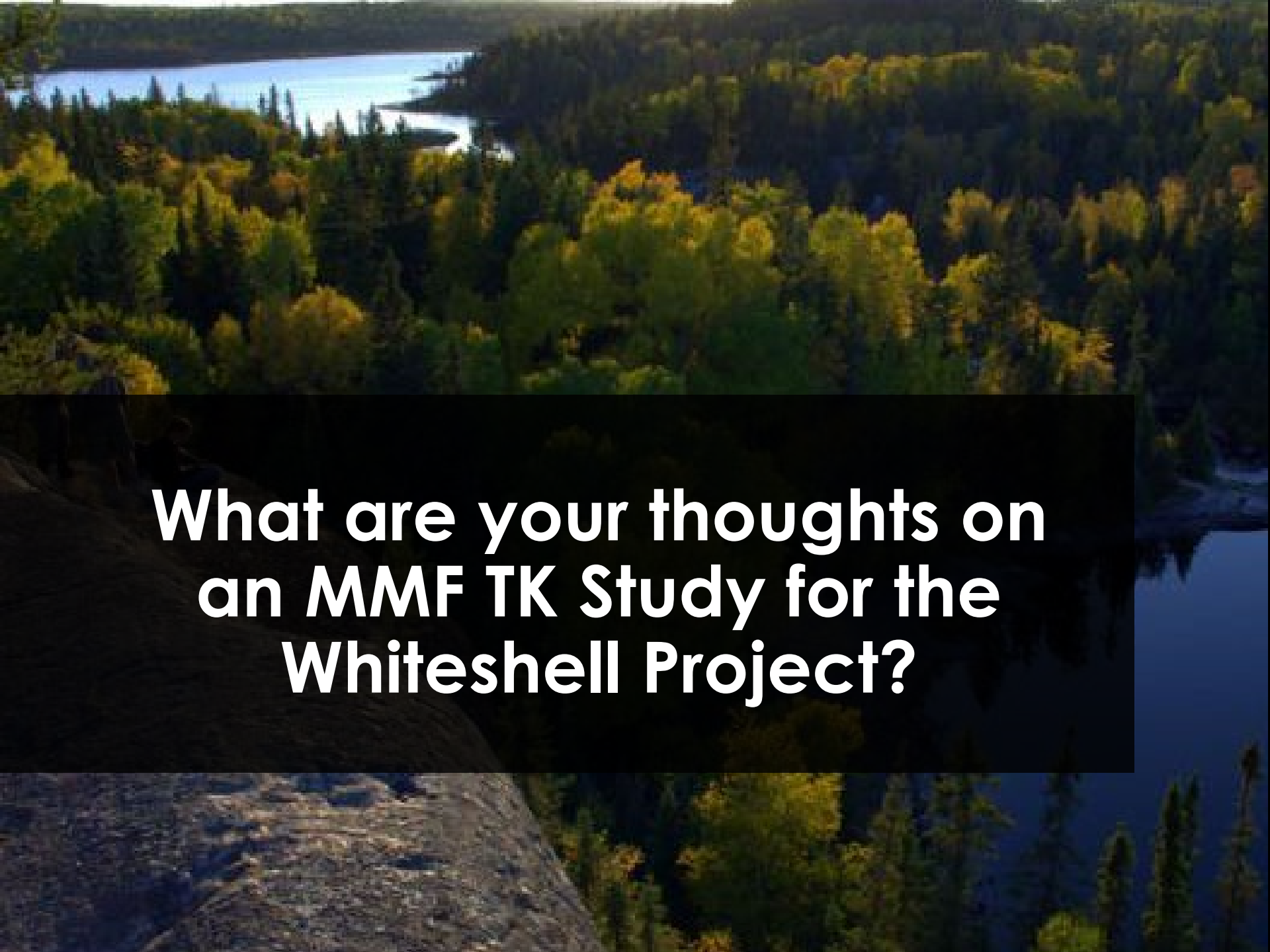
Benefits of a Traditional Knowledge and Land Use Study to the MMF

- **Traditional Knowledge and Land Use Studies, or TKLUS** map and record the land use, ecological knowledge, and stories of the Manitoba Metis community

- The maps and stories collected in a TKLUS create a clear, legally defensible picture of the historic and current connection Metis have to the land

Traditional Knowledge and Land Use Study – Confidentiality

- The studies are designed to ensure confidentiality of each person who participates
- Personal Identification Numbers are used and reports and maps never include participants names.
- Participants will have a chance to confirm their information by reviewing their own maps and transcripts

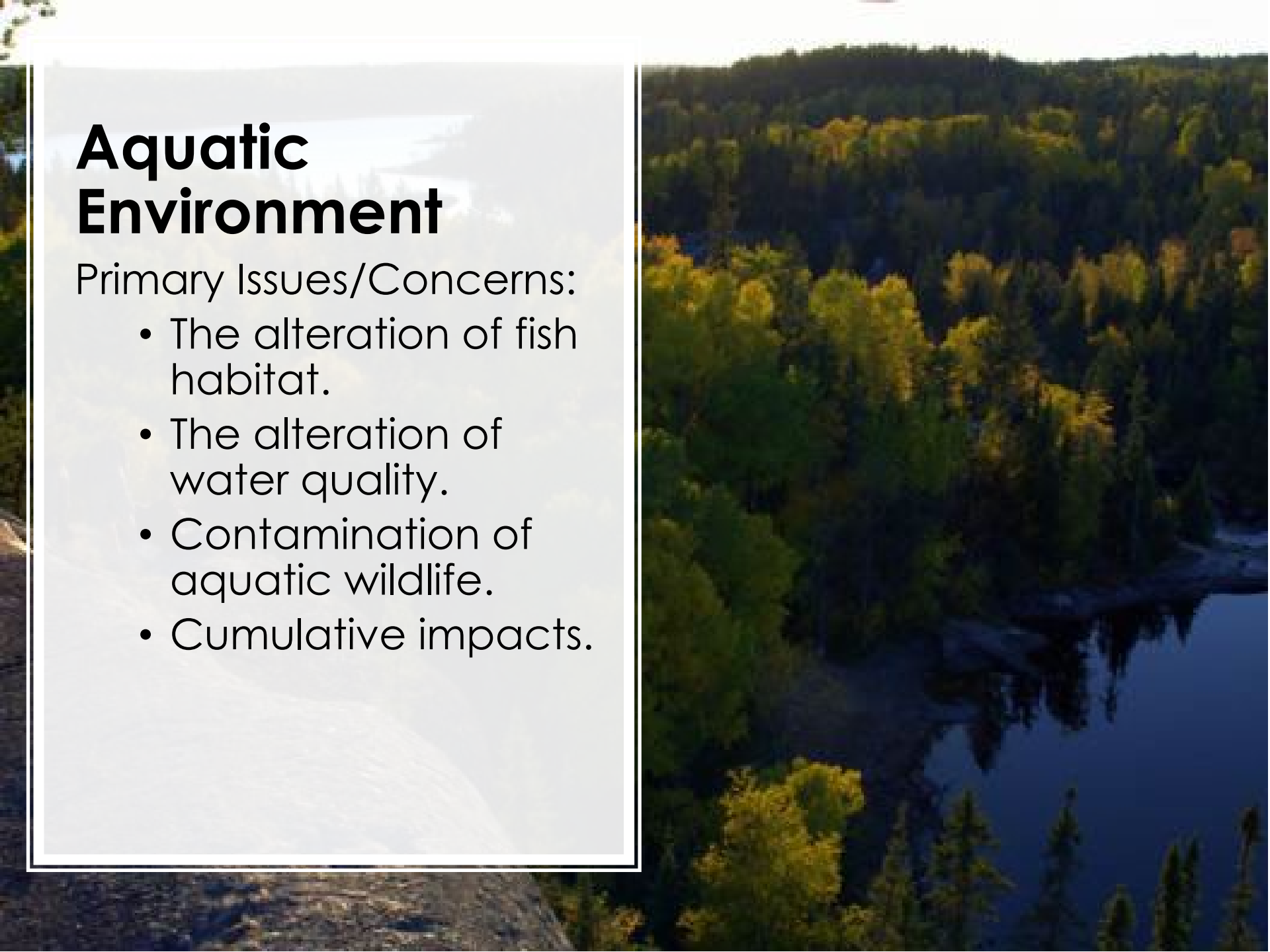

What are your thoughts on an MMF TK Study for the Whiteshell Project?

Technical Review Results

Approach to Technical Review

The following categories were the focus:

- Effects on the **aquatic environment**
- Effects on **wildlife, vegetation and wetlands**
- Effects to **human and ecological health**



Aquatic Environment

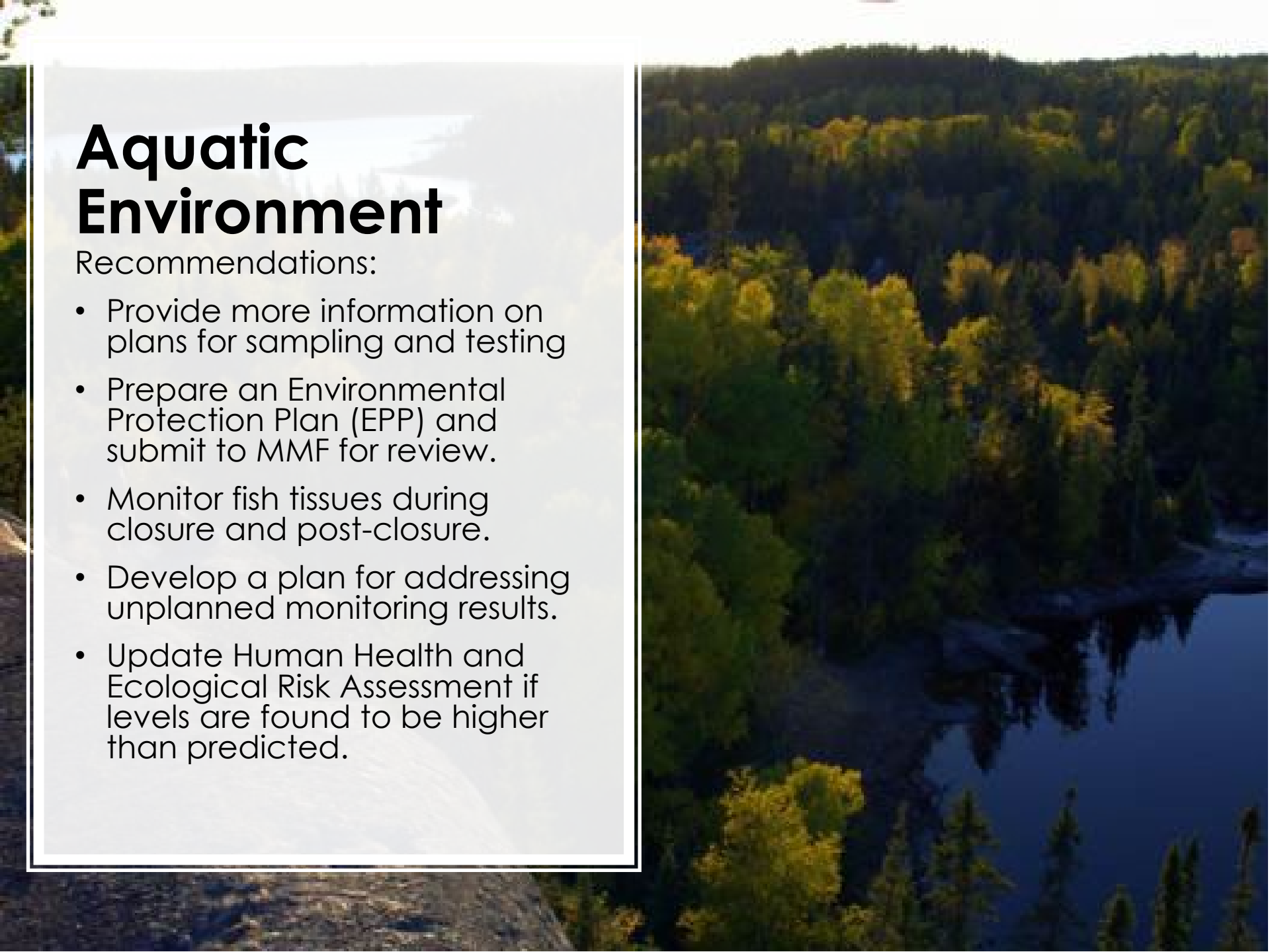
Primary Issues/Concerns:

- The alteration of fish habitat.
- The alteration of water quality.
- Contamination of aquatic wildlife.
- Cumulative impacts.

Aquatic Environment

Recommendations:

- Provide more information on plans for sampling and testing
- Prepare an Environmental Protection Plan (EPP) and submit to MMF for review.
- Monitor fish tissues during closure and post-closure.
- Develop a plan for addressing unplanned monitoring results.
- Update Human Health and Ecological Risk Assessment if levels are found to be higher than predicted.



Wildlife, Vegetation, & Wetlands

Primary Issues/Concerns:

- Impacts to Metis rights due to impacted wildlife and plants.
- Excluding species and habitats of importance to the MMC.
- Disturbance and displacement of wildlife.

Wildlife, Vegetation, & Wetlands

Recommendations:

- Conduct multi-season baseline terrestrial surveys.
- Engage the MMF to identify and consider the MMCs extensive TEK, harvesting rights, current exercise of rights and ongoing needs and interests, thins including undertaking a TKLUS.
- Limit construction activity during sensitive timing periods to prevent disturbance and displacement of wildlife in the Project area.

Human Health and Ecological Risk Assessment (HHERA)

Primary Issues/Concerns

- Longer term site monitoring is needed
- The EIS does not discuss the other sources of radioactivity already stored on the site.
- Alternative decommissioning or disposal options have not been considered
- HHERA must consider ways the Metis may be exposed to contaminants from the site (i.e. diet and land use)

Human Health and Ecological Risk Assessment (HHERA)

Recommendations:

- Extend the timeframe for site decommissioning
- Provide more clarity on how long-term monitoring is expected to be carried out.
- Work with the MMF, including conducting a TKLUS to identify how the Metis will be impacted


Questions?


Thank You

Appendix B– Consumption Survey

1. Have you ever used the land in the following areas for fishing, hunting, trapping, gathering, non-road travel or staying out overnight (i.e. in a tent or cabin.) Please circle all that apply

A. **Lac du Bonnet**
B. **Pinawa**
C. **Seven Sisters Falls**
D. **Winnipeg River**

1a. On the Map *(attached*), please indicate the areas that you have used by circling the areas you may use in the following manner, Hunting, fishing, trapping, and gathering, cultural/ceremonial purposes.

2. Please indicate in what ways you use the area to harvest and describe how long you and your family have harvested there.

a. **Hunting**
b. **Fishing**
c. **Trapping**
d. **Gathering**

Describe:

_____
_____
_____
_____
_____
_____
_____

3. How often do you **Consume** wild game, fish, plants /berries or use firewood. Please circle all that apply.

Deer-----daily-----weekly-----monthly-----once a year-----Other

Moose-----daily-----weekly-----monthly-----once a year-----Other

Geese-----daily-----weekly-----monthly-----once a year-----Other

Ducks-----daily-----weekly-----monthly-----once a year-----Other

Grouse-----daily-----weekly-----monthly-----once a year-----Other

Other Birds-----daily-----weekly-----monthly-----once a year-----Other

Pike/Jackfish-----daily-----weekly-----monthly-----once a year-----Other

Walleye/Pickerel-----daily-----weekly-----monthly-----once a year-----Other

Other fish-----daily-----weekly-----monthly-----once a year-----Other

Berries-----daily-----weekly-----monthly-----once a year-----Other

Medicinal Plants-----daily-----weekly-----monthly-----once a year----Other

Firewood-----daily-----weekly-----monthly-----once a year-----Other

Comments:_____
_____
_____
_____
_____
_____
_____
_____
_____

4.We are undertaking a traditional knowledge and land use study to interview Metis harvesters out on the lands and waters that they utilize near the Project Area. Would you be interested in participating in the study process?

Yes

No

4b. If you know of other Metis Harvesters who use the project area; please have them contact the Energy and Infrastructure Department at MMF Home Office 204-586-8474

Appendix C – Full List of Questions from Manitoba Metis Community Consultation Meeting

- What are the rules around access to the area?
- How much radiation is taken out from asbestos on site?
- Do you just do lab test on entire nuclear facility, working areas around it?
- RE: Disposal of building materials, soil, is it dug up and moved (to dump) or let to sit before hauling away in months/years?
- Is there a barrier next to effluent area to protect the Winnipeg River?
- Looking for sampling of river plants
- Any human health concerns (example. Cancer) in the people in the area/workers?
- Any sign of contamination in ground water? Nearby Lagoon?
- What are the other options for clean up?
- Risks to people/environment?
- Has the river currently been contaminated or tested for radiation exposure? If so, how far down the river/watershed?
- If river were to be contaminated, how far would damage go?
- If buildings are safe, why demolish them, why not use the buildings/space for something else?
- How often will tests be done?
- Will concrete be checked for cracks/exposure?
- Will moving the fuel and keeping it in one large location be safe?
- Does a large quantity in a single place increase the risks and concerns for the area it is stored?
- If someone gets sick/ exposed to material at a location who would be held responsible and what would be done?
- What happens if an error has been made and prolonged exposure occurs/has occurred during this timeframe?
- How will this Project affect future cleanups in this area/other areas?
- How is material from the site that is outside of the cement area stored?
- After +50 years how can radiation testing be done on level of (radioactive) decay in below ground area if it is entombed?
- Do mosquito's carry radiation?

- What are the chances of the concrete casing cracking and leaching radioactivity into the environment?
- Is there any chance of pressure building in the cavity after 50-100-200 years or leaks of gas that can be harmful to the land and the Community?
- How long will it take for the concrete to decay once capped
- What is the risk of spontaneous combustion?
- What is the estimated budget set aside for the Project?
- Are the licensing requirements for decommissioning as rigorous as the licensing processes to build a facility like this?
- How will this assessment be affected by the federal government's new rules?
- Have there ever been any follow up on the health of the workers from Pinawa Nuclear Site? If not, why not? And where are the results posted?
- Why is there a 300-year watch on this site? Is there a fear for leakage from this site?
- What is the prediction of contamination to fish, animal, and birds given that they move long distances/have no borders.
- Are they looking at Lake Winnipeg and all of Winnipeg River?
- Underground lab has been storing nuclear waste for years and presumably performance of containment systems has been monitored, what are the results of this monitoring and are these results within established, expected and licensed expectations and limits?
- How many layers of containment are there?
- What is the largest number of containment layers that have failed in one experiment? How and why? What design changes resulted and how did those changes perform?
- In case something happens, is there a plan B?
- Will this be a preferred person's zone for Indigenous groups?
- Are fish just tested for radiation or other issues as well?
- What is the notification process to the MMC if there is a spike in radiation/emergency situation happens?
- What is the level of radiation across waterways? i.e. is it the same here as it is in Lac du Bonnet? Winnipeg?
- Can we arrange a tour for locals to check out the Site – preferably in Spring time?
- Could tests be taken on moss, birds, fish, wolf, coyotes, foxes?

- Would like more information on the exposure to radiation of local people who are drinking/cooking/bathing in water from the Winnipeg River as well as eating the fish, birds and deer in the area
- Would like to see overall study on children/grandchildren or workers/locals in the area to identify any human health concerns

Appendix D- Technical Review of the Draft Environmental Impact Statement

Whiteshell Reactor Decommissioning Project Technical Review

Technical Review of the Draft Environmental Impact Statement

Prepared for:

Manitoba Métis Federation

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N1H 4G1

Shared Value Solutions

Marci Riel
Manitoba Métis Federation
300-150 Henry Avenue
Winnipeg, Manitoba, R3B 0J7

December 19, 2017

Dear Marci:

It is our pleasure to provide you with our technical review report on the Environmental Impact Statement for the Whiteshell Reactor Decommissioning Project. This review was completed by Scott Mackay, Alison Fraser, Keegan McGrath, and Melissa Tongue of Shared Value Solutions, with assistance from sub-consultant Colin MacDonald. We look forward to continuing to serve you in consultation and lands and resources protection matters. Please do not hesitate to get in touch with us if you have any questions or concerns with the enclosed report.

With best regards,

Scott Mackay, MSc, RPP, MCIP
Managing Partner, Shared Value Solutions Ltd.

