Webequie Supply Road

Acoustic Environment Work Plan

Webequie First Nation

19 June 2020
661910

SNC·LAVALIN

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1. Introduction

The proposed Webequie Supply Road Project is a new all-season road of approximately 107 km in length from Webequie First Nation to the mineral deposit area near McFaulds Lake (also referred to as the Ring of Fire). A Location Plan for the Project is shown on **Figure 1**. The preliminary corridor for the road consists of a northwest-southeast segment running 51 km from Webequie First Nation to a 56 km segment running east before terminating near McFaulds Lake. A total of 17 km of the corridor is within Webequie First Nation Reserve lands.

The goals and objectives of the Webequie Supply Road Project are as follows:

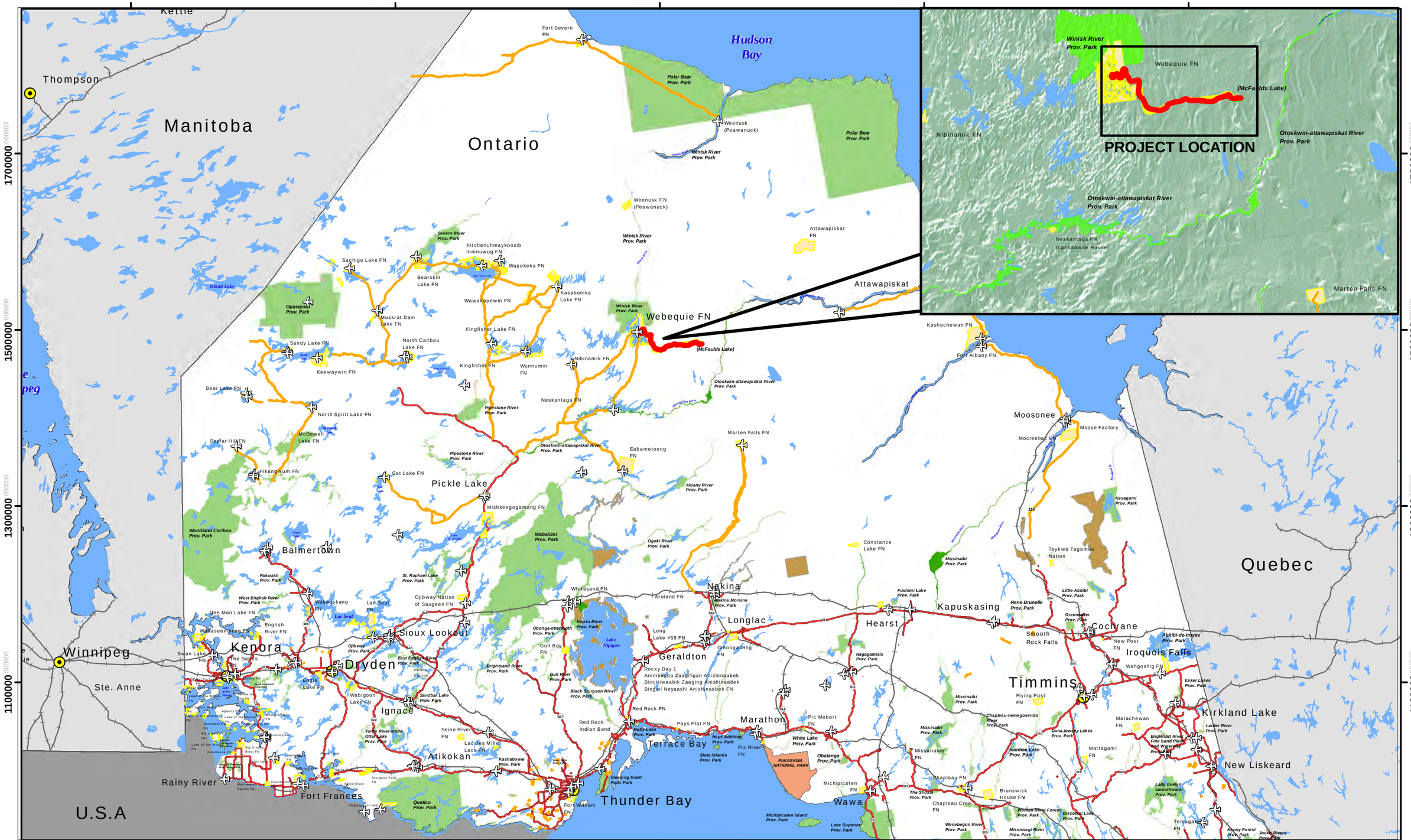
- To facilitate the movement of materials, supplies and people from the Webequie Airport to the area of existing mineral exploration activities and proposed mine developments in the McFaulds Lake area;
- To provide employment and other economic development opportunities to WFN community members and businesses that reside in or around the community's reserve and traditional territory, while preserving their language and culture; and
- To provide experience/training opportunities for youth to help encourage pursuit of additional skills through post-secondary education.

On May 3, 2018, the Ontario Minister of the Environment, Conservation and Parks (then Minister of the Environment and Climate Change) signed a voluntary agreement with Webequie First Nation to make the Webequie Supply Road Project subject to an Individual Environmental Assessment under Ontario's *Environmental Assessment Act*. The Project is also subject to meeting the requirements of the federal *Impact Assessment Act*. For the purposes of this work plan, the term "EA" is meant to include both the provincial environmental assessment and the federal impact assessment.

The purpose of this document is to present the work plan developed to assess the impact of the Webequie First Nation Supply Road Project (WSR Project) on the acoustic environment. It describes the general approach that will be applied during the impact assessment process to address the requirements of the Impact Assessment Agency of Canada (IAAC) laid out in the February 2020 *Tailored Impact Statement Guidelines* (TISG), and meet the expectations of the Ontario Ministry of the Environment, Conservation and Parks (MECP) in the context of established acoustics protocols governing environmental assessments for road projects.

The Acoustic Environment Work Plan is being submitted to IAAC and MECP requesting that a coordinated review be undertaken, with the objective of providing Webequie with technical guidance in meeting the requirements of the TISG and provincial Environmental Assessment Terms of Reference (ToR), pending approval by Ontario. It should be noted that Ontario's review of the work plan is preliminary and secondary to any further review and decisions related to a final approved ToR. The results of the work will be documented in the Environmental Assessment Report/Impact Statement (EAR/IS), which will meet the requirements of both the federal TISG and the provincially approved ToR.

More specifically, the assessment will address the requirements in Sections 8.1, 14.1, 20, 21, 22 and 26 of the TISG. Information from the assessment report(s), as well as information provided via memos, will be used by other disciplines to address, in part, Sections 9 and 16.1 (human heath); Section 15.3 and 20 (wildlife); and Sections 12.4, 17.2, and 19.1 (effects to Indigenous peoples). The plan has been developed to consider effects on community well-being from changes to soundscapes, and impacts of noise on the experience of a practice or the exercise of rights.



Legend

- Optimal Geotechnical Route
- Community Preferred Route
- Airports
- City/Town
- Winter Roads
- All-Season Roads
- Rail
- First Nation Reserve
- Federal National Park
- Provincial Park
- Conservation Reserve
- Waterbody

WSR WEBEQUIE SUPPLY ROAD

0 50 100 Km

N

Canada Lambert Conformal Conic Projection

Webequie Supply Road

Project Location

Date: 2020/05/12	File Number: 649920	Sub Code: 0000
Figure Number: 1		Rev. 0

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The scope of work, to be completed by SLR Consulting (Canada) Ltd., will include the following:

- Identify/confirm the relevant applicable noise assessment guidelines;
- Working with Webequie First Nation and the socio-economic discipline for the Project, identify noise sensitive areas ("NSAs");
- Establish background ambient sound levels at representative NSAs, and key inputs for the future noise assessment modelling;
- Assess potential noise impacts from the construction and operation of the WSR;
- Assess potential noise impacts from expanded operations of the Webequie Airport (WYP);
- Identify any exceedance of the applicable guidelines, and investigate feasible noise mitigation measures;
- Liaise with the socio-economic, wildlife and human health impact assessment disciplines as input to their work; and
- Document and communicate our findings to the Webequie First Nation and project EAR/IS reviewers.

The Work Plan also addresses relevant elements of TISG Section 13 (Effects assessment), Section 20 (Mitigation and enhancement measures) and Section 25 (Description of the project's contributions to sustainability).

The details of the proposed work plan are presented in **Section 2**.

1.1. Defining Spatial and Temporal Boundaries

1.1.1. Spatial Boundaries

Spatial boundaries define the geographic extent within which the potential environmental effects of the Project are considered. As such, these spatial boundaries define the study areas for the effects assessment. Spatial boundaries to be established for the EA will vary, depending on the valued component and will be considered separately for each. The spatial boundaries to be used in the EA will be refined and validated through input from federal and provincial government departments and ministries, Indigenous groups, the public and other interested parties.

Spatial boundaries will be defined taking into account the appropriate scale and spatial extent of potential effects of the Project; community knowledge and Indigenous Knowledge; current or traditional land and resource use by Indigenous communities; exercise of Aboriginal and Treaty rights of Indigenous peoples, including cultural and spiritual practices; and physical, ecological, technical, social, health, economic and cultural considerations.

At this stage in the EA process, the generic spatial boundaries for the EA will include the following three (3) study areas to capture the potential direct and indirect effects of the Project for each valued component, unless otherwise specified in a work plan:

- **Project Footprint (PF)** – is the identified areas of direct disturbance (i.e., the physical area required for Project construction and operation). The PF is defined as the 35 m right-of-way (ROW) width for the WSR and temporary or permanent areas needed to support the Project, including laydown/storage yards, construction camps, access roads and aggregate extraction sites.
- **Local Study Area (LSA)** - is identified as the area where most effects of the Project are likely to be measurable; therefore, along the PF, the LSA will be the focus of data collection to characterize existing environmental conditions. The LSA for most valued components will extend or buffer approximately 1 km from the supply road ROW boundary, and 500 metres (m) from the temporary or permanent supportive infrastructure.
- **Regional Study Area (RSA)** – encompasses the area outside of the LSA used to measure broader-scale existing environment conditions and provide regional context for the maximum predicted geographic extent of direct and indirect effects of the Project. Cumulative effects of the Project in combination with past, present, and reasonably foreseeable developments are typically assessed at this larger spatial scale. For general considerations, the RSA is defined as extending approximately 5 km from the LSA boundary.

