

Lake Manitoba and Lake St. Martin Outlet Channels
Project Environmental Requirements

Table of Contents

1.0	Overview and Guiding Principles	1
1.1	Project Environmental Requirements Overview	2
1.2	Construction Environmental Management Plans	2
1.3	Pre-Construction Activities (Submittals)	3
1.4	Environmental Approvals and Authorizations	3
1.5	Record Keeping	4
1.6	Compliance Inspections and Enforcement	4
1.7	Staff Training and Awareness	5
2.0	Project Environmental Requirements	6
2.1	Designated Areas and Access	7
2.2	Clearing, Grubbing and Brush Disposal	9
2.3	Erosion and Sediment Control	11
2.4	Working Within or Near Water	12
2.5	Machinery, Fuel Storage, Materials Handling and Storage, Spill Response and Remediation	20
2.6	Dust Suppression	27
2.7	Concrete and Asphalt	28
2.8	Noise and Noise Limitations	29
2.9	Wildlife	30
2.10	Wildfires	32
2.11	Heritage Resources	33
2.12	Quarries and Borrow	34
2.13	Site Decommissioning	36
2.14	Revegetation and Vegetation Maintenance	37
2.15	Planned and Unplanned Shutdowns	38
3.0	Glossary – Definitions and Terms	39

1.0 Overview and Guiding Principles

1.1 Project Environmental Requirements Overview

The Lake Manitoba and Lake St. Martin Outlet Channels Project Environmental Requirements (PER) outlined in this document are specific to work and activities conducted under the authority of any and all licences, permits, authorizations or approvals obtained for the Permanent Outlet Channels (POC or the Project) formally known as Lake Manitoba and Lake St. Martin Outlet Channels. Requirements listed herein are not mutually exclusive of one another and must be adhered to for all activities pertaining to **construction, post-construction, maintenance** and **decommissioning** activities for the POC Project.

The PER represent requirements and commitments that are fundamental to Manitoba Infrastructure's (MI) regulatory compliance as well as Project approvals, permits, licences and authorizations. MI personnel or representatives, at their discretion, may inspect work sites to ensure and verify that any and all requirements are adhered to. Failure to comply with PERs, Project approvals, permits, licences and authorizations may result in stop work orders, improvement orders, contract termination, financial penalties and/or suspension or termination of approvals, permits, licences and authorizations to conduct the work.

The PERs are considered incidental to all Project-related works or activities and will not be measured for payment unless indicated otherwise by **the Engineer**.

1.1.1 Review and Updates

MI will review and update the PER's every 3 years from the date of issuance of the Project's Manitoba Environment Act Licence to ensure that requirements reflect best practices, and comply with changing regulation and legislation. PER updates may occur more frequently in circumstances where legislative changes occur in advance of the PER review schedule.

Upon award of a contract the contractor must ensure they have the most current version of the PER's.

1.2 Construction Environmental Management Plans

Environmental protection and regulatory compliance during construction will be ensured through the use of a *Construction Environmental Management Plan (CEMP)*. The CEMP shall be prepared by the contractor and provided at the tendering stage or it may be specified as a required Submittal in the contract Special Provisions. In either case, the Contractor(s) will adhere to the plan as a condition of the contract.

MI will make available a *Guideline for the Preparation of Construction Environmental Management Plans* as well as a compendium of Best Management Practices (BMPs) to assist in the preparation and ensure consistency of CEMPs.

1.3 Pre-Construction Activities (Submittals)

The Contractor shall submit the following for review and acceptance by **the Engineer** no less than 14 business days in advance of the start of work:

- .1 Environmental Emergency Plan for Spill Response and Remediation;
- .2 Material Safety Data Sheets;
- .3 A Water Quality and Fish Protection Plan including but not limited to:
 - Construction Phase Erosion and Sediment Control measures;
 - In-water works;
 - Water quality monitoring;
 - Isolation plan;
 - Fish salvage; and,
 - Mussel salvage.
- .4 Monthly reports providing the records as specified in section 1.5;
- .5 Waste Management Plan;
- .6 Material Management Plan in the event of an Unplanned Shutdown;
- .7 Problem Wildlife Management Plan;
- .8 Cement Washout Plan;
- .9 Petroleum Storage and Equipment Fuelling and Servicing Plan;
- .10 Evacuation and Emergency Preparedness Plan in the Event of a Wildfire;
- .11 Copies of all required approvals, clearances, permits, licences, and certificates issued to the contractor, or their sub-contractors, including but not limited to:
 - Batch Plant Environment Act Licence;
 - Fish collection permits;
 - Septic permits; and,
 - Crown Lands Well permit.
- .12 Other submittals as required.

1.4 Environmental Approvals and Authorizations

The Project is being constructed, operated and maintained under authorization from the Canadian Environmental Assessment Agency (CEAA), and under Licence issued by Manitoba under the *Environment Act*. Additional permits, licences, approvals or authorizations may apply to single or multiple Project components.

No work or activity is to begin without having obtained applicable permits or authorizations for the work. **The Contractor** shall adhere to conditions specified in any and all permits, authorizations, licences, approvals and letters of advice or directive issued for the work. Where **MI** applies for permits, authorizations, licences, approvals and letters of advice or directive to any regulatory body to facilitate **the Contractor's** work plan, there shall be no award for damages, delay claims or other costs by **the Contractor** on MI as a result of delays in issuance or rejections of applications.

1.5 Record Keeping

The Contractor shall maintain a record file at the site in which all relevant information relating to materials handling, spills, leaks, releases, and the implementation and adjustment of the environmental protection measures is documented. **The Contractor** shall maintain a copy of these records for a minimum of 5 years after contract closeout. Relevant information and/or significant events are to be documented and provided to **the Engineer** in a timely fashion. Records may include, but are not limited to:

- .1 all accidents, spills, leaks, and releases and the reporting and clean-up procedures used;
- .2 any reviews, improvements and adjustments to the environmental protection measures;
- .3 details of all environmental training sessions, including the schedule of these sessions and the names of participants;
- .4 a full inventory of dangerous goods brought onto the site;
- .5 a full inventory of all hazardous wastes encountered on the site;
- .6 records of all waste hauled from the site for disposal, including the location, name and description of the disposal facility and waybills/manifests;
- .7 records of all material hauled from the site for recycling, including the location, name and description of the person or facility the material was delivered to;
- .8 records of all fuel transported and stored at the site;
- .9 records of equipment inspections and maintenance;
- .10 records of all public complaints;
- .11 records of actions taken to remove deleterious substances and debris from waterbodies;
- .12 records of annual use of pesticides; and,
- .13 wildlife encounters and/or management measures employed.

As a general requirement, all work shall be photo-documented and notification of the work will be provided to the MI on a monthly basis for record keeping purposes. All construction shall be governed by the *Standard Construction Specification*, *Special Provisions* and the *Project Environmental Requirements* set out in the contract.

1.6 Compliance Inspections and Enforcement

The PER represent requirements and commitments that are fundamental to regulatory compliance as well as Project approvals, permits, licences and authorizations. Manitoba Infrastructure (**MI**) personnel or representatives, at their discretion, may inspect work sites to ensure and verify that any and all requirements are adhered to. Failure to comply with PERs, Project approvals, permits, licences and authorizations may result in stop work orders, improvement orders, contract termination, financial

penalties and/or suspension or termination of approvals, permits, licences and authorizations to conduct the work.

In addition to any penalties or orders issued by **MI**, **the Contractor** will accept all liability and responsibility for issues of non compliance and for any penalties issued by federal or provincial regulators. **The Contractor** is responsible for ensuring compliance with all applicable contract specifications, environmental legislation and regulation, Project approvals, permits, licences and/or authorizations.

1.7 Staff Training and Awareness

The Contractor shall provide mandatory training and awareness sessions for their entire workforce prior to the start of construction, and to new personnel before they begin work, to ensure all personnel working on the contract are aware of and understand the environmental provisions of the contract documents including relevant drawings, specifications and contractor submittals and updates. All training and orientation sessions shall be documented.

The Contractor shall submit the planned frequency and records of these meetings. **The Contractor** shall maintain access to all environmental provisions of the contract documents including relevant drawings, specifications and Contractor submittals and updates, in a location and manner accessible to all employees, subcontractors, and agents

2.0 Project Environmental Requirements

2.1 Designated Areas and Access

Designated areas and proposed access shall be identified for approval by **the Engineer** prior to development and the start of work. Designated areas shall include, but are not necessarily limited to: camps, quarries, borrow, equipment maintenance, fuel and other material storage and other purposes as required. The development, maintenance and decommissioning of such sites shall be conducted in a manner which complies with all applicable legislation, regulations, permits, approvals, authorizations or licences.