1.0 Introduction

The Decommissioning of the Whiteshell Reactor No 1 is undergoing a Federal Environmental Assessment (EA). The EA is being administered by the Canadian Nuclear Safety Commission (CNSC), the Responsible Authority under the Canadian Environmental Assessment Act. The EA process is intended to assess how a proposed project may cause changes to the biophysical and socio-economic environment and whether those effects are adverse and significant. It includes an assessment of potential impacts to Indigenous people. Shared Value Solutions (SVS) has been retained by the Manitoba Métis Federation (MMF) to undertake a technical review of the Whiteshell Reactor No 1 Decommissioning Project (the Project) to support the Manitoba Métis Community (MMC) in this process. The objectives of our review are outlined below:

- Provide a plain language explanation of the scope and nature of the Whiteshell Project
- Clearly identify where the MMC's rights and interests overlap with and may be impacted by the Whiteshell Project
- Identify environmental and technical issues with the Draft EIS, and provide recommendations on where and how MMC's rights and interests may need to be better accommodated through revisions and additions to the Final EIS and Project plan
- Identify issues and challenges with the Project that will require ongoing engagement and consultation with MMF on behalf of the MMC

1.1 Project Description

The Whiteshell Reactor No 1 (WR-1) is located at the Whiteshell Laboratories (WL) site in southeastern Manitoba, near Pinawa. WR-1 was constructed in the early 1960s by Atomic Energy of Canada Limited (AECL) and reached full operation in 1965. WR-1 is a 60 MW thermal nuclear reactor that was historically used as a research reactor to explore the feasibility of using an organic-cooled reactor, and to carry out a variety of engineering and scientific experiments (e.g. alternative fuel sources, fuel channels and reactor coolants). WR-1 was permanently shut down in 1985 and in the early 1990s, the reactor was defueled and underwent preliminary decommissioning.

The Project Proponent, Canadian Nuclear Laboratories (CNL), is a private-sector company, contracted by AECL (a crown corporation) to decommission the WL site, including WR-1. The decommissioning approach previously approved for WR-1 (Licence No NRTEDL-W5-8.04/2018) included the removal and remediation of all activated and contaminated components of WR-1 and associated facilities, including the reactor core. At this time, however, there is no approved long-term nuclear waste disposal facility in Canada, and therefore, the Proponent is proposing to demolish the WR-1 building and decommission the nuclear waste in situ ("ISD" – In Situ Decommissioning). This will involve the demolition and removal of above-ground buildings and facilities (two stories). The below-ground structures and facilities,

including the reactor and radiological hazards, will be permanently disposed of on-site. These will be protected with an engineered cover that is intended to prevent intrusion of soil and groundwater and allow the radioactive contaminants to decay to safe levels. All other previously approved decommissioning activities are assumed to be unchanged.

Upon completion of the decommissioning program, the Whiteshell site will be under 300 years of Institutional Control, with active monitoring occurring for the first 100 years. Table 1.2-1 shows the proposed decommissioning phases and schedule (CNL, 2017).

Table 1.2-1: WR-1 Decommissioning Project Phases and Schedule

Phase	Activity	Duration
Closure	Preparation for In Situ Decommissioning	2019 to 2021
	Grouting of Below-grade Systems and Structures	2021
	Removal of Above-grade Structures	2021 to 2022
	Installation of Engineered Cover	2022 to 2023
	Final Site Restoration	2023
	Preparation for Institutional Control	2024
Post-closure	Institutional Control (Active)	2024 to 2124
	Institutional Control (Passive)	2024 to 2324
	Post-Institutional Control (Passive)	Beyond 2324

1.2 Regulatory Process

The Whiteshell Project is subject to a Federal environmental assessment (EA) by Responsible Authority, as a "designated project" under Section 35 (Regulations Designating Physical Activities) of CEAA, 2012 for "the construction, operation and decommissioning of a new nuclear fission or fusion reactor." For this decommissioning project, the Responsible Authority is the Canadian Nuclear Safety Commission (CNSC).

The Environmental Impact Statement (EIS) is CNL's submission to the CNSC, which, if approved, will subsequently result in the CNSC issuing its own summary report on the Project and EA process as a basis for a regulatory decision regarding the decommissioning program. If it is determined that there are no significant adverse residual effects as a result of the Project, the CNSC will issue a decision to support the Project. If it is determined that there are significant residual effects from the Project, then the CNSC will issue a recommendation to the Minister of Natural Resources including the findings of their review. The final decision regarding whether such Project effects are justified under the circumstances, and subsequently, if the Project should be approved, rejected or approved with conditions, will by made by the Minister and Governor-in-Council (Cabinet).

Other federal and provincial permits, licenses, and authorizations that may be required include:

- permits from Environment Canada for on-site petroleum storage tanks; and
- waste generator registration under the *Dangerous Goods Handling and Transportation Act* from Manitoba Conservation and Water Stewardship.

All EA and permit processes for the Whiteshell Project involve Crown conduct that has the potential to trigger the Crown's duty to consult and, where appropriate, accommodate the Manitoba Métis Community. CEAA 2012 also has specific requirements under Section 5 (c) of the Act for assessing the effects of changes to the biophysical environment on Aboriginal peoples—including the MMC—which may be caused by a project, including:

- effects on current use of lands and resources for traditional purposes;
- effects on health or socio-economic conditions; and
- effects on archaeological or cultural heritage.

As such, the review of the Draft EIS was conducted through the lens of potential impacts to MMC's rights and interests.

2.0 Manitoba Métis Community

2.1 History and Identity

The Métis Nation—as a distinct Indigenous People—evolved out of relations between European men and First Nations women who were brought together as a result of the early fur trade in the Northwest. In the eighteenth century, both the Hudson Bay Company and the Northwest Company created a series of trading posts that stretched across the upper Great Lakes, through the western plains, and into the northern boreal forest. These posts and fur trade activities brought European and Indigenous peoples into contact. Inevitably, unions between European men—explorers, fur traders, and pioneers—and Indigenous women were consummated. The children of these families developed their own collective identity and political community so that "[w]ithin a few generations the descendants of these unions developed a culture distinct from their European and Indian forebears" and the Métis Nation was born—a new people, indigenous to the western territories *(Alberta (Aboriginal Affairs and Northern Development) v. Cunningham*, [2011] 2 SCR 670 at para. 5; *R. v. Goodon*, 2008 MBPC 59 at para. 25; *Manitoba Métis Federation Inc. v. Canada (Attorney General)*, [2013] 1 SCR 623 at para. 2).

The Métis led a mixed way of life. "In early times, the Métis were mostly nomadic. Later, they established permanent settlements centered on hunting, trading and agriculture" (*Alberta v. Cunningham*, at para. 5). The Métis were employed by both of the fur trades major players, the Hudson's Bay and Northwest companies. By the early 19th century, they had become a major component of both firms' workforces. At the same time, however, the Métis became extensively involved in the buffalo hunt. As a people, their economy was diverse; combining as it did, living off the land in the Aboriginal fashion with wage labour (*MMF Inc. v. Canada*, at para. 29).

It was on the Red River, in reaction to a new wave of European immigration, that the Métis Nation first came into its own. Since the early 1800s, the Manitoba Métis Community—as a part of the larger Métis Nation—has asserted itself as a distinct Indigenous collective with rights and interests in its Homeland. The Manitoba Métis Community shares a language (Michif), national symbols (Infinity flags), culture (*i.e.*, music, dance, dress, crafts), as well as a special relationship with its territory that is centered in Manitoba and extends beyond the present day provincial boundaries.

The Manitoba Métis Community has been recognized by the courts as being a distinctive community, with rights that are protected in section 35 of the *Constitution Act, 1982*. In *Goodon*, the Manitoba courts held that:

> The Métis community of Western Canada has its own distinctive identity […] the Métis created a large inter-related community that included numerous settlements located in present-day southwestern Manitoba, into Saskatchewan and including the northern Midwest United States. This area was one community […] The Métis community today in Manitoba is a well-organized and vibrant community (paras. 46-47; 52).

This proud independent Métis population constituted a historic rights-bearing community in present day Manitoba and beyond, which encompassed "all of the area within the present boundaries of southern Manitoba from the present day City of Winnipeg and extending south to the United States" (*R. v. Goodon*, at para. 48).

The heart of the historic rights-bearing Métis community in southern Manitoba was the Red River Settlement, however, the Manitoba Métis also developed other settlements and relied on various locations along strategic fur trade routes. During the early part of the 19th Century, these included various posts of varying size and scale spanning the Northwest Company and the Hudson Bay Company collection and distribution networks.

More specifically, in relation to the emergence of the Métis – as a distinct Aboriginal group in Manitoba – the Supreme Court of Canada wrote the following in the *MMF Inc. v. Canada* case:

> [21] The story begins with the Aboriginal peoples who inhabited what is now the province of Manitoba – the Cree and other less populous nations. In the late 17th century, European adventurers and explorers passed through. The lands were claimed nominally by England which granted the Hudson's Bay Company, a company of fur traders operation of out London, control over a vast territory called Rupert's Land, which included modern Manitoba. Aboriginal peoples continued to occupy the territory. In addition to the original First Nations, a new Aboriginal group, the Métis, arose – people descended from early unions between European adventurers and traders, and Aboriginal women. In the early days, the descendants of English-speaking parents were referred to as half-breeds, while those with French roots were called Métis.

> [22] A large – by the standards of the time – settlement developed at the forks of the Red and Assiniboine Rivers on land granted to Lord Selkirk by the Hudson's Bay Company in 1811. By 1869, the settlement consisted of 12,000 people, under the governance of Hudson's Bay Company.
>
> [23] In 1869, the Red River Settlement was a vibrant community, with a free enterprise system and established judicial and civic institutions, centred on the retail stores, hotels, trading undertakings and saloons of what is now downtown Winnipeg. The Métis were the dominant demographic group in the Settlement, comprising around 85 percent of the population [approximately 10,000 Métis], and held leadership positions in business, church and government.

The fur trade was vital to the ethnogenesis of the Métis, and was active in Manitoba from at least the late 1770s whereby numerous posts and outposts were established along cart trails and waterways throughout the province. These trails and waterways were crucial transportation networks for the fur trade (Jones 2014; Figure 1), and were the foundation of the Manitoba Métis Community's extensive use of the lands and waters throughout the province. In the early 20th Century, the Manitoba Métis Community continued to significantly participate in the commercial fisheries as well as trapping activities, which is well documented in provincial government records.

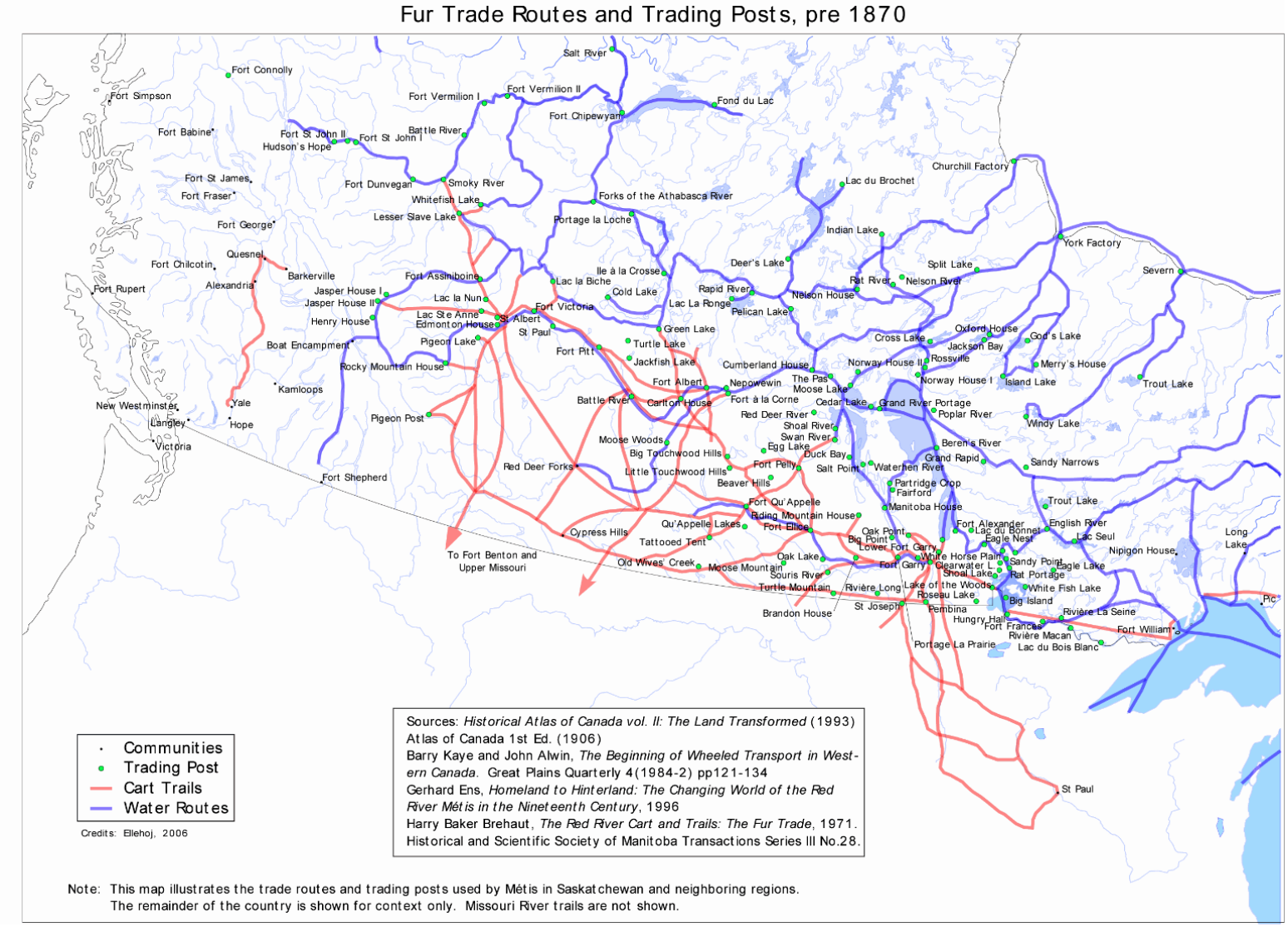

Figure 1. The Fur Trade Network: Routes and Posts Prior to 1870

2.2 Manitoba Métis Federation

The Manitoba Métis Federation (MMF) is the democratically elected government of the Métis Nation's Manitoba Métis Community (MMC), and is duly authorized by the members of the MMC for the purposes of dealing with Manitoba Métis rights, claims, and interests, including conducting consultations and negotiating accommodations (as per MMF Resolution No. 8, see Section 2.3). While the MMF was initially formed in 1967, its origins lie in the 18th century with the birth of the Manitoba Métis Community and in the legal and political structures that developed with it. Since the birth of the Métis people in the Red River Valley in the early 1800s, the Manitoba Métis Community—as a part of the larger Métis Nation—has asserted and exercised its inherent right of self-government. Over the last 50 years, the MMF has represented the MMC at the provincial and national levels.

During this same period, the MMF has built a sophisticated, democratic and effective Métis governance structure that represents the Manitoba Métis Community at the local, regional and provincial levels throughout Manitoba. The MMF was created to be the self-government representative of the MMC—as reflected in the Preamble of the MMF's Bylaws, which are agreed to by its members as a part of registering with the MMF:

> WHEREAS, the Manitoba Métis Federation Inc. has been created to be the democratic and self-governing representative body of the Manitoba Métis Community.

In addition, the purpose: "to provide responsible and accountable governance on behalf of the Manitoba Métis Community using the constitutional authorities delegated by its members" is embedded within the MMF's objectives, as set out in the MMF Bylaws. These objectives mandate the MMF to advance the cultural, legal, constitutional, social, economic, and political rights and interests of the MMC. The objectives of the MMF, as set out in the MMF Bylaws, are as follows:

i. To promote and instill pride in the history and culture of the Métis people.

ii. To educate members with respect to their legal, political, social and other rights.

iii. To promote the participation and representation of the Métis people in key political and economic bodies and organizations.

iv. To promote the political, legal, social and economic interests and rights of its members.

v. To provide responsible and accountable governance on behalf of the Manitoba Métis community using the constitutional authorities delegated by its members

The Federation is organized and operated based on centralized democratic principles, some key aspects of which are described below.

President: The President is the Chief Executive Officer, leader and spokesperson of the Federation. The President is elected in a province-wide ballot-box election every four years and is responsible for overseeing the day-to-day operations of the Federation.

Board of Directors: The MMF Board of Directors, or “MMF Cabinet” leads, manages and guides the policies, objectives and strategic direction of the Federation and its subsidiaries. All 23 members are democratically elected by the membership.

Regions: The MMF is organized into seven regional associations or "Regions" throughout the province (Figure 2): The Southeast Region, the Winnipeg Region, the Southwest Region, the Interlake Region, the Northwest Region, the Pas Region, and the Thompson Region. Each region is administered by a vice-president and two executive officers, all of whom sit on the MMF’s Cabinet. Each Region has a separate office which delivers programs and services to their specific geographic area.

Locals: Within each Region are various area-specific "Locals" which are administered by a chairperson, a vice-chairperson and a secretary-treasurer. Locals must have at least nine members and meet at least four times a year to remain active. There are approximately 140 MMF Locals across Manitoba.

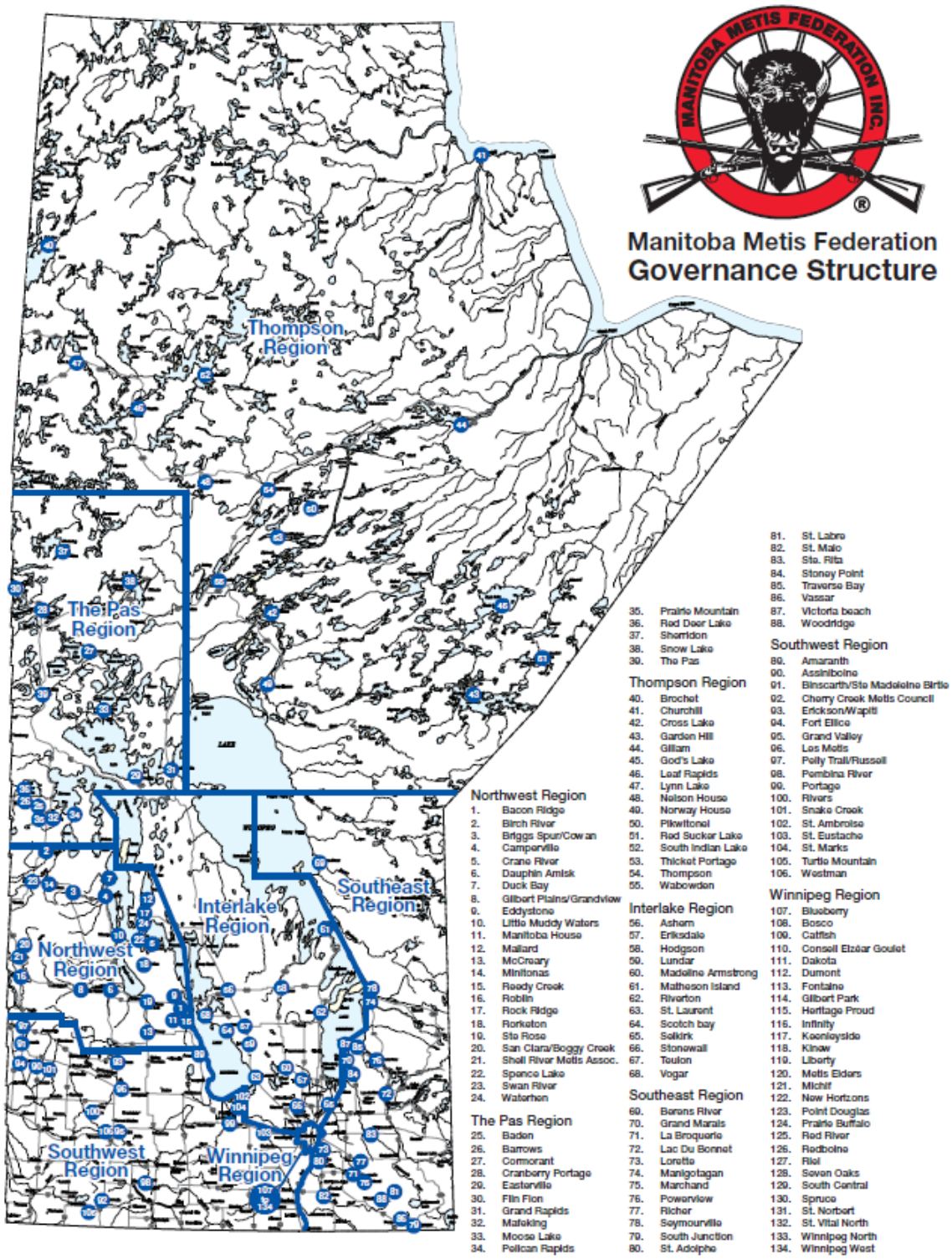

Figure 2. Manitoba Métis Federation (MMF) Regions

2.3 MMF Resolution No. 8

Among its many responsibilities, the MMF is authorized to protect the Aboriginal rights, claims and interests of the MMC, including as related to harvesting resources, traditional culture, and economic development.

In 2007, the MMF Annual General Assembly unanimously adopted Resolution No. 8 in order to set out the framework for engagement, consultation and accommodation to be followed by federal and provincial governments, industry, and others when making decisions and developing plans and projects that may impact the MMC. Under MMF Resolution No. 8, direction has been provided by the MMC for the MMF Home Office to take the lead and be the main contact on all consultations affecting the MMC. Resolution No. 8 reads, in part that:

> …this assembly continue[s] to give the direction to the Provincial Home Office to take the lead and be the main contact on all consultations affecting the Métis community and to work closely with the Regions and Locals to ensure governments and industry abide by environmental and constitutional obligations to the Métis…

The MMF Home Office works closely with the Regions and Locals to ensure the rights, interests and perspective of the MMC are effectively represented in matters related to consultation and accommodation.

