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Abbreviations and Acronyms

EIS	environmental impact statement
dB	decibel
dBA	A-weighted decibel
ISO	International Organization for Standardization
LAA	local assessment area
RAA	regional assessment area

QUESTION IAAC-04

EIS Guideline Reference: 7.1.12. Human Environment; 7.2.1. Changes to the Atmospheric Environment

EIS Reference: 6.2.4.1 Analytical Assessment Techniques - Table 6.2-17

Context and Rationale

Section 7.2.1 of the EIS guidelines require the proponent to describe predicted changes in ambient noise levels.

Table 6.2-17 in the EIS presents the parameters used in the noise modelling and states that the ground factor (G = 0.7) chosen was representative of the ground condition within the LAA considering summertime conditions when land is covered in vegetation. Use of this ground factor may underestimate the presence of large water bodies, winter conditions such as hard packed snow, and the lack of foliage present during fall and spring, considering the construction schedule has not yet been finalized.

Information Requests

a) Provide a justification for use of the ground factor (G = 0.7) in noise modelling with consideration to the presence of large water bodies and the potential for construction to take place in seasons other than spring. Alternatively, provide updated modelling results using ground factors that are representative of the different conditions found in the LAA and the expected construction season(s). Updated modelling should:

    i. Identify if noise model predictions at receptor locations change based on the updated ground factor; and;

    ii. Provide a visual representation of the affected receptors, including seasonal and temporary residences, illustrating seasonal variations.

Response IAAC-04

a) See response below.

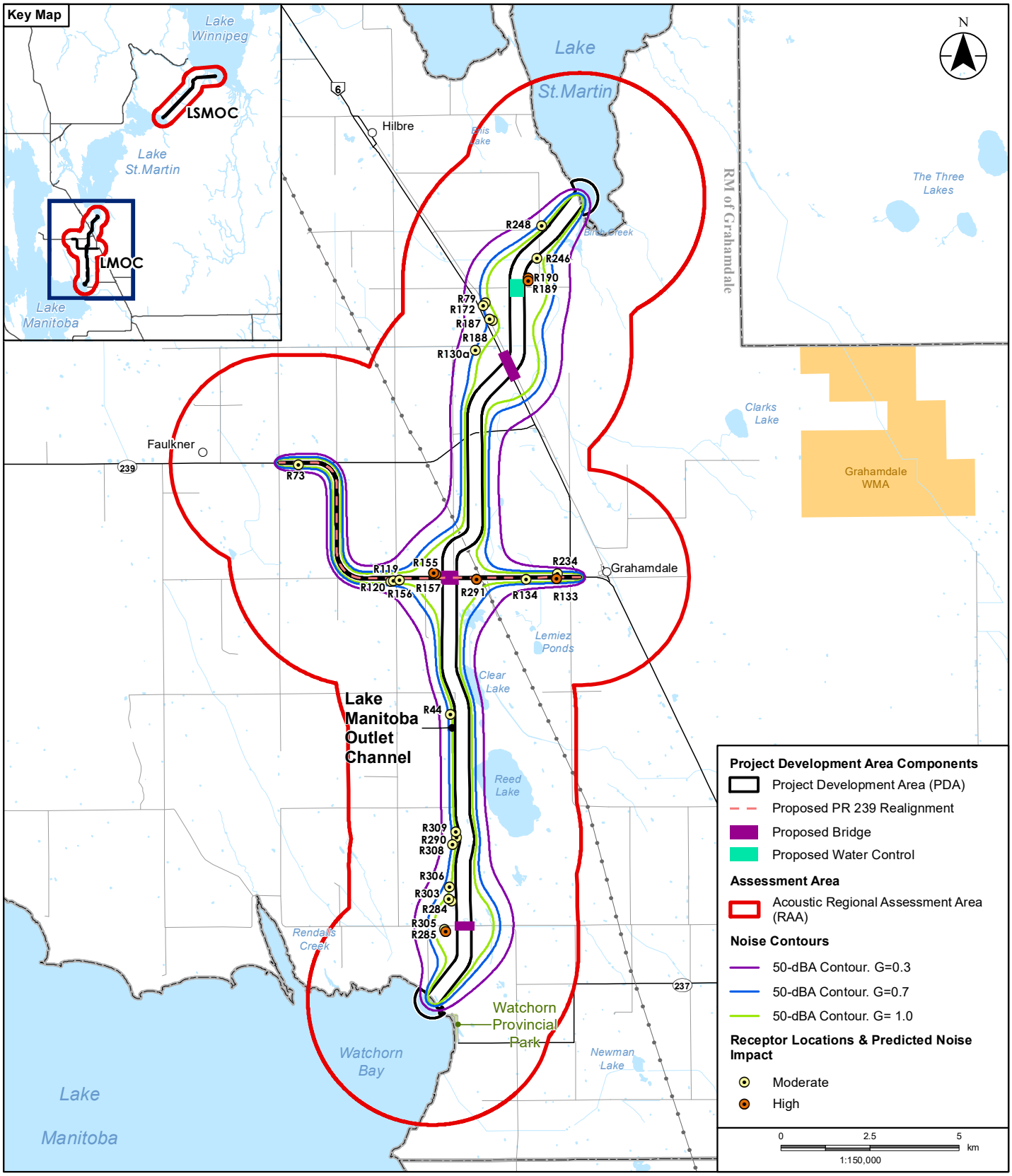
    i. The constant G of 0.7 was selected using professional judgement and experience on the basis of information gleaned by reviewing aerial photographs and “street” views of features in Google Earth®. The area around the Project and the nearby residences comprise farmland, grassland and treed areas. It has considerable vegetation cover and therefore the ground porosity is largely expected to be considerable throughout the various seasons, including the winter season. The use of G = 0.7 is in our view justified. Further to this, we have not identified large bodies of water between the Project activities and the identified receptors within the regional assessment area (RAA). Noise effects are localized and do not extend beyond RAA.

