

Environmental Protection Operations Directorate
Prairie & Northern Region
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Winnipeg, MB R3C 4W2



ECCC File: 4194-10-5/3087
CIAR Reference: 80148

January 20, 2021

Via email: matthew.dairon@canada.ca

Matthew Dairon
Impact Assessment Agency of Canada
Canada Place
Edmonton, AB T5J 4C3

Dear Matthew Dairon:

**RE: Manitoba Infrastructure – Lake Manitoba and Lake St Martin Outlet Channels Project (The Project)
– Technical Review of Round 1, Package 1 Information Request Responses**

Environment and Climate Change Canada (ECCC) has reviewed the information submitted to the Impact Assessment Agency of Canada regarding the above-mentioned information request responses. You will find our technical review comments attached.

We have provided our expert advice based on ECCC's mandate in the context of the *Species at Risk Act* (SARA), the *Migratory Birds Convention Act 1994* (MBCA), and the *Canadian Environmental Protection Act 1999* (CEPA).

Please contact Orlagh O'Sullivan at 431-276-4506 or Orlagh.OSullivan@canada.ca if you have any questions or concerns.

Sincerely,

<original signed by>

Margaret Fairbairn
A/ Regional Director

Attachment(s): ECCC Technical Review Feedback Form

cc: Jody Small, Head, Environmental Assessment South
Orlagh O'Sullivan, Environmental Assessment Officer



Lake Manitoba and Lake St. Martin Outlet Channel Project

Information Request Responses - Technical Review: Optional Feedback Form

Objective: Taking into account the information provided in the information request responses, please provide your views on the potential for significant adverse environmental effects. Identify any areas in the responses to the information requests that require further information to understand the potential environmental effects of the project and their significance, mitigation measures, and follow-up and monitoring programs. For areas where concerns have been identified, when possible, please describe potential mitigation measures that would address the concerns presented.

Please provide us with your comments on the information request responses by **January 20, 2020**. If you are unable to provide comments by this time, please contact the Agency to discuss further.

Reference to IR	Context and Rationale	Specific Question / Comment and potential mitigation
Identify which information request response and/or gap response your comments are related to (e.g. IR-01)	Provide applicable background or rationale for the comment provided, or information requested, including why it is important for understanding the effects of the project, especially as they pertain to Section 5 of CEAA 2012 and potential impacts to rights.	Identify if the concerns raised in the initial technical review have been addressed. Please provide your comment, and/or ask a specific question, request specific additional information, or clarification. When possible, please describe potential mitigation measure that would address the concerns presented.
Atmospheric Environment		
IAAC-01	The Proponent responded that, "Manitoba Infrastructure cannot guarantee that 100% of construction vehicles will be Tier 4 compliant. A requirement that all construction vehicles be Tier 4 compliant is unreasonably and commercially restrictive and may limit opportunities	ECCC Technical Comment 1: ECCC recommends the Proponent to choose engines that meet the most stringent emission standards, which are Tier 4 for the compression-



	<p>for local and Indigenous construction contractors and other firms from participating in the Project.”</p> <p>However, Tier 4 engines are cleaner diesel engines that came into effect in 2014. The use of Tier 4 engines instead of Tier 3 can lead to significant reduction in NOx emissions.</p>	<p>ignition engines during all phases of the project as a mitigation opportunity. Tier 4 engines have been in place since 2014 and should be readily available. Therefore, ECCC recommends that the Proponent choose engines that meet the most stringent emissions standards, wherever possible.</p>
IAAC-02 (i)	<p>The Proponent was requested to:</p> <p><i>“Update the air quality assessment to compare the CAAQS to predicted ambient concentrations (including background, project only and project plus background) for all relevant parameters (SO₂, NO₂ and PM_{2.5}) in the LAA and RAA. Assess the locations and frequency of any exceedances of the CAAQS standards that may occur as a result of the Project.”</i></p> <p>The Proponent response notes that Canadian Ambient Air Quality Standards (CAAQS) are not intended as project-specific objectives. Nevertheless, comparisons to numeric thresholds within CAAQS (or Manitoba Ambient Air Quality Criteria (MAAQC)) provide a quantitative basis on which an assessment of Project effects on the atmospheric environment can be made.</p> <p>Table 6.2-22 of the EIS notes that Project-related emissions of criteria air contaminants are estimated to potentially double the existing emissions of the entire RAA (particularly NO₂ emissions). The Guidance Document on Air Zone Management referenced in the Proponent’s response (CCME 2019) describes the guiding principles of “continuous improvement” and “keeping clean areas clean” which also underpin the Air Quality Management System under which the CAAQS were developed:</p> <p><i>“Keeping clean areas clean refers to preventative measures that are intended to avoid or minimize increases in overall ambient concentrations of pollutants in air zones that are assigned a green</i></p>	<p>ECCC Technical Comment 2:</p> <p>ECCC recommends the Proponent provide isopleth maps of the RAA or LAA, as appropriate, illustrating predicted concentrations of air pollutants emitted from the Project and assess the predicted frequencies of exceedances of CAAQS/MAAQC standards that may occur as a result of the Project, even if those frequencies may be null. This information should be assessed for background, project only, and project plus background scenarios. Provide a discussion/interpretation of these results within an updated assessment of the atmospheric environment.</p>

	<p><i>management level. The guiding principles of continuous improvement/keeping clean areas clean are intended to ensure that air quality does not deteriorate but is maintained or improved to the extent practicable. Maintaining or improving air quality minimizes risk to human health and the environment for the benefit of future generations. The continuous improvement/keeping clean areas clean principles are inherently incorporated in the Air Zone Management Framework.”</i></p> <p>The Proponent’s response also notes that <i>“The maximum 1-hour NO₂ concentrations may exceed the 2020 CAAQS at receptors located up to 300 m from the PDA and the maximum 24-hour PM_{2.5} concentrations may exceed the 2020 CAAQS at receptors located within a 1 km radius of the PDA. However, 1-hour NO₂ and 24-hour PM_{2.5} concentrations are not expected to exceed the CAAQS in the nearest communities or First Nations.”</i> Furthermore, Section 6.2.4.2 (and illustrated in Figure 6.2B-4) of the EIS notes the presence of numerous residential receptors in close proximity to the Project.</p> <p>Although the Proponent has noted that CAAQS exceedances may occur near the PDA, the Proponent has provided neither the locations nor frequency of any predicted exceedances that may occur as a result of the Project. Even if concentrations of relevant parameters do not approach standards provided by CAAQS or MAAQC, this quantitative information is required for a fulsome assessment of the Project’s effects on the atmospheric environment. Furthermore, this information is required to assess the appropriateness of any potential follow-up monitoring and to guide an adaptive air quality management plan.</p>	
IAAC-02 (ii)	<p>The Proponent was requested: <i>“If CAAQS are exceeded, describe what mitigation measures would be employed and how follow-up and monitoring plans would be updated to consider monitoring with comparison to the CAAQS. Describe the criteria which trigger the air quality follow-up and monitoring plan, and the timing for when</i></p>	<p>ECCC Technical Comment 3:</p> <p>1) The Proponent is requested to define the term “immediate vicinity of the PDA” and provide an estimate of the number of residential and other sensitive receptors that</p>

