LAKE MANITOBA
LAKE ST. MARTIN

OUTLET CHANNELS PROJECT

MANITOBA INFRASTRUCTURE

Quarry Management Plan

November 16, 2020

Manitoba

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DISCLAIMER

This document was developed to support the Lake Manitoba and Lake St. Martin Outlet Channel Environmental Management and Monitoring Program. This document has been prepared by Manitoba Infrastructure as a way to share information and have discussion with Indigenous Communities and Groups and the public. This document has been prepared using existing environmental and preliminary engineering information, professional judgement as well as information from previous and ongoing public and Indigenous engagement and consultation. The contents of this document are based on conditions and information existing at the time the document was prepared and do not take into account any subsequent changes. The information, data, recommendations, and conclusions in this report are subject to change as the information has been presented as draft and will not be considered complete until further engagement and consultation is complete. The plans may be further revised based on information and direction received from provincial and federal environmental regulators. This draft report be read as a whole, and sections or parts should not be read out of context.

PREFACE

The Lake Manitoba and Lake St. Martin Permanent Outlet Channels Project (the "Project") is proposed as a permanent flood control mitigation for Lake Manitoba and Lake St. Martin to alleviate flooding in the Lake St. Martin region of Manitoba. It will involve the construction and operation of two new diversion channels: the Lake Manitoba Outlet Channel (LMOC) will connect Lake Manitoba to Lake St. Martin and the Lake St. Martin Outlet Channel (LSMOC) will connect Lake St. Martin to Lake Winnipeg. Associated with these outlet channels are the development of bridges, control structures with power connections, a new realignment of PR 239, and other ancillary infrastructure.

Manitoba Infrastructure (MI) is the proponent for the proposed Project. After receipt of the required regulatory approvals, MI will develop, manage and operate the Project. This Quarry Management Plan (QMP) is one component of the overall Environmental Management Program (EMP) framework which describes the environmental management processes that will be followed during the construction and operation phases of the Project. The goal of the EMP is to ensure that the environmental protection measures committed to in the Environmental Impact Statement (EIS) and the requirements of the Environment Act Licence and Federal Decision Statement Conditions are undertaken in a timely and effective manner. This includes the verification that environmental commitments are executed, monitored, evaluated for effectiveness, and that information is reported back in a timely manner to the Project management team for adjustment if required.

Manitoba Infrastructure remains committed to ongoing engagement and consultation with Indigenous groups and other stakeholders that are potentially impacted by the Project. Detailed EMP review discussions have been incorporated into community-specific consultation work plans and additional engagement opportunities will be provided prior to EMP finalization. Engagement opportunities include virtual open house events and EMP-specific questionnaires. EMP-specific questionnaires will be provided to Indigenous groups and stakeholders to obtain feedback and views on the draft plans, in addition to exploring opportunities for Indigenous participation in follow-up monitoring. Feedback and recommendations will be used to inform the completion of the plans.

The EMP provides the overarching framework for the Construction Environmental Management Program (CEMP) and an Operation Environmental Management Program (OEMP), which will be finalized as separate documents prior to Project construction and ideally operation, respectively. Their finalization will consider applicable conditions of the Environment Act Licence and associated approvals, any other pertinent findings through the design and regulatory review processes and key relevant outcomes of the ongoing Indigenous and public engagement and Consultation processes.

The purpose of the CEMP and OEMP is to guide how environmental issues will be addressed during construction and operation, respectively and how adverse effects of activities will be mitigated. The CEMP is supported by several specific or targeted management plans (e.g. surface water, groundwater, sediment, etc.), as shown in the Figure below, that will guide MI's development of the Project's contract documents and subsequently, the Contractor(s) activities, in constructing the Project in an environmentally responsible manner. The OEMP will likely include the same targeted plans developed to manage issues during construction, but prior to construction completion they would be revised and adapted to suit the specific needs during the operation phase.