Resolution No. 8 has five phases:

Phase 1: Notice and Response;

Phase 2: Funding and Capacity;

Phase 3: Engagement or Consultation;

Phase 4: Partnership and Accommodation; and,

Phase 5: Implementation.

Each phase is an integral part of the Resolution No. 8 framework, and proceeds logically through the stages of consultation.

2.4 Manitoba Métis Community Rights and Interests

The Manitoba Métis Community possesses Aboriginal rights, including, pre-existing Aboriginal collective rights and interests in lands protected by section 35 of the *Constitution Act, 1982*, throughout the territory where the Project is proposed. Indeed, Manitoba courts recognized these pre-existing, collectively-held Métis rights in *R. v. Goodon* (at paras. 58; 72):

> I conclude that there remains a contemporary community in southwest Manitoba that continues many of the traditional practices and customs of the Métis people.
>
> I have determined that the rights-bearing community is an area of southwestern Manitoba that includes the City of Winnipeg south to the U.S. border and west to the Saskatchewan border.

As affirmed by the Supreme Court of Canada, such rights are "recognize[d] as part of the special aboriginal relationship to the land" (*R. v. Powley,* 2003 SCC 43, at para. 50) and are grounded on a "communal Aboriginal interest in the land that is integral to the nature of the Métis distinctive community and their relationship to the land" (*MMF Inc. v. Canada*, at para. 5). Importantly, courts have also recognized that Métis harvesting rights may not be limited to Unoccupied Crown Lands (*R. v. Kelley*, 2007 ABQB 41, para. 65).

The Crown, as represented by the Manitoba government, has recognized some aspects of the Manitoba Métis Community's rights through a negotiated agreement: the *MMF-Manitoba Harvesting Agreement (2012)*. This Agreement was signed at the MMF's 44th Annual General Assembly and "recognizes that collectively-held Métis Harvesting Rights, within the meaning of s. 35 of the *Constitution Act, 1982*, exist within the [Recognized Métis Harvesting Zone], and that these rights may be exercised by Métis Rights Holders consistent with Métis customs, practices and traditions…" (*MMF-Manitoba Harvesting Agreement*, section 1). In particular, the *MMF-Manitoba Harvesting Agreement* recognizes that Métis rights include "hunting, trapping, fishing and gathering for food and domestic use, including for social and ceremonial purposes and for greater certainty, Métis harvesting includes the harvest of timber for domestic purposes" throughout an area spanning approximately 800,000 km² (the "Métis Recognized Harvesting Area") (*MMF-Manitoba Harvesting Agreement*, section 2; Figure 3 below). The MMF further asserts rights and interests beyond this area, which require consultation and accommodation as well.

Beyond those rights already established through litigation and recognized by agreements, the Manitoba Métis Community claims commercial and trade related rights. Courts have noted that Métis claims to commercial rights remain outstanding (*R. v. Kelley* at para. 65). These claims are strong and well-founded in the historical record and the customs, practices and traditions of the MMC, and it is incumbent on the Crown and proponents to take them seriously.

The Manitoba Métis Community has its roots in the western fur trade (*R. v. Blais*, 2003 SCC 44 at para. 9 [*Blais*]; *R. v. Goodon* at para. 25). The Métis in Manitoba are descendants of early unions between Aboriginal women and European traders (*MMF Inc. v. Canada* at para. 21). As a distinct Métis culture

developed, the Métis took up trade as a key aspect of their way of life (*R. v. Powley* at para. 10). Many Métis became independent traders, acting as middlemen between First Nations and Europeans (*R. v. Goodon* at para. 30). Others ensured their subsistence and prosperity by trading resources they themselves hunted and gathered (*R. v. Goodon* at para. 31, 33, & 71). By the mid-19th century, the Métis in Manitoba had developed the collective feeling that "the soil, the trade and the Government of the country [were] their birth rights." (*R. v. Goodon* at para. 69(f)). Commerce and trade is and always has been integral to the distinctive culture of the Manitoba Métis Community. Today, the Manitoba Métis have an Aboriginal, constitutionally protected right to continue this trading tradition in modern ways to ensure that their distinct community will not only survive but also flourish.

Unlike First Nations in Manitoba, whose commercial rights were converted and modified by treaties and the *Natural Resources Transfer Agreement* ("*NRTA")* (*R. v. Horseman*, [1990] 1 SCR 901), the Métis' pre-existing customs, practices, and traditions—including as they relate to commerce and trade—were not affected by the *NRTA* (*R. v. Blais*) and continue to exist and be protected as Aboriginal rights. First Nations' treaty rights in Manitoba are, for example, inherently limited by the Crown's power to take up lands (*Mikisew Cree First Nation v Canada* (*Minister of Canadian Heritage*), [2005] 3 SCR 388 at para 56). Métis rights, in contrast, are not tempered by the "taking up" clauses found in historic treaties with First Nations. Métis rights must be respected as they are, distinct from First Nations' rights and unmodified by legislation or agreements.

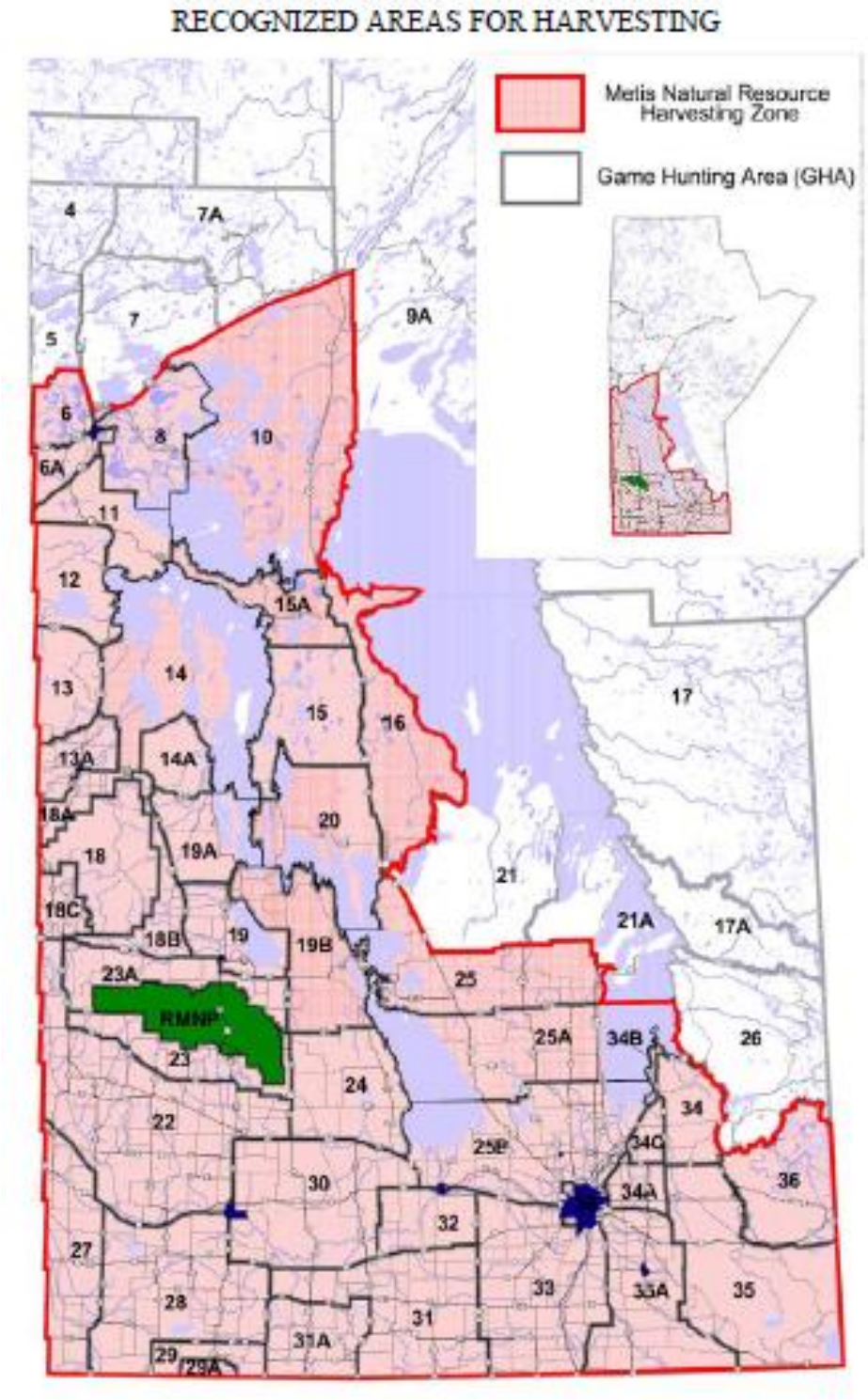

Figure 3. MMF-Manitoba Harvesting Agreement Recognized Manitoba Métis Harvesting Zones

2.5 Potential Impacts of the Whiteshell Project on the Manitoba Métis Community

The proposed Whiteshell Project site falls within the Southeast Region on lands to which MMC asserts and exercises its Aboriginal rights. The site is within the Traditional Territory of the MMC and as such potential risks (such as leaks of radioactive contaminants) associated with the Whiteshell Project would occur within the Traditional Territory of the MMC, and have the potential to affect the exercise of the MMC's constitutionally protected Aboriginal rights. Potential environmental and ecological risks furthermore have the potential to impact and engage the ongoing stewardship rights and obligations of the MMC. The Project site is in proximity to several MMF Locals, including: Lac Du Bonnet, Powerview, Ste Rita, and Traverse Bay, and MMF members live and harvest in the vicinity of the Project.

The MMC has and will continue to exercise its inherent and Aboriginal rights around and downstream of the Project area without limitation. The MMC also continues to significantly rely on the land as a part of their economy; businesses that rely on renewable resources include commercial fishing, outdoor adventure, wild rice gathering, blueberry production and blueberry picking, and bee keeping, among others. Commercial fishing may be one of the biggest Métis employers in Manitoba.

In addition, the Manitoba Métis are highly active land users, and continue to gather for ceremonies and cultural events on the land as well as staying overnight on the land at various occupancy sites across the province of Manitoba. More specifically, the Manitoba Métis consistently harvest large mammals, birds, and plants for food and medicinal purposes. In addition, the Manitoba Métis have water-based land use such as the use of waters for navigation purposes and fishing to provide subsistence for individuals, families, and community members.

Based on land use and occupancy data held by the MMF, it is well-known that the Project site is within a region where the MMC has a longstanding and well-established record of historic use and occupancy and ongoing current use. Drawing on this data, and based on the MMC's constitutionally protected rights, and the requirements of CEAA, 2012, SVS has considered the following potential issues and concerns, related to the rights and interests of MMC in our review of the Whiteshell Project EIS:

- Potential negative impacts to the current use of lands and resources for traditional purposes, including impacts to the exercise of Métis rights by MMC citizens, must be avoided, mitigated, or accommodated.
- Potential negative impacts to the health of MMC citizens—including, but not limited to those conditions reliant on the current use of lands and resources for traditional purposes—must be avoided, mitigated, or accommodated.
- Potential negative impacts to collective MMC informal, and formal, socio-cultural and economic systems associated with the trade and sharing of resources or products from traditional land-use must be avoided, mitigated, or accommodated.

- Potential negative impacts to MMC individuals commercial and subsistence harvesting rights and activities associated with traditional land-use must be avoided, mitigated, accommodated or compensated.
- MMC citizens must be able to equitably participate in the economic benefits and opportunities associated with the construction, operations, and maintenance of the Project.
- Through ongoing consultation and specific roles and/or employment, the MMF must be able to participate in the environmental monitoring and management of the Project in all stages.

3.0 Methodology and Scope

SVS reviewed the 'Environmental Impact Statement - In Situ Decommissioning of WR-1 at the Whiteshell Laboratories Site – Revision 1' (the "EIS") on behalf of the MMF. The review completed by SVS considers the entire area of the Project and any potential effects, including cumulative effects. SVS has completed the review by analyzing the connections between proposed activities and potential risks and impacts to the MMC. In our review, we have

i) assessed adequacy of baseline information and data, Valued Environmental Components ("VECs"), effects assessment, mitigation, management, and monitoring plans;
ii) assessed adequacy of information provided in the EIS; and
iii) evaluated the use of local knowledge, traditional knowledge and land use incorporated in the EIS.

Using the results of the review, we have provided specific recommendations to address the identified issues and concerns, which we believe are representative of MMC's values, rights and interests (Section 3.0). Our recommendations include best practice mitigations, management and monitoring plans for respective subject areas, as well as recommendations for emergency response planning. These issues and recommendations reflect potential impacts from the Project on the MMC's rights and interests, and are meant to inform the MMF of the priority issues identified by SVS for resolution/accommodation. The review was completed by focusing on the following categories of concern that are of priority to the MMC:

Section 4.1 Potential effects on the aquatic environment

Section 4.2 Potential effects on wildlife, vegetation and wetlands

Section 4.3 Potential effects to human and ecological health

4.0 Review Findings

Findings of our review of the EIS with respect to the aquatic environment, terrestrial environment, and human and ecological health are presented in the subsections 4.1 to 4.3 below.

4.1 Aquatic Environment

4.1.1 Summary of EIS Content

A review of the Whiteshell EIS focusing on the Aquatic environment was completed. This includes an evaluation of the surface water quality and quantity, freshwater fish and invertebrates. Specifically, the sections reviewed for this evaluation were:

- Section 3.5 Project Description
- Section 4.3 Aboriginal Engagement
- Section 6.3 Geological and Hydrogeological Environment
- Section 6.4 Surface Water Environment
- Section 6.5 Aquatic Environment
- Section 7.0 Malfunctions and Accidents
- Section 8.0 Summary and Cumulative Effects
- Section 10.0 Assessment of Effects of the Environment on the Project
- Section 11.0 Summary of Monitoring and Follow-up Programs
- APPENDIX 6.4.2-1 Surface Water Quality Data

The Whiteshell Laboratories (WL) Nuclear Reactor 1 operated from 1965–1985, at which time the site was placed into a state of permanent shut down. Preliminary decommissioning of the site occurred during the 1990s when removal of nuclear fuel, coolant and moderators occurred. Removing these materials reduced the amount of radioactive materials on-site and lowered the associated risk. Since this time, the site has been inactive and radioactive materials have been undergoing natural decay.

The WR-1 Reactor and other WL facilities have produced a range of radiological and non-radiological contaminants during construction, operation and preliminary decommissioning. Now that the site is moving towards the next phase in decommissioning the Proponent plans to limit the risks from previous activities to the extent possible while mitigating or minimizing new liabilities that arise.

The WL site slopes towards the Winnipeg River. Groundwater on the site flows towards the river and is discharged through an underground seep to the west of the site. Surface water runoff is also directed towards the Winnipeg River. Surface water in the vicinity of the Project site is managed through a series of swales and ditches that direct it to the Winnipeg River. During operation of WR-1 Reactor, effluent and storm water from the WL site was treated at the Active Liquid Waste Treatment Centre and then released to the Winnipeg River through an outfall pipe located 8m offshore. Each of these represent potential vectors for the movement of contaminants into the aquatic environment (the Winnipeg River).

It is known that at least 61 species of fish inhabit the Winnipeg River (Stewart and Watkinson 2004). This includes many fishes from the minnow (Cyprinidae) and darter (Percidae) families; important game fish such as northern pike, walleye, several suckers (e.g. white sucker, redhorse), smallmouth bass, and lake whitefish; and two species at risk (“SAR”), the carmine shiner and lake sturgeon. Despite the known

occurrence of these species, no targeted baseline study has been completed. The Proponent has taken the conservative approach by assuming that all species known within the Winnipeg River are present within the RSA.

To-date there have been only minor issues related to water or sediment quality associated with the operation of the CNL facility. Monitoring in the aquatic environment has been conducted by the Proponent associated with their existing license for the CNL facility (NRTEDL-W5-8.04/2018), and as part of the current EA process. Sediment and water quality monitoring has occurred in the Winnipeg River 10 km upstream of the WL site near Pinawa, near the effluent outfall and the groundwater seeps, and downstream in Lake du Bonnet (Figure 4 & Figure 5). Results of aquatic monitoring has found that most contaminant concentrations (radionuclides and non-radiological contaminants) in water and sediment are below applicable guidelines (e.g. Canadian Drinking Water Quality Guideline, CCME Water Quality, CCME Sediment Quality). However, there are some notable exceptions that have occurred. For example, levels of Cs-137 in sediment above Nuclear Substance and Radiation Devices Regulations NSRDR guidelines have been observed, the highest of which was 2,610 Bq/Kg in 2000 at station K03 (the NSRDR Clearance Level for Cs-137 is 100 Bq/Kg). Average background water quality levels of some contaminants are also above CCME guidelines including chromium, copper, lead and phosphorus.

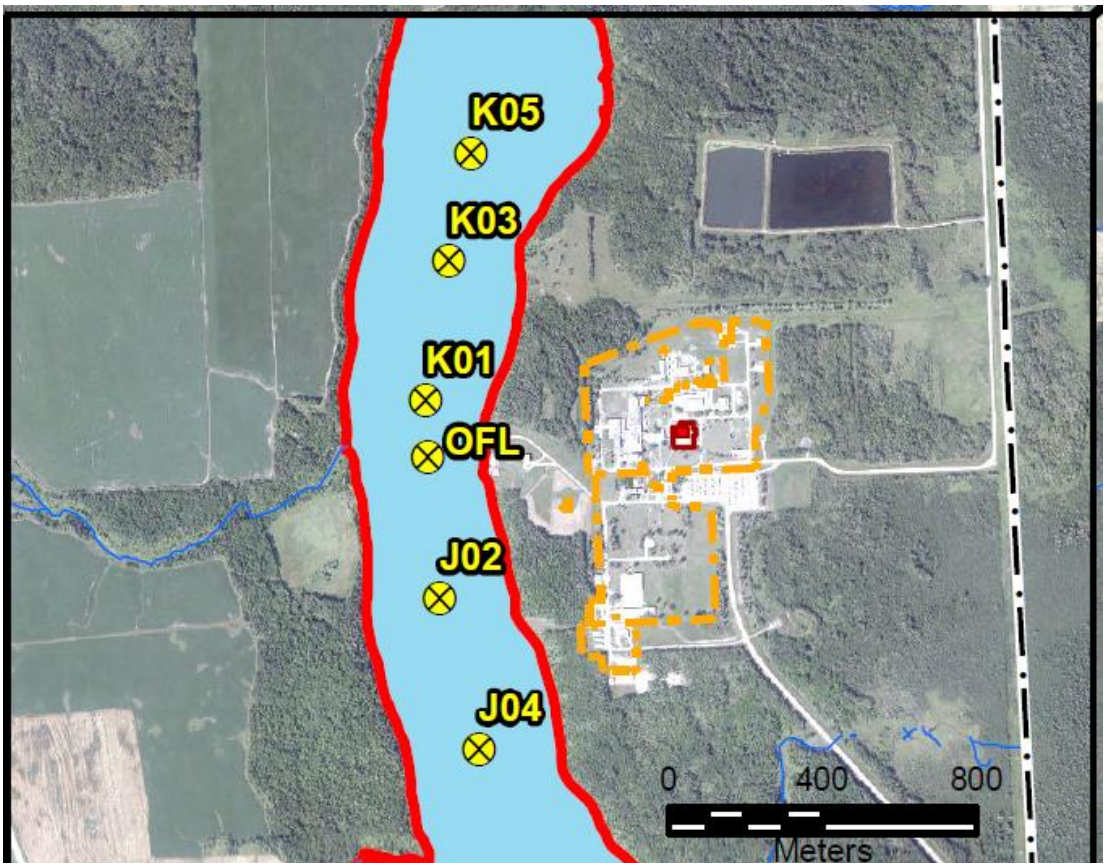

Figure 4. Annual water and sediment sampling locations on the Winnipeg River (modified from Figure 6.4.2-3)