2.1.1 General

- .1 **The Contractor** shall submit details for proposed **Designated Areas** for review and acceptance by **the Engineer** in accordance with general conditions and contract documents. Submittals shall include marked up drawings, and coordinates of the proposed **Designated Areas** including access, and shall provide sufficient detail to demonstrate full compliance with these specifications. **Designated Areas** requiring submittals include, but are not necessarily limited to:
 - a. laydown and staging area(s);
 - b. waste storage area(s);
 - c. fuel storage and refuelling area(s);
 - d. equipment servicing area(s);
 - e. work camp(s);
 - f. parking area(s);
 - g. cement batch plant(s);
 - h. cement washout area(s); and
 - i. others as required by **the Engineer**.
- .2 **The Contractor** shall construct and maintain **designated areas** for their intended purpose and in a manner which provides for inspection including the regular clearance of snow.
- .3 The **designated areas** shall be contained within the designated work limits unless otherwise authorized by **the Engineer**.
- .4 The topsoil in **designated areas** shall be stripped and stockpiled for later reuse in site restoration. Granular material or other surface preparation, as approved by **the Engineer**, shall be placed to ensure all weather accessibility.
- .5 Locations within **Designated Areas** where equipment, hazardous material and/or wastes will be stored or maintained shall be underlain with at least 30 cm of impermeable soil or approved equal and lined with an impermeable groundsheet to contain spills and minimize cleanup costs. Hazardous materials must also comply with the additional requirements outlined in section 2.5.
- .6 **Designated Areas** shall be located a minimum of 100 metres from **waterbody** or as approved by **the Engineer**
- .7 The Contractor shall restore the **Designated Areas** and access roads not required for on-going maintenance to their original condition.

- .8 There shall be no entry of personnel or equipment, or work conducted on private property without proper authority.

2.2 Clearing, Grubbing and Brush Disposal

Clearing and grubbing of vegetation includes the removal of vegetation (clearing) or root mass and organic material (grubbing) for site preparation or as part of specific works, but does not include mowing activities. Clearing and grubbing shall be conducted in accordance with contract documents, or as instructed by **the Engineer**.

2.2.1 General

- .1 Clearing shall not occur between April 1st and August 30th of any year unless otherwise authorized by **the Engineer** in order to avoid disturbance to nesting birds and other wildlife.
- .2 Clearing and grubbing shall be limited to the construction or contract limits unless otherwise approved by **the Engineer**.
- .3 Prior to clearing or grubbing, the work area shall be clearly staked or marked and approved by **the Engineer** so as to prevent over-clearing.
- .4 Existing roads, road allowances, trails, portages and other travel ways shall not be blocked or altered as a result of clearing and grubbing activities so as not to interfere with other users.
- .5 All grubbed organic and topsoil layers with leaf litter and root mass shall be stockpiled in appropriate locations and retained for reclamation efforts.
- .6 **The Contractor** shall take all precautions against damage to other trees, traffic structures, pole lines or property. **The Contractor** is liable for any damages occurring in the performance of this work.
- .7 Clearing, grubbing and burning operations shall be conducted in accordance with the applicable Provincial and Municipal regulations and Acts.

2.2.2 Clearing

- .1 Clearing within 30 meters of a **waterbody** shall be done by hand.
- .2 Unless otherwise authorized by **the Engineer**, all brush and trees, except those designated to be saved shall be cut level with the ground. All surface debris, excluding **merchantable timber** but including fallen timber, slash limbs, brush, grass and weeds shall be disposed of in an appropriate manner.
- .3 There shall be no bulldozing of trees or woody debris into standing timber.
- .4 Removal of riparian vegetation shall be kept to a minimum to help maintain the stability of waterbody banks. The area over which vegetation in riparian vegetation areas is removed shall affect no more than one third (1/3) of the total woody vegetation in the right-of-way within 30 meters of the **ordinary high-water mark** of a waterbody. Vegetative root masses found within the waterbody banks shall remain undisturbed unless specified in the Contract Documents.
- .5 Trees shall be felled towards the center of the area to be cleared. Any brush falling outside the area to be cleared shall be moved back into the work area immediately and disposed of.
- .6 Cleared trees and vegetation shall not obstruct waterways during any season, and shall be kept above the **ordinary high-water mark**. Stockpiles or windrows of any material are to be kept a minimum of 100 meters from any waterbody's **ordinary high-water mark**.

2.2.3 Grubbing

- .1 Grubbing shall not occur within 2 meters (2.5 yards) of standing timber in order to prevent damaging root systems of adjacent standing trees and to reduce the potential of future blow down.

2.2.4 Brush Disposal

- .1 Timber from which forest products can be manufactured (**merchantable timber**) shall be cleared of limbs and neatly stockpiled piled within the work limits as directed or permitted by **the Engineer**.
- .2 All stockpiled material located on Crown Land shall be removed or disposed of by April 30 following clearing activities.
- .3 Disposal of cleared trees and brush must be conducted in a manner approved by **the Engineer**. Disposal may involve burning, compacting, piling, burying, windrowing and compacting, limbing and chipping. Disposal methods may be restricted or prohibited in certain locations if they are deemed to result in future issues.
- .4 All cleared vegetation, grubbed material, and debris that is to be left in place shall be piled and compacted in windrows. Windrows shall be compacted to lie as close to the ground as possible (maximum height of 0.6 of a meter) and shall be no closer than 1 meter to the bush line. Windrows are required to have a 15 meter break every 100m in length.
- .5 Wood and brush piled for burning must be located at least 15m from other wood and brush piles or standing timber. If piles are windrowed for burning a 15m break in the windrow should occur for every 100m of length.
- .6 Slash shall be piled in a manner that allows for clean, efficient burning of all material. Avoid mixing soil into the slash
- .7 Where applicable, **The Contractor** shall obtain a burning permit for open fires between April 1 and November 15, and must adhere to all permit conditions. Burn permits may not be issued in dry conditions. Burning between November 16 and March 31 does not require a burning permit; however, the supervising officer shall be advised prior to any burning. All fires shall be completely extinguished by March 31.
- .8 All occurrences of fire spreading beyond burn piles shall be reported to **the Engineer** and Manitoba Sustainable Development.

2.3 Erosion and Sediment Control

Erosion and Sediment Control includes long-term, temporary or emergency stabilization of any and all soil types to prevent undesirable soil movement or soil releases and discharges to a waterbody. Erosion and Sediment Control may also include efforts to minimize substrate disturbance and sediment uplift or suspension during in-water work.

2.3.1 General

- .1 Vegetation cover within the work limits shall be preserved for as long as possible, or left undisturbed if it does not inhibit work. All vegetated areas that are to be preserved or left untouched shall be well staked and identified.
- .2 Effective erosion and sediment control measures shall be properly installed before starting any work to prevent undesirable soil movement or the entry of sediment into any waterbody or wetland.
- .3 The installation of erosion and sediment control measures shall be completed in accordance with the Contract Documents, or as approved by **the Engineer**. Final erosion protection measures shall be installed progressively during all phases of the project.
- .4 Erosion and sediment control measures shall be inspected and maintained by **the Contractor** on a daily basis, as well as during and after every major rain, runoff or spring melt event. Any necessary repairs and adjustments shall be made immediately to ensure that measures are effective in controlling erosion and sedimentation.
- .5 Erosion and sediment control measures shall be maintained in all disturbed sites until soils have stabilized and complete **revegetation** of all disturbed areas is achieved.
- .6 If Erosion Control Blanket (ECB) is used the product shall be 100% biodegradable, composed of natural fibers including netting, filling and thread.
- .7 Efforts shall be made to minimize the duration of soil exposure and run-off shall be diverted away from exposed soils.
- .8 Construction and maintenance activities shall be halted during heavy rains with the exception of those works pertaining to erosion and sediment control.
- .9 Spoil piles, overburden and topsoil shall not be placed within 100 meters of any waterbody's **ordinary high-water mark**. Spoil piles shall be positioned and maintained in a manner that prevents direct or indirect sediment releases into a waterbody.

2.4 Working Within or Near Water

In water work includes any and all activities occurring within the **ordinary high-water mark** of a waterbody. Requirements in this section apply to work in or near **fish-bearing** and non-fish bearing waterbodies, **fish passage**, **fish and mussel salvage**, dewatering, temporary diversions, temporary crossings and access pads, stream crossings (bridges and culverts), blasting near a waterbody, debris and sedimentation removal, and water quality monitoring.

