



Keeyask Generation Project

PRELIMINARY DRAFT

Generating Station Construction Environmental Protection Plan



April 2013

**KEYYASK GENERATION PROJECT
GENERATING STATION CONSTRUCTION
ENVIRONMENTAL PROTECTION PLAN**

DRAFT

Prepared by

Keeyask Hydropower Limited Partnership

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PREFACE

KEYYASK ENVIRONMENTAL PROTECTION PROGRAM

An Environmental Protection Program (Program) is being developed (*Drafters Note: change text to “has been:” once all documents are finalized*) to mitigate, manage and monitor potential environmental effects described in the *Keyyask Generation Project: Response to EIS Guidelines* during the construction and operation phases of the Keyyask Generation Project (the Project) shown on Map 1 (*Drafters Note: general location map to be provided at a later date*). The Program includes a collection of plans grouped in the following categories: Environmental Protection Plans, Environmental Management Plans, and Environmental Monitoring Plans.

Figure 1 lists all of the plans included in the Program. It also demonstrates how the Program will be managed. The Keyyask Hydropower Limited Partnership (KHLP) has delegated authority to Manitoba Hydro to manage construction and operation of the Project including implementation of the Environmental Protection Program. The organizational structure of the KHLP for this aspect of the Project includes a Monitoring Advisory Committee (MAC), which includes participants from each of the Keyyask Cree Nations and Manitoba Hydro. Manitoba Hydro will be guided on the implementation of the Program by the MAC, the KHLP Board of Directors and ongoing discussion with Regulators.

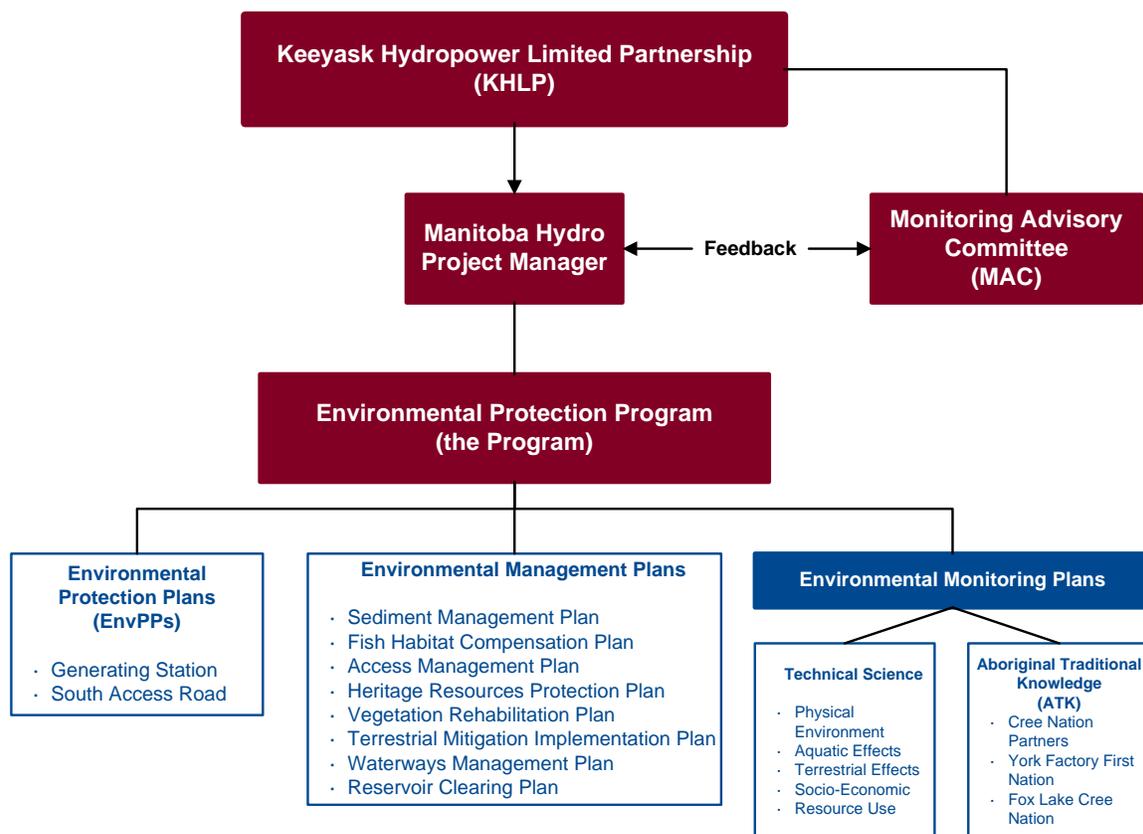


Figure 1: Environmental Protection Program

The Environmental Protection Plans (EnvPPs) provide detailed, site-specific environmental protection measures to be implemented by the contractors and construction staff to minimize environmental effects from construction of the generating station and south access road. They are designed for use as reference documents providing the best management practices to meet or exceed regulatory requirements. EnvPPs are organized by construction activity, highlighting measures to reduce the impact of a specific work activity (e.g., tree clearing or material placement in water). Contractors` compliance with the EnvPPs is a contractual obligation. Under Manitoba Hydro`s construction site management, an Site Environmental Officer will be responsible for monitoring compliance and determining when corrective actions are required.

The Environmental Management Plans focus on minimizing effects of specific environmental parameters. They outline specific actions that must be taken during construction and in some cases into the operational phase to mitigate Project effects. Many of the management plans include monitoring to determine success of the actions taken and to determine other actions that need to be undertaken (adaptive management). Implementation of these plans will involve Manitoba Hydro`s staff, the KCNs, specialized consultants and contractors under the direction of the Resident Manager.

The Environmental Monitoring Plans are designed to measure the actual effects of the Project, test predictions or identify unanticipated effects. During the course for the environmental assessment, various requirements for monitoring were identified. There will be both western science monitoring and Aboriginal Traditional Knowledge (ATK) monitoring undertaken. The western science monitoring will be largely contracted by Manitoba Hydro to specialized consultants, who will in turn hire members of the KCNs to work with them to fulfil the monitoring activities. Manitoba Hydro will also have contracts with each of the KCNs to undertake ATK monitoring of the project.

The activities that occur and the results generated from the Environmental Protection Program will be discussed at MAC meetings. The MAC is an advisory committee to the Partnership Board of Directors and will review outcomes of the programs and if, appropriate, may provide advice and recommendations to the Partnership on additional or alternative mitigation measures that may be required. MAC will provide a forum for ensuring collaboration among all partners. On behalf of the Partnership, the MAC will also ensure that the outcomes of the Environmental Protection Program are communicated more broadly on an annual basis to members of the KCNs, regulators and the general public.

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1.0 INTRODUCTION

This document outlines the efforts that will be undertaken by the Keeyask Hydropower Limited Partnership (the Partnership), a legal partnership entity established by Manitoba Hydro and its four First Nation partners, the Keeyask Cree Nations (KCNs): Tataskweyak Cree Nation; War Lake First Nation; Fox Lake Cree Nation and York Factory First Nation to protect the environment and mitigate environmental effects during the construction of the generating station portion of the Keeyask Generation Project (Project). Manitoba Hydro will serve as Project Manager for the Project and will implement the environmental protection plan on behalf of the Partnership.

1.1 MANITOBA HYDRO COMMITMENT TO ENVIRONMENTAL PROTECTION

Manitoba Hydro is committed to protecting natural environments and heritage resources affected by its projects and facilities. This commitment and a commitment to continually improve environmental performance is demonstrated through the company's Environmental Management System, which is ISO 14001 certified.

Environmental protection can only be achieved with the full engagement of Manitoba Hydro employees, consultants and contractors at all stages of a project from planning and design through construction and into operation.

As stated in the Corporate Environmental Management Policy:

"Manitoba Hydro is committed to protecting the environment by:

- preventing or minimizing any adverse impacts, on the environment and enhancing positive impacts
- continually improving our Environmental Management System
- meeting or surpassing regulatory, contractual and voluntary requirements
- considering the interests and utilizing the knowledge of our customers, employees, communities, and stakeholders who may be affected by our actions
- reviewing our environmental objectives and targets annually to ensure improvement in our environmental performance
- documenting and reporting our activities and environmental performance"

Manitoba Hydro's environmental management policy has been used to guide the development of the environmental protection plan for the Project. Implementation of the plan is a practical application of the policy and will demonstrate Manitoba Hydro's dedication to environmental stewardship.

1.2 KEYYASK CREE NATIONS WORLDVIEW AND VALUES

The Keeyask Cree Nations have lived sustainably in the lower Nelson River region for thousands of years. Past hydroelectric projects have affected their communities, and they are determined to restore harmony and balance with *Askiy* and to enhance their culture and traditions.

The following consensus respecting how the *Ininewak* (the Cree people) live and what is true about *Askiy* (the living earth and all within and upon it) has been developed among and articulated by the Elders and leadership of the KCNs.

Ininewak Askiy Kasikannowapachikatek (How the Ininewak Live and What is True About Askiy)

We are four Cree Nations: Tataskweyak Cree Nation, War Lake First Nation, York Factory First Nation and Fox Lake Cree Nation. We do not speak for others.