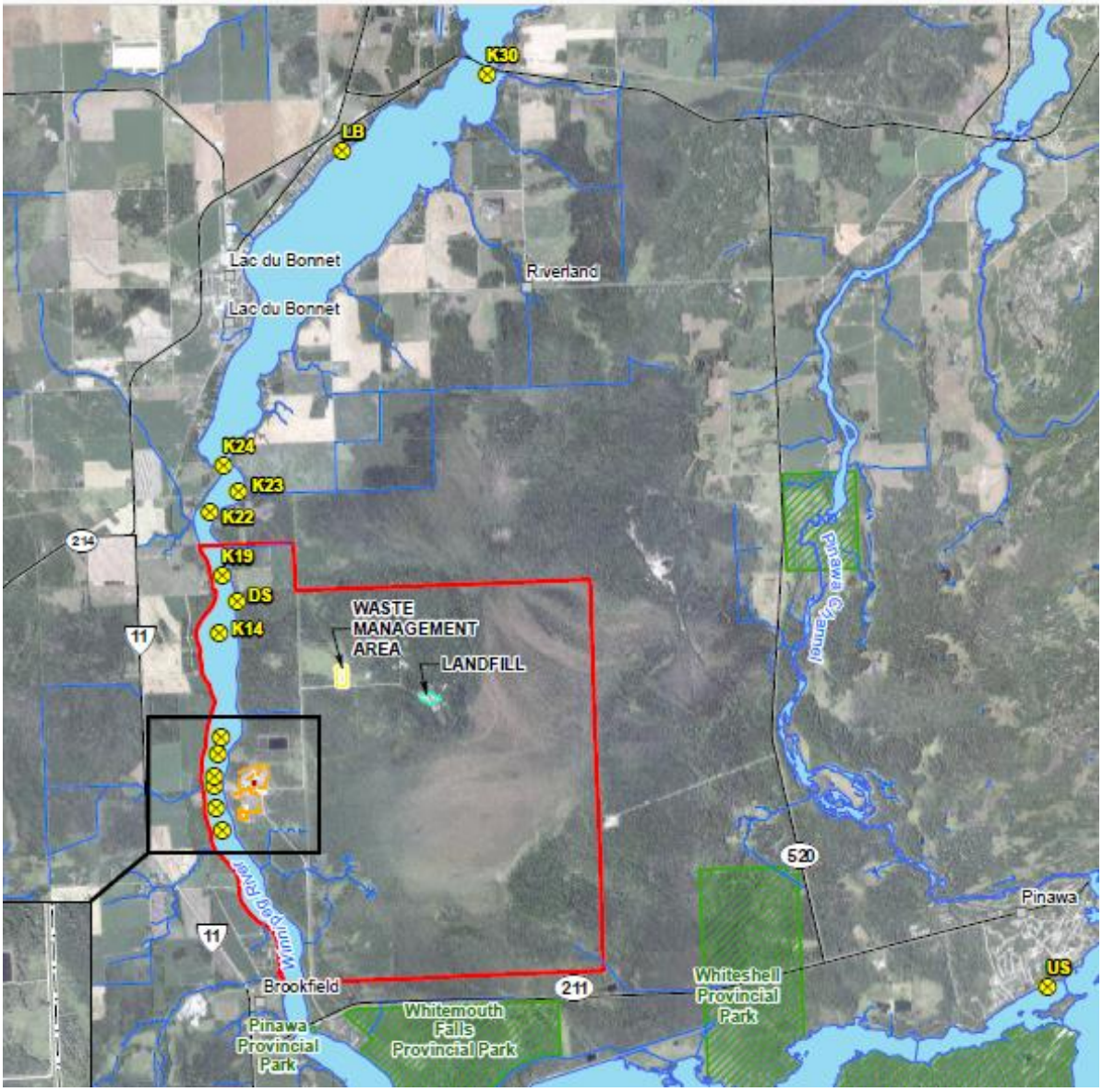

Figure 5. Regional water and sediment quality monitoring stations on the Winnipeg River (modified from Figure 6.4.2-3)

4.1.2 Evaluation and Recommendations

The MMC has an interest in, rights and traditional stewardship responsibilities associated with fish and fishing, including access to fish for harvesting purposes, the maintenance of aquatic resources overall and the ecosystems that support them, and the quality/safety of the fish for consumption as part of a traditional diet. Adverse impacts on the aquatic environment from the Project could negatively impact the rights and interests of the MMC. Moreover, changes to fish health could have negative

consequences on human health for individuals of the MMC that consume fish as part of a traditional diet. The primary risks to the aquatic environment from the Project are related to:

- The alteration of fish habitat.
- The alteration of water quality from deposition of deleterious substances, runoff, erosion and sedimentation, spills, and groundwater seepage.
- Contamination of aquatic wildlife (e.g. benthic invertebrates and fish) through releases of radiological and non-radiological contaminants.
- Cumulative impacts associated with other developments including effects of water level controls associated with hydro electricity, other linear developments such as hydroelectric lines and pipelines, other industrial activities such as forestry, and future developments.

Based on these (and other) risks associated with the Project, several issues and concerns were noted. Recommendations for addressing and/or mitigating these issues are also provided.

Issue 1 – In evaluating options for the decommissioning of the WR-1 Reactor the Proponent has evaluated four (4) alternatives. Of these, ISD represents the highest risk to local aquatic systems because contaminated materials will reside permanently within the local environment. Permanent storage of radioactive contaminated material must be monitored indefinitely. Once the containment system fails, decaying radioactive material will have a direct pathway for contamination of groundwater. Over time, this contamination will likely migrate to surface water (e.g. through seepage to the Winnipeg River <500m), posing risks to aquatic wildlife and humans who consume these organisms. For example, based on predictions of mass loadings to the Winnipeg River, it is expected that Carbon-14 and Tritium are expected to be particularly high, with maximum groundwater concentrations (at point of discharge) of 147 Bq/L and 3,760 Bq/L respectively. The latter of which is expected to occur within 68 years during post-closure. Due to the risks associated with contaminated groundwater, a robust monitoring program must be in place.

The Proponent is planning to conduct surface water monitoring and surficial sediment monitoring to test for contaminants during closure and post-closure (EIS, 2017, pp 6-203). However, it is unclear at what intervals this monitoring will occur. Moreover, the locations for water quality monitoring follow-up program are not sufficient. The nearest downstream surface monitoring location to the groundwater seep is 2 km downstream from the site boundary (monitoring station DS, Figure 6.4.2-3). This is unlikely to detect any contamination except from extreme events, nor to show any gradient or distribution of contamination.

Recommendation 1a – The Proponent must clarify the location, frequency and timing at which surface water and sediment sampling will occur. This data must be presented in text and in the form of a map (similar to Figure 6.4.2-3) with locations of all proposed follow-up monitoring locations clearly marked. This must be accompanied by a description of the frequency of monitoring proposed for these stations.

Recommendation 1b – The nearest downstream surface water and sediment sampling station in the Winnipeg River is too far for monitoring contamination of groundwater seepage. Additional surface water monitoring stations must be planned closer to the location of groundwater emissions. At minimum, we suggest these occur at the effluent outflow, the groundwater seep, 25m, 100m and 500m downstream on the Winnipeg River.

Recommendation 1c – Water quality in trenches/ditches from the Waste Management Area must be monitored actively during closure and post-closure. The Proponent must provide additional details on locations and frequency of monitoring associated with the Waste Management Area. There should be clear adaptive management and contingency plans for responding to degrading water quality in these features such as capture and additional treatment.

Issue 2 – The Proponent has identified "No Linkage Pathway" to residual effects from runoff during closure (EIS, 2017, pp 6-186). However, there is an issue with this evaluation because there could be large loads of contaminated material and dust during active closure. These could be from building demolition, excess piping or other contaminated materials. If there is a significant precipitation or snowmelt while this material is present, it could result in a slug of contaminated runoff to the Winnipeg River. The Proponent has assumed that this would not occur because best practices would be in place. This includes, water management, containment barriers, and water testing.

Recommendation 2 – The Proponent must prepare an Environmental Protection Plan (EPP) outlining in detail the mitigation strategies and actions that will be taken to prevent contaminated runoff from the site to receiving waters during closure. The EPP must be provided to the MMF so that there is an opportunity for review. Failing this, it will be necessary to incorporate potential effects of increased contamination to the Winnipeg River because of runoff, into the EA process.

Issue 3 – Beginning during post-closure and continuing for a up to 500,000 years, groundwater contaminated from contact with the below grade building materials and WR-1 reactor will leach steadily into the Winnipeg River. Radionuclides released can result in harm to aquatic wildlife. In the Goldsim® (Version 11.1) mass balance and transport model for groundwater, only radionuclides with half lives longer than 1 day were modelled. This excludes a large number of potentially damaging radionuclides which, if present in large quantities could contribute to radiological effects on aquatic wildlife in the Winnipeg River. Moreover, certain radionuclides with short half lives may decay into daughter radionuclides with longer half lives that continue to emit radiation. For example, I^{135} with a half life of 6.5 hours can decay through β− decay into Xe^{135} and Cs^{135}, the latter of which has a half life of 2.3 million years. Thus, by excluding short lived radionuclides from the modelling, the Proponent is potentially ignoring important sources of radioactive contamination and underestimating the potential risk to the aquatic environment.

Recommendation 3 – The mass balance and transport model for groundwater must include all radionuclides, including those with half lives shorter than a day.

Issue 4 – In their evaluation of the potential effects of surface water contamination (dispersion modelling), the Proponent only evaluated of concentrations of radionuclide and non-radionuclide contaminants at the Nearfield (50m downstream) and Farm A (approximately 3,100m downstream) locations. As a result, they were able to assume complete mixing of contaminants and utilize large dilution rates. For example, the dilution rate used for evaluation of contaminants for the nearfield site was 300,000:1. However, at the point where contaminated groundwater is being released into the Winnipeg River, the dilution will be much less. This will result in higher concentrations of contaminants in the water column (than shown in Table 6.4.2-12 and 6.4.2-13) and in sediment (shown in Table 6.4.2-14 and 6.4.2-15) (EIS, 2017). This is of concern for all contaminants, but particularly for highly toxic contaminants for which concentrations in groundwater are above applicable guidelines such as cadmium and lead. These contaminants released through the groundwater seep may have locally high concentrations that could bioaccumulate in fish and benthic invertebrates causing harmful effects. Moreover, the accumulation of these contaminants in fish tissues represents a potential pathway for human consumption, including affecting MMC citizens who rely on fishing and harvesting aquatic resources for subsistence and as part of a traditional diet and lifestyle.

Recommendation 4a – By evaluating the concentrations of contaminants at the Nearfield location rather than in the immediate vicinity of the groundwater release, the Proponent is underestimating the potential effects of this Project. To evaluate these effects the Proponent must produce a dispersion model to predict the concentrations of contaminants between the point of groundwater release into the Winnipeg River and the Nearfield location (between 0 and 50m). These higher concentrations should be used to calculate contaminant concentrations in sediment within the mixing zone for groundwater seepage. This updated and more localized information would enable the Proponent to evaluate the potential effects within the immediate area of effect near the seep and whether any contaminants are above regulatory guidelines for either surface water or sediment.

Recommendation 4b – If concentrations of contaminants (radiological and non-radiological) are found to be higher than what has been predicted at the Nearfield and Farm A locations, the Proponent must update the Human Health and Ecological Risk Assessment to evaluate the potential impacts of these higher concentrations.

Issue 5 – As part of the existing license for the CNL facility (NRTEDL-W5-8.04/2018), the Proponent engages in monitoring of fish tissue at upstream and downstream locations from the Project site. However, the Proponent is not planning to monitor fish tissues for contaminants during closure and post-closure (EIS, 2017, pp 6-231). Many individuals from the MMC fish regularly along the Winnipeg River for game species such as walleye, lake whitefish, smallmouth bass, and northern pike. The risk of health effects from consuming these contaminants is thus a serious concern for these fishermen and their families.

Recommendation 5 – Due to the importance of fishing and fish consumption to the MMC, it is critical that monitoring of fish tissue occur and be designed accordingly so that the predictions of low contamination can be verified. The Proponent must engage in monitoring of fish tissues during closure

and post-closure (institutional control) and have adaptive management plans in place to address unanticipated levels of contaminants in edible portions of fish in exposure areas. We recommend that the sampling locations currently used for monitoring associated with the existing license be maintained. Monitoring should occur every year during closure and at least every 10-years during post-closure.

4.2 Wildlife, Vegetation and Wetlands

4.2.1 Summary of EIS Content

The following review and comments on the terrestrial environment are based primarily on Section 6.6 of the EIS Report. Additional resources used for support as a background information include:

- Section 2.0 Purpose of the Project and Alternatives to the Project
- Section 3.5 Project Description
- Section 4.3 Aboriginal Engagement
- Section 6.7 Human and Ecological Health
- Section 6.8 Land and Resource Use
- Section 7.0 Malfunctions and Accidents
- Section 8.0 Summary and Cumulative Effects
- Section 10.0 Assessment of Effects of the Environment on the Project
- Section 11.0 Summary of Monitoring and Follow-up Programs
- Appendices

The Project's Regional Study Area (RSA) is located within the larger Boreal Shield Ecozone, Lake of the Woods Ecoregion, and Stead Ecodistrict (Smith et al. 2001). In general, this ecoregion has a large number of forest types characterized by tall, closed stands of jack pine (*Pinus banksiana*), trembling aspen (*Populus tremuloides*), paper birch (*Betula papyrifera*), white spruce (*Picea glauca*), eastern white cedar (*Thuja occidentalis*), black ash (*Fraxinus nigra*), and American elm (*Ulmus americana*) (Smith et al. 2001). Wildlife are diverse and characteristic of the region, including: gray wolf (*Canis lupus*), American black bear (*Ursus americanus*), moose (*Alces americanus*), White-tailed deer (Odocoileus virginianus), snowshoe hare (*Lepus americanus*), hooded merganser (*Lophodytes cuculata*), turkey vulture (*Cathartes aura*), and ruffed grouse (*Bonasa umbellus*) (Smith et al. 2001). The surrounding area consists of cleared lands with areas of peat bog. Whiteshell Provincial Park, the largest provincial park in Manitoba, is located on the east side of the RSA; Pinawa and Whitemouth Falls Provincial Parks are both immediately south of the RSA.

The spatial extent of the study area for the terrestrial environment was subdivided into the following three categories:

- **Site Study Area (SSA)**: the SSA is the Project footprint, which accounts for the direct physical disturbance and alteration of potential wildlife habitat caused by demolition and reclamation of the WR-1 Building (0.07 ha).
- **Local Study Area (LSA)**: was selected in consideration of the Project footprint, and the spatial extent of potential direct effects of the Project on the terrestrial environment. The LSA includes the fenced area of the WL main campus, which includes the SSA. This spatial area was chosen as it represents an area under the highest anthropogenic activity levels that is distinct from, and also separated from, the surrounding area by a physical barrier (i.e., a six-foot high chain-link fence). Ground-based VC species (i.e., snapping turtle) have restricted access to, or from, the LSA, although movement of aerial VC species (i.e., birds, bats) is less constrained by the presence of the fence. The spatial extent of Project-related physical disturbances to wildlife VCs (through noise) is also highest within this defined area. The approximate size of the LSA is 29 ha.
- **Regional Study Area (RSA)**: is defined as the area within which the maximum geographical extent of potential indirect effects of the Project may interact with the effects of other existing or reasonable foreseeable projects. The RSA is the 3,710 ha portion of the WL property on the east side of the Winnipeg River (Figure 6). This federally-owned property is not fenced around the perimeter, which means there is no physical barrier restricting access to or from the area by ground-based wildlife from the north, east, or south. The Winnipeg River itself represents a partial barrier to (primarily ground-based) wildlife access from the west. The RSA is relevant to the evaluation of effects on wildlife VCs because it is under distinct management and ownership relative to the surrounding landscape. The entire area is under ownership by CNL, and because there are nuclear facilities within the area, it is managed differently from the surrounding landscape (i.e., with respect to active fire suppression and prevention). There is a relatively high degree of diversity in terrestrial habitat within the RSA (Figure 6). The RSA is primarily under treed cover (83% of total area), consisting of a mixture of wetlands and forests of broadleaf, mixed and coniferous stand types. A large area (1,946 ha, or 52% of the total area) contains a complex of bog, fen and swamp wetlands spanning the center and east portions of the RSA, from north to south. Black spruce dominates large portions of this wetland habitat and it is reported that stands may be over 100 years old (AECL 2001). Black spruce dominated bog wetlands have understories of tamarack (*Larix* sp.), willow sp. (*Salix* sp.), blueberry (*Vaccinium* sp.), common Labrador tea (*Rhododendron groenlandicum*), horsetail sp. (*Equisetum* sp.) and mosses.

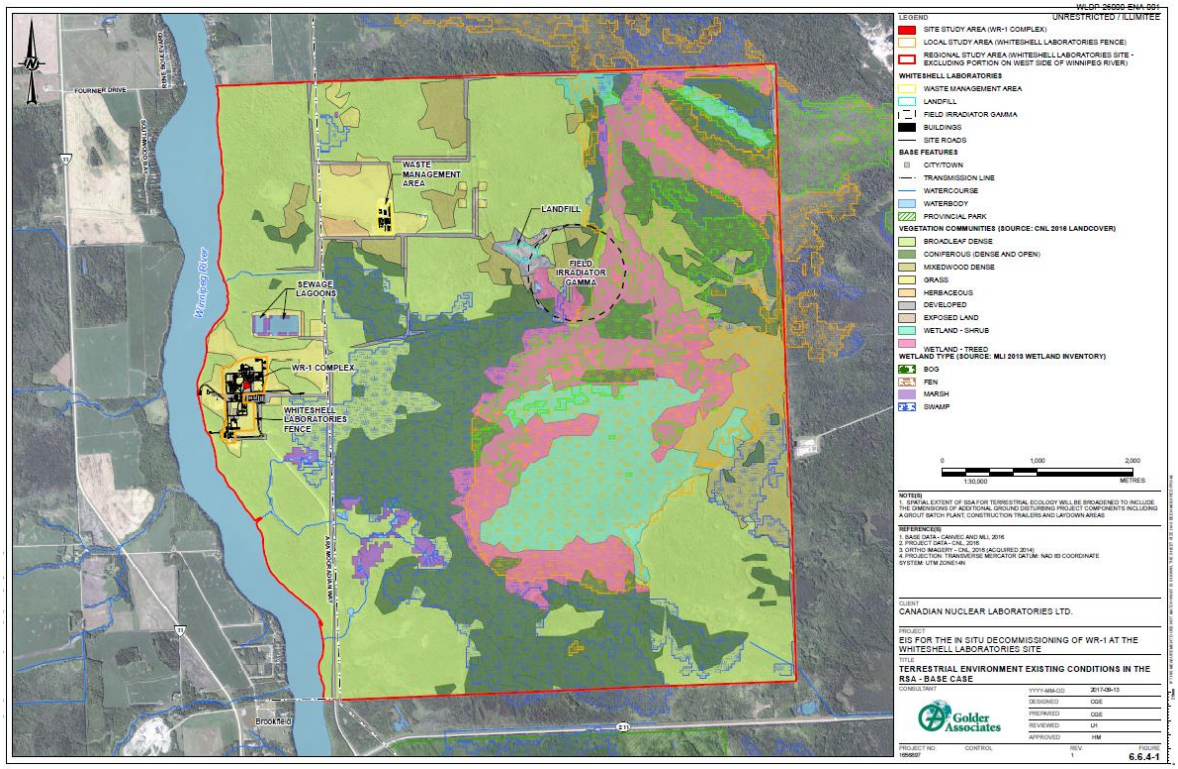

Figure 6: Terrestrial habitat classifications in the Regional Study Area.

Baseline conditions were characterized in the Proponents' application by means of incidental observations and desktop analysis.

4.2.2 Evaluation and Recommendations

The MMC have historic and ongoing land use and Aboriginal rights associated with the terrestrial environment in the EA study areas. The MMC value access to habitats for harvesting (including of timber for domestic purposes), and the quality and availability of medicinal plants and country foods for consumption as part of their traditional culture and diet. Adverse impacts on vegetation and wildlife from the Project have the potential to negatively impact the rights and interests of the MMC. These potential impacts have not been considered in the EIS and as such, some elements of the Project continue to remain issues that have not been addressed and are therefore unresolved with respect to potential impacts on the MMC.

Issue 1 – Baseline terrestrial data for the WL property was gathered through incidental observations by staff and through targeted surveys for Species at Risk (SAR) in 2015 (Section 6.6.4.2/6-245). Desktop review was also completed to identify potential SAR within the RSA, however TEK or harvesting rights, practices and needs of MMC land users were not considered.

Recommendation 1a – Conduct multi-season (spring/summer/fall/winter), baseline terrestrial surveys to provide a less biased and more comprehensive measure of site characteristics and an accurate

representation of the ecological components potentially affected by the Project. This would provide a more comprehensive assessment of potential impacts to native vegetative species and species of traditional importance to the MMC.

Recommendation 1b – Engage the MMF to identify and consider the MMCs extensive TEK, harvesting rights, current exercise of rights and ongoing needs and interests, during or in addition to the base-line surveys recommended in Recommendation 1a. There needs to be recognition of and accommodation measures provided for the Métis who live within the vicinity of and/or harvest within the Project assessment areas as part of determining the significance of net effects as a result of the Project.

Issue 2 – 'Traditional, cultural and heritage importance to Aboriginal peoples' was said to be considered in the selection of valued components (EIS, 2017; pp 2-11), yet no Traditional Knowledge or land use by the MMC has been included in the EIS. The MMC has longstanding use of the lands and waters in the vicinity of the Project that continue to be of ongoing importance to the MMC in exercising their constitutionally protected harvesting and other rights. These rights have the potential to be impacted by the decommissioning activities and yet have not yet been considered by the Proponent, nor have accommodation or mitigation measures been discussed with the MMF.

Recommendation 2 – A Traditional Knowledge and Land Use study with the MMF must be undertaken to determine and understand Métis-specific land use and interests in the Project study area. Further discussions of accommodation and / or mitigation measures with the MMF may be needed.

Issue 3 – Wildlife VECs focus on SAR, as per regulatory requirements, with no inclusion of wildlife species and habitats of traditional and cultural importance to the MMC. The MMF has expressed interest in Indigenous values and rights, as identified in *the Summary of Key Interests and Concerns for the Manitoba Métis Federation* (EIS, 2017; Table 4.3.2-8/ pp 4-15) with regards to Valued Components (VCs) for the Project.