2.4.1 General

- .1 **The Contractor** shall schedule, plan, and carry out works such that in-water work is kept to a minimum. Whenever possible, in-water work shall be staged to occur as a single event.
- .2 Disturbance to the stream bed and banks shall be minimized. Use existing trails, roads or cut lines to access the site where possible to avoid disturbance to riparian vegetation.
- .3 Construction activities shall not occur within 100 meters of a **waterbody** with the exception of construction of a **waterbody** crossing or other authorized in-water works, or unless directed by **the Engineer**.
 - .1 If a 100 meter distance is not possible, allow a buffer zone of undisturbed vegetation between the work and the waterway. Using a buffer zone width of approximately 10 meters plus 1.5 times the slope gradient or 30 m, whichever is greater.
- .4 There shall be no fueling, equipment maintenance, repair or washing within 100 meters of the **ordinary high-water mark**. Ensure runoff and water used for equipment cleaning does not enter any water body.
- .5 All construction activities shall be suspended during adverse weather conditions (i.e., heavy rains).
- .6 Soils shall be spread or graded in a direction away from the **waterbody** and never into the stream itself.
- .7 Flow shall not be constricted by more than one third of the original stream width.
- .8 Immediately after disturbance or upon completion of the work in or around waterbodies, waterbody banks, and riparian vegetation areas, the disturbed areas shall be restored to the original contour and gradient and cover treatment applied.
- .9 If an area cannot be restored to its original contour and gradient due to instability or other reasons, a stable gradient shall be constructed and cover treatment applied.
- .10 Machinery fording shall be limited to a one-time event (over and back) and shall occur only if an existing crossing at another location is not available or practical to use. Fording shall only be conducted in a manner approved by **the Engineer**.
- .11 If minor rutting is likely to occur, waterbody bank and bed protection methods (e.g., swamp mats or rig mats) shall be used provided they do not constrict flows, block fish passage or cause sediment release into the waterbody.
- .12 If rock is used to stabilize waterbody banks, it shall meet appropriate specifications, be clean and free of fine materials, and of sufficient size to resist displacement during peak flood events.

- .13 The waterbody banks shall be stabilized, restored to their original shape, adequately protected from erosion and re-vegetated with native species.
- .14 Any water intakes or outlet pipes in fish bearing waters shall have screens to prevent entrainment or impingement of fish and follow the measures as outlined in Fisheries and Oceans *Freshwater Intake End-of-Pipe Fish Screen Guideline*.

2.4.2 Authorizations and Approvals

- .1 Construction within 30 meters of a waterway requires authorization by Manitoba Sustainable Development except construction of waterbody crossing approaches.
- .2 Fisheries and Oceans Canada Authorization(s) may be required prior to the commencement of any in-water or near water work. **MI** shall obtain these permits as required. **The Contractor** is required to provide **MI** with all project specific information required for these submissions a minimum 90 calendar days prior to the undertaking of in-water and/or near water works, with the understanding that Fisheries and Oceans Canada may request additional information. **MI** shall not be responsible for delays associated with Fisheries and Oceans Canada Authorization(s). All conditions specified in Fisheries and Oceans Canada Authorizations, Letters of Advice and/or other Fisheries and Oceans Canada directives apply to the work.
- .3 Transport Canada (TC) Navigation Protection Approval(s) may be required for the construction of permanent or temporary waterbody crossings and/or other in-water structures. **MI** shall obtain these permits as required. **The Contractor** is required to provide **MI** with all project specific information required for these submissions a minimum 90 calendar days prior to the need to undertake the works with the understanding that TC may request additional information. **MI** shall not be responsible for delays associated with TC Navigation Protection Approval(s). All conditions specified in TC Navigation Protection Approval(s) and other directives apply to the work.
- .4 For all temporary work and construction activities required for in-water works **MI** will apply for required authorizations, permits, and approvals. **The Contractor** must supply detailed schedules and work plans to facilitate these applications and cooperate with additional information requests from regulatory bodies. It may take up to 90 or more business days to process applicable authorizations, permits required. The contractor is bound by all conditions specified in regulatory directives applicable to the work. **MI** shall not be held responsible for any delays related to approvals.

2.4.3 Timing of Work

- .1 In-water work shall be restricted to low flow periods and shall be scheduled during a period when the waterbody is seasonally dry or frozen to the bottom whenever possible.
- .2 South of 53rd parallel, **the Contractor** shall not undertake any in-water activities in **fish bearing** waters or potentially fish bearing waters between September 15 and June 30 of the following

year, during periods of high stream flow or identified spawning periods, unless otherwise authorized by Fisheries and Oceans Canada and Manitoba Sustainable Development.

2.4.4 Site Isolation and Dewatering

- .1 All work requiring site isolation and dewatering shall be conducted in accordance with contract documents, applicable permits, approvals, licences or authorizations, or as directed by **the Engineer**.
- .2 Isolation structures must not constrict more than one-third of a **fish-bearing** waterbody.
- .3 Sediment control measures (e.g. turbidity curtains) shall be used where appropriate prior to the installation and/or removal of any isolated structures.
- .4 Isolated structures must be constructed and sized to prevent overtopping or failure.
- .5 A fish and/or mussel salvage must be performed prior to dewatering isolated sites in fish-bearing waterways.
- .6 Sediment laden dewatering discharge shall be pumped to a settling basin, filtering system or through dense terrestrial vegetation of sufficient distance from the waterbody to allow sediment deposition prior to re-entry downstream of the construction area, or as directed by **the Engineer**.
- .7 All pump discharge points shall be lined with clean rock or other acceptable flow dissipating applications in order to prevent erosion and the release of suspended sediments.
- .8 Accumulated sediment and excess material shall be removed from the isolated area before removing the isolation structure.
- .9 Where a cofferdam shall be installed:
 - a. Cofferdams shall be designed to accommodate any expected high flows during the construction period.
 - b. All spoil material and debris shall be removed from the isolated area prior to the removal of the cofferdam.
 - c. All cofferdam materials shall be removed upon the completion of work.

2.4.5 Fish Salvage

- .1 A fish salvage operation must be conducted where site isolation and/or dewatering within a fish-bearing waterbody is required.
- .2 Fish salvages shall be conducted by **qualified professionals** possessing a live fish handling permit. All fish shall be handled as little as possible and in a manner that minimizes stress and prevents fish injury or death.
- .3 Fish salvage shall be conducted immediately after an area within a waterbody has been isolated. Partial dewatering is permissible to decrease wetted area and increase efficiency of fish capture, however, the fish salvage must be completed prior to complete dewatering of the isolated area.
- .4 If a fish or mussel salvage is required, a Fish Salvage Plan shall be submitted by a professional certified to conduct such works and approved or modified by the MI Biologist.
- .5 All captured fish shall be cataloged by species. The length and weight of a representative proportion of captured fish species shall be recorded.
- .6 The following information shall be collected and recorded:

- .1 Date,
- .2 Location (waterbody name and geographic coordinates),
- .3 Description of project/construction works,
- .4 Physical habitat parameters – channel width, wetted width, size (area) and depth of salvage area, water temperature,
- .5 Fish capture method (e.g. Seine net, dip net, gill net, backpack electrofishing) ,
- .6 Effort (e.g. two passes with a seine net; two people dip netting for 0.5 hours; backpack electrofishing for 350 seconds),
- .7 Number of fish collected, by species, and
- .8 Length and weight of a representative proportion of captured fish species.

2.4.6 Mussel Salvage

- .1 Where required, mussel salvages shall be conducted to remove mussels from the in-water footprint(s) of project components.
- .2 Mussel salvage and relocation work shall be conducted by a **qualified professional** under and in accordance with a live fish handling permit.
- .3 Where a species at risk (SAR), as listed under Schedule 1 of the Species at Risk Act is known to occur, or is found in the waterbed, work shall also be conducted under and in accordance with a species at risk (SAR) permit obtained from Department of Fisheries and Oceans (DFO). If a species at risk is found in a new area, the contractor shall stop work, inform DFO and obtain a species at risk permit prior to continuing work.
- .4 Mussels captured during the survey and salvage will be identified and transported while submerged to a designated location with similar habitat an appropriate distance upstream from the construction work site. (minimum 250 m)
- .5 Applicable measure in *Protocol for detection and relocation of freshwater mussel species at risk in Ontario Great Lakes Area (OGLA) (Mackie et al. 2008)* shall be used.
- .6 Mussel surveys, salvage and relocation activities and results shall be documented in a report generated by the **qualified fish biologist** and submitted to **MI** for review and approval. The report shall contain detailed descriptions, photos, and drawings of site conditions including:
 - .1 Location, habitat profile, description of methodology (including names of collectors) contact information, organization, and schedule of activities.
 - .2 Results including photos of collected species and sites, depths, locations, and substrate in which each animal was found, numbers and the types of species found.
 - .3 For mussel surveys conducted under SAR permit, the qualified fish biologist shall also submit a fish and mussel data collection table. **MI** will supply the template prepared by DFO to the qualified **fish biologist**.

- .7 Any death of a listed species at risk Mussel during salvage operations or associated construction must be reported immediately to **MI**. MI will be responsible for communicating with and the DFO Species at Risk Biologist.

