

**LAKE MANITOBA AND LAKE ST. MARTIN OUTLET CHANNELS PROJECT
RESPONSE TO IAAC TECHNICAL INFORMATION REQUESTS**

Question IAAC-18

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Abbreviations and Acronyms

CCME	Canadian Council of Ministers of the Environment
COPC	Contaminant of Potential Concern
EIS	environmental impact statement
EMP	Environmental Management Program
FMP	Follow-up and Monitoring Program
GCDWQ	Guidelines for Canadian Drinking Water Quality
GWMP	Groundwater Management Plan
LAA	local assessment area
LMOC	Lake Manitoba outlet channel
LSMOC	Lake St. Martin outlet channel
MSD	Manitoba Sustainable Development
MWQSOG	Manitoba Water Quality Standards, Objectives and Guidelines
PAL	Protection Of Aquatic Life
PDA	project development area

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EIS Guideline Reference: 7.2.2. Changes to groundwater, surface water, and fluvial morphology

EIS Reference: 6.4.4.3 Changes in Local Groundwater / Surface Water Interactions; 6.4.7.7 Changes in Regional and/or Local Surface Water Quality; 6.4.11 Follow-Up and Monitoring; 12.4 Groundwater and Surface Water Follow-up and Monitoring Program

Context and Rationale

Section 7.2.2 of the EIS Guidelines requires the proponent to assess the changes to groundwater and surface water as a result of the project.

ECCC notes that during construction there will be active aquifer depressurization, with groundwater to be discharged to surface waters or potentially to wetlands to mitigate loss of artesian recharge of the wetlands. For discharges that are to be directed to wetlands, water quality monitoring is needed to understand the effects on vegetation and aquatic life.

Section 6.4.7.7 of the EIS indicates expectations that the groundwater would be within Manitoba Sustainable Development (MSD) and Canadian Council of Ministers of the Environment (CCME) recommended guidelines for the protection of aquatic life. The EIS does not provide details on the monitoring frequency or actions to be taken if guidelines are exceeded.

The Follow-Up and Monitoring Program for surface water quality includes decision thresholds in the monitoring plan, but similar thresholds are not proposed for groundwater, which will be discharged to surface waters. Details of the proposed water management and monitoring plans are required to evaluate the proposed management, monitoring, and mitigation measures.

Information Requests

- a) Provide details of groundwater monitoring plans that identify groundwater quality thresholds that will be applied in groundwater quality monitoring and indicate what adaptive management actions will be taken if the thresholds are exceeded (such as changes in monitoring frequency and other actions to protect surface water quality). Include description of a monitoring program for runoff and groundwater seepage which also includes water quality thresholds for adaptive management.
- b) If any of the details requested above cannot be provided at the time of response, present a discussion of the gap in information, related uncertainty with regards to potential effects (assessment predictions) and mitigation, and any monitoring and follow up that will be implemented on a precautionary basis to verify assessment predictions as well as additional mitigation measures required to adaptively manage.

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A response for a) and b) is provided below

Development of the Project Groundwater Management and Monitoring Plans

The Groundwater Management Plan (GWMP) is being developed as part of the overall Project Environmental Management Program (EMP). The Groundwater Monitoring Plan that links to the GWMP will represent one of a series of plans associated with the Follow-up and Monitoring Program (FMP). Details of the GWMP and the monitoring plans are being developed concurrently with Project design, and are anticipated to be drafted as the preliminary design for the Project and Project components advance. Please see IAAC-15 for a description of the Project EMP and associated monitoring plans.

As noted in Volume 5, Section 12.4.1.1 of the environmental impact statement (EIS), the objective of groundwater monitoring associated with the GWMP is to determine whether there are changes to the volume, accessibility or quality of the groundwater in the groundwater local assessment area (LAA) as a result of construction or operations, and to update and implement mitigation measures and responses accordingly. The monitoring and analysis plan will provide information to better predict and quantify potential effects and confirm which locations of the groundwater LAA should be further monitored during aquifer depressurization. Domestic water wells in the Lake Manitoba Outlet Channel (LMOC) project development area (PDA), because of their purpose, will be monitored for their quality, with reference to the Guidelines for Canadian Drinking Water Quality (GCDWQ). Field investigations and monitoring will provide further information on geological stratigraphy and hydrogeological parameters to further quantify potential effects due to depressurization. As discussed in Volume 1, Section 3.7 of the EIS, the groundwater monitoring plan being developed will incorporate the following:

- further ongoing investigations into groundwater quantity and quality in the Lake St. Martin Outlet Channel (LSMOC) LAA during Preliminary and Detailed Design of the LSMOC;
- further ongoing aquifer investigation and modelling during Preliminary and Detailed Design to determine the effect of construction dewatering on specific domestic water wells in the potentially affected LMOC Project LAA;
- further analyses of effects of dewatering, followed by communications with the local well users that may be affected (developing mitigation plans will involve working with affected well users);
- installation of additional observation wells prior to construction dewatering to monitor effects during dewatering of each section during construction; and
- modification of mitigation plans if/as required during dewatering as specific information is received from observation wells and local well users.

Project Area Groundwater Quality

Please see IAAC-26 for information on the methods, analyses and results of groundwater sampling that have been conducted in the PDA to date.

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Final Groundwater Management and Monitoring Plans

The GWMP and associated follow-up and monitoring plan currently under development by Manitoba Infrastructure will include the rationale, methods, parameters, sampling locations and sampling schedule for the groundwater quality and quantity monitoring plans. The final list of parameters and locations to be included in the monitoring plans will be determined through the ongoing Indigenous consultation and engagement program, and as the Detailed Design for the Project advances.

The GWMP will include thresholds to aid in adaptive management, such as monitoring of groundwater levels in local wells during dewatering activities, monitoring of water temperatures, and analyses of Contaminants of Potential Concern (COPCs) such as *E. coli*. It is expected that the GWMP will build on the groundwater monitoring conducted to date for the LMOC PDA, and include sampling parameters and locations established to date in the area. Groundwater samples being monitored for drinking water purposes and protection of the aquifer will be referenced to the GCDWQ, and sampling of groundwater being discharged to surface water areas will be monitored and referenced to applicable Canadian Council of Ministers of the Environment (CCME) guidelines and/or Manitoba Water Quality Standards, Objectives and Guidelines (MWQSOGs) for the Protection of Aquatic Life (PAL). Should there be the need to discharge groundwater to overland areas, these discharges will be analyzed in reference to applicable CCME guidelines and/or MWQSOGs for the Protection of Agricultural Water Uses (Irrigation and Livestock Water) (CCME 1993). Groundwater discharges, including seepages, and existing local drinking water wells will be continuously monitored to assure that groundwater quality and quantity are not adversely affected by the Project activities. The sampling frequency and groundwater discharge locations will be selected to allow for adaptive management measures, such as temporary reduction of groundwater depressurization activities, additional sampling, or redirection of groundwater discharges.

The goal of the GWMP will be to protect and maintain existing groundwater quality in the Project area for existing and future use. Monitoring of groundwater levels will occur to assure that changes in groundwater levels due to aquifer depressurization activities are not resulting in adverse effects on local well users or groundwater hydrology in the LAA. This goal will be accomplished through continuous groundwater monitoring in the Project LAA during the pre-construction, construction and post-construction phase, and throughout the operational and maintenance phases of the Project.

References

Canadian Council of Ministers of the Environment (CCME).1993. Canadian Water Quality Guidelines for the Protection of Agricultural Water Uses (Irrigation and Livestock Water) Available at: <http://cegg-rcqe.ccme.ca/download/en/131/?redir=1589230458>. Accessed May 11, 2020.