The following statements are not a complete description of who we are, how we live and what is true to us, and there are differences between and amongst our communities and our individual members. However, we share the following statements regarding who we are, how we live and what is true to us. These statements provide important guidance for the Keeyask Generation Project.

We, the *Ininewak*¹, were placed here on *Askiy* by *Manitou*. We are part of *Askiy*. We are sustained by *Askiy*. We care for *Askiy*. Our language, *Kitayamowin*, is fundamental to who we are, how we live and what is true about *Askiy*. It is important that our language is maintained. We highly value our families, communities, and Nations, and these make up who we are as *Ininewak*.

Askiy is the word used by the *Ininewak* for the whole of the land, water (*nipi*), animals (*aweassisak*), plants including medicines (*muskikeya*), people (*Ininewak*), all other creatures and the interrelatedness of all things. All things are alive, have spirit and come from *Askiy*. *Askiy* and all things come from something greater than us – *Manitou*. Our culture, spirituality and history are part of *Askiy*. *Kakenaw kakona ota aski nikanatenteman* – everyone and everything on *Askiy* is sacred to us.

Niwákomákanak (My Relations)², all things are related; all things are equal. We are all relations. Our relationships with *Askiy* are important to our culture, identity, spirituality and history. Our relationships are based upon *aspénimowin* (trust) and *kisténitamowin* (respect) for every part of *Askiy*. *Ininewak kistentamok kakenow kakona ota aski* – We highly respect everything that is part of *Askiy*.

Mino-pimatisiwin means living a good and honourable life. *Mino-pimatisiwin* includes many things such as being a good person, respecting *Askiy*, harvesting and consuming healthy *Ininew* foods, and following

¹ Some Members of our communities also refer to who we are as the *Muskego Ininuwak* and the *Nehenow Ininiwak*.

² There are different ways of speaking about relationships in *Nehenow ayamowin*. Other Cree terms include *wakohtinwin* (kinship), *kiwákomákananak* (our relations) and *wakoméwéwin* (relationship).

our values. *Kanawécikéwin* – we care for *Askiy* for the *Ininewak* today and future generations. We pray and give thanks for everything that *Askiy* provides. *Ohcinéwin* – if a person harms or abuses anything that is part of *Askiy*, there will be consequences for oneself and even one’s family members. Because this is such a powerful thing, we need to be careful and respect even the use of this word. *Pastamowin* – if a person slanders another person, there will be consequences for oneself and even one’s family members. When we act in a harmful or disrespectful way, we must acknowledge the harm we have created and make sincere attempts to put things right and strive for *é-tipápéskopanik* (balance) and *minonénimowin* (harmony).

To set things right we use rituals and ceremonies. *Matinakéwin* - we share with others. We, the *Ininewak*, maintain our *kiskinohamakaywina* (teachings) and *aniska achimowin* (traditions) by living them (*pimatisiwin*) and teaching them to our youth and future generations.

This is what we know to be true and important. This is how we should conduct ourselves while we are alive.

Consistent with their Cree worldview the KCNs established the following Principles for Respect for the Land to be followed in the construction and operation of the Project, and had these principles embedded in the Joint Keeyask Development Agreement (JKDA).

Principles Regarding Respect for the Land:

- Adopting measures that increase, to the extent ecologically reasonable, the abundance of species and/or growing conditions for species that have special social or economic importance for the **Keeyask Cree Nations**.
- Employing strategies that “go with” rather than “go against” nature, as they have a much higher probability of success.
- Planting species and promoting site conditions that are widespread in the sub-region in which the **Keeyask Generation Project** is located, rather than planting species and promoting site conditions that may be popular in more southern areas.
- Being respectful of the **Keeyask Cree Nations’** traditional relationships with the land.

1.3 OVERVIEW OF ENVIRONMENTAL PROTECTION PLAN

The Keeyask Hydropower Limited Partnership has developed this Environmental Protection Plan (EnvPP) as part of an overall Environmental Protection Program associated with the Project. Besides the EnvPPs, the Program includes various management and monitoring plans, as well as Aboriginal Traditional Knowledge (ATK) monitoring programs. The implementation of this EnvPP is an important means to achieving effective environmental protection and minimizing the environmental effects associated with this Project.

Environmental protection plans provide environmental protection measures that supplement project design, construction and operating specifications to prevent or minimize potential adverse environmental

effects arising from the construction and operation of the project. They are designed for use as reference documents by field construction and operating personnel. Environmental protection plans prescribe practical measures to meet regulatory requirements for environmental protection specific to the project. This EnvPP is organized by construction activity to assist construction personnel in implementing appropriate measures specific to the work site.

It is expected that all people working on the Project, at the construction project site, will be familiar with the contents of this EnvPP. This EnvPP will be thoroughly reviewed with contractors at post contract award pre job meetings and copies will be made available for relevant members of the contractor's staff.

1.4 ENVIRONMENTAL PROTECTION PLAN ROLES AND RESPONSIBILITIES

Manitoba Hydro will serve as Project Manager for the Project and will implement the EnvPP on behalf of the Partnership.

The Resident Manager or delegate will be the senior management authority on-site for the construction of the Project. The Site Environmental Officer will report to the Resident Manager or delegate. The Resident Manager or delegate and the Site Environmental Officer will have the responsibility and first-line authority to confirm that all environmental protection measures are implemented and followed and that the Project is in compliance with environmental regulatory requirements.

The following outlines the environmental roles and responsibilities of personnel during the construction phase of this Project.

1.4.1 Resident Manager (On-Site)

- Confirms that all project activities are in place and conducted in accordance with the EnvPP and other Project related permits, authorizations, licences, approvals, regulations and guidelines.
- Confirms that both Manitoba Hydro personnel and all contractors are aware of the contents of the EnvPP, Heritage Resources Protection Plan and other authorizations, licences, approvals, regulations and guidelines.
- Solicits feedback from and supports the Site Environmental Officer.
- Reviews reports prepared by the Site Environmental Officer.
- Supervises the Site Environmental Officer in environmental compliance monitoring to confirm that the terms of all permits, authorizations, licences and the EnvPP are followed.
- Receives information from the MAC process and implements additional mitigation measures, as appropriate.
- Authorizes the issuing of stop work orders, change orders, etc. with contractor.
- Determines action or response to incidents or non-compliance situations.

- Confirms that construction activities cease at a particular location if heritage resources (or human remains) are discovered, and contacts the Project Archaeologist.
- Conducts a post-construction inspection of the Project area with the regional Natural Resources Officer (Manitoba Conservation and Water Stewardship) to confirm compliance with the Manitoba *Environment Act* licence and identifies any deficiencies to be addressed.
- Conducts a final inspection of any rehabilitated sites with the Site Environmental Officer, contractor and the regional Natural Resources Officer (Manitoba Conservation and Water Stewardship).

1.4.2 Site Environmental Officer(s)

- Conducts environmental compliance monitoring to confirm that the terms of the EnvPP and other project related permits, authorizations, licences, approvals, regulations and guidelines are followed.
- Participates in orientation of environmental requirements to the contractor(s), their staff and Manitoba Hydro personnel.
- Works with the contractor to confirm regulatory compliance and implementation of the EnvPP.
- Applies for the Project work permit with support from the Environmental Licensing and Protection Department and consults with Environmental Licensing and Protection if changes are required.
- Obtains any other required permits or approvals from Manitoba Conservation and Water Stewardship.
- Conducts daily construction-site inspections and maintains a record of all activities.
- Documents any construction-site issues or mitigation measures required to address unanticipated effects.
- Reports environmental incidents immediately to the Resident Manager or delegate.
- Submits and reviews inspection reports with the Resident Manager or delegate.
- Provides direction to the Wastewater Treatment Plant Operator with respect to regulatory compliance.
- Liaises with local Manitoba Conservation and Water Stewardship personnel.
- Confirms that construction activities cease at a particular location if heritage resources (or human remains) are discovered and contacts the Resident Manager or delegate.
- Prepares reports on EnvPP compliance for regulators.
- Attends the MAC meeting to relay information pertaining to the EnvPP.
- Conducts a final inspection of any rehabilitated sites with the Resident Manager or delegate, contractor and the regional Natural Resources Officer (Manitoba Conservation and Water Stewardship).

1.4.3 Environmental Licensing and Protection Department

- Provides primary off-site support for all aspects of the EnvPP and regulatory permits, authorizations, licences, approvals, regulations and guidelines.
- Conducts, after contract award, pre-job meetings to review requirements identified in the EnvPP, permits, authorizations, licences, approvals, regulations and guidelines. Develops inspection and reporting systems and methods.
- Provides information to on-site Manitoba Hydro personnel and contractors of requirements laid out in the EnvPP, permits, authorizations, licences, approvals, regulations and guidelines.
- Assists the Site Environmental Officer with any complex environmental protection issues.
- Liaises with regulatory authorities.
- Prepares and manages Project environmental monitoring plans.
- Reports on Project environmental monitoring plans.
- Reviews reports prepared by the Site Environmental Officer.