The Proponent has determined that the "Project is not expected to have a substantial effect on an individual's land and resource use experience or on harvested species with because of mitigation and management practices put in place for the Project" (EIS, 2017; pp 6-381), however without conducting a full effects assessment with applicable mitigation measures for traditionally valued species of the MMC specifically, we do not believe the Proponent can make this determination with respect to effects on the MMC.

Recommendation 3 – Complete a thorough effects assessment on species of traditional importance to the MMC identified in a Project specific Traditional Knowledge, Land Use and Occupancy Study (TKLUOS). Include monitoring and follow-up programs for potential effects to culturally important terrestrial species, including objectives and any monitoring measures (i.e., thresholds) that will be implemented to verify the predictions of effects and evaluate the effectiveness of proposed mitigation measures.

Issue 4 – The complete removal of the facility (Alternative 2) would improve the perceived suitability of the site for future socio-economic MMC interests because long-lived radioactive material will no longer be present within the former WR-1 Building footprint. In addition, the complete removal *may* allow this portion of the site to be released for unrestricted use which would allow safe use of the land for traditional land use activities and interests by the MMC such as hunting, berry picking, and medicinal plant gathering (EIS, 2017; pp 2-18). There are concerns that the Proponent is choosing ISD due to estimated Project cost differences (in excess of $100 Million difference) rather than selecting a decommissioning alternative that is ecologically preferred or least impactful on the rights of Indigenous communities or best aligned with the long-term use and sustainability of the area for the MMC.

Recommendation 4 – Further meaningful consultation and engagement with the MMC must occur, to identify their interest and preference in the complete removal of the facility, as outlined in the Comprehensive Study Report (CSR) and as identified in Alternative 2 of the EIS. This consultation and engagement should occur through the MMF and in accordance with MMF Resolution No. 8.

Issue 5 – The surrounding grounds that were disturbed during demolition and decommissioning activities will be graded and restored with a grass seed mixture, but information on the approach and/or seed mix has not been provided (EIS, 2017; pp 3-34 & pp 6-266).

Recommendation 5 – The MMF requests that native seed mixes be used for reclamation in the Project area. The incorporation of native floral and grass seed mixes in re-vegetation efforts would further enhance habitat/forage for wildlife, particularly for pollinators.

Issue 6 – During reclamation, the Proponent has stated that the Project site and final vegetation cover will be graded to promote drainage from the site to the Winnipeg River (EIS, 2017; pp 3-34). An engineered cover will be installed over the former footprint of the WR-1 Building to minimize water infiltration and migration of contaminants to underlying aquifers (EIS, 2017; pp 3-33).

Recommendation 6 – The engineered cover will not provide a barrier for release of contamination explicitly, but rather will be installed to limit additional water infiltration into the system and protect the barriers that are in place by resisting intrusion into the sub-surface structure. It is therefore recommended that for the same reason, this impermeable barrier should be installed around the entire grouted below-grade facility.

Issue 7 – Changes in radiation and radioactivity levels during post-closure phases were predicted for wildlife VCs living on or near the WL site (EIS, 2017; pp 6-234). However, because species of traditional importance (i.e., commonly harvested by the MMC such as moose, deer, waterfowl, etc.) to the MMC were not specifically identified or considered as part of the post-closure plan, there are ongoing concerns regarding potential effects and exposure to animals in the long-term, and in particular that some specific species of importance to the MMC may not have been identified or considered.

Recommendation 7 – Re-run the effects assessment of radioactive exposure to wildlife species of traditional importance to the MMC, as per the TKLUOS recommended in Recommendation 2.

Issue 8 – The Proponent has identified that wildlife collisions with vehicles will be monitored, for which adaptive management measures will be considered, however no thresholds have been provided (EIS, 2017; Table 6.6.5-1/pp 6-234).

Recommendation 8 – Please provide adaptive management thresholds at which additional wildlife collision mitigation measures will be applied.

Issue 9 – It is not clear what the Project schedule is for construction/decommissioning activity (EIS, 2017; Table 3.1-1/pp 3-2). Loud decommissioning activity (i.e., jack hammering to remove deeply imbedded contaminants in concrete; EIS, 2017; pp 6-264) is expected. Consequently, there are considerable concerns over the potential disturbance and displacement of sensitive SAR species and to wildlife of traditional interest and importance to the MMC.

Recommendation 9a – Identify what consideration, if any, will be given to limit construction activity during sensitive timing periods for SAR, migratory birds and wildlife species of traditional importance to the MMC, such as during ungulate calving periods. It is recommended that a plan be developed to limit construction activity during sensitive timing periods as to minimize the potential for disturbance and displacement of species and wildlife in the Project area.

Recommendation 9b – Provide clear communication and notification (minimum of 21 days) of the finalized construction scheduling to MMF for distribution to their membership, with follow-up communication on a weekly basis for any scheduling changes. There is concern that Manitoba Métis harvesters may have their harvesting rights and activities impacted when they travel to the Project area to hunt, and then find that the area they are travelling to is subject to construction activity which has disturbed or displaced the wildlife they are planning to hunt or harvest.

Issue 10 – The Proponent has identified that bat surveys will be conducted in the year prior to initiation of Project decommissioning, during the 'appropriate season', and over multiple visits if necessary (EIS, 2017, pp 6-264 – 265, & pp 6-276). Additional measures could be implemented to mitigate effects of disturbance and mortality to SAR bat species which are not considered in the EIS.

Recommendation 10a – Please identify the exact timeframe and frequency at which bat monitoring surveys will be completed. Please note that the seasonal and daily pattern of bat activity and the use of different types of roosts at different times of the year will impact the appropriateness of survey methodologies. The optimum time for dusk surveys at buildings, particularly during early summer is for two hours after the first bats emerge as this will cover the emergence period as well as the first return to the roost for some species. The time of first emergence varies between species, with noctules leaving around sunset and others leaving about 1 hour after sunset. Bats using underground structure at the site during the summer may not emerge until later, upwards of 4 hours after dark. Towards dawn, many bats swarm outside their roosts and surveys beginning about 90 minutes before sunrise and continuing until 15 minutes after sunrise ('sunrise surveys') is recommended (Mitchell-Jones, 2004).

During this time, it is recommended that continuous automated bio-acoustic detectors linked to data-loggers be used, so as to minimize missing the presence of SAR bats in the Project area.

Recommendation 10b – The location and installation of the replacement roosts (bat boxes) should be chosen to maximise the chances of the bats finding and adopting it. Care should be taken to install boxes close to existing flight lines and have an entrance close to appropriate/preferred habitat types. Many bat species prefer to fly in dark areas straight into vegetation, so external lighting on the site close to boxes should be avoided.

Recommendation 10c – If SAR bat species are identified during pre-decommissioning surveys, demolition of the facility should stop until individuals have left the area, roosts/nests are no longer active and/or adoption of habitat off-sets (bat boxes) have been confirmed.

Issue 11 – Chemical and radiological contaminant release will be monitored as part of follow-up monitoring during the closure phase to verify effects predictions and to provide information for use in adaptive management measures to address unforeseen effects. Adaptive management approaches have been proposed, yet thresholds at which implementation of these approaches have not been provided in the EIS (EIS, 2017;Table 6.6.5-1/pp 6-265).

Recommendation 11 – Please provide adaptive management measures and thresholds being considered for follow-up monitoring.

Issue 12 – There are ongoing concerns with airborne contaminants that could deposit to soil, and water, where they could affect vegetation and wildlife/wildlife habitat of interest and importance to the MMC (EIS, 2017; pp 6-273). What Emergency response protocols are in place to notify the MMC in the event that monitoring values exceed radiation benchmark values and applicable environmental guidelines?

Recommendation 12 – An Emergency Response Plan must be developed in consultation with the MMF, to notify its members in the event of radioactive leaks and airborne monitoring exceedances.

Issue 13 – General Comment.

Recommendation 13 – Provide opportunities to the MMC to build capacity and knowledge in decommissioning activities and reclamation of Project components. Opportunities to build MMC capacity and knowledge in efforts that are of importance to the Manitoba Métis, such as participation in seeding, planting and monitoring in follow-up programs should be explored with the MMF.

4.3 Human Health and Ecological Risk Assessment

4.3.1 Summary of EIS Content

The human health and ecological risk assessment portions of the EIS were reviewed with the perspective of MMC traditional land uses, whereby Métis individuals exercising their harvesting rights in the Project

area may be exposed to greater risks from radioactivity released from the decommissioned reactor. This includes Métis practices of harvesting and reliance upon the consumption of land mammals, birds and plants, as well as fish and aquatic plants from the Winnipeg River. The land surrounding the WR-1 reactor and contaminated area such as the Low Level Waste Management Area may be opened to the public or for commercial use, and may allow expanded land use, such as for hunting and harvesting activities. Terrestrial exposure pathways during the post-closure phase of decommissioning are unlikely but increased land use could increase fishing in the Winnipeg River, which may have an impact on members of the MMC exercising their rights in this area. Radionuclides transport and exposure models must consider pathways that demonstrate that Métis rights, including hunting and harvesting, will be protected, and that there will be no adverse impacts on the health and wellbeing of the MMC members pursuing a more traditional lifestyle, including subsistence reliance on the plants and animals in the Project area.

One of the issues with the EIS is that the Proponent assumes that conditions of resource and land use and the environment will be the same in 2324 as in 2024. This may or may not be the case. The proposed ISD will require maintenance and monitoring for at least 100 years, and possibly 300 years (it isn't clear how "active" and "passive" institutional control differ), which places a burden on future generations and may restrict some land uses, such as for example, harvesting fish from the Winnipeg River.

The EIS identifies three alternative scenarios for the decommissioning the reactor, all of which provide some aspects of delay of the decommissioning or removal of the most radioactive components of the reactor. ISD is clearly the Proponents' preferred option (and details of the HHERA are only provided for that option), and the alternative options are only provided in very general terms. Due to the uncertainty in land use and social and environmental conditions in 300 years, the most conservative option is to consolidate radioactive components from across the nation in a single facility that can be monitored indefinitely. This would reduce the burden on future generations as much as possible by concentrating the radioactive components and limiting the area over which risk may result and monitoring would be required.

It is important to note that it is very difficult, and untested, to estimate environmental and social conditions 300 years in the future when the cover of the WR-1 would erode and the grout may start releasing nuclides to groundwater and, ultimately, the Winnipeg River. Models of radionuclide physical decay and transport can estimate the inventory of contaminants in the future (up to 500,000 years in the EIS) but the receiving environment and land use patterns may be significantly changed, particularly in light of climate change. The models used to predict radionuclide and non-radionuclide releases are deterministic and do not include a range of scenarios, such as a broad range of MMC harvester diets, land use and living patterns, TEK and environmental conditions. These factors would need to be considered, particularly as they relate to members of the MMC that have the potential to face disproportionately higher impacts based on pursuing a traditional lifestyle, including through exercising their hunting and harvesting rights and relying on a traditional subsistence diet.

4.3.2 Evaluation and Recommendations

The following review and comments on the potential impacts to human and ecological health due to the proposed Project are based on Section 6.7 of the EIS Report and the Environmental Risk Assessment (EcoMetrix, 2017). Additional information reviewed includes:

- Section 2.0 Purpose of the Project and Alternatives to the Project
- Section 3.5 Project Description
- Section 4.3 Aboriginal Engagement
- Section 6.7 Human and Ecological Health
- Section 6.8 Land and Resource Use
- Section 7.0 Malfunctions and Accidents
- Section 8.0 Summary and Cumulative Effects
- Section 10.0 Assessment of Effects of the Environment on the Project
- Section 11.0 Summary of Monitoring and Follow-up Programs

Issue 1- The safety case for the WR-1 decommissioning relies to a large extent on the conclusions of the 2001 Comprehensive Study Report for the WL site. Two areas with elevated radioactivity were expected to remain on the WL site: the contaminated Winnipeg River sediments and the Low-Level Waste Management Area (LLWM Area). The conclusions from that study were based on the assumption that all high-level waste would be removed from the site and sent to a national disposal site within a number of years. As no facility has been selected or developed, leaving the high-level waste would change the conditions for the Comprehensive Study for the WL site, which should be re-examined as it forms the basis for the long-term plan for the site.

Recommendation 1 – Although the WR-1 decommissioning is a separate component of the Comprehensive Study, exposure models should be assessed in terms of the other sources of radioactivity on the site (LLWM area, Winnipeg sediment, sewage lagoon and other sources of radioactive and noon-radioactive contaminants).

Issue 2 – The Comprehensive Study Report ("CSR") names the CNSC and Fisheries & Oceans Canada as Responsible Authorities (RA), although in the Appendices to the CSR, CNSC is named as the only RA. Given the importance of the aquatic transport pathway in the Post-Closure period, and the potential for contamination of the Winnipeg River and the reliance of MMC harvesters on fish and aquatic resources, the RA for the Project requires clarification and consistency.

Recommendation 2 – Please clarify if Fisheries and Oceans Canada is a Responsible Authority for the WR-1 Decommissioning.

Issue 3 – The Proponent states that **"**ISD is a *permanent, passive decommissioning end state* [and] CNL is proposing a revised approach to the WR-1 decommissioning that includes partial dismantling and demolition, along with *passive, permanent disposal* of the below-grade portions of the facility (the Project)" (EIS, 2017; pp 1-1, emphasis added).

The WR-1 decommissioning is not a "permanent disposal" of the high-level waste in the reactor. It is a long-term storage in which the radioactivity is not isolated from the biosphere but will be released to the environment through time. Conditions of the high-level waste disposal program by the CNSC in the 1990s stipulated that the waste must be isolated from the biosphere and should not be a burden on future generations.

The WR-1 decommissioning as described in the EIS will not isolate the waste from the biosphere and requires monitoring of the site until 2324. This places a commitment on future generations and a possibility of exposure of released radionuclides to the public, particularly to those that harvest fish in the river and may harvest aquatic plants, including wild rice. As already identified throughout this review, the MMC has rights in the Project vicinity that include practices of harvesting fish and other aquatic resources from (among other locations) the Winnipeg River. The ISD plan for the Project has the potential to create additional impacts on the MMC and future harvesters, which are possibly greater than a disposal or decommissioning plan that does not involve in-situ options for decommissioning.

While the ISD plan meets one of the CNL Integrated Waste Strategy Objectives by providing a disposition route for the WR-1 Reactor components and systems (EIS, 2017; pp 2-1), it does not meet the objectives of "limiting nuclear legacy obligations for future generations" but requires monitoring and maintenance of the site for at least 100 years, and possibly as long as 300 years. This long-term monitoring requires ongoing resources and may lead to significant resource costs to correct any deficiencies. The alternative of moving the radioactive material to a final disposal site should be seriously considered.

Recommendation 3a – The CNSC should provide guidance on whether the long-term storage of high level waste in this form is acceptable, given the knowledge that radioactivity will be released to the Winnipeg River in the future.

Recommendation 3b – Alternatives to ISD, such as moving the radioactive material to a final disposition site should be considered as viable options for the WR-1 Reactor decommissioning. The CNSC should make recommendations to reconsider the alternatives to in situ storage of WR-1 Reactor and examine the possibility of removing and storing the highly radioactive components with other high-level waste from other sites. This would significantly reduce monitoring and maintenance costs.

Issue 4 – The EIS identifies that "Although the installation of the engineered cover at the WR-1 Building is expected to slightly alter the drainage rates and flow patterns and discharge volume to the Winnipeg River; the changes are expected to be within the natural range of variation" (EIS, 2017). The data used to justify this statement only cover a few years of when the Proponent has managed the site. It is unclear whether these assumptions will withstand the passage of time, particularly over 300 years given climate change and possible land-use changes in the area. It is unlikely that the surrounding environment and the land use will remain the same. The flow of the Winnipeg River may change with drier or wetter climate, and changes in the dams on the river. This uncertainty will also affect the Project description and other aspects of the Project over time as they are described, assessed and form conclusions in the EIS.

Recommendation 4a – The EIS should be revised to explicitly include acknowledgement that the uncertainty of the estimates increases over time. It is not possible to make conclusions on environmental and climatic conditions 300 years in the future with any certainty and the EIS should identify this limitation.

Recommendation 4b - The CNSC should consider this uncertainty in the conditions that it imposes on the decommissioning plan for the Project, including by imposing conditions or requiring options that include the removal of highly radioactive material to a permanent disposal site.

Issue 5 –The summary of the EIS does not discuss the other sources of radioactivity already stored on the site. The CSR indicates that, after decommissioning, there will be two sources of radioactivity that remain on the site: the Low Level Waste Management Area and the contamination in the Winnipeg River Sediment. There is no mention of these radiation sources or their influence on the risks from the WR-1 decommissioning. These existing sources of radioactivity present the potential for additional radioactive material and effects that requires consideration as it may result in additional cumulative effects on the environment and specifically the MMC members that rely on the natural environment for the exercise of their rights and subsistence.

The EIS further identifies that the "decommissioning approach for the WL site as described in the Comprehensive Study Report (CSR) was to remove all facilities entirely from the WL site with the exception of low level waste trenches in the Waste Management Area, which may be managed through on-site in situ disposal (AECL 2001). Over a 10-year period, multiple buildings and facilities at the WL site have been decommissioned and the occupied space has been remediated, in an effort to meet this objective" (EIS, 2017; pp 2-2). The Winnipeg River sediment is not mentioned here although it was identified in the CSR as remaining after site closure. It is also not clear what the long-term plans are for the irradiated fuel remaining on-site.

Recommendation 5 – Although the EIS is written specifically for the WR-1, it must be reviewed in the context of the larger site and other sources of contamination. At the very least, it is recommended that the description of the site and exposure models should include all sources of contamination and their management plans including identifying the long-term plans for the irradiated fuel currently on-site and the Winnipeg River sediment

Issue 6 – The EIS identifies that "AECL has asked CNL to perform the work, and in keeping with international best practices (IAEA 2004, 2006), the decommissioning timeframe has been accelerated with the goal of completing decommissioning of the WL site by 2024" (EIS, 2017; pp 1-7).

It appears that this timeframe is the key component for the plan to decommission the WR-1. The timeframe may not allow for a consideration of other alternative decommissioning or disposal options that have less potential for contamination effects on the local environment, and correspondingly less potential impacts to the MMC and other members of the public. ISD is the only alternative identified by the Proponent which will allow the decommissioning of the site by 2024.

Recommendation 6 – The CNSC, AECL and CNL should consider extending the timeframe for site decommissioning if it provides the best solution to WR-1 decommissioning.

Issue 7 – The Proponent is proposing ISD of the WR-1 to achieve the closure of the WL site by 2024. The EIS considered, among other factors, worker safety when undertaking ISD. This review does not dispute that worker safety is of importance, however the EIS has not presented evidence of the dose rates to workers currently in the building when performing maintenance or monitoring, or what the doses to workers were when removing the fuel from the WR-1 Reactor or transporting the fuel to its current location, and what the doses will be when transporting the fuel off-site (or where the fuel will be moved to). This information is required to make informed decisions about the preferred options for the WR-1 Reactor. If this information is available in supporting documents, it should be summarised in the EIS.

Other alternatives, such as leaving the reactor in place until a permanent national depository is available, should be re-considered, and affects of these options on worker safety should be identified and considered. The MMF has expressed an interest in having MMC citizens build capacity and knowledge in the decommissioning activities, over the lifecycle of the Project. As such the potential effects of various options for decommissioning on the workers safety is of interest and concern to the MMF.

Recommendation 7 – Consider and provide information about the effects on workers of alternative decommissioning options that do not involve ISD.

Issue 8 – The EIS outlines a consideration of cost estimates of the preferred method (ISD) and alternatives (EIS, 2017; Table 2.6.3.1). The preferred option of ISD has been identified by the Proponent as the cheapest and quickest method to decommission the WR-1 Reactor, but there is no explanation of individual costs. For example, monitoring of Alternative #1 is stated to be $1, but $7 for Alternative #3, however it is unclear what the units are. Alternative #3 has no surveillance after 2024 and no further details are provided. Presumably monitoring will continue on the site after 2024 as part of the site license and because of the legacy contamination in the lagoon, low level waste management area, cesium ditch, etc. however it is not clear whether the cost estimates include this ongoing monitoring. Also, if it has not already been undertaken, the cost estimates should be audited and validated by an independent source.

Recommendation 8a – More complete costing details need to be provided, including identifying individual costs and whether ongoing monitoring has been included. In addition, there needs to be greater transparency about allocated costs. Also, estimates of how costs are allocated 100 to 300 years in the future should be described, along with an explanation of how future costs are being estimated for the next 100 years.

Recommendation 8b- The cost estimates should be audited and validated by an independent source.

Issue 9 – The rationale for ISD relies on maintenance and monitoring of the installation for 300 years and states that “control” will last “indefinitely” (EIS, 2017; section 3.1.2). It is not clear how the

Proponent is prepared to make this commitment for the post-closure after 2124 or, in particular, after 2324. Environmental regulations change with each government, and it is possible that future governments may choose to not allocate funding to maintaining and monitoring the WL site. There is no way to guarantee future commitment of resources.