2.4.7 Temporary Stream Diversions, Fish Passage and Base Flows

- .1 **The Contractor** is responsible for maintaining base flows for the duration of construction activities in waterbody's requiring in-water and near water work, including those works which may require the installation of cofferdams and related structures, unless otherwise approved.
- .2 Flow shall be maintained at all times to permit the safe and unimpeded passage of fish. A temporary diversion channel to direct flows and fish passage around the work site shall be constructed if flows are to be constricted by more than one third of the original stream width in fish bearing waters. In non-fish, bearing waters a pumped diversion may be used to maintain flows downstream.
- .3 Temporary stream diversions shall be designed to provide fish passage, even during low flow conditions.
- .4 Instream diversion structures shall be constructed using erosion resistant materials.
- .5 Temporary diversion channels shall be constructed in the dry. Gradient controls shall be used to ensure that diversion channel slopes correspond to the existing channel gradients.
- .6 Temporary diversion channels shall be designed to accommodate expected waterbody flow from storm, runoff or spring melt events.
- .7 Temporary diversion channels shall be routinely inspected to identify areas of incipient erosion. Eroded areas shall be repaired promptly.
- .8 Existing waterbodies shall not be disturbed until temporary diversion channels have been constructed.
- .9 Diversion channels shall be opened from the downstream end first. Stabilize the connection of the diversion channel to the main waterbody. Pump flows around work site, if possible during construction of the channel connection.
- .10 Pumping system for pumped diversions shall be sized to accommodate any high flows of the waterbody during the construction period. Pumps shall be monitored at all times, and back-up pumps shall be readily available on-site in the event of pump failure.
- .11 The original flows through the site shall be restored as soon as work is completed.

2.4.8 Beaver Dam Removal

- .1 Work plans for beaver dam removal shall be provided to **the Engineer** for review and approval no less than 14 business days prior to the start of dam removal.
- .2 Beaver dam removal shall be scheduled to comply with in water work timing windows, and shall not affect a fishery, or recreational property uses that depend on the dams existence, both upstream and downstream.
- .3 The Manitoba Sustainable Development District Office shall be contacted before proceeding with the beaver dam removal. Dam removal permits or wild animal kill permits shall be

obtained, as or if required, prior to removal of beaver dams. Consultation with users' identified by Manitoba Sustainable Development may be necessary before removal of a dam can proceed. Identify any safety concerns or flag potential downstream infrastructure or stakeholders who should be consulted

- .4 Removal activities shall be restricted to removal or breaching of the dam itself and shall not involve channel or shoreline modification downstream of the dam.
- .5 When a series of dams is to be removed this shall typically be done starting from the most downstream dam and working upstream
- .6 The beaver dam shall be removed gradually (20 cm at a time), allowing water to release slowly and preventing sediment at the bottom of the pond from being released downstream.
- .7 Wherever possible, remove beaver dams by using hand tools. Where removal by hand tools is not possible then machinery may be used.
- .8 The width of the breach opening of the beaver dam shall not exceed the width of the original stream channel to prevent bank erosion and flooding adjacent properties.

2.4.9 Stream Crossings

- .1 Where possible, existing stream crossings shall be utilized to traverse waterbodies.
- .2 All stream crossings shall be constructed in accordance with *The Manitoba Stream Crossing Guidelines for the Protection of Fish Habitat – May 1996*.
- .3 If there is no existing crossing and the waterbody must be crossed, **the Engineer** may approve the construction of a temporary crossing to keep all vehicles and equipment out of the waterbody.
- .4 Stream crossings shall be located at straight stream sections, perpendicular to the bank. In particular, meandering bends, braided streams, alluvial fans and other unstable areas shall be avoided.
- .5 When feasible, the construction of stream crossings shall be scheduled for the period of lowest steam flow and should be a single event.
- .6 The natural alignment of the stream shall be maintained.
- .7 A minimum vegetated buffer strip of 30 meters shall be maintained between the worksite and waterbody except at the actual crossing location.
- .8 The number of temporary stream crossings constructed shall be minimized.
- .9 Temporary stream crossings shall be removed as soon as possible following completion of the work or when it is no longer required, whichever is sooner.
- .12 Natural debris removal shall be limited to that which is necessary to protect bridge piers or abutments or to that which is blocking culverts.

2.4.10 Water Quality Monitoring

- .1 Water quality monitoring shall be required when directed by **the Engineer** or for in-water work in **fish-bearing** waterbodies and may be required when working near fish bearing waterbodies or tributaries to fish bearing waterbodies to demonstrate that deleterious substances are not

entering into the waterbody. Water quality monitoring shall also occur when working upstream and within 5km of a water treatment plant intake.

- .2 Where water quality monitoring is being coordinated by others, **the Contractor** must cooperate and coordinate with **MI** and its agents. All water quality monitoring activities must be conducted or overseen by a **qualified fisheries biologist** or a suitable equivalent at the discretion of **the Engineer**.
- .3 **The Contractor** must advise **the Engineer** no less than 30 business days in advance of work where water quality monitoring is or may be required. The monitoring shall be conducted prior, during and after construction activities. **The Contractor** shall reconfirm the schedule 7 business days and 48 hours in advance of the start of work. Any alteration to the schedule which results in direct or indirect costs to **the Engineer**, **MI** or its agent shall be at **the Contractor's** expense.
- .4 Where monitoring results demonstrate changes above the *Manitoba Water Quality Standards, Objectives and Guidelines* (or other authorized or directed threshold), the activity shall cease until effective mitigative measures are taken.

2.4.11 Culvert Installation, Maintenance and Replacement

- .1 Old culverts are not to remain on site and should be disposed at an appropriate disposal or recycling facility.
- .2 Material and structures shall not be kept within 100 meters of a waterbody.
- .3 Utilize culvert removal techniques that result in the least amount of impacts to the waterbody and riparian area.
- .4 **The Contractor** shall maintain a culvert gradient as close to the natural stream grade as possible.
- .5 **The Contractor** shall embed culverts a minimum of 30 cm or 10% of the total culvert diameter (whichever is greater) below the normal stream bed.
- .6 **The Contractor** shall avoid using frozen backfill to ensure proper compaction. Backfill shall be compacted to avoid settling, hydrostatic uplifting or side movements of the culvert that may lead to blockage of fish passage or washouts.

2.4.12 Blasting Near a Waterbody

- .1 The use of ammonium nitrate-fuel oil mixtures in or near water frequented by fish shall be avoided to prevent the deposit of toxic by-products (ammonia).
- .2 **The Contractor** shall plan and time blasting activities to adhere to legislated and regulated restrictions to respect key life cycle events to critical life functions of fish and wildlife.
- .3 **The Contractor** shall possess all required blasting permits and certificates. Advanced notification shall be given to affected parties including site employees and the local general public prior to each blasting event.

- .4 Blasting near **fish-bearing** waterbodies shall adhere to set back and weight of explosive charge guidelines as referenced in Fisheries and Oceans Canada document *Guidelines for the Use of Explosives in or Near Canadian Fisheries Waters 1998*. Where these guidelines cannot be met, blasting plans shall be submitted to **the Engineer** for application to Fisheries and Oceans Canada to obtain necessary approvals prior to commencement of blasting in areas that could affect fish habitat.

2.4.13 Debris and Sedimentation Removal

- .1 Debris and other materials shall be removed gradually. Whenever possible, remove debris and other materials by hand.
- .2 Removal of debris (i.e., branches, stumps, other woody materials, garbage, etc.) shall be limited to the area within the culvert, immediately upstream of the culvert and to that which is necessary to maintain proper culvert function and safe fish passage.
- .3 Accumulated debris shall be removed slowly to allow clean water to pass, to prevent downstream flooding and reduce the amount of sediment-laden water going downstream. Gradually reintroducing flow will also reduce the potential for stranding fish in upstream areas.
- .4 Accumulated sediment removal shall be limited to within the culvert and to the level of the waterbody bed, to maintain embedment of the culvert.
- .5 Sediment shall be removed in a manner that prevents it from moving downstream.
- .6 Emergency debris removal using hand tools or machinery (e.g. backhoe) may be carried out at any time of year. Emergencies include situations where there is imminent risk of damage to property or the environment, or is in the interest of public health or safety. DFO is to be notified of emergency situations immediately.

2.5 Machinery, Fuel Storage, Materials Handling and Storage, Spill Response and Remediation

Improper machinery maintenance, fuel storage, materials handling and storage can create hazards to people, property and the environment. The following requirements apply to all works during all Project phases.