Figure 2 presents the initial indicative spatial boundaries for the acoustic environment assessment. Within this context, typically, noise and vibration effects are highly localized and do not affect regional sized areas. Therefore, the RSA and LSA for noise and vibration are the same.

For noise, the RSA/LSA used in the assessment will be:

- Within 1.5 km of the boundary of the community of Webequie First Nation and the airport[1]; and
- Within 600 m of the proposed roadway centre-line[2].

At these distances, noise from the roadway and airport operations and roadway construction activities would be expected to decrease to background ambient conditions.

For vibration, the RSA/LSA used in the assessment will be:

- Within 150 m of blasting activity[3].

At this distance, vibration from the roadway operations and construction activities would be expected to decrease to background ambient conditions.

The study areas were selected to characterize existing environmental conditions and predict the direct and indirect changes from the Project on the subject valued component on a continuum of increasing spatial scales from the Project Footprint to broader, regional levels. The preliminary selection of study areas also considered the physical and biological properties of the valued component and related evaluation criteria.

The baseline data collection and effects assessment relative to the spatial boundaries will focus on the set of supply road conceptual alternatives within the preliminary proposed corridor, as identified in the

[1] Consistent with Alberta Energy Regulator (AER) Noise Directive 038, for LSAs in rural areas.

[2] Consistent with Ministry of Transportation of Ontario *Environmental Guide for Noise.*

[3] The DFO G*uidelines for the Use of Explosives In or Near Fisheries Waters* set a distance of 150 m for a 100 kg weight of explosive charge.

federal Impact Assessment Detailed Project Description (November 2019) and the provincial Environmental Assessment draft Terms of Reference (September 2019). The alternatives include the Webequie First Nation community's preferred route for the supply road (35 m right-of-way width) along the centreline of an approximately 2 km wide preliminary proposed corridor, and the optimal geotechnical route within the same corridor. The route alternatives are shown in **Figure 2** with the LSA and RSA boundaries for each route alternative combined to reflect the study area for the Project. At this stage of the EA process, the supportive infrastructure components have yet to be determined. It is anticipated that additional alternative routes may be developed during the EA. For example, a route that may be based on optimizing the geometric design of the community preferred route or optimal geotechnical route may be included. Where such additional alternatives are identified, the study area will be adjusted.

1.1.2. Temporal Boundaries

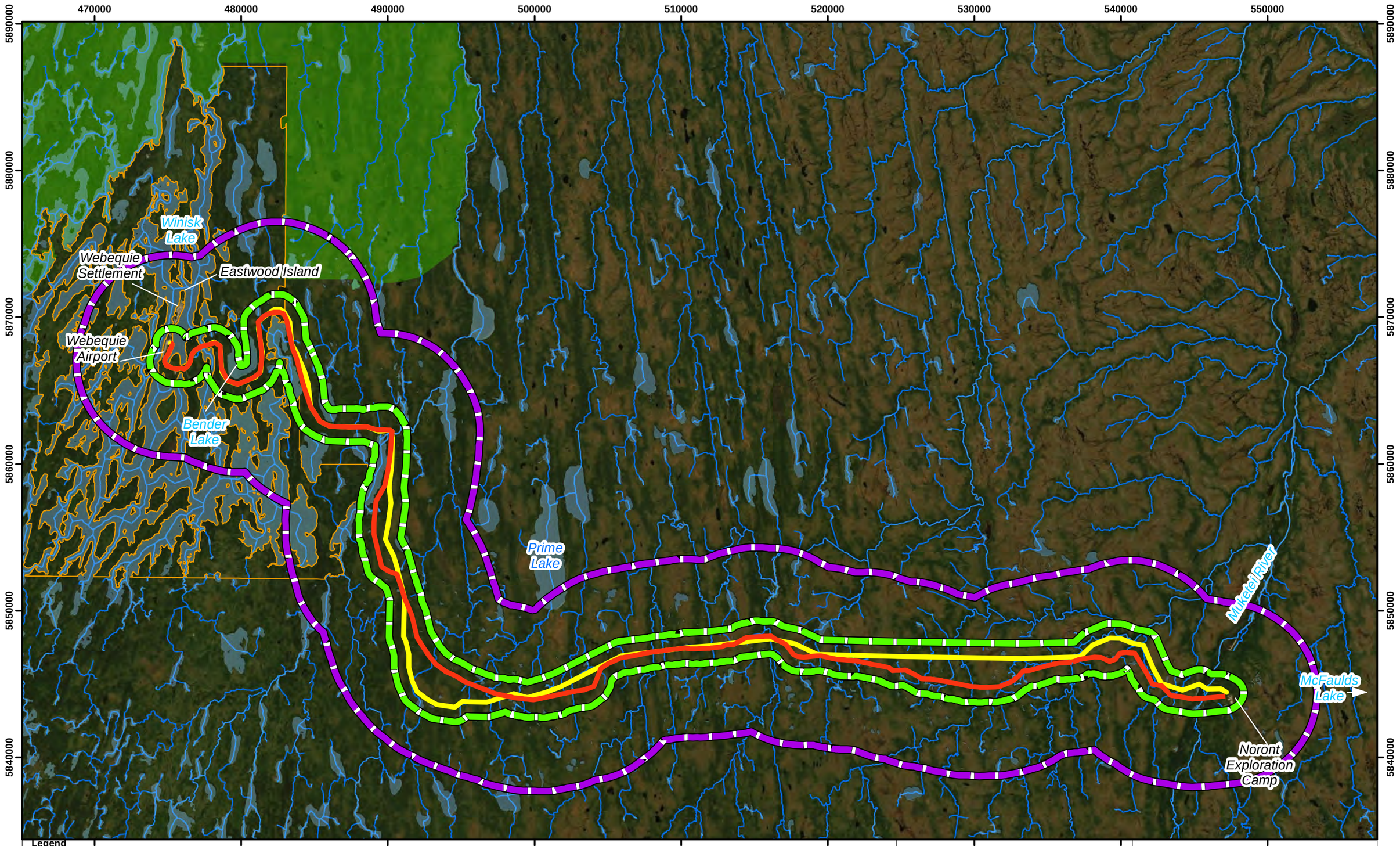
The EA process was designed to evaluate the short-term and long-term changes resulting from the implementation of the Project and associated effects on the environment, including where project activities may overlap such as the restoration (e.g., revegetation) of temporary access roads that could occur during the operation.

Implementation of the Project will occur in phases (refer to **Section 4.3.4** of the ToR). The potential interactions with the natural, cultural and socio-economic environments and the potential occurrence of residual impacts are anticipated to be different in each phase. In order to focus the assessment, the key activities can be divided into the three main phases:

- **Construction Phase**: All the activities associated with the initial development of the road and supportive infrastructure;
- **Operations Phase**: All activities associated with operation and maintenance of the road and any other permanent supportive infrastructure (e.g., operations and maintenance yard, aggregate pits) that will start after construction and continue indefinitely; and
- **Decommissioning/Abandonment/Closure Phase**: The Project will be operated for an indeterminate time period; therefore, retirement (decommissioning/abandonment/closure) is not anticipated and will not be addressed in the EA. Note that clean-up and site restoration, including the decommissioning and removal of temporary infrastructure (e.g., access roads) will be addressed in the construction phase.

Although generally based on the planned stages described above, the final selection of temporal boundaries is criteria-specific and further detail will be provided in the discipline-specific assessment sections of the EAR/IS. Baseline data collection for the acoustic environment is described in **Section 2.1.3**.

Temporal variation or patterns in potential effects associated with different criteria will also be considered (e.g., differential worst case noise impacts and related effects to sensitive receptors associated with the staging/movement of construction along the length of the supply road corridor during the construction period). Temporal considerations will also include potential or foreseeable improvements in technology. For example, it is expected that supply road traffic projections 10 years after operations start-up will be available. Future changes in traffic levels and newer vehicle fleets may have an impact: we may expect a greater proportion of future vehicles to be hybrid or exclusively electrically powered.



Legend

- Optimal Geotechnical Route
- Community Preferred Route
- Local Study Area (LSA 1km From Alternative Footprints)
- Regional Study Area (RSA 5km From Alternative LSA's)
- Webequie First Nation Reserve
- Waterbody
- Watercourse
- Winisk River Provincial Park

WSR WEBEQUIE SUPPLY ROAD

0 5 10 Km

N

NAD 83
UTM Zone 16N

Webequie Supply Road

Preliminary Route Alternatives and Combined Study Areas

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Figure Number: 2		Rev. 0

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2. Work Plan

2.1. Baseline Information Collection

A one-week site visit to the Webequie First Nation community, including field work to measure existing ambient background noise levels, will be completed in the fall of Year 3 of the Project.

2.1.1. Identification of Relevant and Applicable Guidelines

SLR will review the applicable Provincial and Federal guidelines, literature, and regulations, as well as the acoustical environment to identify the applicable noise guidelines and any additional applicable guidelines which may be useful in investigating noise impacts. The guidelines which will be considered include, but are not limited to:

- MECP Publication NPC-300, Environmental Noise Guideline - Stationary and Transportation Sources - Approval and Planning;
- Ministry of Transportation of Ontario ("MTO") Environmental Guide for Noise;
- MECP/MTO Protocol for Dealing With Noise Concerns During the Preparation, Review and Evaluation of Provincial Highway Environmental Assessments (the "Joint Protocol");
- Health Canada "Guidance for Evaluating Human Health Impacts in Environmental Assessment: Noise";
- MECP Publication NPC-115 – Construction Equipment;
- MECP Publication NPC-118 – Motorized Conveyances;
- MECP Publication NPC-119 – Blasting;
- MTO Provincial Standard OPPS.PROV 120, General Specification of the Use of Explosives; and
- Department of Fisheries and Oceans ("DFO") Guidelines for the Use of Explosives In or Near Canadian Fisheries Waters.

2.1.2. Identification of Noise Sensitive Areas

SLR will work with the Webequie First Nation, other identified Indigenous Groups and Stakeholders listed in the *Public Partnership Plan*, and the socio-economic discipline staff for the Project to identify noise sensitive areas ("NSAs"), which are points of reception where noise impacts will be predicted.