Recommendation 9 – Additional clarity is required for the post-closure phase activities and plan, in particular how long-term performance monitoring and maintenance activities are expected to be carried out. The EIS should further consider and acknowledge that the uncertainty in being able to guarantee the sufficiency of these planned activities increases over time given the potential for changes in priorities, funding, and environmental requirements. The CNSC should consider this uncertainty when identifying conditions to apply to the Project.

Issue 10 – The EIS identifies that "Project-specific effects can be quantified (e.g., incremental changes to ground and surface water quality, air quality, and fish and wildlife habitat). Because the socio-economic status of different communities, subpopulations and individuals may vary, a socio-economic effect may have positive aspects and negative aspects. An effect on a biophysical discipline is typically constrained to being negative or positive" (EIS, 2017; pp 6-2).

This introductory text is meant to provide support to later conclusions in the EIS, but it overstates the levels of confidence in the analysis. For example: "Project-specific effects…fish and wildlife habitat" are identified however the subsequent analysis does not quantify effects to fish and wildlife habitat. In fact, there are no formal surveys of fish and wildlife habitat for the WL site described in the EIS, and no methods for estimating effects to habitat, either in 2024 or in the future. This presents problems for later conclusions in the EIS, such as, for example, related to the protection of fish and fish habitat (EIS, 2017; Table 6.1.2.1); while identified as an issue to be assessed and considered in the EIS, the subsequent analysis does not specifically address changes to fish habitat in the Winnipeg River. It estimates the radiation dose to fish in the river (and the concentration of non-radioactive chemicals) and concluded that doses will not cause effects in adult fish. Later in the report (EIS, 2017; pp 6-215) it is stated that "Fish habitat is generally similar throughout the RSA" however it provides no evidence for this conclusion. A consideration of the evidence from the scouring (near the plant site) and depositional zones (further downstream) in several places in the river could be considered as it relates to supporting or refuting this conclusion.

Recommendation 10a – The EIS needs to be reviewed, particularly the text in the Assessment section (Section 6) for conclusions that overstate its accuracy or imply that the analysis will be rigorous and predict impacts with any accuracy or precision. For example, no surveys of fish or wildlife distribution have been conducted for the EIS so the text should not imply or include conclusions based on survey's that have not been undertaken; Log books by staff are not accurate indicators of wildlife presence, abundance, or distribution at the site; etc.

Recommendation 10b – To the extent that the conclusions identified in section 6 require surveys or assessment activities that have not be undertaken regarding the Project site and/or effects, these formal

surveys, assessments etc. should be undertaken by experienced personnel. Risk assessment models for the WL site should use site specific surveys of species distribution for both the aquatic and terrestrial environments to provide some conceptual support for the models. The ecological risk assessment uses data from other studies and anecdotal reports to estimate exposure and does to VCs. These surveys or assessment activities should, as much as possible, be at locations specific to the Project site and not drawn from other locations that may or may not provide comparable data (for example, pp 6-216 Fish Community data is drawn from other locations in the Winnipeg River and it is unclear if the fish population at the Project site are similar or comparable to the location of this data source).

Issue 11 – Section 1.5 (EIS, 2017) is intended to leave the impression that the risk assessment methods used here are rigorous and that the conclusions on exposure and effects are fully justified. However, most of the text glosses over the fact that conclusions are made without justification, a rationale or supported by data specific to the WL site. For example, phrases like "either because there was no linkage initially or because environmental design features or mitigation will remove the pathway, are not advanced for further assessment" or "pathways determined to have no linkage to a VC or those that are considered secondary are not expected to result in environmentally significant effects on the assessment endpoint of VCs" (EIS, 2017; section 6.1.5) result in pathways being removed without sufficient justification. Statements and conclusions must be based on evidence if they are to be relied on to support conclusions that there will be no, or limited, impacts on factors of importance to the MMC, its rights, interests or health and well-being.

Recommendation 11 – The EIS needs to be reviewed and revised so that statements of professional judgement are based on and linked to evidence that is put into the EIS.

Issue 12 – The EIS identifies that "From 1976 to 1982, downstream fish flesh concentrations of Cs-137 were greater than upstream concentrations for all fish species. However, the estimated dose from fish consumption (<0.005 mSv/a) remained far below (0.01%) the occupational dose limit, so the fish remained safe to eat (AECL 1983). Concentrations in water decreased subsequent to improvements to effluent treatment at the ALWTC in 1982, similar to levels observed between 1962 and 1972 (AECL 1983)" (EIS, 2017; section 6.5.4.2.3). This is a significant observation which connects releases of Cs-137 from the plant to fish consumed by fishers. The data presented in Table 6.5.4.1 were collected from 2010 to 2015 and do not include the data prior to 2010 even though AECL has been monitoring fish since 1976. Presumably these data are available and would provide additional details regarding the concentrations of contaminants in fish over longer periods of time. Such information would be relevant to the consideration of the long-term effects of contamination on fish populations, over the 300 years of the Project decommissioning, and the potential adverse effects on members of the MMC who harvest and consume fish as part of a traditional diet.

The total incremental dose due to fish ingestion was identified as 1.14 x 10-4 mSv/a for adults (EIS, 2017; section 6.5.4.2.3) Additional information for this assessment is required, including, sample sizes, species consumed, amount of fish consumed, and the other nuclides assessed. This information is vital

for estimating exposure in MMC citizens, and others harvesting fish as radionuclides are released from WR-1.

Recommendation 12 – Please provide and include a summary of the details of the historic concentrations in fish and the amount of fish consumed in the risk assessment models in the EIS. Monitoring of fish species has been conducted since the early 1970s but only the later data have been used for the assessment. The exposure models should use site specific data on species caught and amounts consumed, not generic values from the CSA.

Issue 13 – The EIS identifies that "CNL's current environmental monitoring program includes collecting water samples at one location upstream and three locations at varying distances downstream of the WL site. Surficial sediment is also collected at two locations upstream, at the outfall, and nine locations downstream. In addition, CNL has committed to collecting cores in depositional areas in 2026, 2046, and 2066 at Sylvia Lake and upstream and downstream of the waterbody Lac du Bonnet" (EIS, 2017; pp 6-205). It is unclear if the collection of samples as described is adequate to detect changes in water chemistry if the WL-1 Reactor releases radionuclide and non-rad components more quickly than predicted. Past monitoring programs may be considered to justify or refute the conclusion that the collecting sampling plan and timelines are sufficient to guard against the risks involved. Collecting cores every 20 years is unlikely to detect changes in water chemistry or deposition of contaminants and won't allow for quick adaptive actions to correct releases.

Recommendation 13 – The Proponent should consider data from past monitoring programs to justify a sampling schedule that will allow detection of any releases. Where indicated by these past monitoring programs, a sampling plan collecting cores more frequently than every 20 years should be implemented.

Issue 14 – The EIS uses the benchmark dose to non-human species from UNSCEAR and CSA (EIS, 2017; pp 6-221), however there have been more quantitative assessments completed. Environment Canada and the AECB used more conservative benchmark values for the Priority Substances List assessment for the protection of the environment around nuclear facilities (EC 2001). Specifically, the Radiation Benchmarks used in section 6.3.2 are very selective in the literature that it uses to rationalize the UNSCEAR 1996 values, which are seriously outdated. EcoMetrix 2017, in Table 7-2 - Assessment endpoints, measurement endpoints, etc. includes a line of evidence for the radiological dose of growth, survival and reproduction that is not supported by the UNSCEAR benchmark. More conservative benchmarks are more protective and are considerably more quantitative.

A more quantitative approach by the European Community (cited by Ecometrix) combined a detailed literature review, species sensitivity analysis and an added safety factor of 5, consistent with the assessment of other contaminants, to provide a chronic incremental screening dose of 10 µGy/h for the protection of all ecosystems (protective of 95% of species) using the ERICA approach (Brown et al. 2008, Garnier-LaPlace and Gilbin 2006, Garnier-LaPlace et al. 2006). It was recognised that this dose rate could also allow some cytogenetic effects in sensitive vertebrate species (Sazykina 2005, Sazykina et al. 2009).

Recommendation 14 - Given the uncertainties in predicting background and incremental doses in the future, the use of a more conservative benchmark should be used.

Issue 15 – The EIS and Ecometrix report indicate that land use plans and institutional control is clearly defined and will continue during Post-Institutional period (300+ years) and will be designated for other uses after 300 years (EIS, 2017 pp 6-225; EcoMetrix section 5). The EIS also acknowledges that the government might not maintain control over the site in which case monitoring programs might not continue and that people may "be present on-site and make some use of local resource" (EIS, 2017; pp 6-305). Given this uncertainty**,** predicting social, political and environment conditions 300 years into the future is very problematic. In terms of exposure modelling and access to the site, it seems to be more conservative to adopt a model that allows for no controls and unrestricted access to the site. The long-term plan or "end use" for the WL site is also unclear, and where possible should be clearly identified in the EIS as this "end use" state will be of importance to the MMF and ultimately affect what traditional uses and activities can be carried out there by MMC citizens.

Recommendation 15a – The EIS should be revised to include, as a possibility, an institutional control model with no controls and unrestricted access to the site, to take into account the uncertainty of the end state of the WL site.

Recommendation 15b – If possible, the long-term plan or "end use" of the WL site should be clearly identified, including a timeline leading up to this end use state. Limitations on the MMC use of the lands and resources resulting from this anticipated "end use" state should be clearly identified.

Issue 16 – The EIS identifies the harvesting practices of First Nations proximate to the Project site, and the potential effects on the harvesting and other rights of First Nations. For example, Table 6.7.1.1, identifies how **"**Sagkeeng FN harvest wild rice and medicinal plants in the area." As is identified throughout this review, the MMC has constitutionally protected rights and interests, and exercise those rights and interests in the vicinity of the Project area. Much like First Nations, these rights and interests and the health and wellbeing of the MMC stands to be impacted by the Project activities and resulting accumulation of contaminants in the environment and resources relied on by the MMC. Métis may have similar concerns and wish to harvest wild rice from depositional areas of the Winnipeg River downstream of WL site, which needs to be taken into account by the Proponent and included in the EIS.

Recommendation 16 – Work with the MMF to identify and consider the rights, interests and activities of the MMC that may be impacted by the Project. These need to be included in the EIS, along with a consideration of how these harvesting activities and practices may be impacted by the presence of contaminants and consequently affect the health and well-being of the MMC. Accommodation and mitigation options may be required.

Issue 17 – The EIS states that the "Results of the Comprehensive Study Report (AECL 2001) indicated that no public health threats were predicted from the decommissioning and reclamation activities for the WL site. Releases are well within regulatory limits for the protection of human health and regular

monitoring provides that any aberrations are detected immediately (AECL 2001)" (EIS, 2017; pp 6-288). It further identifies that the "Results of the Comprehensive Study Report ["CSR"] indicated no residual effects on public health are expected as a result of the closure of the WL site" (EIS, 2017; pp 6-294).

This is a misrepresentation of the results of the CSR. The CSR determined that there would only be the LLWM area and the Winnipeg River sediment as two remaining sources of radioactivity on the site. All high-level waste was to be removed to a national disposal site that would isolate the waste from the biosphere. Because of those assumptions, there would be no long-term impact on public health at WL site. Those assumptions have now been changed with the long-term ISD storage of WR-1 Reactor.

Recommendation 17 – The 2001 conclusions were based on the removal of high level radioactive concerns on the WL site to a national site. This WR-1 Reactor decommissioning was not part of the 2001 Comprehensive Study. The in situ WR-1 Reactor decommissioning should be analyzed in terms of the sources of radiation on the site (LLWM, the Winnipeg River sediment, lagoon, etc.). Also, the CSR should be re-visited with updated data.

Issue 18 – The EIS acknowledges that "Harvesters represent traditional users of the area who may be exposed through harvesting of country foods" (EIS, 2017; pp 2-697). The EIS (pp 6-297) and Ecometrix Report (section 5.2.2) make a series of assumptions about land-use location, duration, and frequency of harvesting activities. The time spent by traditional harvesters at the WL site in the exposure model is very restrictive. The HHRA for the harvester assumes land use practices in 2324 to be similar to those in 2024 but they may be completely different. It should be possible to conduct several land use practices using the transport models to determine if time of residency in the area and a more traditional diet will affect exposure.

The EIS further states that "Recreational users such as swimmers, anglers, and boaters that occasionally carry out recreational activities along the Winnipeg River at locations close to the WL site, as compared to the most critical group locations (Farm A and Farm F), are not directly considered for the assessment because these activities are not representative of population groups in the area" (EIS, 2017; pp 6-297). Given the potential for the change in land-use over time, these recreational activities should be considered as part of the assessment. As the Project-site and surrounding area become available for these uses, there is the potential for the recreational use of the area by the MMC to increase.

Recommendation 18a – Land use studies should be conducted to determine if time of residency in the area and a more traditional diet will affect exposure.

Recommendation 18b – Recreational users and the potential increase in the recreational land use of the area should be considered in the land use studies undertaken.

Issue 19 – Table 5-20 of the Ecometrix Report identifies that the dominant contributor to the total dose is carbon-14 through the ingestion of terrestrial plants and animals, and fish, except for the 3-month-old drinking formula, which has tritium as the dominant contributor to dose. Why is the dose not calculated for the nursing infant of the harvester?

The hazard quotients derived for constituents of potential concern were below the protective benchmark for all receptors, with the exception of a toddler harvester during post-closure, which slightly exceeded the benchmark. For the toddler harvester, the total ingestion HQ slightly exceeded 0.2 for lead (HQ = 0.24) (EIS, 2017; pp 6-314). The EIS further identified that "with the exception of a toddler harvester during post-closure, which slightly exceeded the benchmark. If only the Project contribution is considered, the HQs are reduced even further and hazard quotients are well below for all receptors (the Project contribution to the total is 0.0021% for cadmium and 0.00002% for lead)" (EIS, 2017; pp 6-314).

This gap in the modelling scenario is significant as there does not appear to be a pathway for the nursing infant for the harvester scenario. A rationale for this was not located, nor was a description of the infant diet for the harvester. It is assumed that the "harvester" is represented by a family with adults, a toddler and a breastfeeding infant, however this assumption needs to be confirmed and clearly identified in the EIS. Given the reliance of the MMC on harvesting activities, and the importance of protecting and preserving the harvesting rights and activities of the MMC for future generations of Métis harvesters, the data related to pathways for contaminates between adults and nursing infants is significant in terms of potential long-term health effects on members of the MMC.

Recommendation 19 – Further information is needed, including the diet for the infant harvester, and the identification of the family grouping considered, the pathway for the nursing harvester, etc.

Issue 20 – The Ecometrix Report and the EIS both often use the term 'conservative' when describing uncertainty without explanation or evidence. For example, page 7.1.6 of the Ecometrix Report: "The EcoRA problem formulation is conservative in its assumptions to accommodate uncertainties and meet the objective of protecting ecological health during the post-closure period" and "There is uncertainty in the radiological and non-radiological release rates to the surface water environment; however, the estimates are expected to be conservative." Also In a previous section of the Ecometrix Report, entitled Uncertainty in Exposure Assessment, sentences such as "This is considered appropriate" and "Dose coefficients were obtained from reputable sources" are not convincing and cannot be reviewed. Page 6-344 of the EIS states that: "Although uncertainties in the assessment exist, conservatism has been included in the modelling so that residual effects are not greater than predicted. Overall, residual effects are considered to be not significant for all ecological health VCs during the closure and post-closure phases. Monitoring and follow-up programs include implementation of CNL's existing Environmental Monitoring Program. These activities will verify effects predictions for ecological health."

There needs to be some support for these types of categorical statements. Evaluating conservatism needs to be expressed relative to another set of conditions. Here it is stated, without support. For the statement on page 6-344, there is no support for the observation of "residual effects are not greater than predicted" without some reference.

Recommendation 20 – The EIS needs to be reviewed for consistency in the use of the term "conservative" when describing uncertainty of various aspects of the Project. Evaluating conservatism needs to be expressed relative to another set of conditions.

5.0 Summary and Recommendations

We have conducted a focused review of the Whiteshell EIS based on our understanding of MMC rights and interests, and potential Project interactions with the environment that may lead to effects on MMC rights and interests, as described in Section 2.0 of this report, and the health and well-being of the MMC members. In our review, we have provided 38 specific comments on the Whiteshell Project, and related recommendations to address them in the areas of the aquatic environment, terrestrial environment, and human and ecological health. These comments have focused on all aspects of the EA process including baseline studies and scoping, alternatives assessment, the effects assessment, mitigation measures, significance determination, and follow-up monitoring. In general, we have found inadequacies with respect to baseline studies, failure to appropriately consider the land use, rights and interests of the MMC, missing information and incomplete effects assessment, mitigation of effects on wildlife, and inadequate monitoring and follow-up.

The EIS has not identified—and therefore has not considered—the impacts to the rights, claims and interests of the MMC. As identified throughout this review, the MMC has rights and interests which intersect with the Project area and vicinity and have the potential to be adversely impacted by the Project activities, including the potential for ongoing contamination of the lands and waters. As the health of the land, waters, and resources are impacted, so too is the health of the MMC that relies on those resources for sustenance. The rights and interests of the MMC are distinct from the rights and interests of First Nations and must be specifically considered and identified, through engagement with the MMF. Mitigation, minimization, and accommodation measures for any impacts should be identified, considered, and implemented in coordination with the MMF.

In our review we noted some serious problems with the stated conservatism of the EIS. In many instances professional judgement was used to determine effects without adequate support from scientific literature or an accompanying rationale. Likewise, decisions that the Proponent has taken in predicting effects of the Project may underestimate the potential contamination and result in greater impacts. For example, as described in Issue 3 from Section 3.1.2, the exclusion of radionuclides with half lives shorter than 1 day in the mass balance and transport model for groundwater is not conservative and likely to result in low predictions of contamination. These unconservative selections and resulting low predictions for contamination have resulting consequences on the rigour of the monitoring plans proposed by the Proponent, and whether the monitoring is sufficient to guard against and adequately identify and assess potential contamination.

The lack of conservatism employed for the effects assessment can be compounded by the land use practices of members of the MMC that may increase their exposure to contaminants. There are many individuals within the MMC who are active land users and are likely to be exposed to a higher concentration of environmental contaminants than what has been evaluated in the EIS. For example, land users who regularly consume fish from the Winnipeg River will receive multiple exposures to contamination. The combination of underestimated contamination and higher exposure is a serious

concern for members of the MMC, and presents possible disproportionately higher impacts on members of the MMC that must be considered and assessed.

By opting to go with the ISD alternative for decommissioning of the WR-1 Reactor, the Proponent is placing a considerable risk on future land users of the area. The WR-1 decommissioning is not a "permanent disposal" of the high-level waste in the reactor. It is a long-term storage in which the radioactivity is not isolated from the biosphere but will be released to the environment through time. The WR-1 decommissioning as described in the EIS will not isolate the waste from the biosphere and requires monitoring of the site until 2324. This places a commitment on future generations and a possibility of exposure of released radionuclides to the public and the MMC. The alternative of moving the radioactive material to a final disposal site should be seriously considered.

To address the issues noted herein and move forward discussions about the Project, we provide the following high-level recommendations for the CNL and the CNSC:

- Continue to engage with the MMF to identify and evaluate current land-use and potential future land use impacts associated with the Project on the rights and interests of the MMC. Métis Knowledge of land-use activities must also be used to inform the risk assessment of potential exposure pathways.
- Provide responses to the issues described in this report (summarized in Appendix B) by outlining specific information, actions and/or accommodations that will be undertaken by the CNL.
- The CNSC must to provide guidance on whether the long-term storage of high level waste in this form is acceptable, given the knowledge that radioactivity will be released to the Winnipeg River in the future. CNL has the expertise to move the material to another site safely.

6.0 References

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Appendix A – Review Team CVs

Appendix B – Comment Tracking Table

Table 1. Comment and Response Tracking Table

Comment #	Issue	Question/Recommendation
AQUATIC ENVIRONMENT		
4.1.1	In evaluating options for the decommissioning of the WR-1 Reactor the Proponent has evaluated four (4) alternatives. Of these, ISD represents the highest risk to local aquatic systems because contaminated materials will reside permanently within the local environment. Permanent storage of radioactive contaminated material must be monitored indefinitely. Once the containment system fails, decaying radioactive material will have a direct pathway for contamination of groundwater. Over time, this contamination will likely migrate to surface water (e.g. through seepage to the Winnipeg River <500m), posing risks to aquatic wildlife and humans who consume these organisms. For example, based on predictions of mass loadings to the Winnipeg River, it is expected that Carbon-14 and Tritium are expected to be particularly high, with maximum groundwater concentrations (at point of discharge) of 147 Bq/L and 3,760 Bq/L respectively. The latter of which is expected to occur within 68 years during post-closure. Due to the risks associated with contaminated groundwater, a robust monitoring program must be in place. The Proponent is planning to conduct surface water monitoring and surficial sediment monitoring to test for contaminants during closure and post-closure	**Recommendation 4.1.1a** – The Proponent must clarify the location, frequency and timing at which surface water and sediment sampling will occur. This data must be presented in text and in the form of a map (similar to Figure 6.4.2-3) with locations of all proposed follow-up monitoring locations clearly marked. This must be accompanied by a description of the frequency of monitoring proposed for these stations. **Recommendation 4.1.1b** – The nearest downstream surface water and sediment sampling station in the Winnipeg River is too far for monitoring contamination of groundwater seepage. Additional surface water monitoring stations must be planned closer to the location of groundwater emissions. At minimum, we suggest these occur at the effluent outflow, the groundwater seep, 25m, 100m and 500m downstream on the Winnipeg River. **Recommendation 4.1.1c** – Water quality in trenches/ditches from the Waste Management Area must be monitored actively during closure and post-closure. The Proponent must provide additional details on locations and frequency of monitoring associated with the Waste Management Area. There should be clear adaptive management and contingency plans for responding to degrading water quality in these features such as capture and additional treatment.