1.4.4 Project Archaeologist

- Obtains heritage permits as may be required by The Heritage Resources Act.
- Reports to the Resident Manager or delegate on heritage issues.
- Provides training and advice to the Resident Manager or delegate and Site Environmental Officer on steps required to appropriately manage any heritage resource discoveries.
- Travels, as required, to the construction-site to manage heritage resource discoveries.

1.4.5 Manitoba Hydro Area Spill Response Coordinator (Fulfilled by Site Environmental Officer)

- Coordinates response for any hazardous material spill.

1.4.6 Manitoba Hydro Personnel

- Reports any heritage resources (or human remains) discoveries to their line management.
- Follows all regulations and guidelines set out in the EnvPP and work permits.
- Reports any violations of regulations to their line management.
- Exercises due diligence in carrying out project activities.

1.4.7 Contractor

- Conducts work in accordance with the EnvPP and Project-related permits, authorizations, licences, approvals, regulations and guidelines.
- Obtains any other required permits or approvals related to construction.
- Maintains detailed records of inventories, wastes, incidents, alterations, accidents, equipment maintenance and any public complaints.
- Provides an emergency response plan for their work areas.
- Cleans up spills and collects soil samples while being monitored by Manitoba Hydro.
- Stores and collects all hazardous wastes.
- Notifies (immediately) the Site Environmental Officer in the event of a hazardous material spill/release.
- Reports any heritage resources (or human remains) discoveries to the Resident Manager or delegate.
- Removes equipment, investigates and rehabilitates any areas of potential contamination from Project construction activities during decommissioning of their work areas.
- Conducts a final inspection of any rehabilitated sites with the Resident Manager or delegate, Site Environmental Officer and the regional Natural Resources Officer (Manitoba Conservation and Water Stewardship).
- Conducts additional site rehabilitation to Manitoba Hydro's satisfaction.

1.4.8 Natural Resource Officer (Manitoba Conservation and Water Stewardship)

- Issues work permits and establish special conditions for the duration of construction activities.
- Responds and provides advice, where appropriate, on wildlife issues, the removal of beaver dams, access trail and staging areas, buffer zone or any other resource issues.
- Conducts compliance inspections.
- Completes Work Permit Inspection Reports and follows up on actions of non-compliance.
- Conducts post-construction-site inspections.

1.4.9 Environment Officer (Manitoba Conservation and Water Stewardship)

- Issues permits for on-site wastewater management systems (holding tanks).
- Responds to, and is consulted about site cleanup in the event of a spill.
- Conducts compliance inspections.
- Completes reports and follows up on actions of non-compliance.
- Conducts a post-construction-site rehabilitation inspection.

1.4.10 Keeyask Cree Nations

- Observe and learn about construction activities and environmental mitigation measures being implemented while on-site during ATK monitoring activities.
- Attend Monitoring Advisory Committee (MAC) meetings to obtain information on Environmental Protection Plan compliance.
- Provide feedback at the meeting to be discussed among all MAC members.

1.5 ENVIRONMENTAL PROTECTION PLAN IMPLEMENTATION

Manitoba Hydro, acting as the Project Manager, has committed to the Keeyask Hydropower Limited Partnership to be ultimately responsible for safeguarding the environment affected by the Project. Manitoba Hydro's on-site Resident Manager or delegate will be responsible for the implementation of this EnvPP and for facilitating that all requirements within it are met. Any shortcomings and additional mitigation measures identified through MAC will be addressed. Manitoba Hydro's supervisory and inspection personnel will be familiar with the EnvPP, permits, authorizations, licences, approvals, regulations, guidelines, local environmental sensitivities and environmental protection requirements of this Project.

The EnvPP will be included in tender documents and will become a contractual obligation. Following the award of a contract, pre-job meetings will be conducted to reaffirm the contractor's personnel, their roles and responsibilities, etc. concerning environmental protection during Project construction activities. Construction personnel will be familiar with incident reporting and emergency response plans. Copies of this EnvPP will be made available to applicable members of the contractor's staff. All construction staff will be required to exercise due diligence in carrying out their work activities.

Questions regarding the implementation of the EnvPP will be directed to the Resident Manager or delegate. Where there is a discrepancy, all regulatory permits, authorizations, licences and approvals supersede the EnvPP. This EnvPP will be a regular agenda item at progress meetings for the Project.

1.6 MONITORING AND FOLLOW-UP

The Environmental Protection Program includes extensive monitoring and reporting throughout construction and into the operation phase.

The Site Environmental Officer will be responsible for compliance monitoring on-site to confirm that environmental authorizations, licence, permits and the EnvPP are followed for all construction activities. If additional in-field mitigation measures that address unanticipated effects are implemented they will be documented as part of the monitoring process. Non-compliance issues will be reviewed with the MAC.

If problem areas and/or deficiencies are identified, site specific follow-up actions will be developed and carried out. These areas will be monitored after corrective measures have been taken to confirm that deficiencies have been satisfactorily addressed.

1.7 REPORTING AND COMMUNICATION

The Site Environment Officer, will record monitoring activities on a daily, weekly and monthly basis. Reporting templates for the Site Environmental Officer can be found in **Appendix A - Site Environmental Officer Report Templates**. (*Drafter's note: to be provided at a later date*).

Manitoba Hydro will prepare a report annually on the compliance monitoring undertaken in connection with the construction of the Project on behalf of the Partnership and it will be submitted to Manitoba Conservation and Water Stewardship.

Full cooperation will be given to representatives of government environmental authorities conducting compliance inspections and to Manitoba Conservation and Water Stewardship staff with interests in protecting the environment from the effects of construction activities. Following construction and rehabilitation activities, a post-construction inspection will occur and a post-construction inspection report prepared. The inspection will be carried out by the Resident Manager or delegate, along with the Environment Officer (Manitoba Conservation and Water Stewardship) and Regional Natural Resources Officer (Manitoba Conservation and Water Stewardship). This inspection will confirm compliance with the *Environment Act* Licence for the Project and associated work permits.

Environmental compliance monitoring activities and results will be reported at the Partnership's Monitoring Advisory Committee meetings. Issues and concerns will be discussed and recommendations to address these issues will be tabled.

Open houses will be held with the KCNs to shared environmental protection plan compliance results with the community. The compliance monitoring results will also be summarized in a monitoring overview document that summarizes all monitoring activities for the construction project.

2.0 PROJECT DESCRIPTION

A comprehensive description of the Keeyask Generation Project (the Project) is located in the *Response to the Environmental Impact Statement (EIS) Section 4.0* and the *Project Description Supporting Volume* submitted to regulators. The Construction Phase Project Footprint, as it is described in these documents, is illustrated in a series of maps (**Appendix B - Map Alignment Sheets** (*Drafter's note: sample map included; complete set to be provided at a later date*)). The following section is a summary of the project components and activities associated with constructing the Keeyask Generating Station.

2.1 LOCATION

The Project will be located on provincial Crown land approximately 180 kilometres northeast of Thompson, 60 kilometres northeast of Split Lake, and 30 kilometres west of Gillam. The Project will be located entirely within the Split Lake Resource Management Area.

2.2 PROJECT COMPONENTS

The Project is comprised of principal structures, which are permanent, and supporting infrastructure, some of which is required only for construction and some of which will be permanent. The project comprises of the principal structures:

- Powerhouse complex;
- Intake and tailrace channels;
- Spillway;
- Approach and discharge channels;
- North, central and south dams;
- Wing walls and transition structures;
- North and south dykes; and a
- Reservoir.

Supporting infrastructure consists of temporary facilities required only to construct the principal structures and permanent facilities required to construct and operate the Project. Temporary infrastructure consists of:

- Roads and causeways;
- Borrow sources;
- Work areas;

- Safety and security facilities;
- Communication tower;
- Explosives magazine;
- Concrete batch plant
- Cofferdams;
- Rock groins;
- Access trails;
- Boat launches;
- Barge landings; and,
- Safety booms.

Permanent infrastructure consists of:

- Borrow sources;
- Placement areas for excavated material;
- Communications towers;
- Portions of some cofferdams and groins;
- A transmission tower spur;
- Barge landings;
- Boat launches;
- Portage; and,
- Safety and security facilities during construction and operation phases.

2.3 CONSTRUCTION ACTIVITIES

A comprehensive description of the construction activities of the Keeyask Generation Project (the Project) is located in the *Response to the Environmental Impact Statement (EIS) Section 4.0* and the *Project Description Supporting Volume* submitted to regulators. The following is a brief summary of the main construction activities:

- Development of the camp and work areas (including the concrete batch plant);
- Site preparation (clearing and grubbing);
- Construction of temporary roads and rockfill causeways to borrow areas;

- Construction of trails, boat launches and barge landings;
- Installation of security and safety facilities for the construction phase;
- Development of borrow areas and excavated material placement areas;
- Construction of Stage I river diversion cofferdams and groins;
- Excavation for dykes and dams;
- Construction of dykes and dams;
- Excavation for powerhouse complex, spillway and channels;
- Construction of powerhouse complex and spillway;
- Construction of Stage II river diversion cofferdams and groins;
- Removal of cofferdams;
- Installation of superstructure steel and gates;
- Installation of spillway and powerhouse cranes;
- Installation of turbines and generators;
- Installation of all remaining mechanical and electrical components;
- Reservoir clearing;
- Reservoir impoundment;
- Commissioning of the seven units;
- Installation of security and safety facilities for the operation phase;
- Installation of waterways public safety measures; and
- Clean up, decommissioning and rehabilitation of the site.