2.5.1 General

- .1 **The Contractor** is responsible for ensuring compliance with all applicable legislation, regulation, permits, approvals, licences and/or authorizations.
- .2 Machinery shall arrive on site in a clean condition and shall be kept in good working order and free of fuel, oil or fluid leaks. Machinery that is found to be leaking any fuel, oil or other fluids shall be moved off the work site immediately for repaired.
- .3 All fuel handling and storage shall comply with *Storage and Handling of Petroleum Products and Allied Products Regulation 188/2001* under *The Dangerous Goods Handling and Transportation Act C.C.S.M. c. D12*.
- .4 Storage of fuel stored in drums or containers of 230 L or less shall comply with the requirements of the *Manitoba Fire Code*.
- .5 **Designated Area(s)** shall be established for fuel storage, materials handling and storage, equipment cleaning, refueling and servicing. Any **Designated Area** shall be located at least 100m away from any waterbody or wetland and shall be kept clear of snow and/or miscellaneous materials to allow for clear access and routine inspection and leak detection.
 - .1 Machinery and equipment shall be washed, refueled and serviced in such a manner that wash water shall not contaminate surface water or be discharged into a waterbody.
 - .2 In the event that a piece of equipment must be refueled or serviced outside a **Designated Area**, the fuel shall be transported in approved containers. Absorbent pads or other precautions, such as drip trays or a high density polyethylene (HDPE) groundsheet, shall be used as secondary catchment or containment in the event of spillage.
 - .3 All mobile equipment that is not in use shall be parked within a **Designated Area(s)** where possible. Equipment exhibiting signs of leaks or spills shall be parked over secondary containment to prevent soil contamination.
- .6 All **Designated Areas** used for petroleum storage shall be a minimum distance of 3 meters from a property line or building and 15 meters horizontally from hydroelectric poles and lines.
- .7 Tank vehicles used to deliver fuel to the work site and/or used to move fuel around the work site shall meet the requirements for highway tanks for the shipment of dangerous goods by road set out in CSA Standard B620-14, Highway Tanks and TC Portable Tanks for the Transportation of Dangerous Goods.
- .8 All fuel storage containers and tank vehicles shall be inspected daily for leaks and spillage. Damaged or leaking fuel storage containers shall be promptly removed from site. All used

petroleum products and other regulated hazardous wastes shall be collected and disposed of at a licensed facility in accordance with applicable legislative requirements.

- .9 Equipment shall not be refueled from a watercraft.
- .10 All **designated sites**, including but not necessarily limited to refueling, fuel storage and equipment servicing sites are to be fully remediated (i.e. returned to pre-existing condition, or below CCME guideline) once they are no longer required or decommissioned.
 - .1 **The Contractor** will be liable and responsible for any required remediation and disposal of contaminated material from all applicable work sites and **designated areas** to an appropriate licenced facility. It is in **the Contractors** best interest to identify any pre-existing contamination prior to the start of work.
 - .2 Documented proof of contamination inspection(s) and site remediation of all applicable work sites and **designated areas** shall be provided to **the Engineer** prior to contract closeout.
- .11 Petroleum products shall be transported in accordance with the Manitoba *Dangerous Goods Handling and Transportation Act*.
- .12 Construction, installation and removal of petroleum storage tank systems shall occur under the supervision of a registered licenced petroleum technician.
- .13 Prior to use or filling, all petroleum storage tanks shall be registered and properly permitted, as required, with the province of Manitoba or the government of Canada (on federal lands). All permits are to be kept current.
- .14 Petroleum storage tanks shall be grounded and the dispensing tank shall be attached with a bonding cable to an appropriate location on the receiving tank prior to commencing fueling.
- .15 Dedicated petroleum storage areas shall provide additional spill containment and facilitate clean up through measures such as:
 - .1 Maximum separation from environmentally sensitive features;
 - .2 Clear identification of the materials present;
 - .3 Access restricted to authorized vehicles and employees;
 - .4 Impervious bermed storage areas; and
 - .5 Dedicated spill response equipment.
- .16 Only above ground storage tanks shall be used for the storage of bulk petroleum products. The tanks shall be equipped with overfill protection and spill containment consisting of perimeter dikes or secondary containment in the tank design.
- .17 All **Designated Areas** used for petroleum product storage shall be a minimum distance of 100 meters from any water body and shall have the top soil stripped and be underlain with at least 30 cm of impermeable soil or approved alternate and diked in such a manner as to contain any leakage or spillage. The dikes shall be designed, constructed and maintained to retain not less than 100% of the capacity of the total number containers or 110% of the largest container, whichever is greatest. If dikes are used, the containment areas shall be dewatered after a rainfall event and the containment water disposed of as approved by the Engineer and clean top soil shall be stored and used in the restoration of the site.

- .18 Concrete barriers shall be installed around all petroleum storage tanks to prevent collisions (as per Technical Bulletin PSF-004, March 2015: Impact Protection Requirements for Above Ground Storage Tanks Systems).
- .19 All mobile equipment that is not in use shall be parked within a **Designated Area**.
- .20 All employees involved in the handling and storage of fuels shall have WHMIS and spill response training.
- .21 All internal-combustion engines (regardless of fuel type) shall be shutdown during fueling.
- .22 There shall be no smoking and no open flames at the petroleum storage area at any time.
- .23 Fueling procedures shall be posted where fueling occurs.
- .24 Storage sites for petroleum products shall be secured and signs including but not limited to; hazard warnings, who to contact in case of a spill, access restrictions and under whose authority the access is restricted shall be posted.
- .25 All petroleum storage tanks with a capacity greater than 5000 litres shall be registered with Manitoba Sustainable Development. New tanks shall be registered before installation. Tanks shall be designed, installed, and operated in accordance with the Manitoba *Dangerous Goods Handling and Transportation Act* and the Federal *Transportation of Dangerous Goods Act*. Smaller stationary tanks shall adhere to requirements of the Manitoba Fire Code. A copy of the petroleum license shall be posted at the fuelling site.
- .26 Bulk waste oil shall be stored in aboveground oil tanks, which shall have secondary containment and a weatherproof cover. Waste oil shall be recycled by a reputable recycling agency.
- .27 Used oil filters shall be drained, placed into suitable storage containers and disposed of at approved facilities. The oil drained out of the used filters shall be collected and handled in the same manner as used oil.
- .28 **The Contractor** shall prevent fuel, lubricants or compounds from being released. All empty containers from equipment refueling and servicing shall be removed to a licenced disposal site. **The Contractor** shall be thoroughly familiar with provincial/federal spill response compliance procedures.
- .29 Materials required for spill containment and clean up shall be available at all work sites and **designated areas**. All vehicles shall carry materials and equipment for emergency spill containment.
- .30 All petroleum product storage sites and mobile transportation units shall, at all times, be equipped with appropriate categories of equipment and volumes of fire suppression products

2.5.2 Spill Response and Remediation

- .1 Due care and caution shall be taken to prevent spills, leaks and releases of hazardous products at all times.
- .2 An up-to-date list of key contacts and telephone numbers for reporting spills shall be kept on-site at all times.
- .3 A Workplace Hazardous Materials Information System (WHMIS) file shall be maintained on-site for all hazardous materials at the work area.

- .4 Prior to commencement of the Work, Material Safety Data Sheets (MSDS) shall be available on-site for all hazardous materials to be used. An updated spill response and containment plan for each dangerous good/hazardous waste shall be maintained in the work area at all times.
- .5 **The Contractor** shall contact Manitoba Sustainable Development within 24 hours of any reportable spills (Table 1) by contacting the Emergency Response Program Reporting Line at (204) 944-4888 pursuant to Manitoba Regulation 439/87, respecting Environmental Accident Reporting.

Table 1. Manitoba Sustainable Development Reportable Spill Quantities

Classification	Hazard	Reportable Quantity
1	Explosives	All
2.1	Compressed Gas (Flammable)	100 L*
2.2	Compressed Gas	100 L*
2.3	Compressed Gas (Toxic)	All
2.4	Compressed Gas (Corrosive)	All
3	Flammable Liquids	100 L
4	Flammable Solids	1 kg
5.1 PG I,II,III	Oxidizer	1 kb or 1 L
	Oxidizer	50 Kg or 50 L
5.2	Organic Peroxide	1 Kg or 1 L
6.1 PG I	Acute Toxic	1 Kg or 1 L
PG II & III	Acute Toxic	5 Kg or 5 L
6.2	Infectious	All
7	Radioactive	Any discharge or radiation level exceeding 10 m Sv/h at the package surface and 200 uSv/h at 1 m from the package
8	Corrosive	5 Kg or 5L
9.1	Miscellaneous (Except PCB Mixtures)	50 Kg
9.1	PCB Mixtures	500 grams
9.2	Aquatic Toxic	1 Kg or 1 L
9.3	Wastes (Chronic Toxic)	5 Kg or 5 L

- .6 *Container Capacity (refers to container water capacity)

- .7 All spills shall be reported to **the Engineer** within 24 hours whether it was necessary to report the spill to Manitoba Sustainable Development or not. The spill report shall include the following:

- .1 personnel responding to the spill
- .2 material spilled
- .3 cause of spill
- .4 estimated amount of material spilled
- .5 estimated area and volume of soil affected by the spill
- .6 cleanup action undertaken
- .7 means used to contain, transport and dispose of the materials involved
- .8 All spills of quantities less than those set out in Table 1 and without a potential impact to the environment shall be contained and cleaned up immediately by on-site personnel in accordance with the approved on-site emergency response and containment plan and reported to the Engineer.
- .9 In the event that there is a spill, leak or release onto the ground surface from any piece of equipment (e.g. broken hydraulic hose) the entire affected area shall be cleaned up and all contaminated soil shall be appropriately disposed of at a licenced soil recycling facility. If contaminated soil is to be stored on site for any time a designated storage area is to be identified and prepared to prevent secondary contamination.
- .10 A spill kit or sufficient supply of materials for clean-up or spill containment (i.e. absorbent material, high density HDPE groundsheets and absorbent oil booms when working near water) shall always be available on site, and replenished as needed. If necessary, additional material shall be made available on short notice.
- .11 **The Contractor** shall designate a qualified supervisor(s) as the onsite emergency response coordinator(s) who shall be on site at all times that work is being undertaken. The emergency response coordinator(s) shall have the authority to redirect manpower and equipment in order to respond in the event of a spill.
- .12 The designated emergency response coordinator shall periodically review and if necessary revise the on-site emergency spill response plan.
- .13 As dangerous goods/hazardous waste storage areas are taken out of service remediation shall be conducted, including the appropriate disposal of the contaminated material to the satisfaction of **the Engineer**.