Comment #	Issue	Question/Recommendation
	(EIS, 2017, pp 6-203). However, it is unclear at what intervals this monitoring will occur. Moreover, the locations for water quality monitoring follow-up program are not sufficient. The nearest downstream surface monitoring location to the groundwater seep is 2 km downstream from the site boundary (monitoring station DS, Figure 6.4.2-3). This is unlikely to detect any contamination except from extreme events, nor to show any gradient or distribution of contamination.	
4.1.2	The Proponent has identified "No Linkage Pathway" to residual effects from runoff during closure (EIS, 2017, pp 6-186). However, there is an issue with this evaluation because there could be large loads of contaminated material and dust during active closure. These could be from building demolition, excess piping or other contaminated materials. If there is a significant precipitation or snowmelt while this material is present, it could result in a slug of contaminated runoff to the Winnipeg River. The Proponent has assumed that this would not occur because best practices would be in place. This includes, water management, containment barriers, and water testing.	The Proponent must prepare an Environmental Protection Plan (EPP) outlining in detail the mitigation strategies and actions that will be taken to prevent contaminated runoff from the site to receiving waters during closure. The EPP must be provided to the MMF so that there is an opportunity for review. Failing this, it will be necessary to incorporate potential effects of increased contamination to the Winnipeg River because of runoff, into the EA process.
4.1.3	Beginning during post-closure and continuing for a up to 500,000 years, groundwater contaminated from contact with the below grade building materials and WR-1 reactor will leach steadily into the Winnipeg River. Radionuclides released can result in harm to aquatic wildlife. In the Goldsim® (Version 11.1) mass balance and transport model for groundwater, only radionuclides with half lives	The mass balance and transport model for groundwater must include all radionuclides, including those with half lives shorter than a day.

Comment #	Issue	Question/Recommendation
	longer than 1 day were modelled. This excludes a large number of potentially damaging radionuclides which, if present in large quantities could contribute to radiological effects on aquatic wildlife in the Winnipeg River. Moreover, certain radionuclides with short half lives may decay into daughter radionuclides with longer half lives that continue to emit radiation. For example, I^{135} with a half life of 6.5 hours can decay through β− decay into Xe^{135} and Cs^{135}, the latter of which has a half life of 2.3 million years. Thus, by excluding short lived radionuclides from the modelling, the Proponent is potentially ignoring important sources of radioactive contamination and underestimating the potential risk to the aquatic environment.	
4.1.4	In their evaluation of the potential effects of surface water contamination (dispersion modelling), the Proponent only evaluated of concentrations of radionuclide and non-radionuclide contaminants at the Nearfield (50m downstream) and Farm A (approximately 3,100m downstream) locations. As a result, they were able to assume complete mixing of contaminants and utilize large dilution rates. For example, the dilution rate used for evaluation of contaminants for the nearfield site was 300,000:1. However, at the point where contaminated groundwater is being released into the Winnipeg River, the dilution will be much less. This will result in higher concentrations of contaminants in the water column (than shown in Table 6.4.2-12 and 6.4.2-13) and in sediment (shown in Table 6.4.2-14 and 6.4.2-15) (EIS, 2017). This is of concern for all	Recommendation 4.1.4a – By evaluating the concentrations of contaminants at the Nearfield location rather than in the immediate vicinity of the groundwater release, the Proponent is underestimating the potential effects of this Project. To evaluate these effects the Proponent must produce a dispersion model to predict the concentrations of contaminants between the point of groundwater release into the Winnipeg River and the Nearfield location (between 0 and 50m). These higher concentrations should be used to calculate contaminant concentrations in sediment within the mixing zone for groundwater seepage. This updated and more localized information would enable the Proponent to evaluate the potential effects within the immediate area of effect near the seep and whether any contaminants are above regulatory guidelines for either surface water or sediment.

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	contaminants, but particularly for highly toxic contaminants for which concentrations in groundwater are above applicable guidelines such as cadmium and lead. These contaminants released through the groundwater seep may have locally high concentrations that could bioaccumulate in fish and benthic invertebrates causing harmful effects. Moreover, the accumulation of these contaminants in fish tissues represents a potential pathway for human consumption, including affecting MMC citizens who rely on fishing and harvesting aquatic resources for subsistence and as part of a traditional diet and lifestyle.	Recommendation 4.1.4b – If concentrations of contaminants (radiological and non-radiological) are found to be higher than what has been predicted at the Nearfield and Farm A locations, the Proponent must update the Human Health and Ecological Risk Assessment to evaluate the potential impacts of these higher concentrations.
4.1.5	Issue 5 – As part of the existing license for the CNL facility (NRTEDL-W5-8.04/2018), the Proponent engages in monitoring of fish tissue at upstream and downstream locations from the Project site. However, the Proponent is not planning to monitor fish tissues for contaminants during closure and post-closure (EIS, 2017, pp 6-231). Many individuals from the MMC fish regularly along the Winnipeg River for game species such as walleye, lake whitefish, smallmouth bass, and northern pike. The risk of health effects from consuming these contaminants is thus a serious concern for these fishermen and their families.	Due to the importance of fishing and fish consumption to the MMC, it is critical that monitoring of fish tissue occur and be designed accordingly so that the predictions of low contamination can be verified. The Proponent must engage in monitoring of fish tissues during closure and post-closure (institutional control) and have adaptive management plans in place to address unanticipated levels of contaminants in edible portions of fish in exposure areas. We recommend that the sampling locations currently used for monitoring associated with the existing license be maintained. Monitoring should occur every year during closure and at least every 10-years during post-closure.
WILDLIFE, VEGETATION AND WETLANDS		
4.2.1	Baseline terrestrial data for the WL property was gathered through incidental observations by staff and through targeted surveys for Species at Risk (SAR) in 2015 (Section 6.6.4.2/6-245). Desktop review was also completed to identify potential SAR within	**Recommendation 4.2.1a** – Conduct multi-season (spring/summer/fall/winter), baseline terrestrial surveys to provide a less biased and more comprehensive measure of site characteristics and an accurate representation of the ecological components potentially

Comment #	Issue	Question/Recommendation
	the RSA, however TEK or harvesting rights, practices and needs of MMC land users were not considered.	affected by the Project. This would provide a more comprehensive assessment of potential impacts to native vegetative species and species of traditional importance to the MMC. **Recommendation 4.2.1b** – Engage the MMF to identify and consider the MMCs extensive TEK, harvesting rights, current exercise of rights and ongoing needs and interests, during or in addition to the base-line surveys recommended in Recommendation 1a. There needs to be recognition of and accommodation measures provided for the Métis who live within the vicinity of and/or harvest within the Project assessment areas as part of determining the significance of net effects as a result of the Project.
4.2.2	'Traditional, cultural and heritage importance to Aboriginal peoples' was said to be considered in the selection of valued components (VCs/Section 2.5.1/2-11), yet no Traditional Knowledge or land use by the MMC has been included in the EIS. The MMC has longstanding use of the lands and waters in the vicinity of the Project that continue to be of ongoing importance to the MMC in exercising their constitutionally protected harvesting and other rights. These rights have the potential to be impacted by the decommissioning activities and yet have not yet been considered by the Proponent, nor have accommodation or mitigation measures been discussed with the MMF.	A Traditional Knowledge and Land Use study with the MMF must be undertaken to determine and understand Métis-specific land use and interests in the Project study area. Further discussions of accommodation and / or mitigation measures with the MMF may be needed.
4.2.3	Wildlife VECs focus on SAR, as per regulatory requirements, with no inclusion of wildlife species and habitats of traditional and cultural importance to the MMC. The MMF has expressed interest in	Complete a thorough effects assessment on species of traditional importance to the MMC identified in a Project specific Traditional Knowledge, Land Use and Occupancy Study (TKLUOS). Include monitoring and

Comment #	Issue	Question/Recommendation
	Indigenous values and rights, as identified in *the Summary of Key Interests and Concerns for the Manitoba Métis Federation* (Table 4.3.2-8/4-15) with regards to Valued Components (VCs) for the Project. The Proponent has determined that the "Project is not expected to have a substantial effect on an individual's land and resource use experience or on harvested species with because of mitigation and management practices put in place for the Project" (6.8.5.2.1/6-381), however without conducting a full effects assessment with applicable mitigation measures for traditionally valued species of the MMC specifically, we do not believe the Proponent can make this determination with respect to effects on the MMC.	follow-up programs for potential effects to culturally important terrestrial species, including objectives and any monitoring measures (i.e., thresholds) that will be implemented to verify the predictions of effects and evaluate the effectiveness of proposed mitigation measures.
4.2.4	The complete removal of the facility (Alternative 2) would improve the perceived suitability of the site for future socio-economic MMC interests because long-lived radioactive material will no longer be present within the former WR-1 Building footprint. In addition, the complete removal *may* allow this portion of the site to be released for unrestricted use which would allow safe use of the land for traditional land use activities and interests by the MMC such as hunting, berry picking, and medicinal plant gathering (EIS, 2017; Section 2.5.3.2/pp 2-18). There are concerns that the Proponent is choosing ISD due to estimated Project cost differences (in excess of $100 Million difference) rather than selecting a decommissioning alternative that is ecologically preferred or least impactful on the rights of Indigenous communities or best aligned with the	Further meaningful consultation and engagement with the MMC must occur, to identify their interest and preference in the complete removal of the facility, as outlined in the Comprehensive Study Report (CSR) and as identified in Alternative 2 of the EIS. This consultation and engagement should occur through the MMF and in accordance with MMF Resolution No. 8.

Comment #	Issue	Question/Recommendation
	long-term use and sustainability of the area for the MMC.	
4.2.5	The surrounding grounds that were disturbed during demolition and decommissioning activities will be graded and restored with a grass seed mixture, but information on the approach and/or seed mix has not been provided (EIS, 2017, pp 3-34, pp 6-266).	The MMF requests that native seed mixes be used for reclamation in the Project area. The incorporation of native floral and grass seed mixes in re-vegetation efforts would further enhance habitat/forage for wildlife, particularly for pollinators.
4.2.6	During reclamation, the Proponent has stated that the Project site and final vegetation cover will be graded to promote drainage from the site to the Winnipeg River (EIS, 2017; pp 3-34). An engineered cover will be installed over the former footprint of the WR-1 Building to minimize water infiltration and migration of contaminants to underlying aquifers (EIS, 2017; pp 3-33).	The engineered cover will not provide a barrier for release of contamination explicitly, but rather will be installed to limit additional water infiltration into the system and protect the barriers that are in place by resisting intrusion into the sub-surface structure. It is therefore recommended that for the same reason, this impermeable barrier should be installed around the entire grouted below-grade facility.
4.2.7	Changes in radiation and radioactivity levels during post-closure phases were predicted for wildlife VCs living on or near the WL site (Table 6.6.1-1/6-234). However, because species of traditional importance (i.e., commonly harvested by the MMC such as moose, deer, waterfowl, etc.) to the MMC were not specifically identified or considered as part of the post-closure plan, there are ongoing concerns regarding potential effects and exposure to animals in the long-term, and in particular that some specific species of importance to the MMC may not have been identified or considered.	Re-run the effects assessment of radioactive exposure to wildlife species of traditional importance to the MMC, as per the TKLUOS recommended in 3.2.2.
4.2.8	The Proponent has identified that wildlife collisions with vehicles will be monitored, for which adaptive management measures will be considered, however	Please provide adaptive management thresholds at which additional wildlife collision mitigation measures will be applied.

Comment #	Issue	Question/Recommendation
	no thresholds have been provided (EIS, 2017; pp 6-234).	
4.2.9	It is not clear what the Project schedule is for construction/decommissioning activity (Table 3.1-1/3-2). Loud decommissioning activity (i.e., jack hammering to remove deeply imbedded contaminants in concrete; Table 6.6.5-1/6-264) is expected. Consequently, there are considerable concerns over the potential disturbance and displacement of sensitive SAR species and to wildlife of traditional interest and importance to the MMC.	**Recommendation 3.2.9a** – Identify what consideration, if any, will be given to limit construction activity during sensitive timing periods for SAR, migratory birds and wildlife species of traditional importance to the MMC, such as during ungulate calving periods. It is recommended that a plan be developed to limit construction activity during sensitive timing periods as to minimize the potential for disturbance and displacement of species and wildlife in the Project area. **Recommendation 3.2.9b** – Provide clear communication and notification (minimum of 21 days) of the finalized construction scheduling to MMF for distribution to their membership, with follow-up communication on a weekly basis for any scheduling changes. There is concern that Manitoba Métis harvesters may have their harvesting rights and activities impacted when they travel to the Project area to hunt, and then find that the area they are travelling to is subject to construction activity which has disturbed or displaced the wildlife they are planning to hunt or harvest.
4.2.10	The Proponent has identified that bat surveys will be conducted in the year prior to initiation of Project decommissioning, during the 'appropriate season', and over multiple visits if necessary (EIS, 2017, pp 6-264 – 265, & pp 6-276). Additional measures could be implemented to mitigate effects of disturbance and mortality to SAR bat species which are not considered in the EIS.	**Recommendation 4.2.10a** – Please identify the exact timeframe and frequency at which bat monitoring surveys will be completed. Please note that the seasonal and daily pattern of bat activity and the use of different types of roosts at different times of the year will impact the appropriateness of survey methodologies. The optimum time for dusk surveys at buildings, particularly during early summer is for two hours after the first bats

Comment #	Issue	Question/Recommendation
		emerge as this will cover the emergence period as well as the first return to the roost for some species. The time of first emergence varies between species, with noctules leaving around sunset and others leaving about 1 hour after sunset. Bats using underground structure at the site during the summer may not emerge until later, upwards of 4 hours after dark. Towards dawn, many bats swarm outside their roosts and surveys beginning about 90 minutes before sunrise and continuing until 15 minutes after sunrise ('sunrise surveys') is recommended (Mitchell-Jones, 2004). During this time, it is recommended that continuous automated bio-acoustic detectors linked to data-loggers be used, so as to minimize missing the presence of SAR bats in the Project area. **Recommendation 4.2.10b** – The location and installation of the replacement roosts (bat boxes) should be chosen to maximise the chances of the bats finding and adopting it. Care should be taken to install boxes close to existing flight lines and have an entrance close to appropriate/preferred habitat types. Many bat species prefer to fly in dark areas straight into vegetation, so external lighting on the site close to boxes should be avoided. **Recommendation 4.2.10c** – If SAR bat species are identified during pre-decommissioning surveys, demolition of the facility should stop until individuals have left the area, roosts/nests are no longer active and/or adoption of habitat off-sets (bat boxes) have been confirmed.
4.2.11	Chemical and radiological contaminant release will be monitored as part of follow-up monitoring during	Please provide adaptive management measures and thresholds being considered for follow-up monitoring.

Comment #	Issue	Question/Recommendation
	the closure phase to verify effects predictions and to provide information for use in adaptive management measures to address unforeseen effects. Adaptive management approaches have been proposed, yet thresholds at which implementation of these approaches have not been provided in the EIS (EIS, 2017; Table 6.6.5-1/pp 6-265).	
4.2.12	There are ongoing concerns with airborne contaminants that could deposit to soil, and water, where they could affect vegetation and wildlife/wildlife habitat of interest and importance to the MMC (EIS, 2017; pp 6-273). What Emergency response protocols are in place to notify the MMC in the event that monitoring values exceed radiation benchmark values and applicable environmental guidelines?	An Emergency Response Plan must be developed in consultation with the
4.2.13	General Comment.	Provide opportunities to the MMC to build capacity and knowledge in decommissioning activities and reclamation of Project components. Opportunities to build MMC capacity and knowledge in efforts that are of importance to the Manitoba Métis, such as participation in seeding, planting and monitoring in follow-up programs should be explored with the MMF.
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSEMENT		
4.3.1	The safety case for the WR-1 decommissioning relies to a large extent on the conclusions of the 2001 Comprehensive Study report for the WL site. Two areas with elevated radioactivity were expected to remain on the WL site: the contaminated Winnipeg River sediments and the Low-Level Waste Management Area. The conclusions from that study were based on the assumption that all high-level	Although the WR-1 decommissioning is a separate component of the Comprehensive Study, exposure models should be assessed in terms of the other sources of radioactivity on the site (LLWM area, Winnipeg sediment, sewage lagoon and other sources of radioactive and noon-radioactive contaminants).

Comment #	Issue	Question/Recommendation
	waste would be removed from the site and sent to a national disposal site within a number of years. As no facility has been selected or developed, leaving the high-level waste would change the conditions for the Comprehensive Study for the WL site, which should be re-examined as it forms the basis for the long-term plan for the site.	
4.3.2	The Comprehensive Study Report ("CSR") names the CNSC and Fisheries & Oceans Canada as Responsible Authorities (RA) (Introduction, section 1-1), although in the Appendices to the CSR, CNSC is named as the only RA. Given the importance of the aquatic transport pathway in the Post-Closure period, and the potential for contamination of the Winnipeg River and the reliance of MMC harvesters on fish and aquatic resources, the RA for the Project requires clarification and consistency.	Please clarify if Fisheries and Oceans Canada is a Responsible Authority for the WR-1 Decommissioning.
4.3.3	The Proponent states that "ISD is a permanent, passive decommissioning end state [and] CNL is proposing a revised approach to the WR-1 decommissioning that includes partial dismantling and demolition, along with passive, permanent disposal of the below-grade portions of the facility (the Project)" (EIS, 2017; pp 1-1, emphasis added). The WR-1 decommissioning is not a "permanent disposal" of the high-level waste in the reactor. It is a long-term storage in which the radioactivity is not isolated from the biosphere but will be released to the environment through time. Conditions of the high-level waste disposal program by the CNSC in the 1990s stipulated that the waste must be isolated	Recommendation 4.3.3a – The CNSC should provide guidance on whether the long-term storage of high level waste in this form is acceptable, given the knowledge that radioactivity will be released to the Winnipeg River in the future. Recommendation 4.3.3b – Alternatives to ISD, such as moving the radioactive material to a final disposition site should be considered as viable options for the WR-1 Reactor decommissioning. The CNSC should make recommendations to reconsider the alternatives to in situ storage of WR-1 Reactor and examine the possibility of removing and storing the highly radioactive components with other high-level waste

Comment #	Issue	Question/Recommendation
	from the biosphere and should not be a burden on future generations. The WR-1 decommissioning as described in the EIS will not isolate the waste from the biosphere and requires monitoring of the site until 2324. This places a commitment on future generations and a possibility of exposure of released radionuclides to the public, particularly to those that harvest fish in the river and may harvest aquatic plants, including wild rice. As already identified throughout this review, the MMC has rights in the Project vicinity that include practices of harvesting fish and other aquatic resources from (among other locations) the Winnipeg River. The ISD plan for the Project has the potential to create additional impacts on the MMC and future harvesters, which are possibly greater than a disposal or decommissioning plan that does not involve in-situ options for decommissioning. While the ISD plan meets one of the CNL Integrated Waste Strategy Objectives by providing a disposition route for the WR-1 Reactor components and systems (EIS, 2017; pp 2-1), it does not meet the objectives of "limiting nuclear legacy obligations for future generations" but requires monitoring and maintenance of the site for at least 100 years, and possibly as long as 300 years. This long-term monitoring requires ongoing resources and may lead to significant resource costs to correct any deficiencies. The alternative of moving the radioactive material to a final disposal site should be seriously considered.	from other sites. This would significantly reduce monitoring and maintenance costs.