Environmental Management Program Process and Associated Environmental Management Plans

LAKE MANITOBA
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OUTLET CHANNELS PROJECT

GLOSSARY OF TERMS AND ACRONYMS

Acronyms

CEMP	Construction Environmental Management Program
EAO	Environmental Assessment Officer
EIS	Environmental Impact Statement
EMP	Environmental Management Program
EPP	Environmental Protection Plans
ESSs	Environmentally Sensitive Sites
LMOC	Lake Manitoba Outlet Channel
LSMOC	Lake St. Martin Outlet Channel
MI	Manitoba Infrastructure
OEMP	Operation Environmental Management Program
PERs	Project Environmental Requirements
Project	The Lake Manitoba and Lake St. Martin Permanent Outlet Channels Project
QDP	Quarry Development Plan
QMP	Quarry Management Plan

Glossary of Terms

Aggregate: A broad category of fine to coarse-grained particulate material used in construction including sand, gravel, crushed stone, slag, recycled concrete and geosynthetic aggregates.

Bedrock: The solid rock that lies beneath the soil and or other loose material on the Earth's surface.

Casual quarry permit: An annual permit issued for the production of a specified quantity of Crown quarry mineral (Quarry Minerals Regulation 1992).

Dewatering: Removal or draining groundwater or surface water from a riverbed, construction site, caisson, or mine shaft, by pumping or evaporation.

Discharge: Rate of outflow; volume of water flowing down a river, from a lake outlet, or man-made structure.

Groundwater: Water that occurs beneath the land surface and fills the pore spaces of soil or rock below saturated zone.

Private quarry permit: Refers to a permit for private aggregate or quarry operations in Manitoba.

Quarry: An open excavation or pit from which sand, gravel, clay, shale, gypsum, peat, salt, rock, or stone, is obtained by digging, cutting or blasting.

Quarry lease: Refers to a 10-year lease granted by the Crown with exclusive rights to excavate quarry minerals (e.g. sand, gravel, clay, shale gypsum, peat, salt, rock or stone.)

Riprap: A stone covering used to protect soil or surface bedrock from erosion by water or other elements.

Runoff: The flow of surface water out of a drainage basin.

Shale: A clastic sedimentary rock that is made up of clay-size weathering debris. It typically breaks into thin flat pieces.

1.0 INTRODUCTION

This Quarry Management Plan (QMP) is one component of the overall Environmental Management Program (EMP) for the Lake Manitoba and Lake St. Martin Permanent Outlet Channels Project (the "Project"). The purpose of this plan is to outline criteria for site selection and development of quarries with the objective to avoid (to the extent possible), and mitigate potential adverse environmental effects associated with quarry development and aggregate production activities.

Various construction materials are required for the Project including rockfill riprap, road building aggregates, concrete aggregates, and other granular or fine-grained materials. Estimated quantities, volumes, and identification of potential sources of construction materials are under development as the Project design progresses. Several potential bedrock and granular (i.e. sand and gravel) quarry sources exist in the general Project region, which may be used by Project Contractors. These include some existing permitted and licensed sources.

In addition to the requirements described within this plan, all Project activities, including quarry site selection, development, and management, will adhere to Project Environmental Requirements (PERs; Table 1], as well as applicable components of the Construction Environmental Management Plan, the Operation Environmental Management Plan, and commitments made in the Project's Environmental Impact Statement (EIS) throughout the life of the Project.

1.1 Applicable Legislation and Reference Documents

The selection, development and operation of quarries shall comply with all applicable legislation, licences, authorizations and permits. Key legislation and supporting documents associated with the Project Quarry Management Plan are outlined in Table 1.

Table 1: Key Legislation and Documents Associated with the Quarry Management Plan

Federal Legislation	
***Species At Risk Act* (S.C. 2002, c. 29)**	*Explosives Act* (R.S.C., 1985, c. E-17)
Provincial Legislation	
***The Endangered Species and Ecosystems Act* (C.C.S.M. c. E111)**	*The Dangerous Goods Handling and Transportation Act* (C.C.S.M. c. D12)
***The Workplace Safety and Health Act* (C.C.S.M. c. W210)**	*The Fires Prevention and Emergency Response Act* (C.C.S.M. c. F80)

