

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

Question IAAC-08

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Abbreviations and Acronyms

AAFRD	Alberta Agriculture, Food and Rural Development
EIS	environmental impact statement
EOC	emergency outlet channel
FRWCS	Fairford River Water Control Structure
LAA	local assessment area
LMOC	Lake Manitoba outlet channel
LSMOC	Lake St. Martin outlet channel
PDA	project development area
VC	valued component

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EIS Guideline Reference: 3.1. Designated Project; 5. Engagement with Indigenous Groups and Concerns Raised

EIS Reference: 6.3.1.3 Potential effects, pathways and measurable for Geology and Soils

Context and Rationale

The EIS Guidelines require the proponent to assess the potential effects of the Project on geology and soils.

The EIS states that “Environmental effects on soils could result in changes to soil quantity and quality, which can in turn affect soil capability for vegetation communities and agriculture.” The EIS describes the LMOC portion of the LAA as predominately under natural vegetation and wetlands and not areas rated for agricultural capability. The LSMOC portion was rated using reclamation suitability classes for northern forests regions using an Alberta system. This reclamation suitability system was designed for upland soils that are predominately of the Luvisolic Soils Great Group in Alberta and not for the Organic Soils Great Group in Manitoba.

Reclamation suitability has implications for mitigating the potential effects of the Project on the environment, including effects to wildlife and land use.

Information Requests

- a) Provide rationale for the selection of reclamation suitability and discuss the applicability of a reclamation suitability system that was developed for agricultural capability for northern Alberta forest region to the LSMOC portion of the LAA which is predominately natural vegetation and wetlands. Discuss how the selected reclamation suitability will affect mitigation of effects to other relevant VCs.

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The following response provides rationale for the selection of the Soil Quality Criteria Relative to Disturbance and Reclamation (Alberta Agriculture, Food and Rural Development [AAFRD] 1987) for use in supporting the assessment of effects to soil quantity and quality and the applicability of using this system for the Lake St. Martin Outlet Channel (LSMOC) portion of the Project. Pertinent to the Environmental Impact Statement (EIS) and ongoing reclamation planning, the AAFRD (1987) guidelines provide physical, chemical and biological criteria for evaluating the suitability of soil materials for revegetation, and an associated suitability rating system.

Reclamation suitability of soils was considered for the entire soil and terrain local assessment area (LAA), including both the Lake Manitoba Outlet Channel (LMOC) and the LSMOC portions of the Project for a consistent approach to assessing potential changes to soil quality and quantity. One of the key objectives of this approach is to understand the reclamation suitability of soils across the

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Project to support revegetation efforts within the Project development area (PDA). Soils in the LMOC PDA are predominantly under agricultural land use or are rated as having capability for agricultural use. Therefore, agricultural capability ratings were also used to support the assessment of Project residual effects to soil quantity and quality for the LMOC portion of the Project. In contrast, soils within the LSMOC PDA are predominantly under natural vegetation cover, largely wetlands. Therefore, agricultural capability ratings were not used to assess changes in soil quantity and quality for the LSMOC; rather, reclamation suitability ratings were used.

Direct physical disturbance to soils as a result of Project activities related to the LSMOC is anticipated to be limited to the PDA. The exception to this would include Project components whose specific locations had not been identified at the time of the completion of the EIS and that may be located outside of the PDA, including rock quarries and borrow material areas, and temporary work camps and staging areas. The potential for effects to soils and terrain associated with these components was assessed generally, and the mitigation described the general approach to addressing any potential for effects associated with these components through the site selection process and various follow-up activities (Volume 2, Section 6.3.7, pg. 6.126). The consideration of reclamation and reclamation suitability of soils disturbed by Project activities within the LSMOC PDA is directly addressed through the comments provided below.