2.5.3 Materials Handling & Storage

- .1 All construction areas shall be kept clean and orderly at all times during, and after, completion of work or activities.
- .2 Waste material shall be recycled to a degree that is economically and practically feasible.
- .3 There shall be no indiscriminate dumping of waste and litter on or off work sites or **designated areas**.
- .4 All waste materials shall be collected and contained in a designated waste storage area and in containers appropriate to the waste classification until removed from the site for recycling or disposal at an approved facility.
- .5 Waste storage sites shall be designated for each worksite and camp as approved by **the Engineer**.

- .6 Different waste streams shall not be mixed.
- .7 Contaminated runoff or water shall be contained and prevented from entering any waterbody. The collected contaminated runoff or water shall be hauled off site for disposal at an approved disposal facility.
- .8 No on-site burning of waste or any other material is allowed unless approved by **the Engineer**. When required, **The Contractor** shall be responsible for obtaining a burning permit from Manitoba Sustainable Development for burning between April 1 and November 15.

2.5.4 Dangerous Goods/Hazardous Waste Handling and Disposal

- .14 Dangerous goods and hazardous wastes shall be identified and shall be handled in accordance with *The Dangerous Goods Handling and Transportation Act* and Regulations and Health Canada's *Workplace Hazardous Materials Information System* (WHMIS).
- .15 **The Contractor** shall have staff, trained and certified in the handling of dangerous goods, present on-site whenever said dangerous goods are being utilized for the performance of the work.
- .16 A WHMIS file shall be maintained on-site for all hazardous materials at the work area. Prior to commencement of the Work, Material Safety Data Sheets (MSDS) shall be submitted to **the Engineer**. No material shall be brought to the site without prior submission of a MSDS.
- .17 Designated dangerous goods/hazardous waste storage areas shall have the top soil stripped and be lined with at least 30 cm of impermeable material or approved equal. The dykes shall be designed, constructed and maintained to retain not less than 100% of the capacity of the total number of containers or 110% of the largest container, whichever is greatest. The top soil shall be stored and used in the restoration of the site.
- .18 Disposal of hazardous waste shall only be done at hazardous waste facilities licensed under *The Dangerous Goods Handling and Transportation Act*.
- .19 All waste stored at designated hazardous waste storage areas shall be removed from the site at least once every seven (7) days.
- .20 Hydrocarbons shall not be stored or disposed of in earthen pits.
- .21 All pesticides shall be handled and applied by or under the direct supervision of a licensed commercial applicator, as defined in section 4.1 of the *Pesticides Regulation 94/88*, and further all pesticides shall be used in accordance with any terms and conditions of the permit.
- .22 A pesticide use permit shall be obtained prior to the application of pesticides, if required. **The Contractor** shall ensure that all pesticides are applied by a licenced commercial applicator and adhere to all conditions specified in this permit. These conditions include submitting a properly completed post seasonal form to the Contract Administrator at the completion of the Contract or at the end of each calendar year confirming that any terms and conditions of the permit have been satisfied. **The Contractor** shall supply the following information to **the Engineer** for this form:

- .1 The name of each pesticide used
- .2 The Pest Control Product number of each pesticide
- .3 Quantity in litres of each pesticide used
- .4 Total area treated in hectares
- .5 A map of the treated areas
- .6 Legal description of the land where practical
- .7 Color coded map to indicate where each type of pesticide was used

2.5.5 Domestic Solid Wastes, Demolition and Construction Waste

- .1 Dispose of non-reusable demolition and construction debris at a waste disposal ground operating under the authority of a permit pursuant to Manitoba *Regulation 150/91* respecting Waste Disposal Grounds. Provide proof of appropriate disposal.
- .2 All domestic solid waste containers shall be clearly marked to identify the nature and type of material to be deposited (e.g. containers for recyclable material and containers for disposal).

2.5.6 Domestic Sewage

- .1 All collected sewage shall be removed from the site at least once every seven days by a registered sewage hauler, as defined in section 21(1) of the Onsite Wastewater Management Systems Regulation No. 83/2003 and disposed of at a wastewater treatment facility licenced under the Environment Act
- .2 All sewage shall be collected through the provision of an outside toilet facility in compliance with the *Onsite Wastewater Management Systems Regulation No. 83/2003*.

2.6 Dust Suppression

The following requirements apply to all dust suppression activities for all Project phases.

2.6.1 General

- .1 All work shall be conducted in a manner that minimizes the raising of dust from construction or maintenance operations.
- .2 Only water or approved dust suppressants shall be used for dust control. The use of waste petroleum or petroleum by-products as dust suppressants is not allowed.
- .3 All vehicles used to haul materials to or from the work site shall have the load covered with a tarpaulin cover during transport to minimize dust and prevent material from falling out. All material stockpiles or spoil piles prone to wind erosion shall be maintained as to minimize release of particulate matter or dust. This may include, but is not limited to, covering or stabilization of material stockpiled at the work site as required.
- .4 The application of dust suppressants shall be limited to the roadway, driveway or **designated area**.
- .5 Carefully monitor the application rate of all dust suppressants to ensure adequate coverage without pooling or runoff of products.
- .6 The amount of dust suppressant applied should not exceed the minimum amount required to effectively suppress dust.
- .7 The material must not migrate or run off the traveled portion of the roadway or designated area.
- .8 Dust suppressants must conform to the manufacturer's specifications and must not contain concentrations of contaminants that would not normally be found in the suppressant.
- .9 Ensure that dust suppressants do not enter and contaminate waterbodies, including surface and groundwater. Do not allow the product to leave the roadway.
- .10 Do not apply products to areas of roads that are subject to flooding.
- .11 Do not apply products if precipitation is occurring, or forecast to occur before the product sets or cures.
- .12 Avoid over-application or application beyond the road shoulder.
- .13 Should there be a need for a water source for compaction or dust suppression or related activity, a temporary authorization for any withdrawal greater than 25,000 litres or 550 gdp shall be required from the Manitoba Sustainable Development Water Use Licensing Section. Contact the Manager of Water Use Licensing Section, at (204) 945-3983 prior to the commencement of the work.

2.7 Concrete and Asphalt

The following requirements apply to all concrete and asphalt works during all Project phases.

2.7.1 General

- .1 All concrete obtained and utilized for the Project must be sourced from a concrete **batch plant** licensed in accordance with the Manitoba Environment Act.
- .2 All **contractor** owned **batch plants** must be licenced under the Environment Act prior to development or use.
- .3 Concrete wash out areas must be designated at the pre-construction site meeting and approved by **the Engineer** prior to development or use.
- .4 Waste concrete from concrete pumps and concrete trucks, cleanout materials from concrete trucks, concrete pumps and other equipment shall be deposited only in the concrete washout **Designated Area**. All of this material shall be hauled off site, for disposal at an approved landfill or to a recycling facility, not later than at the closure of the **Designated Area**.
- .5 Concrete washout areas should be located a minimum of 100 meters away from the **ordinary high-water mark** of a waterbody or waterbody and in a non-porous soil location. All concrete washout areas shall be remediated to the satisfaction of **the Engineer** when no longer in use or when construction activities are complete, whichever is sooner. Concrete washout areas are not to be carried over from one contract to another unless approved by **the Engineer**.
- .6 Concrete works shall be conducted in a manner that does not allow direct entry of concrete, concrete fines or concrete washout into a waterbody. Appropriate sealed containment to isolate a structure will be required for concrete usage within water.
- .7 **The Contractor** shall comply with all requirements as laid out in the *Water Rights Act*, including but not limited to:
 - .1 **The Contractor** must not release any excess cement and/or wastewater to surface waters, including wetlands,
 - .2 Any containment area must not be connected to or drain to any surface waters, including wetlands, and
 - .3 Any wastewater generated on site must be contained within the construction site.
- .8 **The Contractor** shall comply with all requirements as laid out in the Environment Act Licence for the **batch plant** regarding utilization, cleanup and disposal of water, waste and hazardous materials at the washout site.
- .9 Barges or shrouding shall be used to trap and prevent concrete and other bridge materials from entering a waterbody.