In order to meet the provincial/federal EA requirements, the NSAs considered will include the following:

- Permanent residences, including homes within the Webequie community;
- Schools, hospitals, community centres, retirement complexes, or assisted care homes;
- Seasonal residences, such as trapper cabins or hunting and fishing campsites, which are used by members of the Webequie First Nation/Other Indigenous Groups and Stakeholders;

- Spiritual or sacred spaces which members of the Webequie First Nation/Other Indigenous Groups and Stakeholders may identify as requiring quiet or being sensitive to disruptions from noise;

- Other locations which members of the Webequie First Nation/ Indigenous Groups and Stakeholders and/or the Wildlife and other Project disciplines may identify as requiring quiet or being sensitive to disruptions from noise, for instance locations important for country food; and

- The mine exploration camp at the McFaulds Lake area operated by Noront Resources.

2.1.3. Establish Background Ambient Sound Levels

Existing background ambient sound levels at representative NSAs within the Webequie First Nation community and along the proposed WSR route will be determined through ambient noise level measurements. For this project, a minimum of two receptor locations will be selected (refer to **Figure 3**):

- One, within the community, at the western terminus of the proposed WSR route; and
- One, at a distance of a few kilometres along the proposed route (away from the community), which will be used as representative of conditions along the corridor.

The community monitor at the western terminus will include noise from community activities (industrial and commercial noise, traffic noise, and airport noise). The second monitor will be sufficiently removed from these sources that it will capture ambient background sound levels in the outlying/bush area, dominated by the sounds of nature and removed from man-made noises.

A third monitor location may be selected along the main supply road corridor, if required, once initial identification of noise-sensitive receptors is complete and the proposed site outside of the WFN community is deemed not to be reasonably representative of conditions along the remainder of the corridor.

The measurements at each location will be conducted for a minimum period of 48 hrs, in accordance with MECP Publication NPC-233 measurement procedure requirements. Longer measurement durations may be required, depending on conditions at the time of measurements, to ensure that an appropriate representative period is captured. Additional measurements at other locations could be conducted, as time permits. Site conditions and access constraints will dictate the extent of deployment of the monitors, particularly in the bush areas outside the community.

The ambient noise measurements will be conducted in accordance with the requirements of the following guidelines:

- MECP Publication NPC-102 – *Instrumentation*;

- MECP Publication NPC-103 – *Procedures*;

- MECP Publication NPC-104 – *Sound Level Adjustments*;

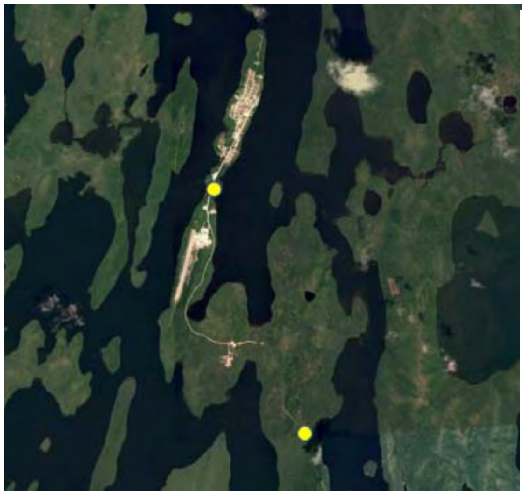
- MECP Publication NPC-233 – *Information To Be Submitted For Approval Of Stationary Sources Of Sound*;

- Health Canada “Guidance for Evaluating Human Health Impacts in Environmental Assessment: Noise”; and

› ISO 1996-2:2007, Acoustics — Description, measurement and assessment of environmental noise – Part 2: Determination of environmental noise levels.

Measurements will be conducted with the Larson-Davis NMS044 Outdoor Noise Monitoring System, which incorporates LD831 Sound Level Meters equipped with portable power supplies and environmental protection kits (refer to **Figure 3**). These are Type 1 sound level meters, capable of recording L_{eq} levels and various L_{max}, L_{min}, and L_n values.

Figure 3: Proposed Measurement Locations & Larson Davis NMS044 Outdoor Noise Monitoring System



Courtesy of Larson-Davis

The monitors will be located in open areas with limited vegetation, will be situated as close to the ground as practical (in keeping with MECP and MTO requirements), and will be equipped with an appropriate windscreen. The monitors will be field calibrated pre- and post-measurement to ensure the accuracy of the results.

Per ISO 1996-2 and MECP Publication NPC-103, the weather conditions during the measurements will be representative of worst-case "noise exposure situation under consideration". For the Project, that period is during spring to fall, when "the ground surface is not covered with snow or ice" and is "neither frozen nor soaked by excessive amounts of water". As a result, measurements will be conducted during the spring to fall period, excluding winter months. This is representative of the potential for worst-case impacts, as it is during this period that windows on residences may be open and people will be out on the land.

The parameters that will be captured and presented in accordance with TISG requirements will include the following:

› L_{eq} (1-min) values, in dBA, dBC, and dBZ;

› L_{max} and L_{min} values;

› L_1, L_{10}, L_{50}, L_{90}, and L_{99} values;

› Histograms; and

- Simultaneous audio recordings.

A portable meteorological station will be used during measurements to characterize local weather conditions, including:

- Wind speeds and direction;
- Temperature;
- Relative humidity; and
- Rainfall.

The above will also be supplemented by meteorological data measured at the airport.

The raw measurement data will be subject to an exclusion analysis, which will flag and, as required, remove from the data set:

- Periods with adverse, extreme weather conditions (e.g., wind speeds greater than 14 km/h; humidity greater than 90%; temperatures lower than -10°C or greater than 50ºC; periods of fog and precipitation);
- Periods with extraneous noise sources (lawn mowers, music, car horns, dogs barking, cicadas and other atypical insect and natural noises, etc.); and
- Periods with noise from airport/airstrip activity (aircraft take-offs and landings; audible noise from Airport ground activity).

The above weather conditions are representative of “worst-case” conditions favourable to sound propagation, as is required by Health Canada’s noise guidelines, and will result in a conservative (low) estimate of existing background ambient sound levels.

The refined measurement data will then be processed to determine typical sound levels. The following levels will be determined:

- A characterization of the noise sources that contribute significantly to the baseline background ambient sound environment, by type (e.g. traffic, aircraft, trains, industrial);
- A characterization of the background ambient sound environment, using descriptors such as “continuous, intermittent, regular impulsive, highly impulsive, high-energy impulsive, and continuous tonal and intermittent tonal”, per ISO 1996-2 and Health Canada guidance,
- An hourly distribution of baseline sound levels during the day and night;
- Overall sound levels during the daytime (7 a.m. to 11 p.m.) and night-time (11 p.m. to 7 a.m.) periods;
- Overall “day-night” sound levels over the entire day (L_{dn} values); and

Measurement results will be supplemented using ambient background measurement data from the noise surveys conducted by Noront for the Eagle’s Nest Mine EA. Although somewhat dated, this appears to

be the most recent data for parts of the project area. The applicability of the data will be fully determined and detailed during the EAR/IS work.

The monitoring data will be further supplemented with a review of typical background ambient sound level data for rural areas based on population density, contained in in Health Canada's noise guidelines and in Alberta Energy Regulator (AER) Directive 038.

2.1.4. Determining Key Inputs for the Future Noise Assessment Modelling

Future noise levels from the WSR roadway and from the Webequie Airport will be determined through noise modelling, as discussed below. Key inputs to the noise models will need to be determined at this initial phase. These parameters include:

For Road Traffic:

- Anticipated number of light vehicles, medium trucks, and heavy trucks[4] that will use the WSR, divided into daytime (7 a.m. to 7 p.m.), evening (7 p.m. to 11 p.m.), and night-time (11 p.m. to 7 a.m.) periods; and
- Noise Emission Levels for these vehicle types, travelling on a gravel roadway, at the presumed road speed (80 km/h).

For Airport Traffic:

- Existing number of flights to and from the airport on a "worst case" or "peak planning" day, divided into the types of aircraft used, and times of day (daytime (7 a.m. to 7 p.m.), evening (7 p.m. to 11 p.m.) and night-time (11 p.m. to 7 a.m.) periods);
- Typical flight paths to and from the airport, take-off flight path angles, and glide slopes;
- Annual breakdown of northbound versus southbound take-offs and landings; and
- For future aircraft, the number of additional flights that are anticipated, including the types of planes to be used.

Road Traffic Data

Per the Detailed Project Description, anticipated total traffic volumes on the WSR are in the range of 500 vehicles per day. SLR will work with the EA team to determine appropriate light/medium/heavy truck and time-of-day distributions.

For vehicle noise emission levels, our initial review of the literature indicates that there are no published values quantifying the difference in sound levels for gravel roads versus paved roads, at the proposed vehicle speeds.

[4] Light vehicles are cars and light trucks; medium trucks have six (6) wheels and weights up to 8.8 tonnes (e.g., panel vans); heavy trucks have eight (8) or more wheels and weights > 8.8 tonnes (e.g., transport trucks).

Noise emission levels for use will be established through a test measurement program. An appropriate test course in southwestern Ontario (Wellington County or Waterloo Region) with a suitable stretch of straight gravel road will be used. Vehicle pass-by measurements of light, medium and heavy trucks along the road, at a number of different speeds, including the WSR posted speed limit of 80 km/h, will be conducted.

This information will be used to create the required noise emission profiles for the later noise modelling exercises.

Airport Traffic Data

During the site visit, SLR will work with the EA team and discuss existing flight operations with WYP airport staff. Future traffic levels will be estimated through those discussions, in addition to discussions the EA team has had with Noront, and through a review any EA documentation filed by Noront for their McFaulds Lake area operations (e.g., Eagle's Nest EA).

2.2. Consideration and Evaluation of Alternatives

The consideration of alternative methods will focus on the supply road conceptual alternatives within the proposed preliminary corridor, as identified in the Detailed Project Description (November 2019) and the draft Terms of Reference (September 2019). These alternatives include the Webequie First Nation community's preferred route for the supply road along the centreline of an approximately 2 km wide preliminary preferred corridor and the optimal geotechnical route within the same corridor (refer to **Figure 2**).

In addition, the following alternative methods related to supportive infrastructure and the preferred supply route will be examined.