Land cover within the LSMOC PDA is predominantly natural wetlands with a minor portion occupied by native upland vegetation and water (Volume 3, Table 8.2A-3). From the perspective of the Canadian Land Cover Classification System (Government of Canada 2003), the area within the LSMOC PDA will be converted to a developed land use category (industrial land cover class per the Canadian Land Cover Classification System) as a result of the Project. For the purposes of the assessment of effects to soil quantity and quality, it was assumed that the entire PDA will be considered disturbed and developed following the completion of construction activities and through Project operation. The change in land use and land cover within the PDA is therefore considered permanent and there are no plans for decommissioning. Despite this, disturbed areas within the PDA will still require reclamation and this reclamation is planned.

As direct, physical disturbances to soils are anticipated to be limited to the area within the LSMOC PDA, soil reclamation needs are anticipated to be confined within the PDA. The Project will result in much of the wetland area within the PDA being converted to Project features characteristic of upland landscapes, such as berms and spoil piles. Other areas within the PDA will remain wet – these will include developed Project features such as the channel and outside drains and, potentially, other minor areas of the PDA which are disturbed during construction but not developed or built-up with Project features (e.g., outer limits of the PDA). Regardless, disturbed areas will require reclamation and revegetation, and a key aspect of this is providing a suitable surface to support vegetative growth.

Soil Quality Criteria Relative to Disturbance and Reclamation (AAFRD 1987) provides useful guidelines, a rating system and soil suitability criteria to support: 1) the evaluation of soil material suitability (quality) for reclamation activities, and 2) planning for reclamation needs, including supporting the development of the re-vegetation plans. Specifically, it provides value in supporting

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re-vegetation efforts for pertinent Project features, including channels, berms, dikes and soil stockpiles within the LSMOC PDA.

The guidelines presented by AAFRD (1987) consider organic soils and materials, which is applicable to the LSMOC PDA. According to these guidelines, "Organic soils should be considered for salvage and use as a soil conditioner". In addition, it is suggested that soil materials be salvaged in a two lift approach, with "The upper lift comprising a mixture of the organic and A horizons of the soil solum...". This upper lift is to provide soil enriched with organic matter with better growth support capability. Handling and replacing soils in a manner that follows these guidelines is an important component of the mitigation of effects to soil quantity and quality. The revegetation plan will incorporate learnings for reclamation suitability and how organic soils were handled during the construction of the Lake St. Martin Emergency Outlet Channel (EOC) project. It is planned that this will include mixing of the organic and mineral soil layers to support re-vegetation.

Soils within the LSMOC PDA are co-dominantly organic (~49% of LSMOC PDA) and mineral (~41% of LSMOC PDA; Volume 2, Table 6.3A-15). Internal drainage in the organic soils is considered predominantly very poor (~40% of the LSMOC PDA), while a portion are imperfectly drained and occur in forested landscapes (~9% of the LSMOC PDA). Internal drainage in the mineral soils is predominantly imperfect (~37% of LSMOC PDA) with a minor portion considered poor to very poor (~3% of the LSMOC PDA). The organic soils mapped within the LSMOC PDA predominantly have mineral soil contact within 1.3 metres of the soil surface, and less than 4% of LSMOC PDA is mapped as having typic or "deep" organic soils with organic materials greater than 1.6 metres deep. As part of general and Project-specific mitigation, organic and mineral topsoil materials will be excavated and stored separate from subsoils in stockpiles adjacent to the channel, as necessary, to support re-vegetation following excavation and other construction activities.

Therefore, the guidelines provided by AAFRD (1987) are appropriate for the purpose in which they were used in the assessment of rating the potential effects to soil quantity and quality in Volume 2, Section 6.3 and are applicable in supporting reclamation and re-vegetation efforts within the LSMOC PDA. The use of reclamation suitability ratings which consider the physical and chemical soil quality characteristics within the LSMOC PDA relative to the criteria provided by AAFRD (1987) will support mitigation efforts related to re-vegetation.

Successful revegetation of disturbed soils and Project features, such as berms and soil stockpiles, will reduce the potential for effects to soil quantity and quality (e.g., through soil stabilization and erosion protection), will provide beneficial vegetative cover for terrestrial environment components (vegetation, wildlife) and will reduce the potential for soil erosion and subsequent sedimentation in surface waters, a process which has the potential to affect the aquatic environment.

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References

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