Comment #	Issue	Question/Recommendation
4.3.4	The EIS identifies that "Although the installation of the engineered cover at the WR-1 Building is expected to slightly alter the drainage rates and flow patterns and discharge volume to the Winnipeg River; the changes are expected to be within the natural range of variation" (Executive Summary). The data used to justify this statement only cover a few years of when the Proponent has managed the site. It is unclear whether these assumptions will withstand the passage of time, particularly over 300 years given climate change and possible land-use changes in the area. It is unlikely that the surrounding environment and the land use will remain the same. The flow of the Winnipeg River may change with drier or wetter climate, and changes in the dams on the river. This uncertainty will also affect the Project description and other aspects of the Project over time as they are described, assessed and form conclusions in the EIS.	Recommendation 4.2.4a – The EIS should be revised to explicitly include acknowledgement that the uncertainty of the estimates increases over time. It is not possible to make conclusions on environmental and climatic conditions 300 years in the future with any certainty and the EIS should identify this limitation. Recommendation 4.2.4b - The CNSC should consider this uncertainty in the conditions that it imposes on the decommissioning plan for the Project, including by imposing conditions or requiring options that include the removal of highly radioactive material to a permanent disposal site.
4.3.5	The summary of the EIS does not discuss the other sources of radioactivity already stored on the site. The CSR indicates that, after decommissioning, there will be two sources of radioactivity that remain on the site: the Low Level Waste Management Area and the contamination in the Winnipeg River Sediment. There is no mention of these radiation sources or their influence on the risks from the WR-1 decommissioning. These existing sources of radioactivity present the potential for additional radioactive material and effects that requires consideration as it may result in additional cumulative effects on the environment and	Although the EIS is written specifically for the WR-1, it must be reviewed in the context of the larger site and other sources of contamination. At the very least, it is recommended that the description of the site and exposure models should include all sources of contamination and their management plans including identifying the long-term plans for the irradiated fuel currently on-site and the Winnipeg River sediment

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	specifically the MMC members that rely on the natural environment for the exercise of their rights and subsistence. The EIS further identifies that the "decommissioning approach for the WL site as described in the Comprehensive Study Report (CSR) was to remove all facilities entirely from the WL site with the exception of low level waste trenches in the Waste Management Area, which may be managed through on-site in situ disposal (AECL 2001). Over a 10-year period, multiple buildings and facilities at the WL site have been decommissioned and the occupied space has been remediated, in an effort to meet this objective" (EIS, 2017; pp 2-2). The Winnipeg River sediment is not mentioned here although it was identified in the CSR as remaining after site closure. It is also not clear what the long-term plans are for the irradiated fuel remaining on-site.	
4.3.6	The EIS identifies that "AECL has asked CNL to perform the work, and in keeping with international best practices (IAEA 2004, 2006), the decommissioning timeframe has been accelerated with the goal of completing decommissioning of the WL site by 2024" (EIS, 2017; pp 1-7). It appears that this timeframe is the key component for the plan to decommission the WR-1. The timeframe may not allow for a consideration of other alternative decommissioning or disposal options that have less potential for contamination effects on the local environment, and correspondingly less potential impacts to the MMC and other members of the public. ISD is the only alternative identified by the	The CNSC, AECL and CNL should consider extending the timeframe for site decommissioning if it provides the best solution to WR-1 decommissioning.

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	Proponent which will allow the decommissioning of the site by 2024.	
4.3.7	The Proponent is proposing ISD of the WR-1 to achieve the closure of the WL site by 2024. The EIS considered, among other factors, worker safety when undertaking ISD. This review does not dispute that worker safety is of importance, however the EIS has not presented evidence of the dose rates to workers currently in the building when performing maintenance or monitoring, or what the doses to workers were when removing the fuel from the WR-1 Reactor or transporting the fuel to its current location, and what the doses will be when transporting the fuel off-site (or where the fuel will be moved to). This information is required to make informed decisions about the preferred options for the WR-1 Reactor. If this information is available in supporting documents, it should be summarised here. Other alternatives, such as leaving the reactor in place until a permanent national depository is available, should be re-considered, and affects of these options on worker safety should be identified and considered. The MMF has expressed an interest in having MMC citizens build capacity and knowledge in the decommissioning activities, over the lifecycle of the Project. As such the potential effects of various options for decommissioning on the workers is of interest and concern to the MMF. Additionally, the EIS states that "While the complete removal of the facility will result in positive effects to the environment, the environmental liabilities	Consider and provide information about the effects on workers of alternative decommissioning options that do not involve ISD.

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	associated with the removed wastes will be transferred to another offsite facility that has not been constructed yet. It is not yet known if this future facility will be within an industrial setting or a green-field site which could result in additional adverse environmental effects (e.g., vegetation clearing required at a green-field site)" (EIS, 2017; pp 2-15). Given that any potential off-site facility is unknown, and removal has not been sufficiently detailed or considered as an option for decommissioning throughout the EIS, it isn't clear whether removal of the WR-1 Reactor would result in adverse environmental effects that would be more significant than the current ISD plan. A future facility would presumably consist of more than removing vegetation from the site, however with such a location underdetermined, any potential effects are speculative and uncertain.	
4.3.8	The EIS outlines a consideration of cost estimates of the preferred method (ISD) and alternatives (EIS, 2017; Table 2.6.3.1). The preferred option of ISD has been identified by the Proponent as the cheapest and quickest method to decommission the WR-1 Reactor, but there is no explanation of individual costs. For example, monitoring of Alternative #1 is stated to be $1, but $7 for Alternative #3, however it is unclear what the units are. Alternative #3 has no surveillance after 2024 and no further details are provided. Presumably monitoring will continue on the site after 2024 as part of the site license and because of the legacy contamination in the lagoon, low level waste management area, cesium ditch, etc.	**Recommendation 4.3.8a** – More complete costing details need to be provided, including identifying individual costs and whether ongoing monitoring has been included. In addition, there needs to be greater transparency about allocated costs. Also, estimates of how costs are allocated 100 to 300 years in the future should be described, along with an explanation of how future costs are being estimated for the next 100 years. **Recommendation 4.3.8b**- The cost estimates should be audited and validated by an independent source.

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	however it is not clear whether the cost estimates include this ongoing monitoring. Also, if it has not already been undertaken, the cost estimates should be audited and validated by an independent source.	
4.3.9	The rationale for ISD relies on maintenance and monitoring of the installation for 300 years and states that "control" will last "indefinitely" (EIS, 2017; section 3.1.2). It is not clear how the Proponent is prepared to make this commitment for the post-closure after 2124 or, in particular, after 2324. Environmental regulations change with each government, and it is possible that future governments may choose to not allocate funding to maintaining and monitoring the WL site. There is no way to guarantee future commitment of resources.	Additional clarity is required for the post-closure phase activities and plan, in particular how long-term performance monitoring and maintenance activities are expected to be carried out. The EIS should further consider and acknowledge that the uncertainty in being able to guarantee the sufficiency of these planned activities increases over time given the potential for changes in priorities, funding, and environmental requirements. The CNSC should consider this uncertainty when identifying conditions to apply to the Project.
4.3.10	The EIS identifies that "Project-specific effects can be quantified (e.g., incremental changes to ground and surface water quality, air quality, and fish and wildlife habitat). Because the socio-economic status of different communities, subpopulations and individuals may vary, a socio-economic effect may have positive aspects and negative aspects. An effect on a biophysical discipline is typically constrained to being negative or positive" (EIS, 2017; pp 6-2). This introductory text is meant to provide support to later conclusions in the EIS, but it overstates the levels of confidence in the analysis. For example: "Project-specific effects…fish and wildlife habitat" are identified however the subsequent analysis does not quantify effects to fish and wildlife habitat. In fact, there are no formal surveys of fish and wildlife habitat for the WL site described in the EIS, and no	**Recommendation 4.3.10a** – The EIS needs to be reviewed, particularly the text in the Assessment section (Section 6) for conclusions that overstate its accuracy or imply that the analysis will be rigorous and predict impacts with any accuracy or precision. For example, no surveys of fish or wildlife distribution have been conducted for this EIS so the text should not imply or include conclusions based on survey's that have not been undertaken; Log books by staff are not accurate indicators of wildlife presence, abundance, or distribution at the site; etc. **Recommendation 4.3.10b** – To the extent that the conclusions identified in section 6 require surveys or assessment activities that have not be undertaken regarding the Project site and/or effects, these formal surveys, assessments etc. should be undertaken by experienced personnel. Risk assessment models for the

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	methods for estimating effects to habitat, either in 2024 or in the future. This presents problems for later conclusions in the EIS, such as, for example, related to the protection of fish and fish habitat (EIS, 2017; Table 6.1.2.1); while identified as an issue to be assessed and considered in the EIS, the subsequent analysis does not specifically address changes to fish habitat in the Winnipeg River. It estimates the radiation dose to fish in the river (and the concentration of non-radioactive chemicals) and concluded that doses will not cause effects in adult fish. Later in the report (EIS, 2017; pp 6-215) it is stated that "Fish habitat is generally similar throughout the RSA" However it provides no evidence for this conclusion. A consideration of the evidence from the scouring (near the plant site) and depositional zones (further downstream) in several places in the river could be considered as it relates to supporting or refuting this conclusion.	WL site should use site specific surveys of species distribution for both the aquatic and terrestrial environments to provide some conceptual support for the models. The ecological risk assessment uses data from other studies and anecdotal reports to estimate exposure and does to VCs. These surveys or assessment activities should, as much as possible, be at locations specific to the Project site and not drawn from other locations that may or may not provide comparable data (for example, pp 6-216 Fish Community data is drawn from other locations in the Winnipeg River and it is unclear if the fish population at the Project site are similar or comparable to the location of this data source).
4.3.11	Section 1.5 (EIS, 2017) is intended to leave the impression that the risk assessment methods used here are rigorous and that the conclusions on exposure and effects are fully justified. However, most of the text glosses over the fact that conclusions are made without justification, a rationale or supported by data specific to the WL site. For example, phrases like "either because there was no linkage initially or because environmental design features or mitigation will remove the pathway, are not advanced for further assessment" or "pathways determined to have no linkage to a VC or those that are considered secondary are not	The EIS needs to be reviewed and revised so that statements of professional judgement are based on and linked to evidence that is put into the EIS.

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	expected to result in environmentally significant effects on the assessment endpoint of VCs" (EIS, 2017; section 6.1.5) result in pathways being removed without sufficient justification. Statements and conclusions must be based on evidence if they are to be relied on to support conclusions that there will be no, or limited, impacts on factors of importance to the MMC, its rights, interests or health and well-being.	
4.3.12	The EIS identifies that "From 1976 to 1982, downstream fish flesh concentrations of Cs-137 were greater than upstream concentrations for all fish species. However, the estimated dose from fish consumption (<0.005 mSv/a) remained far below (0.01%) the occupational dose limit, so the fish remained safe to eat (AECL 1983). Concentrations in water decreased subsequent to improvements to effluent treatment at the ALWTC in 1982, similar to levels observed between 1962 and 1972 (AECL 1983)" (EIS, 2017; section 6.5.4.2.3). This is a significant observation which connects releases of Cs-137 from the plant to fish consumed by fishers. The data presented in Table 6.5.4.1 were collected from 2010 to 2015 and do not include the data prior to 2010 even though AECL has been monitoring fish since 1976. Presumably these data are available and would provide additional details regarding the concentrations of contaminants in fish over longer periods of time. Such information would be relevant to the consideration of the long-term effects of contamination on fish populations, over the 300 years of the Project decommissioning, and the	Please provide and include a summary of the details of the historic concentrations in fish and the amount of fish consumed in the risk assessment models in the EIS. Monitoring of fish species has been conducted since the early 1970s but only the later data have been used for the assessment. The exposure models should use site specific data on species caught and amounts consumed, not generic values from the CSA.

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	potential adverse effects on members of the MMC who harvest and consume fish as part of a traditional diet. The total incremental dose due to fish ingestion was identified as 1.14 x 10-4 mSv/a for adults (EIS, 2017; section 6.5.4.2.3) Additional information for this assessment is required, including, sample sizes, species consumed, amount of fish consumed, and the other nuclides assessed. This information is vital for estimating exposure in MMC citizens, and others harvesting fish as radionuclides are released from WR-1.	
4.3.13	The EIS identifies that "CNL's current environmental monitoring program includes collecting water samples at one location upstream and three locations at varying distances downstream of the WL site. Surficial sediment is also collected at two locations upstream, at the outfall, and nine locations downstream. In addition, CNL has committed to collecting cores in depositional areas in 2026, 2046, and 2066 at Sylvia Lake and upstream and downstream of the waterbody Lac du Bonnet" (EIS, 2017; pp 6-205). It is unclear if the collection of samples as described is adequate to detect changes in water chemistry if the WL-1 Reactor releases radionuclide and non-rad components more quickly than predicted. Past monitoring programs may be considered to justify or refute the conclusion that the collecting sampling plan and timelines are sufficient to guard against the risks involved. Collecting cores every 20 years is unlikely to detect changes in water	The Proponent should consider data from past monitoring programs to justify a sampling schedule that will allow detection of any releases. Where indicated by these past monitoring programs, a sampling plan collecting cores more frequently than every 20 years should be implemented.

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	chemistry or deposition of contaminants and won't allow for quick adaptive actions to correct releases.	
4.3.14	The EIS uses the benchmark dose to non-human species from UNSCEAR and CSA (EIS, 2017; pp 6-221), however there have been more quantitative assessments completed. Environment Canada and the AECB used more conservative benchmark values for the Priority Substances List assessment for the protection of the environment around nuclear facilities (EC 2001). Specifically, the Radiation Benchmarks used in section 6.3.2 are very selective in the literature that it uses to rationalize the UNSCEAR 1996 values, which are seriously outdated. EcoMetrix 2017, in Table 7-2 - Assessment endpoints, measurement endpoints, etc. includes a line of evidence for the radiological dose of growth, survival and reproduction that is not supported by the UNSCEAR benchmark. More conservative benchmarks are more protective and are considerably more quantitative. A more quantitative approach by the European Community (cited by Ecometrix) combined a detailed literature review, species sensitivity analysis and an added safety factor of 5, consistent with the assessment of other contaminants, to provide a chronic incremental screening dose of 10 µGy/h for the protection of all ecosystems (protective of 95% of species) using the ERICA approach (Brown et al. 2008, Garnier-LaPlace and Gilbin 2006, Garnier-LaPlace et al. 2006). It was recognised that this dose rate could also allow some cytogenetic effects in	Given the uncertainties in predicting background and incremental doses in the future, the use of a more conservative benchmark should be used.

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	sensitive vertebrate species (Sazykina 2005, Sazykina et al. 2009).	
4.3.15	The EIS and Ecometrix report indicate that land use plans and institutional control is clearly defined and will continue during Post-Institutional period (300+ years) and will be designated for other uses after 300 years (EIS, 2017 pp 6-225; EcoMetrix section 5). The EIS also acknowledges that the government might not maintain control over the site in which case monitoring programs might not continue and that people may "be present on-site and make some use of local resource" (EIS, 2017; pp 6-305). Given this uncertainty**,** predicting social, political and environment conditions 300 years into the future is very problematic. In terms of exposure modelling and access to the site, it seems to be more conservative to adopt a model that allows for no controls and unrestricted access to the site. The long-term plan or "end use" for the WL site is also unclear, and where possible should be clearly identified in the EIS as this "end use" state will be of importance to the MMF and ultimately affect what traditional uses and activities can be carried out there by MMC citizens.	**Recommendation 4.3.15a –** The EIS should be revised to include, as a possibility, an institutional control model with no controls and unrestricted access to the site, to take into account the uncertainty of the end state of the WL site. **Recommendation 4.3.15b** – If possible, the long-term plan or "end use" of the WL site should be clearly identified, including a timeline leading up to this end use state. Limitations on the MMC use of the lands and resources resulting from this anticipated "end use" state should be clearly identified.
4.3.16	The EIS identifies the harvesting practices of First Nations proximate to the Project site, and the potential effects on the harvesting and other rights of First Nations. For example, Table 6.7.1.1, identifies how **"**Sagkeeng FN harvest wild rice and medicinal plants in the area." As is identified throughout this review, the MMC has constitutionally protected rights and interests, and exercise those rights and interests in the vicinity of the Project area. Much like	Work with the MMF to identify and consider the rights, interests and activities of the MMC that may be impacted by the Project. These need to be included in the EIS, along with a consideration of how these harvesting activities and practices may be impacted by the presence of contaminants and consequently affect the health and well-being of the MMC. Accommodation and mitigation options may be required.

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	First Nations, these rights and interests and the health and wellbeing of the MMC stands to be impacted by the Project activities and resulting accumulation of contaminants in the environment and resources relied on by the MMC. Métis may have similar concerns and wish to harvest wild rice from depositional areas of the Winnipeg River downstream of WL site, which needs to be taken into account by the Proponent and included in the EIS	
4.3.17	The EIS states that the "Results of the Comprehensive Study Report (AECL 2001) indicated that no public health threats were predicted from the decommissioning and reclamation activities for the WL site. Releases are well within regulatory limits for the protection of human health and regular monitoring provides that any aberrations are detected immediately (AECL 2001)" (EIS, 2017; pp 6-288). It further identifies that the "Results of the Comprehensive Study Report ["CSR"] indicated no residual effects on public health are expected as a result of the closure of the WL site" (EIS, 2017; pp 6-294). This is a misrepresentation of the results of the CSR. The CSR determined that there would only be the LLW area and the Winnipeg River sediment as two remaining sources of radioactivity on the site. All high-level waste was to be removed to a national disposal site that would isolate the waste from the biosphere. Because of those assumptions, there would be no long-term impact on public health at WL site. Those assumptions have now been changed with the long-term ISD storage of WR-1 Reactor.	The 2001 conclusions were based on the removal of high level radioactive concerns on the WL site to a national site. This WR-1 Reactor decommissioning was not part of the 2001 Comprehensive Study. The in situ WR-1 Reactor decommissioning should be analyzed in terms of the sources of radiation on the site (LLWM, the Winnipeg River sediment, lagoon, etc.). Also, the CSR should be re-visited with updated data.

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4.3.18	The EIS acknowledges that "Harvesters represent traditional users of the area who may be exposed through harvesting of country foods" (EIS, 2017; pp 2-697). The EIS (pp 6-297) and Ecometrix Report (section 5.2.2) make a series of assumptions about land-use location, duration, and frequency of harvesting activities. The time spent by traditional harvesters at the WL site in the exposure model is very restrictive. The HHRA for the harvester assumes land use practices in 2324 to be similar to those in 2024 but they may be completely different. It should be possible to conduct several land use practices using the transport models to determine if time of residency in the area and a more traditional diet will affect exposure. The EIS further states that "Recreational users such as swimmers, anglers, and boaters that occasionally carry out recreational activities along the Winnipeg River at locations close to the WL site, as compared to the most critical group locations (Farm A and Farm F), are not directly considered for the assessment because these activities are not representative of population groups in the area" (EIS, 2017; pp 6-297). Given the potential for the change in land-use over time, these recreational activities should be considered as part of the assessment. As the Project-site and surrounding area becoming available for these uses, there is the potential for the recreational use of the area by the MMC to increase.	**Recommendation 4.3.18a –** Land use studies should be conducted to determine if time of residency in the area and a more traditional diet will affect exposure. **Recommendation 4.3.18b –** Recreational users and the potential increase in the recreational land use of the area should be considered in the land use studies undertaken.
4.3.19	Table 5-20 of the Ecometrix Report identifies that the dominant contributor to the total dose is carbon-14 through the ingestion of terrestrial plants and	Further information is needed, including the diet for the infant harvester, and the identification of the family

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	animals, and fish, except for the 3-month-old drinking formula, which has tritium as the dominant contributor to dose. Why is the dose not calculated for the nursing infant of the harvester? The hazard quotients derived for constituents of potential concern were below the protective benchmark for all receptors, with the exception of a toddler harvester during post-closure, which slightly exceeded the benchmark. For the toddler harvester, the total ingestion HQ slightly exceeded 0.2 for lead (HQ = 0.24) (EIS, 2017; pp 6-314). The EIS further identified that "with the exception of a toddler harvester during post-closure, which slightly exceeded the benchmark. If only the Project contribution is considered, the HQs are reduced even further and hazard quotients are well below for all receptors (the Project contribution to the total is 0.0021% for cadmium and 0.00002% for lead)" (EIS, 2017; pp 6-314). This gap in the modelling scenario is significant as there does not appear to be a pathway for the nursing infant for the harvester scenario. A rationale for this was not located, nor was a description of the infant diet for the harvester. It is assumed that the "harvester" is represented by a family with adults, a toddler and a breastfeeding infant, however this assumption needs to be confirmed and clearly identified in the EIS. Given the reliance of the MMC on harvesting activities, and the importance of protecting and preserving the harvesting rights and activities of the MMC for future generations of Métis harvesters, the data related to pathways for	grouping considered, the pathway for the nursing harvester, etc.

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	contaminates between adults and nursing infants is significant in terms of potential long-term health effects on members of the MMC.	
4.3.20	The Ecometrix Report and the EIS both often use the term conservative when describing uncertainty without explanation or evidence. For example, page 7.1.6 of the Ecometrix Report: “The EcoRA problem formulation is conservative in its assumptions to accommodate uncertainties and meet the objective of protecting ecological health during the post-closure period” and “There is uncertainty in the radiological and non-radiological release rates to the surface water environment; however, the estimates are expected to be conservative.” Also In a previous section of the Ecometrix Report, entitled Uncertainty in Exposure Assessment, sentences such as “This is considered appropriate” and “Dose coefficients were obtained from reputable sources” are not convincing and cannot be reviewed. Page 6-344 of the EIS states that: “Although uncertainties in the assessment exist, conservatism has been included in the modelling so that residual effects are not greater than predicted. Overall, residual effects are considered to be not significant for all ecological health VCs during the closure and post-closure phases. Monitoring and follow-up programs include implementation of CNL’s existing Environmental Monitoring Program. These activities will verify effects predictions for ecological health.” There needs to be some support for these types of categorical statements. Evaluating conservatism needs to be expressed relative to another set of	The EIS needs to be reviewed for consistency in the use of the term “conservative” when describing uncertainty of various aspects of the Project. Evaluating conservatism needs to be expressed relative to another set of conditions.

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	conditions. Here it is stated, without support. For the statement on page 6-344, there is no support for the observation of “residual effects are not greater than predicted” without some reference.	