- Alternative sites for temporary and/or permanent aggregate extraction pits and production facilities needed for construction and operation of the road, including access roads to these sites;
- Alternative sites for supportive infrastructure (i.e., temporary laydown and storage areas, and construction camps, including access roads to these areas);
- Watercourse crossing structure types (i.e., culverts, bridges), span length, lifecycle, and construction staging methods at waterbody crossings;
- Road attributes, including roadbed foundation; horizontal alignment, vertical alignment (elevation/profile), and adjustments to the cross-section and right-of-way (ROW) width of the corridor.

Both a quantitative and/or qualitative assessment of potential noise and vibration impacts from the preferred alternatives will be conducted to allow for a comparison of the advantages and disadvantages and selection of a preliminary recommended route for the WSR and the sites/access routes for supportive infrastructure. This information will feed into the final selection of the preferred route and construction program/locations.

2.3. Noise Assessment – Road

The noise assessment of the WSR will examine two main scenarios:

1. Operation of the roadway.
2. Construction of the roadway.

2.3.1. Operational Noise

For roadway projects, operational noise is of primary importance in determining potential impacts. Noise levels from the roadway will be predicted using Cadna/A, a noise computer modelling package produced by Datakustik GmbH. Cadna/A includes a computerized implementation of the internationally recognized ISO 9613 noise propagation algorithms, and can account for:

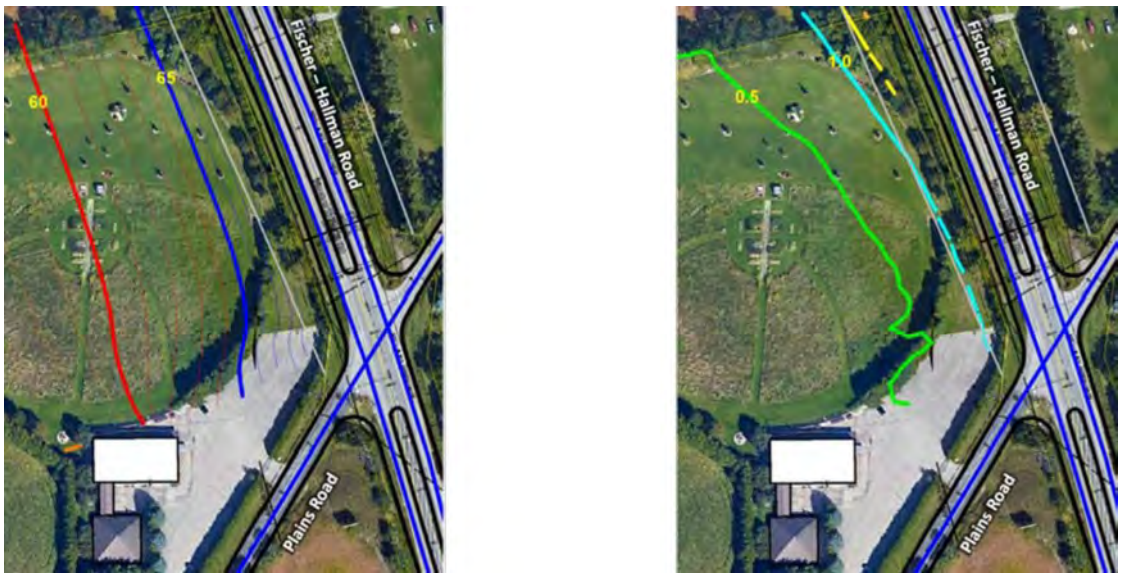
- Source and receiver geometrics and distances;
- Source directivity;
- Screening from terrain and purpose-built noise barriers;
- Attenuation from woods and heavily forested areas;
- Ground attenuation due to soft terrain;
- Atmospheric absorption; and
- Worst-case meteorological conditions.

WSR traffic near the identified NSA's will be modelled as a "moving point source" type of sound. "Future Build" sound levels (i.e., with the WSR in operation) will be predicted at the NSAs. The following levels will be determined:

- Overall sound levels during the daytime (7 a.m. to 11 p.m.) and night-time (11 p.m. to 7 a.m.) periods;
- Overall "day-night" sound levels over the entire day (L_{dn} values); and
- Maximum sound levels from vehicle pass-bys and the number of events during the night-time period (10 p.m. to 7 a.m.).

These will be compared to the "No-build" background ambient sound levels previously determined, as well as against the corresponding applicable and/or relevant noise guidelines, and presented graphically using noise contours, as shown in the example in **Figure 4**.

Figure 4: Example of Predicted Road Traffic Sound Levels and Changes from Existing Conditions



Determination of Potential Impacts – MECP and MTO Noise Guidelines

The MECP and MTO noise guidelines are based on:

- The change from existing "no-build" background sound levels, and the "future build" sound levels with the Project in place (background sound levels + Project); as well as the Provincial Objective for outdoor sound levels of 55 dBA. Changes greater than 5 dBA require an investigation of noise mitigation; and
- The maximum "future build" sound levels. Sound levels in excess of 65 dBA require an investigation of noise mitigation.

The following table summarizes the requirements for investigation of mitigation measures:

Future Sound Levels	Change in Noise Level Above "No-Build" Ambient (dBA)	Mitigation Effort Required
< 55 dBA	0 to 5	None
	> 5	
> 55 dBA	0 to 5	
	> 5	Investigate noise control measures within right-of-way. Noise control measures where used must provide a minimum of 5 dBA of attenuation, averaged over the first row of receivers.
> 65 dBA	All	Mitigate to as close to ambient as possible, where technically, economically and administratively feasible.

Notes: Values are L_{eq} (16h) levels for municipal roads and provincial highways, and L_{eq} (24h) for freeways.

Determination of Potential Impacts – Health Canada Noise Guidelines

Health Canada's noise guidelines for operational noise are based on three main parameters:

- The change in "Percent Highly Annoyed" (%HA) due to project operations. This is calculated based on the change from existing "no-build" background sound levels to the "future build" sound levels with the Project in place (background sound levels + Project[5]). The change in %HA at each representative NSA is calculated based on the predicted L_{dn} sound levels, in accordance with ISO 1996-1:2003. A change in %HA of more than 6.5% indicates the potential for adverse effects and the requirement to investigate mitigation measures. Health Canada also holds the view that mitigation of project noise should be applied if it exceeds an L_{dn} of 75 dBA, even if the change in %HA does not exceed 6.5%.

- Indoor night-time average sound levels should not exceed 30 dBA (10 p.m. to 7 a.m.); and

- Maximum indoor sound levels from individual events should not exceed 45 dBA and the number of events occurring during the over-night period should not exceed 10 to 15 events (10 p.m. to 7 a.m.).

In evaluating the change in %HA, appropriate sound level adjustments will be provided, based on the measured sound levels and in accordance with HC guidance and ISO 1996-1. For example, for rural environments, a +10 dBA adjustment may be appropriate in some locations. This will be determined based on a review of the baseline background ambient sound level data.

In evaluating indoor night-time sound levels, a conservative adjustment of -15 dBA will be applied, as appropriate, to account for attenuation through open windows in accordance with the Health Canada guidelines.

Mitigation

Where noise levels in excess of the noise guidelines are identified, the feasibility of noise mitigation measures will be assessed. Under the applicable provincial guidelines for transportation noise, noise mitigation must be:

- Technically feasible – it must provide at least 5 dB of attenuation.

- Economically feasible – it must be affordable on a per-affected-receptor basis.

- Administratively feasible – it must be within the right-ow-way to be installable and maintainable.

The types of noise mitigation which will be considered include, but are not limited to:

- Minor changes to the roadway alignment (horizontal or vertical, within the overall preferred alignment);

- Acoustical barriers (earthen berms or noise walls); and

- Other mitigation measures which may arise during the EA process.

[5] Project noise will include noise from roadway operations, noise from the WYP Airport, and noise from the long-term aggregate/bedrock extraction site discussed below.

The assessment will include commentary on the feasibility of mitigation at the affected NSAs, and recommendations will be provided.

Noise Input to Wildlife Discipline

Many areas of the Project will not be located near NSAs, but WSR noise in these areas may still affect wildlife. SLR will provide a chart to wildlife discipline staff of typical noise levels versus distance from the roadway. This can be used by wildlife discipline staff in their work to determine areas and species that may be adversely affected by noise.

Noise Input to Human Health and Socio-economic Impact Assessment Discipline

SLR will provide tables and figures of existing and future mitigated sound levels at NSAs to human health and socio-economic impact discipline staff for use in their assessment. Overall cumulative noise levels (Ambient + WRS road + WYP Airport) noise levels will also be provided.

2.3.2. Permanent Aggregate/Bedrock Extraction Site

For the purposes of the acoustic environment assessment, it is assumed that one aggregate/ bedrock extraction site ("the Aggregate Site"), originally developed during the construction phase, will be maintained into the operational phase to supply needs for road maintenance. Noise sources associated with the Aggregate Site with the potential to effect NSAs and wildlife could include:

- Blasting of bedrock;
- Drilling of bedrock;
- Rock crushers, screening decks and wash plants;
- Conveyors and stackers;
- Front end loaders and excavators;
- Haul trucks; and
- Diesel-powered electrical generators.

Vibration sources associated with the Aggregate Site with the potential to effect NSAs and wildlife could include:

- Blasting of bedrock.

Determination of Potential Impacts – MECP Noise Guidelines

Noise from the facility will be modelled as a "stationary" source of sound, in accordance with the requirements of MECP Publication NPC-300. The applicable noise limits used in the assessment will be the "Class 3" rural area limits of L_{eq} (1-hr) 45 dBA during the day (7 a.m. to 7 p.m.) and 40 dBA during the evening and night (7 p.m. to 7 a.m.). These are the strictest stationary noise limits in the provincial guideline.

Noise levels will be modelled at the closest NSAs to the site. If there are no noise sensitive receptors within 1.5 km of the Aggregate Site facility boundary, the point of reception used in the assessment will

be a 1.5 km radius from the site[6].

Determination of Potential Impacts – Health Canada Noise Guidelines

L_{dn} noise levels from the Aggregate Site will be included in the "future build" scenario for the assessment of impacts of road operations discussed previously.

Mitigation

Where the applicable MECP and/or Health Canada noise guidelines are exceeded, noise mitigation will be developed to bring noise levels into compliance with the criteria. Mitigation measures to be investigated will include (but are not limited to):

- Relocation of equipment;
- Selection of and upgrades to equipment (e.g., upgraded mufflers for electrical generators); and
- Berms, noise walls, and other acoustical screens.