3.0 REGULATORY REQUIREMENTS

All relevant regulatory approvals will be obtained prior to constructing the Project. An *Environment Act* Licence for the Keeyask Generation Project will be procured prior to the commencement of construction activities. All terms and conditions in the licence will be adhered to. All documentation will be kept on-site by both the contractor and Manitoba Hydro personnel. All Project licences, approvals and permits obtained at time of printing can be found in **Appendix C - Project Licenses, Approvals and Permit**. (*Drafter's Note: to be added at a later date*).

Protection of fish and fish habitat is a requirement of the federal *Fisheries Act*. Unless otherwise authorized under the *Fisheries Act*, in-water work or activities that may affect fish spawning/incubation or fish habitat will be restricted each construction year. In-water work will be conducted in accordance with the Department of Fisheries and Oceans Canada (DFO) requirements. If applicable, a *Fisheries Act* Authorization will be obtained for each stream crossing prior to construction.

Construction will be scheduled to minimize clearing activity during sensitive breeding periods for birds, for each construction year.

A heritage resource impact assessment was undertaken specifically for the Keeyask Generation Project and a Heritage Resources Protection Plan has been prepared. If any new heritage resource (of any size) is found prior to or during construction, the location will be flagged and work activities at the site halted until the Project Archaeologist has examined the artefacts, recorded pertinent data and determined their heritage significance as per *The Heritage Resources Act*. In the event that human remains are exposed during construction, all activity will cease at that location and the Project Archaeologist will be contacted so that the procedures outlined in the *Province of Manitoba's Policy Concerning the Reporting, Exhumation and Reburial of Found Human Remains* (1987) can be implemented.

Prior to the start of construction, all applicable transportation and work permits, agreements and authorizations will be obtained, as required, from Manitoba Conservation and Water Stewardship and Manitoba Infrastructure and Transportation. Site specific regulatory requirements for this Project will be listed in the Manitoba Conservation and Water Stewardship work permit(s).

A post-construction field inspection will occur with Manitoba Conservation and Water Stewardship to confirm that all work has been completed to their satisfaction.

4.0 CONTRACTOR DEVELOPED ENVIRONMENTAL PLANS

4.1 EMERGENCY RESPONSE PLAN

Prior to construction, the contractor will prepare a Project-specific Emergency Response Plan including prevention planning and response for both hazardous material spills and fires. The plan will be reviewed and accepted by the Resident Manager or delegate.

The contractor is responsible for all spills in their work areas. All spills will be reported to the Resident Manager or delegate and regulators as required. The contractor will appoint a Spill Response Coordinator for their work areas. Site clean-up and disposal of contaminated material will be managed as stated in the Emergency Response Plan in consultation with the Site Environmental Officer and the Resident Manager or delegate.

The contractor will confirm that proper fire fighting practices are established and that adequate firefighting equipment is installed and maintained in all buildings, vehicles and work areas under their ownership. Project emergency response/evacuation procedures will be adhered to in case of forest fires.

4.2 WASTE MANAGEMENT PLAN

The contractor will develop, in conjunction with Manitoba Hydro and at the approval of the Site Environmental Officer or Resident Manager, a solid waste reduction, re-use and recycling plan that will reduce solid waste and recover recyclable material from site waste streams. Plans for food services, office, and construction recycling must be included.

Examples of materials that may be recovered include, but are not limited to:

- aluminum;
- paper and cardboard;
- plastic; and
- wire, piping and scrap metal.

Inventories of all solid waste exiting the site for final disposal must be kept. Confirmation of final destination must be recorded on inventory sheets, along with the date and amounts. These records must be provided to the Resident Manager or delegate on a monthly basis.

Solid waste will be disposed of as per *Environment Act* Licence #XX. (*Drafter's Note: to be added at a later date*), which can be found in **Appendix C - Project Licenses, Approvals and Permit**. (*Drafter's Note: to be added at a later date*). An agreement must be in place with the local municipal authority to accept the specified solid waste. Residual construction waste must be disposed of at a facility approved under an

operating permit issued pursuant to the Waste Disposal Grounds Regulation, 150/91, or an *Environment Act* Licence issued pursuant to *The Environment Act*.

Hazardous materials, fuel containers and other materials will be removed from the site and managed according to *The Dangerous Goods Handling and Transportation Act*. These materials shall not be placed in municipal waste disposal sites.

During the Project, all equipment, solid and construction waste(s) will be removed and disposed of in accordance with Manitoba Conservation and Water Stewardship regulations.

5.0 ENVIRONMENTAL PROTECTION MEASURES

5.1 MAP ALIGNMENT SHEETS

The Construction Phase Project Footprint, as it is described in the *Response to the Environmental Impact Statement (EIS) Section 4.0* and the *Project Description Supporting Volume* submitted to regulators, is illustrated in a series of maps (**Appendix B - Map Alignment Sheets** (*Drafter's note: sample map included; complete set to be provided at a later date*)). This is to provide visual guidance to personnel working on the project. The total area illustrated by the various colours/project components shows the extent of the Construction Phase Project Footprint.

The maps will be reviewed before work begins in an area.

Green Zone – Disturbed Areas

Green areas on the maps show the maximum extent of areas anticipated to be disturbed during construction. All areas requiring hand clearing are identified within the Green Zone (*Drafter's note: sample map does not show hand clearing areas but final version will*). Aside from the areas to be hand-cleared and following the applicable environmental protection measures listed in this plan, there are no special considerations for working throughout the Green Zone.

Yellow Zone – Potentially Disturbed Areas

Yellow areas are those that could potentially be disturbed for some reason once the project begins, should some unanticipated requirement preclude completing the work in the Green Zone. Proposed work in the Yellow Zone will be reviewed by the Resident Manager in consultation with the Environmental Licensing and Protection Department. If practicable, approval to work in the Yellow Zone will be granted by the Resident Manager.

Other than the environmental protection measures listed in this plan, there are no special considerations for working in the Yellow Zone.

Red Zone – Environmentally Sensitive Sites

The red areas shown on the maps coincide with potentially disturbed areas (Yellow Zone) but require special arrangements/precautions/protection measure be taken to avoid disruption of the component(s) that make them environmentally sensitive. **Section 5.2** describes specifics related to working in the Red Zone.

5.2 ENVIRONMENTALLY SENSITIVE SITES (RED ZONE)

- Environmentally sensitive sites have been identified in red (Red Zone) on a series of annotated maps, which can be found in **Appendix B - Map Alignment Sheets** (*Drafter's note: sample map included; complete set to be provided at a later date*).
- Work will not take place in the Red Zone without permission from the Site Environmental Officer, who will first obtain specific environmental protection measures to be applied at the requested site from the Environmental Licensing and Protection Department.
- Environmentally sensitive sites will be flagged in the field to confirm that construction crews are able to distinguish boundaries and locations. These areas will be flagged by the Site Environmental Officer in consultation with the Environmental Licensing and Protection Department.
- The Contractor will not disturb marked/flagged environmentally sensitive sites.
- If markers or marked areas are unclear, construction will halt and the Site Environmental Officer will be consulted to provide clarification before construction continues.

5.3 SCHEDULING

Project activities will be scheduled, where practicable, to avoid sensitive periods as outlined in Table 5-1. Scheduled activities that will conflict with Table 5-1 will be discussed with the Environmental Licensing and Protection Department to prevent noncompliance with licences and authorizations.

Table 5-1: Construction Scheduling

Activity	Details
In-water work	<ul style="list-style-type: none"> · All in-water work or construction activities that may affect watercourse/bodies, fish mobility or habitat are restricted between May 15 and July 15 (Lake Sturgeon spawning) and September 16 to May 15 (Lake Whitefish spawning). · During these periods no in-water work (below the ordinary high water mark) is to occur, unless prior authorization is received from the Department of Fisheries and Oceans Canada.
Clearing	<ul style="list-style-type: none"> · Clearing will avoid the sensitive breeding period for birds.
Burning	<ul style="list-style-type: none"> · Burning is not permitted between April 1 - November 15 unless a burning permit is obtained from Manitoba Conservation and Water Stewardship.
Blasting	<ul style="list-style-type: none"> · Blasting will be minimized to the extent practicable between May 15 and June 30 to reduce the effects on calving, female caribou and their young.