***The Mines and Minerals Act* (C.C.S.M. c. M162)**	Quarry Minerals Regulation, 1992 (Regulation 65/92)
***The Forest Act* (C.C.S.M. c. F150)**	*The Wildfires Act* (C.C.S.M. c. W128)
***The Crown Lands Act* (C.C.S.M. c.C340)**	
Other	
Manitoba Infrastructure (MI) Contracts and Associated Documents	Project Licences and Authorizations
Applicable Manitoba Mines and Minerals Casual Quarry Permits or Quarry Leases	Applicable Manitoba Conservation and Climate Work Permits
Environmental Protection Guidelines	
Relevant Project Environmental Requirements	
2.1 Designated Areas and Access	2.2 Clearing and Grubbing
2.3 Erosion and Sediment Control	2.5 Machinery, Fuel Storage, Materials Handling and Storage, Spill Response and Remediation
2.6 Dust Suppression	2.8 Noise and Noise Limitations
2.9 Wildlife	2.10 Wildfires
2.11 Heritage Resources	2.12 Quarries and Borrow
2.13 Site Decommissioning	2.14 Revegetation and Vegetation Maintenance
2.15 Planned and Unplanned Shutdowns	

2.0 COMMUNICATION

Effective public education and communication about the Project is important to achieve success of the Project. The education and communication strategy for the construction and operations phases of the Project is intended to promote safety for all and to maintain an understanding among specific relevant groups and the public-at-large regarding all aspects of the project, including quarry site selection, development, and operation.

Ongoing communications pertinent to quarry management will include information such as:

- Changes to access control points, timing of certain project items, changes to exclusion areas due to blasting, etc.
- The Proponent is committed to working with stakeholders, the public and Indigenous groups to mitigate disruptions in use of resource areas and will provide effective and timely communication about Project activities and about any restrictions to activities that will be applied.
- Advanced notification will be given to affected parties prior to blasting events in the event blasting is required.

Locations of potential quarries have been identified on Figure 9.2A-15 in the Project EIS; a copy has been included in Appendix 1. This figure will be updated as required as design and construction progresses and new information becomes available. Potential blasting areas will be included on the construction maps, however more detailed blasting exclusion zones will be shown on a separate map, which will be distributed closer to the start of the construction period, should blasting be required.

During the pre-construction period MI will maintain communication with local residents including members of local Indigenous communities and non-Indigenous communities.

2.1 Contact Persons

MI, as the overall Project Manager and owner, is responsible for implementing, monitoring and amending the environmental aspects of the Project. The overall Project organization structure is outlined in Section 2.2 of the EMP. The MI Project Manager will coordinate with the MI Construction Supervisor and MI Environmental Assessment Officer (EAO), or designated alternates, who will monitor daily construction activities. These individuals will be supported by advice from a MI technical support team comprised of off-site environmental and design personnel. The MI Project Manager will coordinate information sharing between on-site activities and off-site support teams.

Throughout the construction phase, the MI Project Manager will be the main contact for communications between the construction team and the local residents and will be responsible for regular communications with Indigenous and non-Indigenous communities. This person will facilitate communication between the construction site staff and the local communities, including keeping leadership apprised of project activities.

The Contractor is responsible for regular communication with the MI Construction Inspector on construction activities including overall construction schedule, identification of proposed quarries, and submission of Quarry Development Plans (QDPs) and Quarry Decommissioning Plans. Prior to quarry development, and as required, the MI Project Manager will provide members of the local Indigenous and non-Indigenous communities with information about any Project activities and restrictions that will be put in place. The MI Project Manager will work collaboratively on measures to address community concerns.

3.0 CONSTRUCTION

3.1 Quarry Identification and Selection Criteria

3.1.1 General

The Contractor shall comply with all applicable legislation, licences, authorizations and permits with respect to aggregate exploration, quarry development and operations (Table 1). Quarry site selection, development and operation procedures outlined in this plan are to be read in conjunction with the PERs (Table 1), as well as the Construction Environmental Management Program (CEMP), Operation Environmental Management Program (OEMP), and the Project EIS.

3.1.2 Site Selection

Aggregate for use in Project construction or maintenance shall, to the greatest extent possible, be sourced from existing sites, or from within the Project footprint. Should existing aggregate sources be of insufficient quantities or inadequate material quality, development of additional sites shall, to the greatest extent possible, be limited to sites identified in the Project EIS and shown on Figure 9.2A-15.

