

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

Question IAAC-61

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Abbreviations and Acronyms

CDA	Canadian Dam Association
cfs	cubic feet per second
EIS	environmental impact statement
MI	Manitoba Infrastructure
mm	millimetre
PDA	project development area

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EIS Guideline Reference: 7.6.2 Effects of the environment on the project

EIS Reference: 15.5 Effect of Long-Term Climate Change on the Project; Volume 1, Appendix 3D
Operational Guidelines

Context and Rationale

The EIS guidelines require consideration of events under a range of future climate states and that the assessment of effects of the environment on the project take into account both natural events and human management of the existing environment.

Appendix 3D outlines operational guidelines for the project and other flood management infrastructure, and uses historic data to develop water level simulations for the period of 1915-2017 under different operating regimes.

There is limited discussion in the EIS regarding operation and management of integrated flood infrastructure under future climate states.

This information is required to understand potential climate change impacts on the Project and how the project will perform over its lifetime in the context of climate change.

Information Requests

- a) Under a range of future climate scenarios where there is an increase the frequency, duration, and magnitude of extreme weather events, including extreme precipitation and flooding:
 - i. Describe management, operation and capacity of the integrated system of flood management infrastructure (e.g., Fairford Water Control Structure), and how this may interact with the project.
 - ii. In the context of the integrated system of flood management infrastructure, describe how events under future climate scenarios may adversely affect the project and how this in turn could result in effects to the environment.
 - iii. Describe details of planning, design, construction, and operation strategies intended to minimize any potential environmental effects of the environment on the project.

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- a) The purpose of the Lake Manitoba and Lake St. Martin Outlet Channel Project is to develop permanent flood mitigation for Lake Manitoba and Lake St. Martin to alleviate flooding in the Lake St. Martin region. The Lake Manitoba Outlet Channel is designed to convey 7,500 cfs at 814 ft water elevation and the Lake St. Martin Outlet Channel is designed to convey 11,500 cfs at 801 ft water elevation. Both channels are designed to convey the 1 in 300-year event (equivalent to the 2011 event) with reduced freeboard to a degree of tolerable risk as determined using the risk based approach described in the Canadian Dam Association (CDA) Dam Safety Guidelines. The design flood for the Project is the equivalent to the 2011 flood which has been classified as an approximate 1:300- year flood.
- i. The Project will be operated in tandem with the Fairford Water Control Structure. Future climate scenarios expect increased frequency, duration, and magnitude of extreme weather events, including extreme precipitation and flooding. In such events, the integrated flood management infrastructure will operate as described in the environmental impact statement (EIS) (Volume 1, Section 3, Appendix 3D, Operational Guidelines), which includes recognition of the Operating Guidelines for the Fairford River Water Control Structure. The Project is designed to accommodate flooding up to a 1:300-year event. A future climate sensitivity analysis showed an increase of 30-90 mm to the peak water levels in a 1:300-year flood event. This is considered to be within the safety factor range for the Project design. Extreme flooding beyond a 1:300-year event may cause the infrastructure to be overwhelmed and the effects on the environment will be as described in the response to IAAC-59.
 - ii. Future climate scenarios, as discussed in Volume 5, Section 15.5 and in the response to IAAC 57, 58a and 58b, indicate increased precipitation and flooding. These events are the purpose of the Project. As discussed in the response to i, above, the integrated system of flood management infrastructure is designed to accommodate a flood up to the 1:300-year event (the design flood). Floods greater than the design flood, will result in the excess water flowing overland, as described in the response to IAAC 59.
 - iii. The Project has been designed to minimize the effects of floods on the environment. Thus, the effects of increased precipitation and flooding due to climate change is part of the purpose of the Project. Planning, design, construction, and operation strategies intended to minimize any potential environmental effects of the environment on the Project are presented throughout Volume 1, Section 3, the Project Description and its Appendices. These include the following:

From the Project Environmental Regulations (Volume 1, Section 3, Appendix 3F):

- The Project Environmental Requirements (Volume 1, Section 3, Appendix 3F) require all contractors to have approved (by Manitoba Infrastructure [MI]) plans including:
 - Environmental Emergency Plan for Spill Response and Remediation

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- Construction Phase Erosion and Sediment Control measures
- Petroleum Storage and Equipment Fueling and Servicing Plan
- The outlet channels and other structures will be designed to resist both normal and extreme physical environmental conditions, based on historical records and future climate predictions.
- Construction and maintenance work will be halted in adverse weather.
- Damage to infrastructure caused by adverse weather conditions would be minimized and repaired as necessary; this will be facilitated by immediate event-specific site inspections at sites potentially affected by an extreme event.
- Site-specific drainage control measures and erosion and sediment control measures (as well as potential use of the Emergency Outlet Channel) would be used during construction to mitigate effects of precipitation and flooding within the Project development area (PDA).
- The channels and other structures will be designed and constructed to address foundation or stability issues.
- 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.
- 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.
- 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.
- Efforts shall be made to minimize the duration of soil exposure and run-off shall be diverted away from exposed soils.

Further operational strategies to minimize any potential environmental effects of the environment on the Project are presented in the Operational Guidelines (Volume 1, Section 3, Appendix 3D).