2.8 Noise and Noise Limitations

The following requirements apply to all Project-related works and during all Project phases. All activities shall be undertaken by means that do not result in violation of applicable noise by-laws, or other specified thresholds. **The contractor** is responsible for ensuring compliance with contract specifications, environmental legislation, permits and authorizations.

2.8.1 General

- .1 All plant and equipment supplied for use on the Project shall be effectively “sound-reduced” by means of proper silencers, mufflers, acoustic linings, acoustic shields or acoustic sheds.
- .2 Noise by-laws of the adjacent communities and municipal authorities shall be complied with.
- .3 Any operation of plant or equipment beyond dates or times as specified or regulated by applicable by-laws or adjacent communities or municipal authorities shall require an exemption in writing.

2.9 Wildlife

Wildlife includes a broad range of terrestrial, aquatic, or avian species that may be affected by various activities. This procedure is intended to compliment other targeted procedures, regulatory requirements and monitoring plans. **The Contractor** is responsible for ensuring compliance with contract specifications, environmental legislation, permits and authorizations.

2.9.1 General

- .1 Construction camps and worksites shall be kept clean and tidy. All food, garbage or waste that may attract wildlife shall be stored in an appropriate manner and be disposed of at an area which has been designated as an appropriate waste disposal site.
- .2 Nuisance wildlife shall be immediately reported to the Natural Resources Officer and **the Engineer**.
- .3 Employees, workers and other staff shall not hunt, trap or harass wildlife.
- .4 **The Contractor** shall not remove, destroy or disturb species pursuant to Manitoba Regulation 25/98, or any future amendment thereof, respecting Threatened, Endangered and Extirpated Species, or species listed in the federal *Species at Risk Act*.
- .5 Wildlife habitat shall not be destroyed or damaged, except pursuant to a licence, permit or other authorization issued for the Project.
- .6 No person shall take or be in possession of or willfully destroy the nest or eggs of birds.
- .7 No person shall remove, disturb, spring or in any way interfere with any trap set out lawfully by any other person for the purpose of taking furbearing animals.
- .8 No blasting shall be permitted within close proximity to known sensitive wildlife habitat during critical lifecycle periods.
- .9 Trees containing large nests of sticks and areas where active dens or burrows occur shall be identified, left undisturbed, and reported to the Natural Resources Officer.
- .10 Terrestrial buffers, as identified by the Manitoba Conservation Data Centre's *Recommended Development Setback Distances from Birds* and/or Manitoba Sustainable Development's *Forest Management Guidelines for Terrestrial Buffers* shall be adhered to for all applicable sites.
- .11 To reduce the possibility of vehicle collisions with wildlife, vehicle speed shall not exceed posted speed limits and wildlife warning signs shall be installed where appropriate.
- .12 Prior to reinstating a quarry or borrow site, the area shall be surveyed to determine presence or absence of bank swallows and or common nighthawk nests. If nests are discovered, work shall be suspended and **the Engineer** will be contacted for further advice.
- .13 Prior to removing temporary structures, an inspection shall be conducted to determine the presence or absence of barn swallow nests. If nests are discovered, work shall be suspended and **the Engineer** will be contacted for further advice.

2.9.2 Preventative Measures for Transfer of Invasive Species

- .1 **The Contractor** shall ensure that equipment which has previously been in contact with an aquatic ecosystem, including but not limited to rivers, lakes, and marshes is properly cleaned so as to prevent the spread of aquatic invasive species.
 - .1 Equipment of particular concern includes, water tanks, tank trucks, pumps, hoses, intake screens, boats and motors, and fish and water monitoring equipment.
- .2 Equipment coming in contact with aquatic ecosystems must be cleaned and drained completely, dried, and inspected before and after contact. Cleaning is defined as the removal of all aquatic plants, animals, and sediments.
- .3 Equipment that has or will come in contact with listed control zones (see attached Map) must be decontaminated using one of the methods described in Table 1. (See Manitoba Sustainable Development's website: <http://www.gov.mb.ca/waterstewardship/stopais/> for the most up to date list of Control zones)
- .4 Equipment that has come into contact with aquatic ecosystems in another province, territory, or country must be decontaminated as described in Table 1.
- .5 In the event that aquatic invasive species are discovered during inspection **the Contractor** shall inform **the Engineer** and shall remove the equipment or machinery from the work site until it has been cleaned to the satisfaction of **the Engineer**. Manitoba Sustainable Development shall also be notified by using the web-form linked below:
(http://www.gov.mb.ca/waterstewardship/stopais/ais_reporting.html)
- .6 To prevent the transfer of terrestrial invasive species, all equipment is to be cleaned to remove all earthen material and plant debris and inspected before being brought to site and before it is removed from site. Cleaning should be carried out with a pressure washer or scrub brush. If soap is used it shall be phosphate free.
- .7 Documentation of measures to ensure the prevention of the spread of aquatic and terrestrial species invasive species shall be incorporated into the respective Water Quality and Fish Protection Plan and Monthly Environmental reports including:
 - .1 History of equipment work locations and potential sources of contamination.
 - .2 Details of cleaning / decontamination plan and procedures (methods).
 - .3 Documentation of cleaning and decontamination (date, personnel, confirmation of methods used).

2.10 Wildfires

Wildfires can be a threat to people, property and activities. Advance planning, preparation and the implementation of safety measures is required to effectively respond to wildfires when they do occur.

2.10.1 General

- .1 An evacuation and emergency preparedness plan addressing wildfires shall be implemented and submitted to **the Engineer** prior to commencing construction.
- .2 No fires shall be started without first taking sufficient precautions to ensure that the fire can be kept under control.
- .3 Open fires are prohibited from April 1st to November 15th annually. In the event that burning is required during that period, an application for a burning permit shall be submitted for approval to Manitoba Sustainable Development, where applicable. All conditions imposed by the burning permit shall be adhered to.
- .4 No activity shall be conducted which may cause a fire to spread. Similarly, burning or smoldering matter shall not be placed where it may cause a fire to spread.
- .5 A primary zone shall be established around camp sites and other longer term temporary structures associated with construction and maintenance activities. Flammable materials such as leaves, brush, dead limbs, and fallen trees shall be cleared from the area regularly.
- .6 The locations of construction camps, offices, and related structures shall be chosen in such a fashion as to minimize the risk of exposure to wildfires.
- .7 In the event that a wildfire occurs, it shall be immediately reported to **the Engineer** and to Manitoba Sustainable Development at 1-800-782-0076.
- .8 All reasonable steps shall be taken in order to prevent a fire from burning out of control or spreading from land owned or occupied for construction purposes.
- .9 In the event that a wildfire is identified where construction activities are taking place, all reasonable attempts shall be made in order to extinguish the wildfire. All available equipment, services and labor shall be made available at the disposal of an officer for the purposes of wildfire protection operations.
- .10 All construction and related activities taking place in the vicinity of a wildfire shall cease until advised by **the Engineer** that it is safe to resume operations.

2.11 Heritage Resources

Heritage resources are an important component of Manitoba's historical legacy which may be uncovered during a wide range of construction activities. Heritage resources may include human remains, a heritage site, a heritage object, and any work or assembly of works of nature or human endeavor that is of value for its archeological, paleontological, pre-historic, historic, cultural, natural, scientific, or aesthetic features, and may be in the form of sites or objects or a combination thereof.

2.11.1 General

- .1 Areas of heritage or cultural resources of interest will be identified in the Special Provisions and/or construction drawings and shall be inspected prior to the start of construction.
- .2 Work shall immediately cease where archaeological or historic artifacts are encountered during construction activities. The discovery shall be reported to **the Engineer**.
 - a. Work at the location shall be suspended until a Historic Resource Consultant can assess the archaeological or historic artifacts encountered, and mitigation measures are confirmed with the Manitoba Historic Resources Branch.

2.12 Quarries and Borrow

The following requirements apply to all quarry and borrow related works during all Project phases.

2.12.1 Quarry Site Selection

- .1 No operator of a quarry is to establish or mine a quarry closer than 400 meters from a residence, unless the operator has established a vegetated berm or tree screen sufficient to shield the quarry from view from the residence.
- .2 With the exception of quarries that are contiguous with the road right-of-way, all quarry operations shall maintain a 100 meters buffer from the proposed road right-of-way. If no vegetated buffer or screen exists this distance shall be at least 150 meters.
- .3 Habitat occupied by protected species shall be avoided.
- .4 Quarry site selection shall consider the proximity of sensitive sites including waterbodies, wildlife, heritage resources and culturally important sites. Setbacks will vary depending on circumstances however selected areas are to be a minimum of:
 - .1 100 m from a water course or waterbody,
 - .2 100 m buffer from any large stick nest, eagle nest, heron rookery, or any other sensitive wildlife area,
 - .3 30 m from heritage resources or identified cultural sites,
 - .4 400 m from any residence,
 - .5 15 m from the property line, and
 - .6 Other setbacks as required.
- .5 Prior to developing quarry sites, the potential for acid rock generation. Sites found to contain acid generating rock shall not be developed or used.