	<p><i>mitigation measures to reduce (COPC) concentrations would be implemented.”</i></p> <p>In their response, the Proponent stated, “The potential for concentrations of NO₂ or PM_{2.5} that exceed the short-term (1-hour and 24-hour, respectively) CAAQS is anticipated to be limited to the PDA and areas within the immediate vicinity of the PDA.” However, the Proponent has not provided any quantitative, site-specific information such as an air quality model assessment, to support this statement. In Section 6.2.4.2 (and illustrated in Figure 6.2B-4) of the EIS, the Proponent notes the presence of numerous residential receptors in close proximity to the Project. Section 5.1 of the draft Construction Environmental Management Program notes that the Lake Manitoba outlet channel is located in a developed area.</p> <p>The Proponent draws comparisons to the Springbank Off-stream Reservoir Project in their EIS and IR responses. However, it should be noted that the Proponent for the Springbank project established a comprehensive air quality management plan that includes ambient air quality monitoring for PM_{2.5} and NO₂, which uses the numeric value of NO₂ and PM_{2.5} CAAQS as triggers for enhanced mitigation measures.</p> <p>The Proponent has not provided any monitoring/mitigation/management plan for NO₂, despite noting the potential for exceedances of short-term CAAQS for NO₂ and recognizing that residential receptors are in close proximity to the Project.</p>	<p>exist within this area. It is recommended that the Proponent demonstrate, through the use of a predictive air quality model, the locations and frequency of CAAQS exceedances for NO₂ and PM_{2.5} that they predict for the project.</p> <p>2) ECCC recommends the development of an Adaptive Air Quality Management Plan that incorporates monitoring and mitigation objectives for both NO₂ and PM_{2.5}. It is recommended to use NO₂ and PM_{2.5} CAAQS as thresholds to trigger any mitigation actions within the Adaptive Air Quality Management Plan.</p>
<p>IAAC-02 (ii) Attachment A1 – Environmental Management</p>	<p>The Proponent’s response refers to the draft Dust Control Plan within Attachment A1 – Environmental Management Plans.</p> <p>Sections 1.4.1 and 1.4.2 of the draft Dust Control Plan do not state the methodology that the contractor and Contract Administrator, MI, or designated alternate will use to monitor dust at the specified locations.</p>	<p>ECCC Technical Comment 4:</p> <p>ECCC recommends the Proponent update the draft Dust Control Plan to include a range of possible monitoring methodologies and clearly define thresholds at which continuous ambient air quality monitoring for PM_{2.5} may be required.</p>

Plans (Dust Control Plan)	<p>The Proponent's response to IAAC-02 (ii) suggests visual observation will be the initial method to monitor dust but this is not reflected in the Dust Control Plan.</p> <p>The response notes that if visual monitoring is insufficient to resolve stakeholder dust complaints, then MI may implement ambient air quality monitoring for PM_{2.5}, but this is not reflected in the Dust Control Plan.</p>	
Surface Water		
IAAC-12 IAAC-44	<p>In the assessment of sediment quality effects, the Proponent provides a description of potential sources of sediment, including: construction related erosion and sedimentation, sediments accumulating in the channel, and flushing of softened till from the channel. However, there is no consideration of the potential for eroded sediment from the inlets of the channels to be transported and act as a source of additional sediment load. The only mention of potential erosion effects and the transport of sediment between water bodies related to the Project are in reply to IAAC 44, which states, <i>"following the construction of the LMOC, modeling results show that, during northerly wind events when the Water Control Structure (WCS) is closed, some sediment accumulates on the northern side of the outlet excavation and erodes on the southern side..</i> In addition, ECCC notes that no baseline sediment quality information has been provided for these potential erosional areas. If sediment quality differs between the inlet and outlet areas there is the potential for contaminants to be transferred between water bodies via the channels in addition to potential impacts related to suspended sediments.</p> <p>Some preliminary sediment transport modelling for Birch Bay has been referred to in the response to IAAC-44. It is stated that, <i>"the coarser material will likely deposit in the vicinity of the LMOC outlet in Birch Bay and the finer sediment (e.g. silt) will stay in suspension. Deposition of the site may occur further out into Birch Bay"</i> and that <i>"preliminary</i></p>	<p>ECCC Technical Comment 5:</p> <p>ECCC recommends the Proponent provide:</p> <ol style="list-style-type: none"> 1) Additional discussion on the potential for sediment transport due to erosion of sediments from the inlet of the channel to be deposited at the outlet. If erosion of sediment at the inlets of channels is anticipated to occur, baseline sediment quality information from these areas should be collected to identify potential contaminants which could be transported via the channel to downstream waterbodies. 2) The results of the sediment transport modelling referred to in IAAC-44, including information on distances of sediment transport from the outlet and duration of impact. 3) A quantitative analysis on the expected range of TSS/turbidity concentrations, duration of elevated sediment load, and the magnitude

	<p><i>modelling suggests that, after initial opening of the gates, and increase in total suspended solids (TSS) may results for a few hours to a few days.”</i> Modelling was only completed for Birch Bay, and has not yet been completed for Sturgeon Bay. ECCC notes that while the Proponent has made several overarching statements regarding the modelling results, the actual results of the modelling have not been provided for analysis.</p> <p>Overall, in their analysis of effects of sediment, the Proponent acknowledges the potential for mobilization of sediments during construction and operation of the outlet channels and that this could result in impacts to water quality and potentially fish health. Specifically they state that, <i>“regardless of the pathway, the effect of sediment on fish depends on the amount of sediment mobilized, suspended, or deposited, the duration of exposure to the sediment and/or elevated sediment concentrations, and the sensitivity of the fish species and life stage.”</i> However, no quantitative analysis has been presented on the expected range of concentrations, duration of elevated sediment loads, or magnitude of impact within the receiving environments. Without information quantifying the range of expected conditions with operation of the Project, it is not possible to assess significance of impacts or appropriateness of mitigation presented.</p>	<p>(i.e. distance) of impact within the receiving bays (Birch Bay and Sturgeon Bay), including the distance from outlet where aquatic life guidelines will be achieved.</p>
IR-13	<p>As identified in the EIS, the Proponent relies on numerous sources to establish their baseline water quality conditions. In response to IR-13a, a number of references have been provided (requested references and water quality data sources #1 through #6) but a summary of this data has not been collated. The Proponent provided summary statistics for some of the 2011-2015 data collected as part of the Emergency Outlet Channel Project, as well as preliminary data from the 2020 Aquatic Effects Monitoring Program (AEMP). However, there is no compilation of all the data that will be used by the Proponent to establish baseline water quality conditions.</p>	<p>ECCC Technical Comment 6:</p> <p>ECCC recommends the Proponent:</p> <ol style="list-style-type: none"> 1) Provide a clear compilation of the complete baseline water quality dataset which will be used in the AEMP analysis. This should also include a description of the methodology used to compare measured values to baseline conditions to assess for potential impacts to water quality.

	<p>The Aquatic Effects Monitoring Program identifies broadly the sources that will be used for baseline information (Section 3.2.2 of the AEMP) and notes, <i>“the early warning triggers will be based on a change from baseline or background (i.e. upstream) conditions.”</i> However, given that baseline monitoring data is being used from various sources, and has not been compiled, it is unclear how the Proponent intends to detect a change from baseline conditions, as section 3.3.5 of the AEMP (Data analysis) only states, <i>“comparison to baseline data to determine if there are linkages to the project.”</i> ECCC notes that in order to determine differences from baseline, baseline must be clearly established, and methodology for comparing measured values to the baseline dataset must be described.</p> <p>In response to IR-13 the Proponent acknowledged the gap in monitoring data for Lake Manitoba and the South Basin of Lake St. Martin, which led to the initiation of the AEMP sampling program in fall of 2020. As described in the AEMP (Section 3.3.2), <i>“samples are planned to be collected during four sampling sessions in each year to capture seasonal variability (i.e. once in spring, summer, fall and winter).”</i> However, as noted in the response to IR-13, it is the intention of the Proponent to only sample for water quality baseline at the AEMP sites in the fall (completed Sept/Oct 2020) and during late winter 2020/21. Given the identified data gaps in Lake Manitoba and the South Basin of Lake St. Martin water quality baseline, AEMP baseline monitoring should be continuous throughout 2021 in order to achieve a more complete dataset that can demonstrate any seasonal variability. The AEMP (Table 4) provides a proposal for supplemental data collection, and although supplemental data collection is proposed through 2021 and 2022, the proposed supplemental monitoring does not include water quality as a parameter.</p>	<p>2) Continue water quality baseline monitoring at the AEMP stations with spring/summer monitoring in 2021 to create a robust dataset that includes sufficient baseline data, representing seasonal variability, in both Lake Manitoba and the South Basin of Lake St. Martin.</p>
IAAC-14	<p>Section (i) <i>Assessment Methodology</i> of the response to IAAC-14 outlines the assessment approach, noting that the surface water quality assessment focused on effects that have the potential to change surface</p>	<p>ECCC Technical Comment 7:</p> <p>ECCC recommends that the Proponent:</p>