Blasting Noise

Bedrock blasting activities will need to be designed to meet the noise (overpressure) requirements of MECP Publication NPC-119, of:

- 120 dBL, for unmonitored blasts; and
- 128 dBL for blasts where routine monitoring of peak pressure levels occurs.

Blasting noise levels must meet the above criteria at the closest NSAs to the Site. If there are no noise sensitive receptors within 1.5 km of the Aggregate Site facility boundary, the point of reception used in the assessment will be a 1.5 km radius from the site.

The requirement to meet the above guideline limits will be included as a commitment in the EAR/IS report.

Noise Input to Wildlife Discipline

SLR will provide noise contour maps (isopleths of equal noise levels) from the facility. This can be used by wildlife discipline staff in their work to determine areas and species that may be adversely affected by noise.

Noise Input to Human Health and Socio-economic Impact Assessment Discipline

SLR will provide tables and figures of existing and future sound levels at NSAs to human health and socio-economic impact discipline staff for use in their assessment. Overall cumulative noise levels (Ambient + WRS + Aggregate Site + WYP Airport) will also be provided.

Vibration Guidelines and Assessment of Impacts

It is anticipated that the only vibration source with the potential to affect off-site receptors (human or wildlife) associated with the Aggregate Site will be bedrock blasting. Vibration from blasting activities

[6] Consistent with the requirements of AER Directive 038 for remote facilities.

must meet the following limits:

- MECP Publication NPC-119 – Blasting;
- MTO Provincial Standard OPPS.PROV 120, General Specification of the Use of Explosives; and
- Department of Fisheries and Oceans ("DFO") *Guidelines For The Use Of Explosives In Canadian Fisheries Waters*.

The applicable criteria are summarized in the following table.

Criteria	Medium	Limit		
DFO *Guidelines For The Use of Explosives In or Near Canadian Fisheries Waters*	Water	› No explosive is to be detonated in or near fish habitat that produces, or is likely to produce, an instantaneous pressure change (i.e., overpressure) >100 kPa in the swimbladder of a fish; › Maximum PPV Velocity of 13 mm/s in spawning beds during incubation		
MECP Publication NPC-119 – Blasting	Ground	› Maximum PPV Velocity of 10 mm/s for unmonitored blasts; › Maximum PPV Velocity of 12.5 mm/s for blasts where routine monitoring of peak pressure levels occurs		
MTO Provincial Standard OPPS.PROV 120	Ground	Structures and Pipelines	Maximum PPV Velocity of 20 mm/s ≤40 Hz	Maximum PPV Velocity of 50 mm/s >40 Hz
		Concrete and Grout <72 hours from placement	Maximum PPV Velocity of 10 mm/s	
	Water	100 kPA, (mandatory monitoring required)		

Note that the above guidelines are not based on background ambient vibration levels – rather, they are from the activity itself, which will dominate over background levels. Vibration levels are controlled through blast design and confirmed through monitoring. The requirement to meet the above guideline limits will be included as a commitment in the EAR/IS report.

2.3.3. Construction Noise and Vibration

Construction noise is temporary in nature, and largely unavoidable. For this project, construction activities will most often be located at distances far from noise sensitive areas. Construction activities of most concern will most likely include blasting of rock; aggregate extraction, including crushing/screening; hauling and stockpiling operations; placement and grading of gravel; and construction of waterbody crossings.

Preliminary construction plans will be reviewed to identify locations where significant amounts of construction activity will be located for extended periods of time. Such areas include the waterbody crossings, aggregate extraction areas, stockpiling areas and access roads to these areas. Where such areas are located near an NSA, the anticipated sound levels from the activity will be predicted. To meet Health Canada requirements, NSAs for the construction phase will also include the temporary construction camps.

Noise Modelling of Short-Term Transient Construction Activities

Many construction activities are only located in a given area for a brief period of time; for example, surveying, initial tree and brush clearing. Other activities, such as excavation, filling and grading, will vary in time and space as the supply road is completed. The construction plan will be reviewed to identify typical types of activities along the linear route, and the number and types and construction vehicles associated with them (information provided by experienced construction staff within the Project's Engineering Team). Daytime L_d, night-time L_n, and overall L_{dn} noise levels at various setback distances from the roadway centreline and at the representative NSAs will be predicted. The assessment will use conservative assumptions on equipment use, which will be documented in the EAR/IS.

Noise Modelling of Specific Long-Term Construction Activities

Certain facilities will be fixed in place for the majority of, or for the entire duration of the project. These facilities include:

- Construction camps (moving equipment/vehicles and electrical power systems);
- Laydown and storage areas (moving equipment/vehicles and electrical power systems); and
- Aggregate and bedrock extraction areas (equipment/vehicles, crushing, screening, drilling, blasting and electrical power systems).

Noise levels from these facilities will be modelled as "stationary" sources of sound. Daytime L_d, night-time L_n, and overall L_{dn} noise levels at the nearest NSAs and in the form of noise contour maps will be provided.

Evaluation of Impacts – Health Canada Noise Guidelines

Section 6.3.1 of Health Canada's noise guidelines addresses the assessment of construction noise impacts. These are broken down into two periods:

- Short-Term Construction Noise Exposure (<1 year); and
- Long-Term Construction Noise Exposure (≥1 year).

Conservative (high) predicted construction noise levels for both daytime (L_d), night-time (L_n) and overall (L_{dn}) at all representative NSAs will be developed, combining noise from background ambient, short term transient and long-term construction activities discussed above. The potential for impacts and the need for construction noise mitigation will be evaluated following the approaches outlined in Sections 6.4.2, 6.4.3, and 6.4.4 of the Health Canada guidelines.

Evaluation of Vibration Impacts

It is anticipated that the only vibration source with the potential to effect off-site receptors (human or wildlife) associated with the Aggregate Site will be bedrock blasting. Vibration from blasting activities must meet the following limits:

- MECP Publication NPC-119 – Blasting;
- MTO Provincial Standard OPPS.PROV 120, General Specification of the Use of Explosives; and

- Department of Fisheries and Oceans ("DFO") *Guidelines For The Use Of Explosives In Canadian Fisheries Waters*.

Code of Practice

As part of the Environmental Protection Plan framework to be developed during the Impact Statement phase, a Construction Code of Practice will be developed, which should be followed by the contractor to reduce the potential for construction noise and vibration impacts. The Code of Practice will outline:

- Applicable noise emission limits for equipment;
- Applicable noise and vibration guidelines for blasting, including impacts on fisheries;
- Considerations for operating times;
- Considerations for equipment selection and maintenance; and
- Complaints procedures.

Noise Input to Wildlife Discipline

In addition to the above, a chart of typical noise levels for various construction activities at various distances from the roadway will be provided to wildlife discipline staff. This can be used by wildlife discipline staff in their work to determine areas and species that may be adversely affected by noise.

Noise Input to Human Health and Socio-economic Impact Assessment Discipline

SLR will provide tables and figures of construction-related sound levels at NSAs to human health and socio-economic impact discipline staff for use in their assessment.

2.4. Noise Assessment – Airport

Noise levels from the Webequie Airport will be predicted using Cadna/A. Existing and "Future Build" sound levels (i.e., with the WSR in operation) will be predicted at the NSAs. The following levels will be determined:

- Overall sound levels during the daytime (7 a.m. to 11 p.m.) and night-time (11 p.m. to 7 a.m.) periods; and
- Overall "day-night" sound levels over the entire day (L_{dn} values).

These will be compared to the "No-build" background ambient sound levels previously determined, and against the corresponding applicable and/or relevant noise guidelines.

Noise Input to Human Health and Socio-economic Impact Assessment Discipline

Tables and figures of existing and future sound levels at NSAs will be provided to human health and socio-economic impact discipline staff for use in their assessment.

Overall cumulative noise levels (Ambient + WRS road + WYP Airport) noise levels will also be provided.

2.5. Acoustic Environment Criteria and Indicators

Criteria are components of the environment that are considered to have economic, social, biological, conservation, aesthetic or cultural value (Beanlands and Duinker, 1983). The assessment will focus on valued components, and applicable specific criteria, that have physical, biological, social, economic or health importance to the public, Indigenous groups, federal and provincial authorities and interested parties, and have the potential for change as a result of the Project. Valued components have been identified in the federal TISG and by the Project Team and are, in part, based on what Indigenous communities and groups, the public and stakeholders identify as valuable to them in the EA process to date. The list of valued components identified to date include the following:

- Geology, Terrain and Soils;
- Surface Water;
- Groundwater;
- Air Quality;
- Climate Change;
- **Noise** (subject of this work plan);
- Vegetation and Wetlands;
- Fish and Fish Habitat;
- Wildlife, including migratory birds;
- Archaeological Resources;
- Built Heritage and Cultural Heritage Resources;
- Socio-economic Environment;
- Aboriginal Land and Resource Use;
- Visual/Aesthetic Environment;
- Human Health; and
- Aboriginal and Treaty Rights and Interests.

The list of valued components will be informed, validated and finalized through the engagement and consultation process, including those to whom these concerns are important and the reasons why, such as environmental, cultural, spiritual, historical, health, social, economic and their relation to the exercise of Aboriginal and Treaty rights.

The list of identified valued components and associated criteria will be validated and finalized by the Project Team through a variety of means and consideration of factors that include, but are not limited to the following:

- Engagement with Indigenous communities and groups and the extent to which the valued component is linked to the interests or exercise of Aboriginal and Treaty rights of Indigenous peoples;
- Stakeholder engagement, including discussions with interest holders, and government authorities;
- Presence, abundance and distribution within, or relevance to, the area associated with the Project;
- Extent to which the effects (real or perceived) of the Project and related activities have the potential to interact with the valued component;
- Species conservation status or concern;

- Umbrella or keystone species with potential to represent a broad range of potential effects;
- Uniqueness or rarity in the study area;
- Likelihood of an indirect effect on an associated criterion (i.e., a link exists between the affected criterion and another criterion, such as noise impacts affecting the exercise of Aboriginal or Treaty rights, or community health and well-being);
- Ecological, social and economic value to Indigenous communities, municipalities, stakeholders, government authorities, and the public; and
- Traditional, cultural and heritage importance to Indigenous peoples.