5.4 FISH, WILDLIFE AND TERRESTRIAL HABITAT PROTECTION

- Wildlife that affects, or has the potential to affect, worker health and safety will be reported immediately to the Site Environmental Officer, who will then contact the local Natural Resources Officer (Manitoba Conservation and Water Stewardship) and Regional Wildlife Manager (Manitoba Conservation and Water Stewardship).
- Trees containing large nests of sticks (potential raptor nests) and areas where active animal dens are encountered will be left undisturbed, where practicable. Presence of nests and active dens will be reported to the Site Environmental Officer, who will report the information to the regional Natural Resources Officer (Manitoba Conservation and Water Stewardship) and the Environmental Licensing and Protection Department.
- Bald eagle nests, removed as a result of reservoir clearing or at risk of eroding into the reservoir after flooding, will be replaced by artificial nesting platforms located in suitable areas along the new reservoir shoreline. The location will be decided in conjunction with the Northeast Region Wildlife Manager.
- Stick nests (other than bald eagles) requiring removal will be reported to the Northeast Region Wildlife Manager (Manitoba Conservation and Water Stewardship). Upon review, the regional Wildlife Manager will advise whether the stick nest should be reconstructed near the original location or if the nest can be destroyed.
- Where practicable, 100 metre buffers will be established around active gray wolf and black bear dens within the Construction Phase Project Footprint to minimize the disturbance of animals during sensitive periods.
- Caribou calving islands greater than 0.5 hectares in the reservoir area will be marked and left undisturbed from clearing activities. (These will remain above the water after flooding.)
- Beaver baffles will be used where culverts and control structures are repeatedly blocked due to beaver dam construction.
- Beaver and muskrat will be trapped from the reservoir area prior to and during reservoir clearing and periodically after, until the reservoir is impounded to full supply level (159 masl).
- The contractor will notify the Site Environmental Officer if beaver dams need to be removed. Beaver dams will be removed following the Department of Fisheries and Oceans (DFO) Operational Statement for Manitoba, Beaver Dam Removal, included in **Appendix D - DFO Operational Statements** (*Drafter's Note: to be added at a later date*). The appropriate notification form will be submitted by the Site Environmental Officer to DFO ten days prior to beaver dam removal.
- To reduce the possibility of vehicle and wildlife collisions, posted speed limits will not be exceeded.

- Wildlife crossing signs will be posted along the access road in areas of high-quality caribou habitat and travel corridors and are to be respected.
- All vehicle collisions with wildlife will be reported to the Site Environmental Officer, who will report it to the local Natural Resources Officer (Manitoba Conservation and Water Stewardship) and regional Wildlife Manager (Manitoba Conservation and Water Stewardship). Road kill will be disposed of as soon as practicable.
- Staff working on-site will attend wildlife awareness training.
- No person on-site will feed or harass wildlife. Failure to comply could lead to dismissal from the Project.
- The Access Management Plan for the Project will be followed.
- The hunting or harvesting of wildlife by Project staff will not be allowed on-site (this includes access trails). Signs prohibiting these activities will be posted as necessary.
- Where construction activity occurs near open watercourses, silt fences will be installed to limit soil erosion into waterbodies.
- 100m vegetated buffers will be retained wherever practicable around lakes located adjacent to infrastructure sites as identified on **Appendix B - Map Alignment Sheets** to minimize noise-related disturbances and the loss of upland nesting habitat for mallards, geese and rusty blackbirds. *(Drafter's Note: infrastructure site and 100m vegetated buffer are not shown on the sample map sheet, but will be shown on the final maps.)*
- A fish salvage will be conducted in areas where they could become isolated, prior to and during dewatering, to minimize the number of stranded fish.

5.5 HERITAGE RESOURCES

- A Heritage Resources Protection Plan has been written for the Project and will be implemented.
- All Project employees will be aware of the potential for heritage resources to be discovered during clearing and construction. Orientation for Project staff working in the construction area will include heritage resource awareness training so they know who to contact if a heritage resource is discovered.

5.6 EQUIPMENT

- All equipment will remain within the Green Zone of the Construction Phase Project Footprint shown in **Appendix B - Map Alignment Sheets** *(Drafter's note: sample map included; complete set to be provided at a later date)*, unless otherwise approved by the Environmental Site Officer.
- Vehicle idling will be minimized, where practicable.

- Equipment will be operated at and within load tolerances, be regularly maintained and be in good working order to reduce noise and vibration emissions.
- Every off-road vehicle, including ATVs and 4-wheel drive trucks used for off-roading purposes, will be equipped with a working spark arrester that will be in operation while the engine is running to prevent the possibility of a fire hazard to the terrain.
- An emergency spill kit will be kept on-site at all times in case of fluid spills.
- Machinery, vehicles and equipment will arrive on-site in a clean condition, in good working order and maintained as such and be free of fluid leaks.
- All machinery, vehicles and equipment will be stored 100 metres away from any watercourse/body. Where not practicable, machinery, vehicles and equipment, will be stored in a fashion that prevents fluid leaks from entering any watercourse/body. They will not be stored at the top or on the side of steep slopes, adjacent to water.
- All machinery, vehicles and equipment working within 100 metres of any watercourse/body will be visually checked for fluid leaks prior to work commencing and spills will be reported to the Resident Manager or delegate.
- Any parts of equipment entering the water to place/remove material will be cleaned of existing dust/clay/sand/soil, etc. prior to work commencing.
- Maintenance activities will take place in contained areas on impermeable surfaces. These surfaces will be surrounded by berms to contain spills.
- Drip pans will be placed under machinery, vehicles and equipment during maintenance.
- All machinery, vehicle and equipment washing will take place at a site approved by Manitoba Hydro. Wash water will be contained and treated before release.
- Contractors' with equipment, machinery and vehicles that were recently used more than 150 kilometres from the Project site will be washed prior to transport to the Project site to aid in the prevention and spread of invasive plant species. Contractors will be educated about the importance of cleaning their vehicles, equipment and footwear before travelling to the area.
- Maintenance, washing and refuelling of machinery, vehicles and equipment in borrow areas and quarries are not permitted.

5.7 HAZARDOUS MATERIALS AND PETROLEUM PRODUCTS

5.7.1 Transportation and Inventory Control

- All hazardous materials including petroleum products will be transported, including transfer between storage areas and work sites, according to *The Dangerous Goods Handling and Transportation Act*.

- The contractor will establish a documented inspection process for all hazardous materials and petroleum products.
- Transportation of Dangerous Goods labels will be present and legible on all hazardous material and petroleum product containers.
- Containers will be correctly labelled to disclose contents, according to *The Transportation of Dangerous Goods Regulation, SOR/2008-34*.
- Hazardous material and petroleum product containers will be inspected daily for leaks.
- Product inventory and inspection sheets will be recorded daily and retained for Manitoba Hydro and regulatory authorities (as required).
- A material inventory covered by Workplace Hazardous Materials Information Systems will be maintained on-site.

5.7.2 Storage

- All chemicals, fuels, and other harmful materials will be stored a minimum of 100 metres from a watercourse/body.
- Storage of hazardous materials will be limited to only the necessary quantities to conduct work.
- Site selection for hazardous materials and petroleum product storage must be approved by the Resident Manager, or delegate.
- Hazardous materials and petroleum products will be stored in full compliance with regulatory requirements within dedicated sites at staging areas.
- Storage and handling of all products will occur only within dedicated staging areas.
- Sites dedicated to hazardous material and petroleum product storage will provide the following features:
 - Bermed storage areas;
 - Clear identification of the materials present;
 - Restricted access to authorized personnel and vehicles only; and
 - Dedicated spill response equipment.
- If stored outside, all materials will be stored in weatherproof containers on appropriately sized spill containment pallets and under a weatherproof tarp.
- Storage areas will be protected from accidental vehicle collisions via concrete filled bollards or other methods approved by the Resident Manager or delegate.
- Warning signs will be posted in clearly visible locations near the storage facility.

5.7.3 Petroleum Products

- All portable petroleum storage containers (< 230 litres) will be located on spill trays in the construction area when not in use.
- Spill trays will remain impervious at very low temperatures (-45°C) and be maintained daily to remove accumulated precipitation when in use.
- All petroleum storage sites (> 230 litres) will incorporate secondary containment features (double-walled tanks, containment dikes, or concrete pads).
- Containment systems other than double walled tanks must be liquid proof and maintained to remove accumulated precipitation daily.
- Containment systems must have 110% capacity of the largest tank's volume.

5.7.4 Refuelling

- There will be no refuelling of machinery, vehicles and equipment within 100 metres of a watercourse/body. If 100 metres cannot be attained, machinery, vehicles and equipment will be refuelled in an approved fuelling area, in a contained manner, as approved by the Environmental Site Officer.
- Portable petroleum storage containers will be refuelled in a designated area.
- Fuel nozzles will not contain a filling lock flap.
- All portable petroleum storage containers must be removed from the back of the vehicle and placed on a spill pad or inside a berm for filling.
- No person shall transfer a petroleum product from a storage tank system to a tank vehicle or from a tank vehicle to storage tank system, without properly grounding the tank system.
- The transfer of petroleum products will be supervised at all times and in such a manner as to be able to immediately shut off the flow of the petroleum product during transfer.
- The grounding connection points will be free from corrosion, contamination and all pieces of equipment must be free from defects.
- All fuel dispensing systems will be secured and locked by authorized personnel when not in use.

5.7.5 Petroleum Product Tanks 5000 L (or greater)

- Tanks will consist of all above ground double-walled tanks.
- Tanks will be registered with Manitoba Conservation and Water Stewardship.
- Tanks will meet all standards and codes outlined in The Storage and Handling of Petroleum Products and Allied Products Manitoba Regulation, 188/2001.