	<p>water quality in a way that could cause harm to ecological and human receptors. The EIS does not include a significance conclusion statement for surface water quality or other physical environment valued components (VCs). Rather, the significance of effects related to surface water quality are reflected in the pathways of effects assessment of each VC that is affected by changes in the physical environment (i.e., the aquatic environment, fish and fish habitat, terrestrial environment, human environment and Indigenous Peoples). Only residual environmental effects (i.e., effects remaining after mitigation measures are applied) were assessed for significance. The response includes a table outlining the effects pathways and measurable parameters. However, the response does not provide the requested data analyses to support/ demonstrate the conclusions drawn by the Proponent regarding residual environmental effects on surface water quality.</p> <p>Section (ii) <i>Addressing Changes to Surface Water Quality</i> states that surface water quality was assessed in terms of changes affecting groundwater and surface water hydrology. Four (4) effect pathways were identified and the potential effects on surface water quality were discussed, as listed below:</p> <ul style="list-style-type: none"> • Changes to groundwater – surface water interactions: Effects to temperature and water quality; • Changes in regional flows and water levels: Effects to water quality; • Changes in local drainage areas and patterns: Effects to water quality; and • Changes in regional and local sediment and debris transport: Effects to water quality. <p>The response discusses potential surface water quality effects in relation to these four effect pathways. However, the statements and conclusions regarding potential changes to water quality appear to be</p>	<ol style="list-style-type: none"> 1) Quantify predicted project-related changes to water quality using science-based methodology (e.g., water quality modelling); 2) Identify and discuss assumptions and uncertainties; and 3) Provide the degree of confidence associated with the water quality predictions.
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	<p>qualitative in nature. The response does not present quantitative water quality evidence (such as estimated water quality based on modeling) to support these conclusions.</p> <p>As water quality estimates/predictions have not been provided, it is unclear how water quality effects were quantified. Without data analyses to support/ demonstrate the EIS conclusions regarding water quality, ECCC cannot determine whether potential effects to water quality have been accurately characterized.</p>	
<p>IAAC-15</p> <p>Attachment A1 – Environmental Management Plans:</p> <p>Surface Water Management Plan</p> <p>Aquatic Effects Monitoring Plan</p>	<p>The Proponent's response notes that methodologies for monitoring water quality are described in the Aquatic Effects Monitoring Plan (AEMP), Surface Water Management Plan (SWMP) and Groundwater Management Plan (GWMP), and that mitigation measures relating to surface water are discussed in the SWMP, GWMP, Project Environmental Requirements and Sediment Management Plan (SMP). These draft plans were provided as Attachment A1 – Environmental Management Plans.</p> <p>Although best management practices are discussed, the draft plans include only preliminary/high-level descriptions of project-specific mitigation measures, and many mitigation details are yet to be determined. In addition, there are a number of uncertainties regarding project details and environmental effects. Overall, the level of detail provided in the draft plans does not permit a thorough understanding of how potential effects to surface water quality will be mitigated throughout the Project.</p> <p><u>With regards to the Surface Water Management Plan:</u></p> <p>1) Section 1.0 (Purpose and Scope) of the draft Surface Water Management Plan states:</p>	<p>ECCC Technical Comment 8:</p> <p>With regards to the Surface Water Management Plan, ECCC recommends the Proponent:</p> <ol style="list-style-type: none"> 1) Clarify whether and how stakeholders will be consulted regarding any changes to the SWMP and other management plans over the life of the Project; 2) Revise contingency measures to include "downstream" monitoring in the event of emergency conditions or undesirable circumstances. 3) a) Discuss whether and how precipitation and runoff from multiple/successive 1 in 10 year (or greater) runoff events could be managed: <ol style="list-style-type: none"> i) Prior to operations, with respect to each outlet channel; and ii) By the outside drain at LMOC and LSMOC during operations.