Proposed quarries that are not currently active or identified in the EIS are subject to a site selection analysis to be approved by MI. The analysis will include a review of the Environmental Protection Plan (EPP) so that proposed quarry sites will not interfere with sensitive features such as:

- heritage resources and known cultural sites
- sensitive wildlife habitat including species at risk and migratory birds (e.g., active swallow nesting colonies)
- surface water, fish or fish habitat
- groundwater
- other sensitive sites (e.g. mineral licks or other materials placed in the field that may attract wildlife)

Environmentally Sensitive Sites (ESSs), including those listed above, will be identified to the extent practicable prior to quarry development. ESSs may also be identified during the construction period and brought to the attention of the Construction Supervisor and/or MI Contract Administrator, to take appropriate mitigative action.

With respect to site selection, the following requirements shall apply:

1. No operator of a quarry may establish or mine a quarry closer than 400 m 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. Mining operations shall not encroach within 15 m of any property boundary adjoining private, municipal or crown-leased land.

3. With the exception of quarries that are contiguous with the road right-of- way, all quarry operations shall maintain a 50 m buffer from the proposed or actual road right-of-way. If no vegetated buffer or screen exists this distance shall be at least 150 m.
4. No quarry shall be established closer than 150 m 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.
5. Habitat occupied by endangered species shall be avoided.
6. Quarry site selection shall consider the proximity of sensitive sites including, but not limited to, waterbodies, wildlife, heritage resources and culturally important sites. While setbacks vary depending on site conditions, selected quarry development sites are to be a minimum of:
    a. 100 m from a water course or water body
    b. 100 m from any large stick nest, eagle nest, heron rookery, or any other sensitive wildlife area
    c. 30 m from heritage resources or identified cultural sites
    d. other setbacks as required
7. Prior to development of a quarry site, it shall be assessed for the potential of acid rock generation. Sites found to contain acid generating rock shall not be developed.

3.2 Quarry Development Plan

Once a proposed quarry location has been approved for use or development by MI, a Quarry Development Plan (QDP) shall be produced by the selected Contractor. The QDP shall be submitted to MI for review and approval. The QDP may form part of the relevant permit or lease applications. The QDP shall describe the mobilization and demobilization of equipment, tools, materials, facilities and all things necessary for the Work including but not limited to site access, site work roads, site drainage, snow removal, clearing and grubbing, blasting, crushing and stockpiling of aggregate, environmental protection and mitigation measures, explosives storage and handling (including explosives residuals management plan), and general site cleanup and restoration.

The QDP shall include drawings diagrams or maps showing proposed site use or development limits, including the location of the initial extraction area, the progression of the extraction area, the location of sheds, offices, toilets and other temporary structures (including the explosives storage magazine), surface drainage areas and surface drainage control, stockpile areas, equipment maintenance areas, and other designated sites. The relationship between the planned quarry development, and site surface water and groundwater conditions shall also be addressed in the QDP, including items such as:

- Plans for the control of surface water inflow and runoff from the quarry site.
- The relationship between the planned quarry excavation geometry and the groundwater conditions at the site (i.e. the relationship between the invert of the quarry excavation and the groundwater conditions at the site).
- Surface water and groundwater management for unwatering/dewatering and associated discharge (if necessary).

The QDP is subject to approval by MI, and may require revision(s) to meet relevant licences, permit or lease conditions, specifications, or site-specific requirements.

3.3 Quarry Operation

Quarries shall be operated in accordance with all applicable licences, approvals, permits and/or leases, the PERs, and as per approved QDPs. The Contractor will not be permitted to commence any site work including mobilization, drilling activities or material extraction until the QDP is approved and the required permits are issued including but not limited to the following (as applicable):

- Casual quarry permit or quarry lease (Manitoba Mines Branch).
- Work permit (Manitoba Conservation and Climate).

The Contractor will be responsible to acquire and maintain all relevant utility clearances prior to excavating in the proposed quarry development area.