The proposed set of Evaluation Criteria for assessing the comparative advantages and disadvantages of the methods/means of carrying out the undertaking includes the following considerations pertaining to the Acoustic Environment:

Criterion	Indicators	Rationale for Selection of Indictors	Data Source
Noise	Predicted Noise Levels – Quantitative and qualitative assessment of changes to noise levels	Sensitivity of wildlife to changes above existing noise levels - sensory disturbance can impact habitat availability, use and connectivity (movement and behaviour), leading to changes in abundance and distribution of terrestrial animals Sensitivity of humans to changes above existing noise levels - annoyance to individuals/households/ communal uses in community based on noise proximity effects	• Indigenous consultation and Indigenous Knowledge • MNRF – LOI database sets • Environmental Noise Guideline Stationary and Transportation Sources – Approval and Planning, Publication NPC-300 (MOECC, 2013) • Model Municipal Noise Control By-Law Noise Pollution Control Guideline Construction Equipment, Publication NPC-115 • Equipment list provided by Project engineering team

Details on the application of quantitative indicators in the effects assessment are included in **Section 2.2** Noise Assessment - Road and **Section 2.3** Noise Assessment - Airport. As described in **Section 2.5.1**,

the acoustic effects assessment will also consider/evaluate alternatives for infrastructure supporting the supply road, including: temporary and/or permanent aggregate extraction pits and production facilities; temporary laydown and storage areas; and construction camps, including access roads to these areas.

Where there are discernible differences between the alternative means or methods of implementing the Project (supply road corridors; sites for supporting infrastructure) with respect to the acoustic environment, the respective advantages and disadvantages of each alternative will be assessed and incorporated in the evaluation of alternatives and selection of the preferred option. For example, the Cadna/A impact assessment software is able to account for source and receiver geometrics and distances; source directivity; natural screening from terrain; attenuation from woods and heavily forested areas; and ground attenuation due to soft terrain.

The EAR/IS will further describe the criteria and indicators, including details of how each indicator will be measured, along with data sources and rationale for selection. This will be presented in tabular format and will build on the preliminary criteria and indicators presented above and included in **Appendix B** of the ToR.

2.6. Effects Assessment Approach

The approach for the assessment of project effects has been developed to satisfy regulatory requirements under the *Environmental Assessment Act* and is based on the MECP *Code of Practice: Preparing and Reviewing Terms of Reference for Environmental Assessments in Ontario* (MOECC, 2014), and the Terms of Reference for the Project that is currently pending approval from the MECP. The approach for the assessment has also been developed to meet the requirements of the federal TISG and, specifically, Section 13 – Effects Assessment.

2.6.1. Consideration and Evaluation of Alternatives

The EA process requires that two types of project alternatives be considered: “alternatives to” the Undertaking (i.e., functionally different ways of addressing an identified problem or opportunity to arrive at the preferred planning solution) and “alternative methods” of carrying out the Undertaking (options for implementing the preferred planning solution). The consideration and evaluation of alternatives to the Undertaking were documented in the federal Impact Assessment Detailed Project Description (November 2019) and the provincial Environmental Assessment draft Terms of Reference (September 2019), and concluded that developing a new all-season road between Webequie and the McFaulds Lake area is the preferred alternative. It is not proposed that this analysis and conclusion be re-examined as part of the EA process, but it will be documented in the EAR/IS. Therefore, in keeping with the focussed approach, the preferred planning alternative (developing a new all-season road) has been carried forward to the initial consideration of alternative methods of carrying out the Undertaking.

As described in **Section 2.2**, the consideration of alternative methods will focus on the supply road conceptual alternatives within the proposed preliminary corridor and alternatives related to supportive infrastructure for the supply road.

The assessment of alternatives will include environmental, socio-economic, cultural and technical factors, using criteria and indicators for the comparative analysis. This will also include specific consideration of community based Indigenous land and resource uses (e.g., fishing, hunting) and cultural (e.g., built, sacred or spiritual sites) criteria of value to Indigenous communities within the broader factors. As noted

previously, the criteria and indicators will be developed in detail as part of the EA through input from the engagement and consultation activities with Indigenous communities, the public and stakeholders. Both a quantitative and/or qualitative assessment of alternatives for each criterion will be conducted to allow for a comparison of the advantages and disadvantages and selection of a preliminary recommended route for the WSR and the sites/access routes for supportive infrastructure.

2.6.2. Assessment of Net Effects

A step-wise process will be used to assess the environmental effects of the Project in a systematic and transparent manner once the relevant project elements and activities and their interactions, assessment boundaries, and relevant environmental criteria and indicators are identified and finalized through the engagement and consultation process. The net effects assessment method will include the following primary steps:

- Identification of potential environmental effects;
- Identification of technically and economically feasible impact management measures;
- Prediction of net effects following implementation of impact management measures; and
- Evaluation of the predicted net effects (i.e., describe and determine the magnitude, duration, extent, frequency, and significance of the predicted net effects).

2.6.2.1. Identification of Potential Environmental Effects

The net effects assessment will consider the potential interactions between the project components and activities and the criteria within the identified spatial boundaries and phases of the Project (i.e., construction and operations). Potential effects of the Project on valued components will be determined by comparing baseline/no-build conditions to those expected to result from the construction and operation and maintenance of the Project. Potential effects will be described for each assessment criterion, including an indication of whether they are expected to be direct (i.e., as a result of a project component or activity affecting a valued component), or indirect (i.e., as a result of a change to one valued component affecting another valued component). Relevant project works and activities will be analysed individually to determine if there is a plausible pathway for an effect on valued components.

The assessment of potential supply road effects on the acoustic environment will include the characterization of baseline and future no-build conditions in the project study area using both publicly available information on a regional scale, and data obtained in the field or via desktop review on a local scale or site-specific basis, as described in **Section 2.1** and **Section 2.3.1**. The consideration of potential acoustic environment effects will be based on both quantitative and qualitative assessments in accordance with approved Ontario and Health Canada protocols and guidelines, as described in **Section 2.2** and **Section 2.3.**

2.6.2.2. Identification of Impact Management Measures

Once potential effects are identified, technically and economically feasible impact management measures (or “mitigation measures”) to avoid and minimize potential adverse effects will be identified for each phase of the Project. The definition of effect levels may vary from one valued component or criterion to another, recognizing that the units and range of measurement are distinct for each. Lastly, effects may impact communities, Indigenous groups and stakeholders in different ways, including through a gender-based lens (refer to **Section 2.6.3**) and they may respond differently to them. Therefore, determining and characterizing effects will be based largely on the level of concern expressed through engagement with the Indigenous groups and community members. Refinements to these measures may also be made in

the future detail design phase of the Project. Impact management measures will be developed for the Project based on:

- Knowledge and experience of the Project Team with linear infrastructure developments;
- Industry best management practices and applicable agency requirements and guidance; and
- Measures identified by Indigenous communities, the public and stakeholders through feedback received as part of the engagement and consultation program.

The assessment of means to reduce or mitigate potential effects to the acoustic environment will generally be qualitative in nature, including consideration of other measures that may have been used on similar projects. Design, construction and operations phase considerations and impact management measures for the acoustic environment, as described in **Section 2.3.1, Section 2.3.2** and **Section 2.3.3**, will be identified to offset or eliminate potential adverse effects and will be described in the EAR/IS. Examples for operational effects include design changes to the roadway alignment; and the introduction of acoustical barriers (earthen berms). Examples for construction period effects include enforcement of applicable noise emission limits for equipment; use of applicable noise and vibration guidelines for blasting, including in proximity to fish bearing waterbodies; prescriptive operating times; considerations for equipment selection and maintenance; and instituting complaints procedures.

It is understood that impact management measures are not always fully effective; therefore, WFN will identify a compliance monitoring and effects monitoring program as part of the EA for implementation during the project phases (refer to **Section 2.6.2.6**).

2.6.2.3. Prediction of Net Effects

A net effect, or the alternative term residual effect, is considered an environmental (biophysical), social, economic or health effect from the Project and its related activities that is predicted to remain after the implementation of impact management measures. A potential effect is considered to occur where anticipated future conditions resulting from the Project differ from the conditions otherwise expected from natural change without the Project. In some situations, the recommended impact management measures will eliminate a potential adverse effect, while in other situations impact management measures may reduce, but not eliminate the effect.

Impact management measures may also enhance positive effects. A potential effect that will be eliminated, or considered unlikely after impact management measures, will be identified as not resulting in a net effect (i.e., no net effect) and will not be considered further in the net effects assessment. An effect that may remain after the application of impact management measures will be identified as a net effect and will be further considered in the effects assessment. Positive effects will also be considered further in the effects assessment, including means of enhancing benefits of the Project. Neutral changes will not be carried forward for the characterization of net effects, but, where identified, will be characterized in terms of the confidence in the predictions and the likelihood of the effect.

2.6.2.4. Characterizing the Net Effects

The characterization of net effects will provide the foundation for determining the significance of incremental and cumulative effects from the Project for each assessment criterion. The objective of the method is to identify and predict net adverse and positive effects that have sufficient magnitude, duration, and geographic extent to cause fundamental changes to the self-sustainability or ecological function of a valued component and, therefore, result in significant combined effects.

The assessment of significance of the net effects of the Project on the acoustic environment and other valued components will be informed by the interaction between significance factors (as defined below), in addition to those concerns raised by Indigenous groups, interested agencies, and individuals during the consultation and engagement for the EA. Therefore, predicted net effects, where identified, will be described in terms of the following significance factors that are consistent with the assessment methodology identified in the TISG.

- **Direction** – The direction of change in effect relative to the current value, state or condition, described in terms of Positive, Neutral, or Negative.
- **Magnitude** - The measure of the degree of change from existing (baseline) conditions predicted to occur in the criterion.
- **Geographic Extent** - The spatial extent of which an effect is expected to occur/can be detected and described in terms of the PF, LSA and RSA.
- **Severity** - The level of damage to the valued component from the effect that can reasonably be expected; typically measured as the degree of destruction or degradation within the spatial area of the PF, LSA and RSA. Severity would be characterized as: Extreme; Serious, Moderate or Slight.
- **Duration/Reversibility** - Duration is the period of time over which the effect will be present between the start and end of an activity or stressor, plus the time required for the effect to be reversed. Duration and reversibility are functions of the length of time a valued component is exposed to activities. Reversibility is an indicator of the degree to which potential effects can be reversed and the valued component restored at a future predicted time. For effects that are permanent, the effect is deemed to be irreversible. Duration/Reversibility would be characterized for each adverse effect as: Short-Term (0- 5 years), Medium-Term (6-20 years), Long-Term (21 - 100 years) or Permanent (>100 years).
- **Frequency** – Is the rate of occurrence of an effect over the duration of the Project, including any seasonal or annual considerations. Frequency would be characterized as: Infrequent; Frequent or Continuous.
- **Probability or Likelihood of Occurrence** – Is a measure of the probability or likelihood an activity will result in an environmental effect. Probability or likelihood of occurrence would be characterized as: Unlikely, Possible; Probable and Certain.