- The contractor will provide all valid documentation to the Resident Manager or delegate for all tanks.
- Tanks will have a valid operating permit issued by Manitoba Conservation and Water Stewardship for that location.
- The installation or removal of petroleum product storage tank systems identified in *Manitoba Regulation, 188/2001* will only occur under the supervision of a registered licensed petroleum technician.

5.8 HAZARDOUS WASTE DISPOSAL

- The contractor is responsible for the proper disposal of hazardous materials waste products.
- All used oil products (including empty containers and filters) and other hazardous wastes will be collected and disposed of in approved storage containers.
- All used oils and hazardous wastes will be removed from the site for recycling or disposal at a licensed facility.
- An inventory of materials shipped for recycling and/or disposal must be maintained, as well as a record of receipt of materials from the licensed facility.

5.9 NON-HAZARDOUS WASTE MANAGEMENT AND RECYCLING

- Littering is prohibited. This includes solid waste tobacco products - this is a fire hazard.
- The entrance to each building will have a proper receptacle for the disposal of tobacco products.
- Work area(s) will be kept neat and tidy at all times.
- All solid waste (including construction waste) will be collected for proper disposal.
- Solid waste containing food wastes will be collected on a regular basis to prevent wildlife attraction to work area(s).
- Animal (bear)-proof bins will be used to contain food waste until it is disposed.
- On-site burning of waste will be limited to scrap wood and paper products; burning other types of waste is not permitted.
- Construction waste will be separated and sorted for reuse or recycling.
- Waste will be disposed of at a facility approved under an operating permit issued pursuant to *The Waste Disposal Grounds Manitoba Regulation 150/91* or a Manitoba *Environment Act* Licence.

5.10 DRAINAGE

- Natural drainage will be maintained and drainage channels will be kept free of slash and debris and blockages will be avoided, where practicable, to prevent erosion and ponding.
- Openings will be left between piles of cleared debris to allow for drainage.
- Stockpiled materials will not impede natural drainage.
- Drainage activities will not be intentionally directed to watercourses/bodies.
- If drainage is directed into dense vegetation the area will be monitored to confirm the receiving environment is not eroded.
- If it is imperative that an area must be used as a drainage route even though it is susceptible to erosion, proper erosion and sediment control measures will be put in place to prevent site degradation.

5.11 EROSION AND SEDIMENT CONTROL

- Prior to construction activities, as soon as it is feasible, ESC measures will be put into place.
- All ESC measures will remain in place and be maintained throughout construction.
- Measures will be implemented around construction areas that are within 50 m of any off-system marsh that is outside of the Construction Phase Project Footprint.
- All ESC measures will be maintained in proper working condition during all phases of the Project. In addition, the following will be adhered to by the contractor:
 - Wherever practicable, clearing will be minimized to reduce the exposure of bare ground;
 - Construction will be designed and executed to prevent the release or settling of any sediment outside of construction boundaries;
 - In steeply sloped areas susceptible to erosion, runoff will be directed away from disturbed areas to prevent further site degradation;
 - Disturbed areas will be stabilized, vegetated and/or seeded as soon as practicable following construction;
 - Accumulated sediment will be removed from silt fences, check dams, straw bales, etc. as required, to confirm proper function;
 - ESC measures will be maintained until either natural vegetation or permanent measures are established to prevent further erosion or sediment loss; and

- Additional measures will be implemented, if required, to protect permafrost areas from extreme runoff events during periods of heavy precipitation or melt.
- All temporary and permanent ESC measures will be inspected regularly by the Site Environmental Officer for effectiveness. Shortcomings will be rectified to restore their proper function.
- Routine maintenance (at least once per week) of sediment (silt) fencing, check dams and erosion control blankets, etc. will be completed to confirm proper function.
- All ESC measures (structures and procedures), either temporary and/or permanent, will be maintained in proper working condition for the duration of the Project.
- Changes to the construction schedule may be required to maintain ESC measures.
- Completed work areas will be graded and permanently stabilized.
- ESC measures will be left in place until at least 50% vegetative cover is established in the seeded area.
- Stockpiled material will be located at least 100 metres from any watercourse/body or wetland, where practicable and will be surrounded by a berm if it contains a high fines content.
- Borrow areas and excavated material placement areas located within 50 m of high quality wetlands will be fortified with erosion and sediment control measures to prevent damage to those features.

5.12 CLEARING

- Clearing will follow **Table 5-1**.
- Clearing in the reservoir will follow the Keeyask Hydropower Limited Partnership Reservoir Clearing Plan.
- Hand clearing in the reservoir will take place in areas identified on **Appendix B - Map Alignment Sheets** (*Drafter's Note: specifically relates to the reservoir and will be added to maps at a later date*) during the winter period to protect key habitat areas. Trees and shrubs will be cleared about 15 to 30 cm from the ground. The stumps and other forest floor debris will remain on the ground.
- Clearing will be limited to the Green Zones of the Construction Phase Project Footprint shown in **Appendix B - Map Alignment Sheets** (*Drafter's note: sample map included; complete set to be provided at a later date*) and as per **Section 5.1**.
- Vegetation will be removed by mechanical means in the Green Zone, except where illustrated on **Appendix B - Map Alignment Sheets** (*Drafter's note: sample map included; complete set to be provided at a later date*). These areas will be hand cleared (*Drafter's note: sample map does not show hand clearing areas but final version will*).
- In all cases, clearing will be kept to the minimum area required to carry out construction. Areas within the Green Zone that are not required for construction activities should not be cleared.

- Environmentally sensitive sites (Red Zone) bordering on disturbed areas (Green Zone) within the Construction Phase Project Footprint will be clearly marked with flagging tape by the Site Environmental Officer, prior to clearing taking place adjacent to these areas. Environmentally sensitive sites are shown in **Appendix B - Map Alignment Sheets** (*Drafter's note: sample map included; complete set to be provided at a later date*).
- A 100 metre vegetated buffer will be maintained adjacent to lakes, streams, marsh and riparian areas, wherever practicable.
- No chemical vegetation control will be utilized during construction clearing.
- At locations where in-water construction will occur, a 30 metre buffer of low vegetation from the ordinary high water mark will be left adjacent to the watercourse until immediately preceding construction at that location.
- Existing trails, roads or cut lines will be used wherever practicable to avoid disturbance to riparian vegetation.
- Trees will not be felled into watercourses and solid waste and/or slash will not be allowed to enter a watercourse/body.
- Trees will be felled towards the cleared area to avoid damage to standing trees.
- Any trees located outside the designated clearing area that overhang the construction area will be identified and felled by hand. These trees (known as danger trees) present a risk to human safety.
- Slash will not be stockpiled within 100 metres of watercourses/bodies.
- Solid waste or slash will not be pushed within six metres of standing trees.
- A timber salvage will be undertaken to the extent practicable.
- The majority of the remaining timber/slash will be burned. Anything left will be stockpiled and mulched for erosion control, where required. Any remaining stockpiles designated for mulch will be burned at the end of the Project.

5.12.1 Burning Cleared Materials and Fire Prevention

The timelines and approval processes provided in Table 5-2 will be adhered to regarding the burning of debris piles.

Table 5-2: Burning Restrictions

Timeline	Permit Required	Other Required Action
April 1 - November 15	Yes	Written notification must be given to Manitoba Conservation and Water Stewardship Office
November 16 - March 31*	No	Advise Natural Resources Officer in advance

*Note: Extinguish all fires by March 31
Immediately inform Manitoba Conservation and Water Stewardship if not extinguished before March 31

- A slash free firebreak zone at a minimum of six metres wide or greater will be maintained between the right of way (ROW) being cleared and standing timber.
- Mixing soil in with the materials to be burned will be avoided.
- Burn piles will be located a minimum of 30 metres from the ordinary high water mark of any watercourse/body.
- A 15 metre (minimum) fire break will be created in slash windrows every 100 metres, or alternately, the placement of windrows will be varied from side to side along the ROW.
- To prevent damage to standing trees, burning will take place within the cleared ROW at least 15 metres from standing trees.
- Firefighting equipment will be kept in working condition and at the Project site during clearing and construction operations and in accordance with work permit conditions for the Project.
- All occurrences of fire spreading beyond a slash pile will be reported to the Resident Manager or delegate immediately, who will report them to the Manitoba Hydro Corporate Fire Marshal, at (204) 360-4177.
- As much as practicable, any unburned material remaining post-burn will be piled and removed or spread out for erosion control.

5.13 GRUBBING

- Grubbing will not occur within six metres of standing timber to prevent damage to the root system and to reduce the occurrence of blow down.
- The contractor will stabilize (grade, seed, etc.) construction-sites requiring extensive grubbing as soon as practicable to minimize erosion.

- Windrows of grubbed material to be burned will be piled at a minimum of 15 metres from standing timber.
- Work will be halted during heavy rains, if practicable, when grubbing in areas of finely textured soils (clays, silts, fine sands, etc.).
- Grubbing will not occur along shorelines, except at access locations or areas required to construct project structures. In these instances, grubbing will take place immediately before the work is scheduled to begin.