2.12.2 Quarry Development

- .1 **The Contractor** shall comply with all legislations, licenses, authorizations and permits respecting the Project and quarry.
- .2 **The Contractor** shall not commence any mobilization or drilling activities until a casual quarry permit or quarry lease have been issued by the province of Manitoba (if required).
- .3 **The Contractor** is responsible for maintaining the site and promoting surface water runoff to minimize ponding after rainfall events. In the event that ponding does occur, it shall be discharged or removed using effective erosion and sediment control devices and pumps as accepted by **the Engineer**.
- .4 Quarries shall be developed in accordance with the site plan submitted to **the Engineer** prior to the beginning of construction and, where applicable, the immediate quarry area plan provided to Manitoba Sustainable Development as part of the work permit (if required).
 - .1 The major components of the Work are as follows:
 - .1Access Road Construction,
 - .2Clearing and Grubbing,
 - .3Blasting, and
 - .4Gravel Crushing and Stockpiling of Aggregate.

- .5 Quarry operations shall not encroach within 15 meters of any property boundary adjoining, private, municipal, or crown leased land.
- .6 No operator of a quarry shall establish or mine a quarry closer than 150 meters from a Provincial Trunk Highway, or Provincial Road, unless the operator has established a vegetated berm or tree screen sufficient to shield the quarry from view from the road or residence. A quarry shall not be established within 400 meters of a residence.
- .7 A rehabilitation levy shall be paid by the lease holder for production of aggregate quarry mineral. This only applies to quarry minerals that are produced and removed from the quarry lease; no fee is required to be paid as long as the quarry mineral remains stockpiled on the quarry lease. (The current levy is 12¢ per tonne, as of 2018, and subject to change.)
- .8 **The Contractor** may be subject to operational restrictions if in close proximity to sensitive receptors, including but not limited to: wildlife, fish, residences or communities as stipulated in applicable permits or by **the Engineer**.
- .9 **The Contractor** shall maintain the quarry site in a tidy condition and free from the accumulation of debris
- .10 A Decommissioning Plan shall be developed in accordance with all applicable permits, Legislation and Regulations and as approved by **the Engineer**.
- .11 Borrow pits will be left in a manner which promotes natural re-vegetation of the site
 - .1 In cases where seeding is required, and when conditions permit, seeding shall commence immediately upon completion of capping and trimming operations. When conditions do not permit immediate seeding, **the Contractor** will endeavor to ensure seeding is completed within the next growing season, unless otherwise authorized by **the Engineer**.
 - .2 Seeding operations shall not be carried out under adverse conditions of high winds, frozen ground, or ground covered with snow, ice, or standing water

2.13 Site Decommissioning

All work sites are to be fully decommissioned when no longer required. The following requirements apply to decommissioning of all sites developed or used for the Project.

2.13.1 General

- .1 All **designated areas** shall be leveled to natural or pre-existing grade and slope as part of **decommissioning**. Stockpiled topsoil and other organic matter that had been removed from the site shall be spread to promote natural re-establishment of vegetation.
- .2 Where seeding is not required, temporary site locations shall be left in a manner which promotes natural re-vegetation of the site.
- .3 In cases where seeding is required, and when conditions permit, it shall commence immediately upon completion of grading, capping and trimming operations.
- .4 When conditions do not permit immediate seeding, **the Contractor** shall endeavor to ensure seeding is completed within the next growing season, unless otherwise authorized by **the Engineer**.
- .5 Seeding operations shall not be carried out under adverse conditions of high winds, or ground covered with snow, ice, or standing water.

2.14 Revegetation and Vegetation Maintenance

The following requirements apply to all **revegetation** or vegetation maintenance works during all Project phases.

2.14.1 General

- .1 Immediately following construction and decommissioning, all salvaged and stockpiled organics and soils which were set aside during site development shall be spread back over the area from which they originated and shall be seeded. If local soils are not available, other organic-based covers may be used to allow seed germination.
- .2 Do not plant the following undesirable/invasive species:
 - a. Smooth Brome (*Bromus inermis*)
 - b. Downy Brome (*Bromus tectorum*)
 - c. Crested Wheatgrass (*Agropyron cristatum*)
 - d. Reed Canary Grass (*Phalaris arundinacea*)
 - e. Creeping Red Fescue (*Festuca rubra*)
 - f. Kentucky Bluegrass (*Poa pratensis*)
 - g. Birdsfoot Trefoil (*Lotus corniculatis*)
 - h. Yellow Sweet Clover (*Melilotus officinalis*)
 - i. White Sweet Clover (*Melilotus alba*)
 - j. Dutch Clover (*Trifolium repens*)
 - k. Alsike Clover (*Trifolium hybridum*)
 - l. Alfalfa (*Medicago sativa*)
 - m. Meadow Foxtail (*Alopecurus pratensis*)
 - n. Tufted/Cow/Bird Vetch (*Vicia cracca*)
 - o. Tall Fescue (*Festuca arundinacea*)
- .3 Utilization of ditches as a heavy-machinery transportation corridor shall be minimized to the greatest extent possible.
- .4 **Revegetation** works shall not alter existing drainage patterns.
- .5 Should there be a need for a water source as part of **revegetation** efforts, a temporary authorization shall be required from the Water Use Licensing Section of Manitoba Sustainable Development and Water Stewardship. Contact the Manager of Water Use Licensing Section, at (204) 945-6118 prior to the commencement of the work. Note any water withdrawal greater than 5500 gpd requires a permit.

2.15 Planned and Unplanned Shutdowns

The following requirements for planned and unplanned shutdowns apply to all temporary or permanent stoppages of work, including but not necessarily limited to: staff rotations, holidays, stop work orders or as part of contract closeout.

2.15.1 General

- .1 **The Contractor** shall ensure all equipment, supplies, and any other items used during construction are relocated to designated areas for laydown and staging or taken off site prior to any shutdown period.
- .2 All dangerous goods/hazardous waste shall be removed from the site, including from the designated areas for waste and/or fuel storage, for any shutdown period where transportation permits and/or at the discretion of **the Engineer**. In all instances dangerous goods/hazardous waste shall be securely stored and inspected regularly during the shutdown.
- .3 Waste products shall be removed from the construction site during a shutdown period, including from the designated areas where transportation permits and/or at the discretion of **the Engineer**. The demolition and construction waste products, such as gravel and waste concrete, may be left on-site as long as they are stored in a secure designated area for waste.
- .4 **The Contractor** shall submit a plan to the Engineer for removal and/or securing of equipment, supplies and waste materials in the event of an unplanned shutdown.

3.0 Glossary – Definitions and Terms

Batch Plant:

“Batch Plant” refers to concrete and asphalt production facilities.

Construction:

“Construction” refers to the period and activities associated with constructing Project infrastructure, including site preparation and decommissioning.

Decommissioning:

“Decommissioning” refers to the closure and/de-construction of infrastructure or work sites.

Designated Areas:

“Designated Areas” refers to specific sites that have been identified for a specific purpose which requires special approvals and/or careful documentation, maintenance, and decommissioning.

Fish-Bearing:

“Fish-Bearing” refers to waterbody containing **fish** as defined in the *Fisheries Act*.

Maintenance:

“Maintenance” refers to the period and activities related to Project upkeep.

Merchantable Timber:

“Merchantable Timber” refers to woody vegetation, specifically a tree, which is a specific taper, straightness, diameter and overall form which allows it to be harvested for commercial, community, or personal use.

Ordinary High-Water Mark:

“Ordinary High-Water Mark” refers to the average expected elevation at which a waterbody or waterbody would reach at least once in every two year period (1:2).

Post-Construction:

“Post-Construction” refers to the period and activities related to the time after which the Project is constructed and operational.

Qualified Fish Biologist:

“Qualified Fish Biologist” refers to designated individuals or groups with adequate certification and experience, as approved by **the Engineer**, to perform key fisheries or aquatics related tasks.

Revegetation:

“Revegetation” refers to, and includes, all works associated with site preparation, seeding and germination of plants for erosion control, aesthetics or any other purpose.

The Contractor:

“The Contractor” refers to the individual, company or group tasked with the construction, operation or maintenance activity, and includes all subcontractors and affiliates.

The Engineer:

“The Engineer” refers to designated Manitoba Infrastructure personnel or their representatives, including Manitoba Infrastructure Environmental staff.

Waterbody:

“Waterbody” (including the term watercourse) refers to any significant accumulation of water such as: a drain, stream, river, pond, or lake. Waterbodies can be natural or artificial. Waterbody can also refer to an ephemeral waterbody which is a shallow water body that temporarily contains water after spring snowmelt or a heavy rainfall and typically dries up within a matter of days to weeks