	<p><i>The SWMP is intended to be a living document that will be refined over the life of the Project and will be updated as preliminary and detailed design advances, incorporating applicable engagement feedback provided via regulatory review of the Environmental Impact Statement (EIS), landowners and/or Indigenous Groups...</i></p> <p>However, it is unclear whether stakeholders will be consulted regarding any changes to the SWMP and other management plans over the life of the Project.</p> <p>2) Section 2.0 (Objectives) lists the objectives that the SWMP is intended to address, including the following objective: <i>Monitor surface water quality in the vicinity of the LMOC and LSMOC to verify that the measures implemented meet expectations and identify additional contingency measures in the event of emergency conditions or undesirable circumstances.</i> ECCC notes that contingency measures should include “downstream” monitoring in either of these events.</p> <p>3) Per Section 3.2.1 (Lake Manitoba Outlet Channel) and 3.2.2 (Lake St. Martin Outlet Channel), the design criteria for managing precipitation, surface run-off and discharge for the outside drains is based on a 10 year return period. It is unclear whether the proposed design capacity for precipitation and surface run-off management during the construction and operations/maintenance phases (i.e., 1 in 10 year runoff event for LMOC; 1 in 10 year runoff event/ wind event for LSMOC) will be sufficiently protective of the receiving environment.</p>	<p>b) Describe the potential effects on surface water quality in the event of multiple/successive 1 in 10 year (or greater) runoff events during the Construction Phase and the Operations and Maintenance Phase.</p> <p>4) Revise Table 2 (Proposed Surface Water Quality Monitoring Parameters) to add phosphate (PO₄), potassium, sodium and carbon parameters (dissolved organic carbon, total inorganic carbon, total organic carbon).</p> <p>5) Compile summary statistics for the baseline datasets to define a comprehensive summary of baseline conditions, with data QA/QC included.</p> <p>6) Design operation phase monitoring to capture a representative range of flood events, including extreme events, for this permanent project.</p> <p>7) Describe what mitigation measures would be used to avoid adverse effects on the receiving environment from the following potential sources of processed water:</p> <p>a) Nitrogen-based explosives (if required);</p> <p>b) Leachate from rock stockpiles and structures containing rock exposed to surface waters and/or drainage;</p>
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	<p>4) Table 2 of the SWMP sets out the proposed surface water quality monitoring parameters. ECCC recommends adding phosphate, potassium, sodium and total/dissolved organic and inorganic carbon to the list of parameters to be analyzed in Table 2, to allow a comparison with AEMP monitoring parameters.</p> <p>5) Sections 7.1 and 14.1 (Historical Monitoring) indicate that historic surface water quality data will serve as a baseline to identify changes in water quality parameters during construction and operation of the LMOC and LSMOC, respectively. ECCC notes that summary statistics for the baseline datasets have not been compiled into a comprehensive summary of baseline conditions. Therefore, it is unclear how project monitoring results will be evaluated to determine change from baseline conditions.</p> <p>6) Sections 7.3 and 14.3 describe operation phase monitoring for the LMOC and LSMOC, respectively. Post-construction water quality monitoring is planned for a minimum of two years. It is unclear whether the proposed operation phase monitoring is sufficient to capture a representative range of flood events for this permanent project.</p> <p>7) Sections 5.3 and 12.3 (Processed Water) list potential sources of processed water for the project. Although the management plans discuss mitigations for some of these sources (e.g., dewatering, accidental spills and releases, sewage water), it is unclear what mitigations and measures would be used to avoid adverse effects on the receiving environment from the other potential sources.</p> <p><u>With regards to the Aquatic Effects Monitoring Plan (AEMP):</u></p>	<p>c) Discharge of wastewaters from processing of aggregate materials and concrete batch plant; and</p> <p>d) Water treatment plant filter backwash.</p> <p>ECCC Technical Comment 9:</p> <p>With regards to the Aquatic Effects Monitoring Plan, ECCC recommends the Proponent:</p> <p>a) Clarify how monitoring results will be evaluated against baseline conditions; including the use of critical effect sizes or other thresholds.</p> <p>b) Describe how a statistically significant difference in the monitoring observations would be evaluated in terms of ecological effects and function.</p> <p>c) Develop a more conservative definition for the management threshold, which reflects how ecological effects would be prevented.</p> <p>2) Provide details regarding whether/how water quality will be monitored throughout the water column for the various water quality monitoring studies.</p> <p>3) Establish water quality thresholds for declines/changes that lead to remedial measures being implemented.</p>
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	<p>1) Section 2.2 (Adaptive Management) states that <i>a two-staged approach is being used for adaptive management based on the development of two benchmarks: an early warning trigger, typically defined as a statistically significant change from baseline conditions; and a management threshold, the level of an indicator when the magnitude of an adverse effect is sufficient that it may result in long term adverse effects to a key fish species.</i></p> <p>ECCC notes that measuring statistically significant change from baseline conditions requires that baseline variability be sufficiently characterized. If there is a statistically significant difference, this should be reviewed in terms of ecological effects and function.</p> <p>It is unclear whether defining the management threshold as <i>“the level of an indicator when the magnitude of an adverse effect is sufficient that it may result in long term adverse effects to a key fish species”</i> would allow sufficient time and opportunity to prevent or mitigate adverse effects in the aquatic ecosystem.</p> <p>2) The AEMP does not indicate whether the proposed water quality monitoring studies will incorporate monitoring throughout the water column. As water quality can vary vertically within a waterbody/course, sampling of profiles should be incorporated in the monitoring where appropriate.</p> <p>3) Section 3.2.4 (Adaptive Management) lists measures that <i>‘may be implemented’</i> and <i>‘will be considered’</i> as components of adaptive</p>	<p>4) Verify the site-specific turbidity/TSS relationships periodically, and update as required.</p> <p>5) Benthic invertebrate sampling should be done with appropriate replication and subsamples, and analysed for total benthic invertebrate density, taxa richness, evenness index (Simpson’s), and similarity index (Bray-Curtis). Sediment should be collected at the same time, and analysed for particle size, total organic carbon, and total carbon.</p> <p>6) Add a comparison of fish tissue mercury levels to consumption guidelines for Study 14 (Fish Mercury Concentration Monitoring).</p> <p>7) Design operation phase monitoring to capture a representative range of flood events, including extreme events, for this permanent project.</p>
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	<p>management. However, these measures do not discuss whether or how thresholds would trigger implementation of remedial actions.</p> <p>4) Section 3.5.3, which describes the field and laboratory methods for the TSS monitoring study (i.e., Study 3), indicates that site-specific turbidity/TSS relationships will be established to allow the conversion of turbidity logger data to TSS. ECCC notes that site-specific turbidity/TSS relationships should be verified periodically, and updated as required.</p> <p>5) Section 4.3 describes Study 4: Aquatic Habitat Monitoring. It is unclear whether Study 4 will include replication, subsamples and all standard parameters.</p> <p>6) Section 6.3 describes Study 14: Fish Mercury Concentration Monitoring. The AEMP (Section 6.4) indicates that results will be compared to baseline mercury concentrations. ECCC notes that it will also be important to compare fish tissue mercury levels to consumption guidelines, as this is the relevant metric for users.</p> <p>7) Table 4 sets out the planned AEMP monitoring schedule, which includes post-construction monitoring before and after the first two operational periods. As mentioned previously regarding the SWMP, it is unclear whether the proposed operation phase monitoring is sufficient to capture a representative range of flood events for this permanent project.</p>	
<p>IAAC-17</p> <p>Attachment A1 –</p>	<p><u>With regards to the Sediment Management Plan (SMP):</u></p>	<p>ECCC Technical Comment 10:</p> <p>With regards to the Sediment Management Plan, ECCC recommends the Proponent:</p>

<p>Environmental Management Plans: Sediment Management Plan</p>	<ol style="list-style-type: none"> 1) It is unclear whether all potential erosional and depositional areas and pathways associated with the project have been identified and addressed within the plan. 2) Per Section 3.2 of the SMP, short-term increases in TSS over background levels may occur during commissioning and initial operation of the LMOC and LSMOC. The Sediment Management Plan describes general locations and timing of potential project-related increases in suspended sediment/ TSS levels. However, these increases have not been quantified. Section 3.2 indicates that further work will be undertaken prior to construction to estimate the potential increase in short-term TSS and develop a response protocol that links to the adaptive management strategies for each channel. ECCC cannot evaluate potential effects associated with suspended sediment increases, given the absence of information to quantify such increases, the lack of specific management thresholds, and limited detail regarding response measures. 3) The SMP states that if water quality exceeds the relevant water quality criteria and exceedances are attributed to the Project, then additional mitigation measures <i>would be considered</i>. ECCC notes that it would be more protective of the receiving environment to establish ecologically-meaningful thresholds that <i>will trigger</i> specific management actions. The SMP should identify specific management thresholds that would trigger specific management actions. Details of response measures should include a discussion of the expected effectiveness of such measures, and any limitations regarding applying response measures. 	<ol style="list-style-type: none"> 1) Ensure the Sediment Management Plan identifies and describes all erosional and depositional areas and pathways associated with this project. 2) Provide a detailed update regarding the following statement from Section 3.2: <i>"Further work will be undertaken prior to construction to estimate the potential increase in short-term TSS and develop a response protocol that links to the adaptive management strategies for each channel"</i>. 3) Identify specific management thresholds that will trigger specific management actions. Describe the expected effectiveness and any limitations of mitigation and response measures, for the erosional and depositional areas and pathways associated with this project, for all project phases. 4) Specify how 'anticipated seasonal fluctuations' are determined, and how monitoring results will be analyzed to determine project-related changes to TSS and turbidity. Clarify whether and how information from the baseline dataset (e.g., summary statistics, monitoring details) will be
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4) Per the Proponent's response, based on the management thresholds and the results of the surface water monitoring program, follow up responses will be implemented when documented surface water quantity and quality conditions appear to be outside of anticipated seasonal fluctuations. The management plan should specify how 'anticipated seasonal fluctuations' are determined, and how monitoring results will be analyzed to determine project-related changes to TSS and turbidity.

5) As contingency measures and emergency response measures have not yet been developed for the Sediment Management Plan, ECCC cannot assess these aspects of the project.

With regards to the Frequency Analysis of Operation for LMOC and LSMOC:

The estimation of the frequency of operation for the LMOC and LSMOC is dependent on the reconstructed 100-year record (1915-2017) and the proponent's water balance model (EIS appendix 6K). However, it is evident that there is a trend in this record which violates the stationarity assumption for flood frequency analysis. For example, the use of the LMOC in this record is very sparse at the beginning of the century, but increases to every year for the last 7 years (see table below, based on appendix A in EIS appendix 6K).