5.14 STRIPPING AND GRADING

- Where there is sufficient depth of materials, stripping will take place in two phases:
 - Removal of organics; and
 - Removal of inorganics.
- Organic material, topsoil and overburden will be stripped and piled separately and will be used for future site rehabilitation.
- All stockpiles will be stabilized; measures include biodegradable mats or tarps. If they are to be stored for extended periods, they will be vegetated to minimize nutrient loss, erosion of fines and structure change.
- Compaction and disturbance of the vegetation and organic cover which insulates permafrost will be minimized.
- Grading activities will halt during heavy rains, where/when practicable, to reduce the potential for erosion.
- Soils will be graded away from all watercourses/bodies at all times and never towards them.
- Grading at watercourse/body access locations for Project structures will be timed to occur immediately before construction begins.

5.15 TEMPORARY ACCESS ROADS/TRAILS

- Existing and planned ROWs will be used as much as practicable during construction and the need for additional access trails will be carefully reviewed before proceeding.
- The Resident Manager or delegate will consult Environmental Licensing and Protection and the local Natural Resources Officer (Manitoba Conservation and Water Stewardship) regarding the routing of all access trail locations, including rock outcrop by-passes, prior to establishment. (A Crown Lands permit may be required.)

- Except for existing resource-use trails (see Access Management Plan), Project-related cutlines and trails will be blocked where they intersect with the Construction Phase Project Footprint, and the portions of these features within 100 m of the Construction Phase Project Footprint will be revegetated to minimize the risk of invasive plant, accidental fire and other access-related effects.
- 1. Only water or calcium chloride will be used to control dust. Oil or petroleum products will not be used.
- 2. Calcium chloride will not be applied:
 - During periods of rain;
 - If rain is expected within 12 hours of application; and
 - If the area to be sprayed is already saturated.
- 3. If water is taken from fish bearing water for dust control, the intake will be fitted with a fish screen that meets the Department of Fisheries and Oceans *Freshwater Intake End-of-Pipe Fish Screen Guideline*.

5.16 STAGING AREAS (FOR EQUIPMENT, VEHICLES AND MACHINERY)

- All staging areas will be located at least 100 metres from any watercourse/body.
- Staging areas will be sited (where practicable) on soils with a high weight bearing capacity and low permeability.
- Equipment servicing will only be permitted in specified areas. Drip pans will be placed under machinery, vehicles and equipment during maintenance.
- Spill containment equipment must be available at all refuelling and service areas within the staging area.
- All machinery, vehicle and equipment washing will take place in a contained area within the staging area. Wash water will be either pumped into the settling pond(s), directed away from watercourses/bodies through dense vegetation or through filter cloths/bags and/or velocity dispersion devices.

5.17 UTILITIES

5.17.1 Potable Water

- Potable water produced at the water treatment plant will be metered, recorded and reported to the Site Environmental Officer.
- Potable water treatment will comply with *The Drinking Water Safety Act* and its regulations.

- Drinking water holding tanks will be designed for potable water containment.
- Drinking water holding tanks will be cleaned and disinfected before use.
- The water treatment plant will provide potable water that meets *The Guidelines for Canadian Drinking Water Quality*.
- Potable water used to fill the drinking water holding tanks will be in compliance with *The Guidelines for Canadian Drinking Water Quality*.
- Water Sample(s) and Sampling will be:
 - Collected and submitted for analysis every two weeks;
 - Taken from the water holding tank and two different faucets at the end of the distribution piping;
 - Put on ice and submitted within 24 hours to a laboratory;
 - Tested for total coliform, *Escherichia coli* and free chlorine levels; and
 - Conducted until the camp or work area is decommissioned.
- Potable water will be conserved by personnel at the site.
- Leaking fixtures will be repaired in a timely manner.

5.17.2 Wastewater

- Wastewater will not be directly released to a water body unless it has been treated to meet applicable provincial and federal effluent licences, authorizations and guidelines.
- Wastewater will be removed from holding tanks when they are no more than 90% full by a registered sewage hauler and disposed of at a wastewater treatment facility licensed under *The Environment Act*.
- Wastewater holding tanks installed will:
 - Be registered with Manitoba Conservation and Water Stewardship and installed by a certified installer;
 - Be watertight with a minimum capacity of 4500 L;
 - If prefabricated, conform to Canadian Standards Association Standard B66-00, Prefabricated Septic Tanks and Sewage Holding Tanks and bear a valid stamp or mark indicating certification by the Association;
 - Be constructed of concrete, fibreglass, polyethylene or other approved material.
 - Be installed in accordance with the manufacturer's recommendation;
 - Be protected from damage by equipment and vehicles by installing barricades;

- Be protected from freezing. If the tank is located above ground and in a heated building, a temperature alarm is required for winter operation;
- Be anchored in place when located in areas with a high water table;
- Be above the one hundred (100)-year flood mark;
- Be equipped with liquid level monitor and alarms;
- Have a covered, watertight, perpendicular access shaft that extends above the ground surface; and
- Have a locked access prevention cover.
- Levels in all wastewater holding tanks used will be inspected and reported to the Site Environmental Officer on a weekly basis to prevent overflowing.

5.18 DRILLING

- All sediment laden drill water will be treated before release.
- Only non-toxic drilling additives and muds will be used.
- Any artesian flow (water bubbling out of a hole) will be plugged and permanently sealed immediately after drilling.
- Fluids will be contained at the drill hole locations to allow sediment to settle.

5.19 BLASTING

- Blasting will be done by qualified blasters licensed in Manitoba for such activity.
- The contractor will submit blasting plans to the Resident Manager for approval prior to the commencement of blasting operations.
- Explosives will be stored, transported and handled in accordance with regulations in *The Workplace Safety and Health Act* and *The Explosives Act*. (Refer to Manitoba Hydro's Safety Publication (0016/05) Transportation, Storage and Handling of Explosives).
- Drillhole sites will be clearly marked with flagging tape and tape will be removed upon completion of the blasting. Signage will be posted to warn personnel of safety hazards.
- Affected parties (including site personnel) will be notified prior to each blasting event in accordance with the blasting plan.
- Blasting, to the extent practicable, will be scheduled outside of the period from May 15 to June 30, to reduce the effects on calving, female caribou and their young.

5.19.1 Blasting in and/or near Fish Bearing Waters

- The Guidelines for the Use of Explosives In or Near Canadian Fisheries Waters will be adhered to.
- Ammonium nitrate fuel oil will not be used in or near a watercourse/body.
- After loading a charge in a hole, the hole will be back-filled with angular gravel to the level of the substrate/water interface or the hole collapsed to confine the force of the explosion to the formation being fractured.
- The angular gravel will have a particle size of approximately one-twelfth (1/12th) the diameter of the borehole.
- All "shock-tubes" and detonation wires will be recovered and removed after each blast.
- No explosive will be detonated in or near fish habitat that produces, or is likely to produce, an instantaneous pressure change (i.e., overpressure) greater than 100 kPa (14.5 psi) in the swimbladder of a fish.
- No explosive will be detonated that produces, or is likely to produce, a peak particle velocity greater than 13 mm•s⁻¹ in a spawning bed during the period of egg incubation.
- Mitigation measures to reduce blasting effects will be used wherever *The Guidelines for the Use of Explosives in or near Canadian Fisheries Waters* (DFO, 1998) cannot be achieved.
- Blasting will take place in the dry as much as practicable.

5.20 BORROW AREAS AND/OR QUARRIES

- It is Manitoba Hydro's responsibility to obtain a permit for borrow areas and/or a permit or lease for quarries and to follow all conditions of those documents.
- The number of borrow areas and/or quarries developed will be minimized as much as practicable.
- Borrow areas and/or quarries will be located as close to existing access as practicable.
- No quarry will be established closer than 150 metres from a Provincial Trunk Highway or Provincial Road unless there is an established vegetated berm or tree screen sufficient to shield the quarry from view of the road.
- Construction, solid and food waste will not be discarded into borrow areas and/or quarries.
- Maintenance, washing and refuelling of machinery, vehicles and equipment will not be permitted in borrow areas and/or quarries.
- Open burning will not be permitted in any borrow areas and/or quarries.

5.21 EXCAVATION

- All temporary shoring, bracing, sheeting, pumping, roads/bridges will be removed after excavation activities are complete.
- 1. Excavated material will be separated by size/type and stockpiles will be spaced appropriately to allow for drainage.
- 2. Excavated material comprised of many fines will be placed in a contained area (i.e. with a surrounding berm) to prevent it from entering watercourses/bodies during precipitation events. Collected runoff from bermed areas will be sent to settling ponds.
- 3. The side slopes of piles will be set to minimize washout and erosion.
- 4. Material will be piled to a maximum height of three meters.
 - Where temporary pumping may be required to empty water (seepage or surface runoff) from an excavated area, water will be tested for total suspended solids (TSS) by the Site Environmental Officer prior to release. If the TSS concentration is < 25 mg/L, the water can be released directly to the Nelson River. If the water does not meet this criterion, it will be treated prior to release.
- 5. Excavated material remaining in the reservoir will be placed in such a way that it will not erode.