The Contractor is to provide MI at least eleven (11) working days advance notice of the location of the quarry operation. The notice to MI is to include the QDP, and associated drawings of the working area including the location of the initial extraction area, the progression of the extraction area and the location of sheds, offices, toilets and other temporary structures, drainage and stockpile areas, equipment maintenance areas, and other designated sites. The suitability of the working area and commencement of works is to be subject to approval of MI.

The Contractor is to provide the MI Contract Administrator with at least six (6) working days advance notice of the intention to commence production of aggregates. The notice shall include: a preliminary schedule for work activities including establishment of access, clearing, relocation of equipment, establishment of water and wastewater services, appropriate systems to prevent accidental release of environmentally sensitive materials (e.g. fuels, oils, etc.), provisions for disposal of wastes, explosives management plan (including explosives residuals management plan), blasting plan(s), and commencement of crushing operation.

Where blasting is required, the Contractor is required to submit a blast plan (or series of blasting plans) to the Contract Administrator prior to preparatory work for each blast including such information as:

- The location, depth and area of the sinking cut.
- The blast sequencing, including location, depth, and area of each blast.
- Diameter, depth, pattern and inclination of blast holes for each blast.
- The type, strength, amount, column load, and distribution of explosives to be used per hole, per delay and per blast.
- The sequence and pattern of delays for each blast and the description and purposes of any special methods to be adopted.

Storage, transportation, and on-site handling of explosives (where required) will be in accordance with the *Explosives Act*. Storage of explosives (including magazine design and location) must be in a dry location away from flammable substances and sources of ignition and in a secure location to ensure that access is limited to authorized personnel. During transport, explosives shall be appropriately labelled, packaged and an

appropriate vehicle shall be used. Additional precautions pertaining to the transport and storage of explosives are detailed in the *Explosives Act.*

The quarry areas shall be maintained and left in a clean and orderly condition satisfactory to the Mines Inspector and/or Environment Officer. The explosives residuals management plan developed by the Contractor shall be adhered to throughout quarry development and operations.

The Contractor may amend the QDP to account for unexpected conditions or re-positioning of material and equipment, but must do so with approval from MI.

3.4 Record Keeping and Reporting

In accordance with Section 25 of the Manitoba Provincial Quarry Minerals Regulation, 1992 (65/92) under *The Mine and Minerals Act* (C.C.S.M. c.M162), the holder of a quarry shall provide the Mining Recorder with the following (as applicable):

- An annual statement of the total quantity of quarry mineral produced from the quarry.
- A royalty payment.
- A rehabilitation levy payment.
- The annual rent, no later than the 30th day following the anniversary date of the lease.

Only quarry minerals that are produced and removed from the quarry shall be included within the annual statement. Quarry mineral removed by the Contractor for a public purpose is exempt from payment of royalties where the public agency certifies in an exemption certificate prepared on a form furnished by the recorder that the quarry mineral has been used for a public purpose.

Pursuant to Schedule C of the Quarry Minerals Regulations, 1992, a rehabilitation levy of 12¢ per tonne is required for production of aggregate quarry mineral (Note: Every operator of an aggregate quarry shall remit to the recorder a rehabilitation levy equal to the product of the number of tonnes of aggregate quarry mineral produced multiplied by 0.12). This only applies to quarry minerals that are produced and removed from the quarry (the holder does not pay this fee as long as the quarry mineral remains stockpiled on the quarry).

Prior to the commencement of mining, a work permit shall be obtained from the local Natural Resource Officer and notice of the commencement date shall be given to the Mines Inspector.

The Contractor shall maintain an accurate daily record of the quantity of material removed from the site and shall make this information available to MI and/or the Mines Inspector upon request. If the permit was applied for on the basis of a contract for MI, material can only be used for the purposes of that project.

3.5 Quarry Decommissioning Plan

Quarries that are exhausted of material or are are no longer required, as determined by MI, shall be decommissioned and remediated of any contamination in accordance with applicable regulations prior to Contractor demobilization. The Contractor shall develop and submit a Quarry Decommissioning Plan to MI no less than 90 days prior to demobilization.