Decade	1920s	1930s	1940s	1950s	1960s	1970s	1980s	1990s	2000s	2010 - 2017
Operation Years LMOC	4	0	1	4	0	4	2	4	6	8

comprehensively summarized to characterize baseline conditions with respect to suspended sediments.

5) Ensure that contingency measures and emergency response plans are developed and in readiness to implement prior to the start of construction.

ECCC Technical Comment 11:

With regards to the Frequency Analysis used, ECCC recommends the Proponent Conduct an additional statistical test on the 100-year record to identify the most recent period that may be deemed stationary and then recalculate the frequency of operation for the LMOC/LSMOC based on this stationary period. We recommend the Proponent re-evaluate any analyses influenced by the frequency of operation of the outlet channels, including but not limited to the sediment deposition and/or erosion in Birch Bay and Sturgeon Bay.

	<p>This data shows an increasing trend and is therefore not stationary, and furthermore, the frequency of future use of the outlet channels is likely underestimated. The effects of discharges into Birch Bay and Sturgeon Bay in terms of sediment deposition and/or erosion are likely to be compounded by more frequent operation of the LMOC/LSMOC than what has been accounted for in the EIS and response to IAAC-17. (Note: This rationale does not affect the design water level/flows for the LMOC/LSMOC as the proponent is designing to the largest event on record (the 2011 flood) and not a specific return period flood).</p>	
<p>IAAC-18</p> <p>Attachment A1 – Environmental Management Plans:</p> <p>Groundwater Management Plan</p> <p>Surface Water Management Plan</p>	<p>The Proponent's response notes that groundwater monitoring is discussed in the Groundwater Management Plan (GWMP), whereas monitoring for runoff and groundwater seepage is described in the Surface Water Management Plan (SWMP).</p> <p>The response states that predicted residual effects during construction and operation of the Project include a change in local groundwater flow due to dewatering operations, and a change in groundwater-surface water interaction due to surficial drainage diversion and bedrock aquifer depressurization.</p> <ol style="list-style-type: none"> 1) Tables 5 and 10 of the Groundwater Management Plan list the groundwater quality parameters for the pre-construction monitoring program for the LMOC and LSMOC, respectively. ECCC notes that additional parameters (ammonia, chloride, BTEX and petroleum hydrocarbons) should be included on these tables. 2) Section 3.3 (Environmental Effects) of the Groundwater Management Plan states that analyses of potential groundwater quality changes, or surface water quality changes as a result of short- or long-term discharges of groundwater to the surface water system, are not included in the detailed design, but may be included in The Environment Act licence. Consequently, ECCC cannot assess the accuracy of the EIS conclusions regarding potential surface and 	<p>ECCC Technical Comment 12:</p> <p>ECCC Recommends the Proponent:</p> <ol style="list-style-type: none"> 1) Include the following additional groundwater quality parameters in the Pre-Construction Monitoring Program of the Groundwater Management Plan: <ol style="list-style-type: none"> a) Add ammonia and chloride to Table 5, Part 2 (LMOC), and b) Add BTEX and Petroleum Hydrocarbons to Table 10, Part 3 (LSMOC). 2) Provide an update regarding how effects of groundwater and surface water interactions on water quality will be quantified (see Recommendation 4 below). 3) Provide an update regarding whether and how groundwater and seepage discharge volumes to surface will be quantified.

	<p>groundwater water quality changes resulting from short- and long-term discharges of groundwater to the surface water system.</p> <p>3) The Surface Water Management Plan indicates that quantification of groundwater and seepage volumes will be defined, as required, during detailed design.</p> <p>4) Although the Surface Water Management Plan indicates that groundwater discharge to the surface will be monitored periodically, the monitoring details (e.g., monitoring locations, parameters, frequency, thresholds and management actions) are not provided.</p>	<p>4) Provide monitoring details (e.g., monitoring locations, parameters, frequency, thresholds and management actions) for:</p> <ul style="list-style-type: none"> • Groundwater discharge to the surface; and • Environmental monitoring to detect surface water quality changes resulting from short- and long-term discharges of groundwater to surface water.
Groundwater		
IAAC-26	<p>In response to IR-26 and the identified gap in groundwater quality data for the Lake St. Martin Outlet Channel (LSMOC) Project Development Area (PDA), the Proponent states that groundwater was sampled in 2019 and 2020, but that technical analysis and reporting is ongoing and will be reported in the Final Design Phase. As such, they have stated that, “for the purposes of the EIS, the groundwater quality within the LSMOC PDA was considered to be similar to that observed within the Lake Manitoba Outlet Channel (LMOC) PDA.</p> <p>It is unclear why it is not possible for data collected and analyzed in 2019 and 2020 to be summarized and presented as interim groundwater quality data to inform assessment of potential groundwater-surface water interactions for potential impacts to water quality. Given that data is available, it is unclear why the Proponent would apply proxy groundwater quality data.</p>	<p>ECCC Technical Comment 13:</p> <p>ECCC recommends the Proponent provide groundwater quality data collected during 2019 and 2020 at the LSMOC PDA to inform analysis of potential groundwater-surface water interactions.</p>
Hydrology		
IAAC-7a and 7b IAAC-14 IAAC-23 IAAC-24	<p>The Proponent references a satellite-image based vegetation health study conducted around the Emergency Outlet Channel (EOC) after its first use to inform the Local Assessment Area (LAA) definition as an area within 500 m of either side of the LSMOC . That study found changes to vegetation within 600 m downgradient and 1600 m upgradient with</p>	<p>ECCC Technical Comment 14:</p> <p>ECCC recommends the Proponent commit to updating the Wetland Compensation Plan and</p>