The definitions and description of the above factors will be described in detail in the EAR/IS.

2.6.2.5. Assessment of Significance

The determination of significance of net effects and cumulative effects from the Project and other previous, existing, and reasonably foreseeable developments will generally follow the guidelines and principles of the *Draft Technical Guidance Determining Whether a Designated Project is Likely to Cause Significant Adverse Environmental Effects under the Canadian Environmental Assessment Act* (CEA Agency, 2017) and the *Operational Policy Statement: Determining Whether a Designated Project is Likely to Cause Significant Adverse Environmental Effects under the Canadian Environmental Assessment Act*, 2012 (CEA Agency 2015).

In general, the assessment of significance of net effects will be applied to each valued component for which net effects are predicted, and net adverse effects or positive effects will be classified as significant or not significant (i.e., binary response). Additional details on the application of biophysical, cultural, socio-economic and health criteria and definitions that would describe “significant” and “not significant” will be provided in the EAR/IS.

2.6.2.6. Identification of a Monitoring Framework

Webequie First Nation will develop a monitoring framework during the EA process for each project phase (construction and operation and maintenance). The two primary types of monitoring to be developed will include:

- Compliance monitoring; and
- Effects monitoring.

The compliance monitoring will assess and evaluate whether the Project has been constructed, implemented and/or operated in accordance with commitments made during the EA process, and any conditions of the federal IA and provincial EA approvals and other approvals required to implement the Project.

The effects monitoring will be designed to verify the prediction of the effects assessment, and to verity the effectiveness of the impact management measures. This would include construction and operational monitoring that would identify actual effects, assess the effectiveness of the measures to minimize or eliminate adverse effects, and evaluate the need for any additional action to ensure that environmental commitments and obligations are fulfilled and mitigation measures are effective.

2.6.3. Gender Based Analysis Plus (GBA+)

Information and data collected will be disaggregated by diverse subgroups (women, youth, elders, etc.), as part of applying a Gender Based Analysis Plus (GBA+) lens. For the acoustic environment, the focus will be on gaining insight into the location and geographic extent of sensitive soundscapes, and the value of such areas to the aforementioned subgroups. This information will be obtained through such methods as socio-economic and health surveys (using Survey Monkey), key informant interviews with community members whose activities or well-being may be affected by noise and vibration levels (youth, elders), desktop research and Indigenous Knowledge, where provided. This will include qualitative and quantitative data that help to characterize and describe differential perceptions of the acoustic environment through a GBA+ lens, including, where feasible, the data disaggregated by sex, age, and other identity factors. Through Survey Monkey, the data will be filtered and disaggregated based on the demographic questions answered (i.e., gender, age, Indigenous community membership, etc.).

The Project Team will work with the Indigenous communities to identify the appropriate participants for each of the subgroups that are willing to contribute to the baseline data collection through surveys and key informant interviews. The Project Team will tailor how they engage with these groups based on community protocols (i.e., it is expected that elders would prefer in-person dialogue and will require a community translator, versus youth, who would participate in online survey).

3. Consideration of Input from the Public and Indigenous Peoples

3.1. Public Participation

EA study participants as identified in the Agency *Public Participation Plan* dated February 24, 2020 for the WSR Project will be engaged and consulted. The Public Participation Plan was developed by the

Agency to set out proposed opportunities for participation during the impact assessment process for Agency-led activities. The proponent, or its subject matter experts, may participate in activities as requested by the Agency.

The ToR provides a plan for engaging and consulting government ministries and agencies, the public and stakeholders based on EA study milestones similar to those for Indigenous communities.

All identified affected and/or interested stakeholders and members of the public will be notified at the EA study milestones. The public and stakeholders will have the opportunity to attend two (2) open house sessions that will be held in the City of Thunder Bay, focussing on:

1. Project and EA process overview; baseline data collection; spatial and temporal boundaries for assessment; criteria and indicators; and identification and preliminary evaluation of alternatives; and

2. Presentation of the selected preferred alternatives/the Project, including potential effects, mitigation, net effects and their significance and follow-up monitoring.

The open houses will include display materials and handouts containing information on the Project, the EA study process, known existing environmental conditions, the results of studies that have been conducted to date; the development and evaluation of alternatives, including the rationale for use of criteria and indicators; the project schedule; and the results of the consultation program. The Webequie Project Team will be available to receive and respond to questions and have an open dialogue regarding the EA process. Written comments may be prepared and left at the open house venue or sent to the Project Team within a specified period following the event.

The public and stakeholders will be notified regarding the commencement of the EA and submission of the Draft and Final EAR/IS. The EAR/IS will be available for review on the Project Website, and at municipal offices or nearby public libraries in:

- City of Thunder Bay
- Municipality of Greenstone
- Township of Pickle Lake
- City of Timmins
- Municipality of Sioux Lookout

In summary, the methods and activities for engagement and consultation with the public will include:

- Notification letters;
- Public notices and newspaper advertising at key EA milestones – Notice of Commencement; Notice of Open Houses; Notices for Draft and Final EAR/IS;
- Open houses;
- Communication materials for use at meetings such as slide decks, project fact sheets, handouts, etc.;
- Project Website; and
- Opportunities to review and provide comments on the Draft and Final EAR/IS.

All comments received from the public engagement and consultation activities will be tracked (i.e., Record of Consultation) and considered by the Project Team with the objective that the public be provided meaningful opportunities to participate, including in meaningful discussions in the EA process.

3.2. Indigenous Engagement and Consultation

3.2.1. Communities to be Included in the Assessment

The assessment of the acoustic environment component will include the 22 identified Indigenous communities that are to be consulted as part of the EA process, as shown in **Table 4** below. These communities have been identified by the MECP and Agency as communities whose established or asserted Aboriginal and/or Treaty rights may be adversely affected by the Project and/or may have interests in the project. Communities marked with an asterisk are those whose Aboriginal and Treaty rights may be affected by the Project.

The table also includes those communities that have been identified by Webequie First Nation based on Elders' guiding principles and Webequie's Three-Tier approach to Indigenous consultation and engagement. WFN identified communities and assessed them based on the following criteria:

- Geographically closer to the project area than others;
- Known to have traditionally used some of the potentially affected lands in the past, or currently;
- Downstream of the Project and may experience impacts as a result of effects to waterways;
- Considered to have closer familial/clan connections to the members of WFN; and/or
- Have been involved in all-season road planning in the Region, either directly with the WFN, or in consideration of all-season road planning that the WFN has been involved with in recent years.

Based on these factors, the communities identified by WFN will be offered the deepest or intensive consultation/engagement.

Table 1: Indigenous Communities to be Consulted

Indigenous Community	Identified by WFN	Identified by MECP	Identified by IAAC
Webequie First Nation	✓	✓*	✓*
Aroland First Nation		✓*	✓*
Attawapiskat First Nation	✓	✓*	✓*
Constance Lake First Nation		✓*	✓
Eabametoong First Nation	✓	✓	✓*
Fort Albany First Nation		✓*	✓*
Ginoogaming First Nation		✓	✓
Kasabonika First Nation	✓	✓*	✓*
Kaschechewan First Nation		✓*	
Kitchenuhmaykoosib Inninuwug		✓*	✓
Kingfisher Lake First Nation		✓*	
Long Lake #58 First Nation		✓	✓
Marten Falls First Nation	✓	✓*	✓*
Mishkeegogamang First Nation		✓	
Neskantaga First Nation	✓	✓*	✓*

Indigenous Community	Identified by WFN	Identified by MECP	Identified by IAAC
Nibinamik First Nation	✓	✓*	✓*
North Caribou Lake First Nation		✓	
Wapekeka First Nation		✓*	
Wawakapewin First Nation		✓*	
Weenusk (Peawanuck) First Nation	✓	✓*	✓*
Wunnumin Lake First Nation		✓*	
Métis Nation of Ontario – Region 2		✓	

3.2.2. Consultation Approach and Methods

A variety of activities and materials will be used to provide information and receive input from Indigenous communities during the EA process. These are outlined and detailed in the provincial ToR which includes the mechanisms, activities and events that are planned for various stages throughout the EA process and will be used at milestone points to ensure optimal engagement with Indigenous communities. In summary, this includes the following:

- Notification letters sent by registered mail to all of the identified Indigenous communities and groups (i.e., Tribal Councils) informing them at key milestones (e.g., Commencement of provincial EA; Submission Draft EAR/IS and Submission of Final EAR/IS);
- Community visits throughout for those communities identified by IACC and MECP whose established or asserted Aboriginal and/or Treaty rights may be adversely affected by the Project;
- Meetings (2) with off-reserve community members of the 22 Indigenous communities to be consulted as part of the EA;
- Information meetings with Métis Nation of Ontario;
- Engagement with Tribal Councils and Nishnawbe Aski Nation, with meetings held upon request;
- Communication materials for use at meetings, such as slide decks, project fact sheets, handouts, etc., including, where requested, translation to native language;
- Audio and visual products for those Indigenous communities that have the capability; community meetings and presentations will be live-streamed through local community media to allow for a wider audience to participate in the meetings;
- Use of surveys (e.g., “Survey Monkey”) or focused community-based meetings to obtain information (e.g., socio-economic, human health, etc.) and identify concerns from Indigenous people;
- Project Website (www.supplyroad.ca) for the public to review project related information and documents, including informative video tutorials (e.g., EA studies); and
- Project Newsletter letters.

Engagement with Indigenous groups has been undertaken as part of the ToR phase and included components of the work plan (e.g., baseline studies for valued components, spatial and temporal boundaries, criteria and indicators, EA alternatives, etc.) and will continue as part of the planned EA engagement activities for the Project.

All outreach efforts and consultation activities will be recorded as part of the Record of Consultation to allow for validation by the Agency and the MECP. The EAR/IS will describe how input from Indigenous

communities, stakeholders and the public was incorporated into the acoustic assessment and other valued components.