The Quarry Decommissioning Plan shall adhere to applicable regulations and incorporate measures listed in the Project Environmental Requirements, the Construction Environmental Management Plan, the Operation Environmental Management Plan, and commitments made in the Project EIS. The Quarry Decommissioning Plan shall at minimum describe all remedial measures to address:

- **Access removal** – Access roads, approaches, and temporary culverts will be removed or appropriately blocked as part of site restoration. If the public will be affected during the decommissioning of any temporary construction roads the Contractor will require signage or flag persons to ensure the health and safety of workers and residents in the area. Any existing or constructed roads that are required as part of the Project that will be used during the operation and maintenance phases are not required to be decommissioned.
- **Sloping considerations** – Quarry sites are to be regraded as necessary to establish safe side slopes and restore natural drainage to the area.
- **Re-vegetation including spreading of organic material** - Closure of temporary construction work areas, including quarry areas, will typically consist of redistributing topsoil and other organic materials to encourage natural vegetation and regeneration. Re-seeding will occur, as required, following the Revegetation Plans developed for the Project. Should re-seeding be required, and when conditions permit, re-seeding should be completed following grading, capping and trimming operations. If conditions do not permit re-seeding immediately, the Contractor is responsible to re-seed the next growing season. Seeding operations should not be carried out during high wind events, snow cover, ice conditions or in standing water.
- **Remediation of contamination** - Areas with fuel storage or refueling, hazardous substance and/or explosives handling, or vehicle or heavy equipment parking will require environmental soil testing. Should soil concentrations result in exceedances above applicable criteria the area will be remediated in accordance with applicable regulations (i.e. below CCME guidelines) prior to Contractor demobilization.
- **Excess material** – Surplus material may be left in stockpiles that are re-graded to establish safe slope angles. Alternatively, surplus material may be moved to alternate site locations for future use during operation and maintenance phases or spread evenly over disturbed areas prior to closure. Excess material shall be left in a manner that does not impede drainage.
- **Waste** – Waste management shall be conducted in accordance with requirements set out in the CEMP and OEMP. For example, non-hazardous debris, construction waste and solid waste is to be removed and disposed of at existing permitted waste disposal sites. Hazardous materials will be removed and handled by licensed contractors and in accordance with specific legislation.
- **Removal of temporary structures and equipment** - Buildings, outbuildings, above-ground storage tanks and associated infrastructure will be removed. Dismantling of buildings will include disconnecting services such as potable water and septic holding tanks and removal of associated infrastructure. Dismantling electrical and telephone services including removal of overhead lines, poles and transformers.
- **Safety requirements** – Access restrictions to the quarry cut edge are to be included as required. Decommissioning activities will be in compliance with applicable safety and health regulations. Signage and flag persons at the site may be required as part of the decommissioning and reclamation activities if the activities pose a risk to the safety of local residents.

- Other requirements as listed in relevant legislation, regulations, licences, authorization, approvals permits and/or leases.