	<p>most effects within 300 m. However, the study neglected to address (1) that the variability in effect distance from the EOC appears to be related to wetland type, with fens exhibiting greater effect distances, and (2) that flow patterns in the vicinity are largely parallel to the EOC whereas the flow patterns around the LSMOC will be perpendicular. Also, the Buffalo Creek complex (to the west of LSMOC) will lose surface water flows from the portion of the watershed cutoff by the LSMOC (response to IAAC-7b and 23, Table 3 in SWMP), in addition to undetermined reductions in groundwater flow (response to IAAC-24). In their response to IAAC-7b, the Proponent submits that effects to the upgradient (east) side will be mitigated by an outside drain designed to the 10 yr flood event.</p> <p>ECCC is providing recommendations to update the Wetland Compensation and Surface Water Management Plans, which include advice related to monitoring requirements.</p>	<p>Surface Water Management Plan to include the following:</p> <ol style="list-style-type: none"> 1) During construction: Continuously monitor flows in outside drainage channel at the Reach 3 plug (Figure 14 in SWMP) as this will give an idea of the surface water flows that will no longer reach the Buffalo Creek complex upon completion of the LSMOC. This could provide a first estimate of the level of mitigation required to limit drying of Big Buffalo Lake and the surrounding area. If construction phase depressurization flows are released into the Buffalo Creek complex or the outside drainage channel, these flows will need to be continuously monitored so that they may be factored into assessments of mitigation effectiveness. 2) For the east side of the LSMOC: The area to be considered for effects to wetlands should extend to the 1600 m distance. It is recommended that flows at the outside drainage channel outlets (either into the LSMOC at multiple points or to Lake Winnipeg), and changes to wetlands from the drainage backwater be monitored, for example by perhaps using the NDVI satellite image technique. If wetland changes are not within desirable range, then the size of outside drainage channel may be adjusted. 3) For the west side of the LSMOC: The area to be considered for effects to wetlands should
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		<p>extend to the entire Buffalo Creek watershed on the west side of the LSMOC. Monitoring of flows in Buffalo Creek and continuous water levels within Big Buffalo Lake. If water is diverted to the Buffalo Creek complex (depressurization wells, pumping from LSMOC, EOC operation, etc), then these flows must be measured to allow the correlation of mitigation measures to desired outcomes (limited wetland alteration).</p>
IAAC-29	<p>It remains unclear what the ultimate fate of the Emergency Outlet Channel (EOC) will be. The EIS included the EOC as part of existing conditions (EIS section 6.4.7.1, p. 188 in the pdf) and the response to IAAC-29 indicated that it would need to remain in place during construction of the LSMOC in case of a high magnitude flood event similar to previous EOC uses in 2011 and 2014.</p> <p>Beyond construction, the proponent has alternated between decommissioning the EOC, although in an undetermined time and manner (i.e., Proponent response to IAAC-29) and using the EOC as a mitigation measure to supplement lost flows to Buffalo Creek system (CEMP section 5.4). The Buffalo Creek watershed has experienced impacts related to the EOC (see Proponent response to IAAC-7a) and its use/disuse is under the sole control of the Proponent.</p>	<p>ECCC Technical Comment 15:</p> <p>ECCC recommends the Proponent provide clarification on the fate of the EOC and present plans, including timelines and maps, for either the decommissioning (disuse scenario) or alteration (mitigation scenario) of the EOC. If the course of action cannot be determined at this time, it is recommended the Proponent provide both plans.</p>
IAAC-41	<p>In response to IAAC-41 the Proponent presents results from 1D and 2D HEC-RAS modeling of the Fairford and Dauphin Rivers. Although the Proponent states that effects to habitat remain unchanged from the EIS, the flow duration curves presented in Figures 8 (pdf page 867) show potential for the median flows to decrease by approximately 27% in the fall months. Depending on how this translates to lower stream velocity, the reduced flows could increase the rate or extent of siltation; completing the HEC-RAS modeling for low and median flows and</p>	<p>ECCC Technical Comment 16:</p> <p>ECCC recommends the Proponent complete the HEC-RAS modeling for low and median flows and compare the results to the deposition threshold for silt for the Fairford and Dauphin Rivers.</p>

	<p>comparing to the deposition threshold for silt would provide greater assurance that streambed habitat would remain intact. Note: While Figure 9 for the winter months shows a similar decrease in median flows, the risk for silt deposition is likely not as high due to lower winter sediment load.</p>	
<p>Attachment A1 – Environmenta I Management Plans: Wetland Compensation Plan</p>	<p>The reference to Section 4.1 of the Wetland Compensation plan or EIS Volume 2, Section 6.3.4.2 and Section 6.4 describes potential drying on the east side of LMOC caused by LMOC cutting off surficial flows from the west. It is noted that this drying would result in shifts in the plant community, consequently shifting or removing habitat availability for some migratory birds, including SAR. If the proposed mitigation to address this predicted drying is insufficient, the resulting reduction in some wetlands, including habitat for SAR, may qualify for compensation under provincial rules. Additionally, the response to IAAC-14ii and SWMP section 5.1 describes drainage waters (from the west side of LMOC) as mostly agricultural runoff that had previously benefited from the buffering effect of passing through wetlands, but will now discharge directly into Birch Bay. Wetlands enhance water quality by intercepting and filtering surface runoff, and reducing levels of sediments, nutrients and pollutants. Given the loss of wetland filtering, it is noted that drainage water quality may be reduced and should be monitored for potential effects to Birch Bay.</p>	<p>ECCC Technical Comment 17:</p> <p>ECCC recommends the Proponent plan to monitor indirect changes in wetland habitats from changes in surface water (within the Surface Water Management Plan with support from wetland-based SAR surveys). These plans should include monitoring water levels at additional locations to assess multiple wetland classes around Goodison and Reed Lakes to assess potential drying cause by LMOC cutting off surficial flows from the west. Monitor flow from outside drainage channels on west side of LMOC. Monitor water quality in drainage waters discharging to Birch Bay.</p>
I Wildlife, Species at Risk, and Migratory Birds		
<p>IAAC-45</p>	<p>The Proponent was requested to provide further details regarding the leading indicators for the reclamation of suitable habitat for Species At Risk (SAR), migratory birds, and species of cultural significance. Review of these details will allow ECCC to better advise the Agency on the</p>	<p>ECCC Technical Comment 18:</p> <p>Should the Agency require support in its evaluation of the Proponents refined plans, ECCC is available to provide additional advice.</p>

	<p>likelihood that the Proponents reclamations efforts will lessen the residual Project effects identified in the EIS.</p> <p>Additional details regarding leading indicators for habitat reclamation were presented in the Proponent’s response to this IR, the Revegetation Management Plan, and in the Wildlife Monitoring Plan. Taken together, the details presented in these plans constitute a reasonable approach that considers the needs of SAR, migratory birds, and species of cultural significance.</p> <p>The Proponent states “<i>details regarding targets to measure success will be developed in consultation with the regulator as plans are further refined</i>”. While the lack of fully developed details regarding targets to measure success of habitat reclamation leaves some uncertainty around the residual effects to wildlife, by providing the draft plans the Proponent has demonstrated that their approach is likely to be able to validate the predictions made in the EIS.</p>	
IAAC-46	<p>The Proponent was requested to augment baseline data for several Species at Risk (SAR), or describe how data limitations affected the conclusions in the EIS. The Proponent was also asked to provide further details for wildlife monitoring and habitat mitigation plans to allow ECCC to better evaluate the likelihood of residual Project effects to SAR.</p> <p>The Proponent provided data from surveys conducted in 2020 to support the conclusions in the EIS regarding Project Effects to wildlife.</p> <p>The Proponent also provided a Draft Wildlife Monitoring Plan, Red-headed Woodpecker Habitat Mitigation Plan, Eastern Whip-poor-will Habitat Mitigation Plan, and the Wetland Compensation Plan that provided significantly more detail and structure to the Proponents Plans for avoidance, mitigation and monitoring of Project effects.</p>	<p>ECCC Technical Comment 19:</p> <p>The Proponent acknowledges that these plans will need to be further refined by engaging with regulators, stakeholders, and indigenous groups. ECCC agrees that further details of these plans will need to be developed and is available to provide expert advice as required by the Agency.</p>

IAAC-47	<p>The EIS indicated that the power distribution line associated with the LSMOC is a potential pathway for increased mortality to migratory birds. Many of the species that are most at risk of interacting with the distribution line (waterfowl, raptors) are also species that are identified as species of cultural significance. ECCC asked for clarification on the mitigation measures that will be used to reduce the risk of mortality to migratory birds.</p> <p>The Proponent states that no mitigation will be applied to the distribution line to reduce the likelihood of migratory bird mortality from collisions and electrocution, as they deem the risk of collisions to be “relatively low”. There is no mention of whether monitoring will be employed to confirm that the risk of mortality is low. There are no details in the Wildlife Monitoring Plan that suggest monitoring for potential mortality along the distribution line will occur or what methods would be employed to do so.</p>	<p>ECCC Technical Comment 20:</p> <p>ECCC is of the opinion that, without monitoring for potential mortality of migratory birds, the risk posed by the distribution line to increased mortality to migratory birds, including SAR and species of cultural significance, cannot be confirmed as low. ECCC recommends that monitoring for potential mortality of migratory birds along the distribution line be conducted so that adaptive management can be applied in the event that migratory bird mortality is detected. Details of the monitoring plan and the mitigation that would be applied if mortality were detected should be included in the Wildlife Monitoring Plan. At a minimum, monitoring should be conducted along the sections of the distribution line that were identified as potentially higher risk in the Proponent’s original response to this IR.</p>
IAAC-50	<p>The EIS recognizes that road salt and potentially petroleum products from the realignment of Provincial Road 239 route are likely to affect wetlands. ECCC asked the Proponent to provide further details regarding mitigation to avoid the deposition of harmful substances in waters frequented by migratory birds and a plan to confirm the effectiveness of the proposed mitigation.</p> <p>Information provided in the Draft Environmental Management Plans includes avoidance and mitigation measures that will be applied to reduce the likelihood that harmful substances will be deposited in waters frequented by migratory birds. Additionally, details in the Aquatic Effects Monitoring Plan and Wildlife Monitoring Plan outline the timing and methods for monitoring water quality in wetlands</p>	<p>ECCC Technical Comment 21:</p> <p>The Proponent is required to comply with the <i>Migratory Bird Convention Act</i> and follow prohibitions, including, but not limited to, avoiding the deposition of harmful substances in wetlands frequented by migratory birds.</p> <p>For further details, please refer to the Avoiding Harm to Migratory Birds website https://www.canada.ca/en/environment-climate-change/services/avoiding-harm-migratory-birds.html</p>