3.2.3. Incorporation of Indigenous Knowledge for Acoustic Environment

Through engagement activities, the Project Team will also collect Indigenous Knowledge relevant to the WSR study area and specific valued components, where available, from the 16 Indigenous communities identified by Ontario and the 10 Indigenous communities identified by the Agency. Indigenous Knowledge will assist in describing existing conditions (e.g., characterizing the study area, natural environment conditions, social and economic conditions, cultural characteristics, community characteristics, past and current land uses and other values of importance. Indigenous Knowledge will be used to assist in developing mitigation measures, monitoring commitments and accommodation measures, where necessary.

The Project Team will document efforts to obtain Indigenous Knowledge. It is recognized that each community may have its own protocols and procedures to be followed in transferring Indigenous Knowledge to outside parties such as WFN and the Project Team. The Project Team will ensure that related protocols are respected and will work with each community to understand how the information will be transferred, securely stored, and applied. Additionally, the Project Team will ensure that the Indigenous Knowledge provided will be protected and kept confidential. The Project Team will seek guidance from the community as to how the information will be used and published.

For the acoustic environment, the focus will be on gaining insight into the location and geographic extent of sensitive soundscapes, particularly outside the community (relative to the experience of engaging in traditional activities and use of the land and resources).

As Indigenous Knowledge is holistic it can provide insights related to interrelationships between the natural, social, cultural, and economic environments, community health and well-being, Indigenous governance and resource use. Therefore, Indigenous Knowledge, where provided, will be included in all of aspects of the technical assessments of potential impacts of the Project on Indigenous peoples, or, given is holistic nature, may be presented in one section of the EAR/IS. It will also be considered in technical sections or chapters of the documents (e.g., baseline data on the acoustic environment will include baseline information gathered through collection of Indigenous Knowledge). It is recognized that it is important to capture the context in which Indigenous groups provide their Indigenous Knowledge and to convey it in a culturally appropriate manner. Indigenous Knowledge will only be incorporated in the EAR/IS where written consent has been granted.

3.2.4. Aboriginal and Treaty Rights

The Webequie Project Team will be engaging with Indigenous communities regarding potential impacts of the Project on the exercise of rights, and where possible, the project's interference with the exercise of rights. Potential effects to be considered will include both adverse and positive effects on the current use of land and resources for traditional purposes, physical and cultural heritage, and environmental, health, social and economic conditions of Indigenous peoples impacted by the Project. For example, this will include such effects as reductions in the quantity and quality of resources available for harvesting (e.g., species of cultural importance, including traditional and medicinal plants; or interference with the current and future availability and quality of country foods (traditional foods). Webequie First Nation and the Project Team will discuss with Indigenous communities their views on how best to reflect and capture impacts on the exercise of rights in the EAR/IS.

Should impacts on the exercise of Aboriginal and Treaty rights be identified, Webequie First Nation and the Project Team will work with Indigenous communities to determine appropriate mitigation measures to reduce or eliminate such impacts. Where no mitigation measures are proposed or mitigation is not possible, the Project Team will identify the adverse impacts or interference to the exercise of Aboriginal and Treaty rights and this will be described (e.g., level of severity) and documented in the EAR/IS. Webequie First Nation and the Project Team will advise Ontario and the Government of Canada on concerns Indigenous communities may have in relation to their exercise of Aboriginal and Treaty rights and whether their concerns cannot be addressed or mitigated by the Project Team.

4. Contributions to Sustainability

4.1. Overarching Approach

As recognized in the Agency's current guides to considering how a project will contribute to sustainability, it is not until baseline information has been collected and the potential effects of the Project are assessed that a full understanding or determination of the project's contribution(s) can be achieved/made. However, information and data requirements for sustainability have been considered from the outset of the WSR Project for planning purposes. In the absence of the potential effects assessment, this section outlines the general approach to determining sustainability contributions for this valued component.

The approach is based on the goal of providing a broad or holistic description of the project's potential positive and negative effects, including the interactions among those effects and the long-term consequences of the effects. In the context of the IAA requirements, sustainability means "the ability to protect the environment, contribute to the social and economic well-being of the people of Canada and preserve their health in a manner that benefits present and future generations", with the aim of "protecting the components of the environment and the health, social and economic conditions that are within the legislative authority of Parliament from adverse effects caused by a designated project", recognizing that the Minister's or the Governor in Council's public interest determination must include sustainability as one of five factors to be considered in rendering a final decision.

The approach also considers the level of effort required to assess a project's contribution to sustainability to be scalable, depending on the phase of the process and the context of the project, and can/will be adjusted/scoped as the impact assessment proceeds. For example, effects on future generations requires temporal scoping (i.e., consideration of next generation to "seventh generation"), based on expectations as to how many generations it will take for effects to become fully apparent, including return to VC baseline conditions; resilience of the VC; and whether a VC is expected to recover from effects.

As part of the public participation and Indigenous peoples engagement programs described in **Section 3.2.2**, the Project Team has (and will continue to) facilitate early identification of values and issues to better inform the assessment of the project's contribution to sustainability; and identify VCs that should be carried forward into that assessment, scoping related criteria and indicators to reflect the project context. As part of sustainability considerations, this information has also been used (with regard to which VCs are considered most important to Webequie First Nation) to identify alternative means of carrying out the Project and select alternatives to be carried forward for an assessment of sustainability contributions. Ultimately, with the appropriate input from the engagement and consultation program, the

sustainability assessment will culminate with the development of commitments to ensuring the sustainability of Indigenous livelihood, traditional use, culture and well-being.

In identifying and scoping key VCs for sustainability contributions, the Project Team will consider VCs that:

- could experience long-term effects, including how those effects could change over time, and how they could affect future generations;
- may interact with other VCs;
- may interact with potential effects of the designated project; and/or
- may interact with project activities.

4.2. Assessment of Contribution to Sustainability

During preparation of the Impact Statement, the four (4) Sustainability Principles identified in the Agency's guides and the TISG will be applied as follows:

Principle 1 - Consider the interconnectedness and interdependence of human-ecological systems

A systems approach will be used to determine/express VC interconnectedness. The degree of interconnectedness within systems and/or subsystems may vary greatly (may be characterized as very intricate and tight/direct, or quite loose and indirect). The focus will be on those aspects that are most important to communities, the social-ecological system and to the context of a project. All interactions, pathways and connections among effects to the environment, and to health, economic and social conditions will be described, as will how these interactions may change over time. The Project Team will ensure that the description of systems and the direct and indirect relationships are guided by input from Indigenous Knowledge. It is expected that a graphic with simple pictorial images will be developed to visually represent the connections between human and ecological systems to facilitate comprehension and encourage input/feedback.

Principle 2 - Consider the well-being of present and future generations

The long-term effects on the well-being of present and future generations will be assessed. To conduct an analysis on future generations, the Project Team will first determine the potential long-term effects on well-being. This will entail consideration of the elements of environmental, health, social and economic well-being, across a spectrum of VCs, that communities identified as being valuable to them. In the context of subject VC (aquatic environment), well-being could include community cohesion, protection of the environment, culture, stress, or livelihoods. Available Comprehensive Community Plans (CCP) will be consulted to determine whether sustainability is a CCP central theme. How the environmental, health, social and economic effects on well-being could change over time will also be assessed, as information permits. Although effects on future generations could include effects beyond the lifecycle of a project, this is not expected to be major consideration for the WSR Project, as no expected decommissioning or abandonment timeframe has been identified. With respect to temporal scoping, there is still a need to determine what the "future generation" is (i.e., how far into the future the project effects will be considered). Predicted potential effects on future generations will be assessed based on the supporting data or uncertainty; any uncertainty will be documented.

Principle 3 - Maximize overall positive benefits and minimize adverse effects of the designated project

The Impact Statement will include a consideration of ways to maximize the positive benefits of the Project and consider mitigation measures that are technically and economically feasible and would mitigate any adverse effects of the Project. Sustainability considerations will include: whether additional mitigation measures are required; have additional benefits been identified and, if so, how can they be maximized; does the direction of the impact (i.e., positive or negative) shift between different groups and sub-populations; are there particular strengths or vulnerabilities in the potentially affected communities that may influence impacts; do the impacts cause regional inequities; and do the near term benefits come at the expense of disadvantages for future generations.

Principle 4 - Apply the precautionary principle and consider uncertainty and risk of irreversible harm

The precautionary principle states that "where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation". All uncertainties and assumptions underpinning an analysis will be described. A precautionary approach will be applied in cases where there is risk of irreversible harm (irreversible harm refers to project-related effects from which a VC is not expected to recover; reversibility is influenced by the resilience of the VC). Taking such a conservative approach may include setting out worst-case scenarios for decision-makers to consider, particularly when there is uncertainty about the significance or irreversibility of potential effects. As appropriate, the precautionary approach may be extended to commitments regarding the project's design (to prevent adverse effects, prevent pollution, deal with unplanned events) and the development of monitoring and follow-up programs to verify effects predictions, or gauge the effectiveness of mitigation measures. Uncertainty may be characterized quantitatively (e.g., description of confidence levels of modelled predictions) or qualitatively (e.g., through descriptors such as "high", "medium", and "low"). Qualitative descriptions of uncertainty will explain how the level of uncertainty was determined, identify sources of uncertainty and data gaps, and describe where and how professional judgment was used.

5. Schedule

The preparation and completion of the assessment work described in this Acoustics Work Plan is expected to start in late summer 2020 and to be completed by spring 2021. Baseline background ambient noise measurements will need to be conducted in the spring to fall period. Based on the current project schedule, that work would need to be conducted in September of 2020.

6. Reporting

The above studies will be documented in stand-alone draft report(s) suitable for inclusion as one or more Appendices to the EAR/IS, and review by the WSR Project Team and government authorities. Once all comments are received from the EA team and the community, a final report(s) will be prepared.

SLR will also provide input to the draft and final EAR/IS, specifically in regard to the classification of residual effects (TISG Section 21) and Cumulative Effects (TISG Section 22).

7. Closure

Prepared by:

<Original signed by>

Tahrana Lovlin, MAES, P.Eng.
Specialist – Microclimate

<Original signed by>

Chris T. Blaney, B.A.
Senior Specialist – Noise

Reviewed by:

<Original signed by>

R. L. Scott Penton, P.Eng.
Principal Engineer – Acoustics, Noise and Vibration