Question IAAC-04

Although we believe that the constant G of 0.7 is a good representation of a typical (average) ground condition for the area, it is recognized that the actual ground absorption may be somewhat higher or lower than that represented by G of 0.7. For example, after a snowfall during winter or a period of dry weather during summer, a higher ground absorption is expected. On the other hand, after heavy precipitation, ground saturation with water may give rise to a lower ground absorption. It is not possible to know what ground condition may exist during the time that construction activities take place near a particular receptor, and therefore, selecting a more representative ground condition than that designated by G = 0.7 is not possible.

To help address this request, modelling has been performed with G set to 0.3 and 1.0. The former represents a very “hard” ground for the type of area present around the Project, while the latter represents a very “soft” ground. Map 4-1, below, shows the predicted 50-dBA noise isopleths for the three cases: hard ground condition (G = 0.3), average expected ground condition (G = 0.7), and soft ground condition (G = 1.0). The 50 A-weighted decibel (dBA) isopleths correspond to the lower limit for noise from construction and can be thought of as representing the potential extent of the noise-affected area. Daytime construction noise levels below 50 dBA are not considered as consequential in regard to noise impacts. With ground absorption G set to 0.3, the 50-dBA isopleth expands by an average of 300 meters relative to the case with G = 0.7. With G = 1.0, the 50-dBA isopleth contracts by an average of 150 meters. In terms of the decibel level, the relative difference between G= 0.7 and G = 0.3 is approximately +3 dB (an increase in levels) and the relative difference between G = 0.7 and G = 1.0 is approximately -2 dB (a decrease in levels). This suggests that the uncertainty related to the ground condition for the 50-dBA isopleth was +3, -2 decibel (dB). In comparison, the stated accuracy of sound propagation calculations performed under International Organization for Standardization (ISO) 9613 is ±3 dB for distances of up to 1 km; and the uncertainty related to operational noise emissions from specific pieces of construction equipment is on the order of ±5 dB. We therefore maintain that using ground absorption constant G of 0.7 is reasonable and appropriate for the Project.

ii. The visual representation of the affected receptors is shown in Map 4-1. Only receptors designated as potentially subjected to high or moderate impacts are shown. Seasonal variations cannot be presented. The equipment noise emissions do not vary appreciably with ambient temperature or relative humidity. Atmospheric conditions that affect sound propagation, such as wind speed and direction, atmospheric stability, levels of turbulence, can be similar in all seasons. Ground absorption, as discussed earlier, can also be similar in different seasons. Therefore, seasonal variability in regard to noise impacts is small and cannot easily be quantified.



Legend

- Existing Transmission Line
- Provincial Highway (PTH/PR)
- Municipal Road
- Rural Municipality
- Wildlife Management
- Provincial Park

Notes

1. Coordinate System: NAD 1983 UTM Zone 14N
2. Data Sources: Governments of Manitoba and Canada, Manitoba Infrastructure, Stantec
3. Last Update: 5/8/2020 4:27:06 PM

Manitoba

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

Receptor Locations & Predicted Noise Impact - Acoustic RAA

Map 4-1

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