	<p>throughout the Project area to ensure compliance with the <i>Migratory Bird Convention Act</i> (MBCA).</p> <p>However, the Proponent states, “based on the mitigation measures and best management practices described above, and the limited interaction of the road realignment with wetland habitat, it is unlikely that harmful substances, if released, would have a measurable effect on wetland dependent migratory birds.”</p> <p>This statement is not consistent with the prohibitions outlined in the MBCA and Regulations. The Proponent should focus on preventing the deposition of harmful substances in wetlands and conduct monitoring for water quality. Monitoring activities should be in place to detect deficiencies of the mitigation measures proposed in the Environmental Management Plans.</p>	
IAAC-51	<p>The Proponent identified the salvage of decadent trees within the Project Development Area and the construction of artificial nesting structures post-construction as mitigation for Project effects to Red-headed Woodpecker (RHWO) Habitat. ECCC requested further details regarding these plans to support the assessment of the ability of these proposed mitigations at reducing the risk of residual Project effects on RHWO.</p> <p>1) In the Proponent’s response to this IR and in the Draft Red-headed Woodpecker Habitat Mitigation Plan, further details to the proposed mitigation for RHWO breeding habitat, in areas outside of identified Critical Habitat, were provided for review. Additionally, the Proponent proposed a method of evaluating the success of the mitigation measures and reasonable alternatives should the mitigation be deemed a failure. In general, these plans demonstrate a reasonable approach to the application of these mitigation measures and are likely to reduce some of the risks the Project poses to RHWO. However, the timing of application of the mitigation measures (i.e. the sequence of the application of the</p>	<p>ECCC Technical Comment 22:</p> <p>ECCC recommends the Proponent:</p> <ol style="list-style-type: none"> 1) Clearly identify the timing of application of the mitigation measures (i.e. the sequence of the application of the mitigation measure (habitat replacement) and the effect (habitat loss)) in the plan. ECCC recommends that any suitable nesting trees that are removed be replaced by salvaged decadent trees or artificial nesting structures at a ratio greater than 1:1 to increase the likelihood of success of the mitigation measure. 2) ECCC recommends that direct, passive observation of the artificial nesting structures be used to determine occupancy.

	<p>mitigation measure (habitat replacement) and the effect (habitat loss)) should be clearly identified in the plan as any temporal lag in the uptake of the artificial nesting structures could reduce the efficacy of the mitigation.</p> <p>2) A RHWO nest survey was proposed to evaluate the success of the mitigation with the measureable parameter being “habitat occupancy of salvaged decadent trees or artificial nesting structures by breeding red-headed woodpecker”. However, the proposed method for assessing RHWO use of these artificial nesting structures (a 10-minute point-count survey protocol with a call-broadcast component) is not appropriate. Detection on a point-count survey does not confirm RHWO occupancy of the artificial nesting structures and call playback may be disruptive to RHWO nesting behaviour. Additionally, these surveys are proposed to “occur at all HMAs where salvaged decadent trees or artificial nesting structures have been installed”, but not in adjacent RHWO habitat that is suitable for breeding, which may not give an accurate assessment of the effectiveness of the RHWO habitat with and without the mitigation efforts.</p>	<p>Regardless of the survey design used, the Proponent should consider the <i>Migratory Bird Regulations</i>, or consult with ECCC directly, to determine if a SARA compliant Migratory Bird Permit is required to carry out the finalised RHWO survey activities.</p>
IAAC-53	<p>The EIS identified direct and indirect loss of Wetlands due to Project activities. Wetlands support SAR, migratory birds (including SAR), and vegetation including species of cultural significance to Indigenous groups and other resource users. ECCC asked the Proponent to present a Wetland Compensation Plan that is consistent with the Federal Policy on Wetland Conservation.</p> <p>Indirect effects to wetlands have been further detailed with respect to the updated predictions of Project effects to surface and ground water (see response to IAAC-23). The Proponent has also presented a Draft Surface Water Management Plan and Groundwater Management Plan that present possible mitigation for these Project effects and monitoring strategies to confirm the mitigation outcomes.</p>	<p>ECCC Technical Comment 23:</p> <p>ECCC agrees with the approach that the Proponent has proposed to report and evaluate the need for adaptive mitigation as part of the WMP adaptive management framework.</p>

	<p>In conjunction with water monitoring, the Proponent has proposed a monitoring strategy of wetland-dependent wildlife, including migratory birds and SAR, within the Wildlife Monitoring Plan. The Proponent states, <i>“annual reporting will include an evaluation of the need for adaptive mitigation as part of the WMP adaptive management framework.”</i> ECCC suggests that this reporting and evaluation is a vital component of evaluating effects to Section 5(1)(c) of CEAA 2012</p> <p>A Draft Wetland Compensation Plan (WCP) has been provided to address direct Project effects to wetlands within the Project Development Area (239 ha of class 3, 4, and 5 wetlands). There is a commitment to No Net Loss of wetlands from the Manitoba Water Rights Act within this plan, but no mention of the Federal Policy on Wetland Conservation. However, the WCP appears to be in keeping with the intent of the Federal Policy and identifies appropriate provincial oversight and potential partners for delivering wetland compensation.</p>	
IAAC-54	<p>ECCC requested Red-headed Woodpecker (RHWO) and Eastern Whip-poor-will (EWPW) mitigation and offsetting plans to address residual Project effects to these two Species At Risk (SAR). These SAR were identified as uniquely susceptible to Project effects due to the possible interaction of Project components and identified Critical Habitat (CH).</p> <p>The Proponent has provided Draft Habitat Mitigation Plans for RHWO and EWPW. In general, these plans provide the necessary detail for ECCC to understand the anticipated Project effects and proposed mitigation for these two SAR. ECCC recommends that the locations and total area (ha) proposed for species specific HMAs (Habitat Management Areas) be included in the final plans.</p> <p>However, the results of the most recent GIS analysis done by the Proponent, which compare the overlap between the Project Development Area and CH for RHWO and EWPW shows no direct</p>	<p>ECCC Information Request 1:</p> <p>ECCC requests the date, location (with an accuracy description), and associated details of all Red-headed Woodpecker observations (Point-count, ARU or Incidental) made during all field surveys related to the project be summarized and made available. While these observations have been reported in various supporting documents for the EIS, the observations are not presented in a consistent format and some lack an associated location. This will help ECCC understand the current use of the LAA by Red-headed Woodpecker, particularly recent active nests, and the sufficiency of the Proponent’s Red-headed Woodpecker Habitat Mitigation Plan.</p>