5.22 AGGREGATE PROCESSING

- Aggregate stockpile areas and transfer points will be enclosed and/or shielded to reduce dust generation, where practicable.
- Aggregate stockpiles will be wetted to control dust, if practicable.
- Conveyors will be enclosed, if practicable.
- Transfer points for raw materials will be minimized.
- Drop heights for conveyor or hoppers will be minimized to reduce dust emissions.
- Where aggregates are washed, the wash water will be directed to settling ponds for treatment.
- Crushing operations and associated pits will be left in a safe condition free from overhanging banks.

5.23 CONSTRUCTION NEAR AND IN WATER (COFFERDAMS, DYKES, CAUSEWAYS, ETC.)

- The schedule for in-water work will follow **Table 5-1**.
- During construction, the use of heavy equipment in and near watercourse/bodies will be restricted to limits prescribed in regulatory permits and authorizations.
- Measures to protect against erosion, siltation and hydrological alteration will be implemented in disturbed areas that are within 50 m of any off-system marsh identified in **Appendix B - Map Alignment Sheets** (*Drafter's note: sample map included; complete set to be provided at a later date*).
- Where required, clearing below the ordinary high water mark on steep or potentially unstable slopes will be conducted by hand.
- Disturbed banks will be restored, where practicable.
- A 30 metre buffer of vegetation from the ordinary high water mark will be left in place until immediately preceding placing rock in water.
- Granular (and larger) material used will consist of screened, blast rock or boulders with low fines content.
- Impervious fill will be placed in tranquil water.
- A fish salvage will be conducted in areas where they could become isolated, prior to and during dewatering, to minimize the number of stranded fish.
- Impounded water will be tested for TSS by the Site Environmental Officer before release. If the TSS concentration is < 25 mg/L, the water can be released directly to the Nelson River. If the water does not meet these criteria, it will be treated prior to release.
- Excavated materials will be removed to the extent practicable from within the dewatered area before removing the cofferdam.
- Removal of the cofferdam will be done "in the dry" as much as practicable to mitigate suspension and transport of sediment.
- Prior to removal of cofferdams, the water levels inside and outside of the isolated area will be equalized, where appropriate, to mitigate suspension and transport of sediment in the river.
- The inner rockfill groin of cofferdams will be removed as much as practicable using the outer groin for protection from the bulk of the flow, which will minimize mobilization of fine material into the river.
- Excavation in the wet will be conducted in tranquil waters, as much as practicable.

- The installation of headwalls or rock will be carried out at the earliest possible time following culvert installation (causeway) in order to prevent erosion and sedimentation.
- The Site Environmental Officer will inspect the culverts (causeway) each spring and fall during the project for debris/blockage, alignment and structural changes to determine if fish passage may be affected.

5.23.1 Winter Stream Crossings

- Snow fills and ice bridges will be constructed in accordance with the construction guidelines listed in the Department of Fisheries and Oceans Operational Statement (2010) for Manitoba, Ice Bridges and Snow Fills which can be found in **Appendix D - DFO Operational Statements**. (*Drafter's Note: to be added at a later date*).
- Snow fills at stream crossing will be constructed using clean snow only (i.e. free of dirt and debris) and only when there are sufficient depths available to protect the banks. Construction will begin (where applicable):
 - After the stream has frozen to the bottom;
 - After the stream has ceased to flow; and/or
 - Once there is enough ice over the stream to prevent snow loading from damming any free water beneath the ice.
- Care will be taken to not scrape dirt and debris into the snow fill during its construction.
- All snow fill material will be removed as soon as the work is complete, and prior to the spring melt. It will be placed above the ordinary high water mark to minimize sedimentation and erosion. Care will be taken to not disturb the streambed or banks.
- A "V" shaped notch will be placed at the centre of any ice bridges prior to the start of the spring thaw.

5.24 CONCRETE

- If practicable, the concrete batch plant will be sited in an area with minimum exposure to prevailing winds.
- The batch plant and associated activities, including material stockpiles and truck washing, will not be situated within 100 metres of a watercourse/body.
- A wheel wash will be installed at the entrance of the plant area, if practicable.
- Liquid concrete will not be dumped on the ground, or allowed to enter a watercourse/body.
- The concrete batch plant water intake will be screened according to the Department of Fisheries and Oceans *Freshwater Intake End-of-Pipe Fish Screen Guideline*.

- Water use will be metered, recorded and reported weekly during periods of heavy use to the Site Environmental Officer.
- Water will be conserved as much as practicable.
- Storage, mixing and placing of concrete and grouting will be undertaken in the contractor work area or within the cofferdam, or at least 100 metres from the Nelson River or tributary streams. Measures will be taken to prevent concrete or construction debris from entering any watercourses/bodies.
- Water from cutting green concrete and wash water will be confined within the cofferdam and pumped to the settling ponds.

5.25 SETTLING PONDS

- All water originating from concrete activities and any other sediment laden water, where the TSS > 25 mg/L, will be directed to adequately sized multi-cell settling pond(s) and not directly to the environment.
- The multi-cell settling pond will be constructed with a barrier to prevent contained wastewater from percolating into the ground.
- The settling pond cells will be properly designed, which could include (but not be limited to) installing baffles and/or filters, such that the final effluent is < 25 mg/L TSS.
- The final effluent will be monitored on a weekly basis to verify the settling ponds are in good working order.
- Sludge will be periodically removed from the settling pond and disposed of at an appropriate location where fines will not enter a watercourse/body.

5.26 SPILLWAY AND GENERATING STATION COMMISSIONING

- Commissioning of the spillway gates and turbines will follow the mitigation prescribed in the *Sediment Management Plan* to reduce sediment impacts downstream.

5.27 DECOMMISSIONING AND REHABILITATION

- Construction areas that are not required for GS operations will be decommissioned and rehabilitated, where practicable. This includes borrow areas and quarries not required for operation of the station or access roads constructed for the Project.
- A full decommissioning and rehabilitation plan will be developed for review and approval by regulators prior to the end of construction. The plan will take into consideration the KCNs and

provincial interests regarding the level of decommissioning, potential future use for the site(s) and revegetation.

- With respect to borrow pits and quarries, closure plans will be forwarded to Manitoba Innovation, Energy and Mines and Manitoba Conservation and Water Stewardship, as required.
- Decommissioning and rehabilitation will occur as soon as practical.
- Decommissioning and rehabilitation activities will be completed under the review of the Natural Resource Officer (Manitoba Conservation and Water Stewardship). A joint inspection will take place at the end of the work, to confirm it meets the Province's standards.
- With respect to decommissioning, it will include (but is not limited to):
 - Removal of equipment, fuel, chemicals, etc;
 - Removal of all project structures, including roads, buildings, underground tanks, stockpiles and other features not required for site operation;
 - Blocking trails built for construction;
 - Collection and disposal of any remaining wastes, recyclables and hazardous materials;
 - Removal and disposal of survey tapes, stakes, and other markers;
 - Removal and disposal of temporary erosion and sediment control devices if they are no longer required;
 - Cleaning up areas of contaminated soils/sediment;
 - Closure of the landfill (if one is required);
 - Capping drinking water wells;
 - Removal and recycling of fire hydrants and above ground water mains/forcemain;
 - Cutting off buried watermains, forcemains and effluent discharge pipes, if not used for long-term operation, below the surface and sealing;
 - Removal of the mechanical sewage treatment facility and holding/septic tanks;
 - Closing borrow areas and/or quarries not required for GS operations.
- With respect to rehabilitation, it may include:
 - Leaving borrow area walls at a maximum slope of 4:1 (horizontal:vertical) for erosion and sediment control purposes, unless otherwise written in the provincial permit;
 - Landscaping borrow areas and/or quarries, where practicable, and depending on the planned future use for the site and the size of the excavation, to promote drainage and revegetation;
 - Spreading organic material/seeding/planting tree seedlings in other appropriate areas;

- Site preparation, if necessary, to re-establish vegetation. These activities may consist of scarification, grading and/or contouring (to stabilize slopes) and fertilizing;
- Spreading organic material, topsoil and subsoil that was stripped and piled separately from areas required for construction over decommissioned areas;
- Placing barricades at access points to rehabilitated areas to promote rehabilitation success;
- Areas that require seeding to assist rehabilitation and to prevent erosion will be seeded with a mixture that only contains native and/ or non-invasive introduced plant species (i.e. will not contain sweet clover or other invasive species). The seed will also be of low quality food value for mammals.
- Seed mixes selected for revegetation efforts will be approved by Manitoba Hydro prior to use;
- Maintaining erosion and sediment control devices until at least 50% vegetative cover is established in the seeded area;
- Inspecting rehabilitated areas annually for at least five years to confirm revegetation success; and
- Improving and replanting rehabilitated areas where vegetation planted covers less than 50% of the area seeded after 5 years.

6.0 APPENDIX A - SITE ENVIRONMENTAL OFFICER REPORT TEMPLATES

7.0 APPENDIX B - MAP ALIGNMENT SHEETS

8.0 APPENDIX C - PROJECT LICENSES, APPROVALS AND PERMITS

9.0 APPENDIX D - DFO OPERATIONAL STATEMENTS