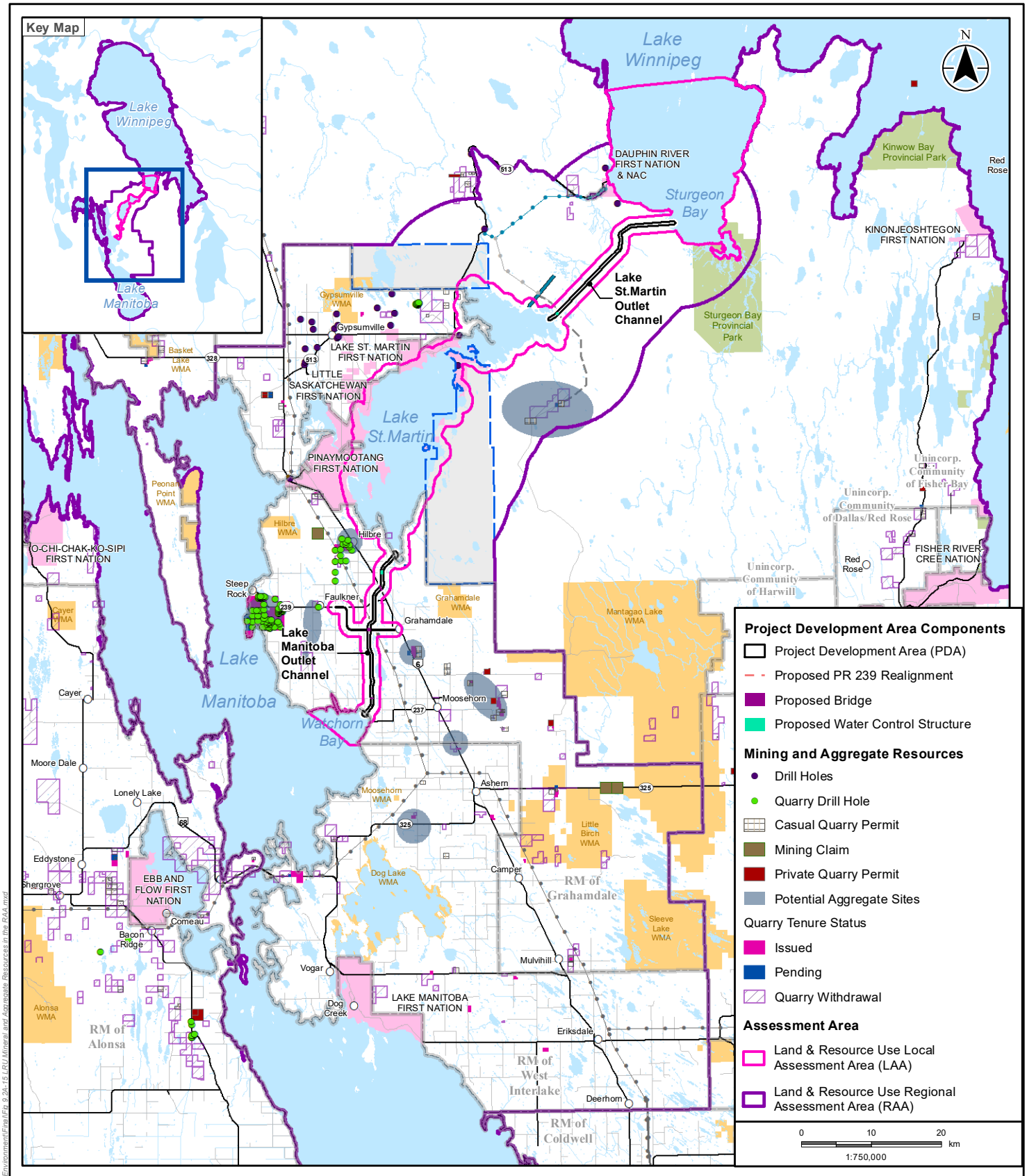
Rehabilitation of any quarry used during the operation phase of the Project will be required during or prior to Project decommissioning. Affected communities would be advised, and all applicable regulatory requirements would be met. The specific methodology would include and, where possible, build on the decommissioning procedures for temporary construction sites.

4.0 OPERATION

Some of the quarry areas developed during the construction phase may be retained by MI to support ongoing operation and maintenance of the Project. These quarries will be managed following the procedures outlined in Section 3.0. Likewise, if any new quarry sites are required in the future for any major maintenance or repair, these similarly would be sited, developed and managed in accordance with measures in Section 3.0.

APPENDIX 1

EIS Figure 9.2A-15 (March 2020)



Legend

- Fairford Water Control Structure
- Lake St.Martin Emergency Outlet Channel (Reach 1)
- Lake St.Martin Access Road
- Existing Transmission Line
- Existing Distribution Line
- Planned Distribution Line
- Provincial Highway (PTH/PR)
- Municipal Road
- Lake St. Martin Area Unorganized Territory
- Rural Municipality
- Northern Affairs Community (NAC)
- First Nation
- Wildlife Management Area
- Provincial Park

Notes

1. Coordinate System: NAD 1983 UTM Zone 14N
2. Data Sources: Governments of Manitoba and Canada, Manitoba Infrastructure
3. Last Update: 8/23/2019 3:51:15 PM

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MANITOBA INFRASTRUCTURE
Lake Manitoba & Lake St.Martin Outlet Channels Project
Environmental Impact Statement

Mineral and Aggregate Resources in the RAA

Figure 9.2A-15

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