	<p>impact to the identified CH of either species. It is unclear why this result is different from the estimates of direct impact to CH that were originally reported in the EIS since no additional information on CH was provided to the Proponent by ECCC.</p> <p>In response to IAAC-51 the Proponent states that results from 2020 field surveys indicate that the 19.8 ha of habitat within the RHWO CH square that will be impacted by the Project are “not considered critical habitat as defined by the recovery strategy (ECCC 2019)”. While the Proponent’s response to IAAC-54 states that, “the only red-headed woodpecker critical habitat polygons known to occur within the LAA are located greater than 600 m from the Provincial Road 239 realignment (ECCC 2020).”</p> <p>In order for ECCC to determine if the Draft Habitat Mitigation Plans provide an appropriate framework to address Project effects to RHWO and EWPW habitat, it is necessary to validate the Proponent’s conclusion that there will be no direct loss of CH or SAR residences, and that impacts to important habitat outside of identified CH are sufficiently mitigated.</p>	
Effects of the Environment		
<p>IAAC-57</p> <p>IAAC-58 a and b</p>	<p>The range of climate change projections should be taken into account and thus the projection used for modeling/design should be reasonably conservative.</p> <p>In their response to IAAC-57, the Proponent has stated that the project will withstand a peak flood equivalent to the 2011 event. It is expected that due to climate change, events with return periods similar to the 2011 event would result in peak flows of higher magnitude compared to the 2011 event.</p> <p>Similarly, it is expected that due to climate change, events with magnitudes similar to the 2011 event would be more frequent.</p>	<p>ECCC Information Request 2:</p> <p>ECCC requests the Proponent provide the following information:</p> <ol style="list-style-type: none"> 1) Provide method for runoff projections and the reference for 2080s runoff projection values. 2) Provide information on how the sensitivity model run (scenario 3a and 3d in Table 2 Appendix IAAC-57) compares to the <u>range</u> of runoff projections at the 2080s horizon.

	<p>Maximum one-day flow has increased in some watersheds related to this project (figure 6.3 in reference 3). The provided references do not describe how runoff projections for the project were calculated. Consequently, we cannot determine if the range of runoff projections, instead of the inherently non-conservative mean, was considered. Furthermore, the provided references (see below) do not list the 2080s runoff projections, which are of interest due to the permanent nature of the project infrastructure. In addition to the 2050s and 2080s runoff projections, the proponent uses a third projection with a 25% increase in runoff for the Lake Manitoba basin and a 50% increase in runoff for the Assiniboine River basin as a sensitivity analysis (an increase of 15.5 mm and 5.5 mm, respectively). However, it is unclear how these increases relate to the range of possible future climate scenarios. The proponent concludes that climate change will not be incorporated into the design levels because the climate scenarios presented are within a safety factor (response to IAAC-58a part ii).</p> <p>References:</p> <ol style="list-style-type: none"> 1- Manitoba Hydro. Climate Change Report for Fiscal Year 2014-2015. July 2015 2- Manitoba Hydro, M. Gervais, M. Vieira, K. Sagan, P. Slota, K.A Koenig, M. Braun, 2014. Lake Winnipeg Watershed Hydroclimatic Study. July 28, 2014 3- Bonsal, B.R., Peters, D.L., Seglenieks, F., Rivera, A., and Berg, A. (2019). Changes in freshwater availability across Canada; Chapter 6 in Canada's Changing Climate Report, (ed.) E. Bush and D.S. Lemmen; Government of Canada, Ottawa, Ontario, p. 261–342 	<p>i) If the <u>upper bound</u> of 2080s runoff projections is higher than the sensitivity values, re-run water balance model with the more conservative projection. If the above results give a Lake Manitoba or Lake St. Martin water level above the current design level and safety factor, the proponent should:</p> <ol style="list-style-type: none"> (1) Consider modifying design. (2) Demonstrate capacity to adapt design for higher water levels after construction. Update the relevant management plans to include periodic reassessment of the 30-year future runoff projections compared to the contemporary design levels. <p>3) Provide reference for safety factor used in design of LMOC/LSMOC. Clarify if the safety factor is intended to adjust the design level to account for climate change or simply to account for uncertainty in measurements/models/materials/construction</p>
<p>IAAC-58a</p> <p>Attachment A1 – Environmenta</p>	<p>The Proponents response to IAAC-58a says, “The channels and control structures are designed for [the 2011 flood or a 1:300-year event] flood frequency.” Part i of the response describes the exact design level as the conveyance of 7,500 cubic feet per second (cfs) at 814 feet (ft) water elevation for the Lake Manitoba Outlet Channel (LMOC) and 11,500 cfs</p>	<p>ECCC Information Request 3:</p> <p>ECCC requests the Proponent provide the following information:</p>

<p>I Management Plans: Surface Water Management Plan</p>	<p>at 801 ft water elevation for the Lake St. Martin Outlet Channel (LSMOC). However, these values do not match the modeled water levels and conveyances that would pass through these channels in a 2011-type event (EIS Appendix 6K). Appendix A of EIS Appendix 6K (PDF pages 452 and 468) describes in figures that a 2011 event with the outlet channels in place would require a conveyance of ~9,000 cfs at ~815.4 ft water elevation in the LMOC and ~15,000 cfs at ~802.8 ft water elevation in the LSMOC. In fact, the LSMOC modeling shows multiple other years where either the 801 ft Lake St. Martin water elevation or the 11,500 cfs conveyance is exceeded.</p> <p>Furthermore, the Surface Water Management Plan (SWMP) indicates a third design level:</p> <p style="padding-left: 40px;">“The LSMOC [...] is designed to convey flows up to the Inflow Design Flood (IDF), considering the intent of the Canadian Dam Association Dam Safety Guidelines. A 1:1000-year flood event has been assumed for the IDF and will be updated at detailed design based on the results of a detailed dam safety classification and dam breach assessment.”</p> <p>There appear to be some design level discrepancies between the response to IAAC-58a, the description of the 2011 event in the EIS, and the as-yet unquantified SWMP IDF.</p>	<ol style="list-style-type: none"> 1) Clarify what the design floods are for the channels and control structures. 2) Clarify whether the design floods were increased using a safety factor. If so, provide details on what the safety factor accounted for. Provide details on the resulting design floods, including the safety factor. 3) Present a summary table and graph detailing the changes to flows and levels resulting from the <u>safe operation (i.e. maximum flow = design)</u> of the outlet channels as compared to the baseline condition (covering at least the 2011 and 2014 events).
<p style="text-align: center;">Environmental Emergencies:</p>		
<p>IAAC-60</p>	<p>The proponent has indicated that <i>“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 repair.”</i> It is unclear if there is a particular management plan or operating procedure which will ensure the mitigation measure is in place.</p> <p>The proponent has also indicated, <i>“Only above ground storage tanks shall be used for the storage of bulk petroleum products. The tanks shall</i></p>	<p>ECCC Technical Comment 24:</p> <p>ECCC recommends the Proponent provide the following:</p> <ol style="list-style-type: none"> 1) Identify what mechanism (maintenance plan, standard operating procedure, etc.) will be used to ensure machinery equipment remains

	<p><i>be equipped with overfill protection and spill containment consisting of perimeter dikes or secondary containment in the tank design."</i></p> <p>ECCC is not clear what the Proponent's definition of 'secondary containment' is, and notes that a double-walled tank does not provide overfill protection and should not be used interchangeably with perimeter dikes for protection against overfills.</p>	<p>in good working order and free of fuel, oil or fluid leaks.</p> <p>2) Clarification on the definition of "<i>secondary containment in the tank design.</i>"</p>
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