Hydro Québec

Technical Report

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To Ministère de l'environnement
(MELCCFP)

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Subject **New Inukjuak generating station – Noise monitoring program during operation phase**

1. Introduction

In the second half of 2023, the community of Inukjuak will start being supplied by a new hydroelectric generating station (Innavik generating station). To provide a backup electricity supply for the new generating station, Hydro-Québec plans to build a new thermal generating station north of the village of Inukjuak. The backup thermal generating station will operate only a few hours a month, only during the day, for a preventive startup, and it will only be used to supplement Inukjuak's energy needs during a temporary shutdown of the hydroelectric generating station.

The draft-design study showed that noise emissions from the new backup thermal generating station would be compliant with the noise level criteria established for the village's built and inhabited areas, specifically 55 dBA LAr for 12 hours a day and 45 dBA LAr for 1 hour in the evening and night. To ensure compliance with these criteria, we are implementing a noise monitoring program covering the content presented below.

2. Methodology

The methodology suggested for monitoring noise is made up of three components:

- Noise surveys conducted with class 1 sound level meters in inhabited areas located near the thermal generating station's noise sources.
- Sound propagation modeling carried out based on the noise surveys to validate compliance over a larger area.
- Identification of noise mitigation measures, if necessary, in the event of non-compliance.

In the village, noise surveys will be conducted at the inhabited sites identified during the draft design, specifically at points R1 to R4 in Figure 1 below.

Figure 1: Location of measuring points in the village

The envelope of the generating sets is the source of the noise emissions, and the noise is transmitted to the outside through the walls of the generating station and through ventilation openings; this is the noise emitted by fuel combustion exhaust, the ventilation of cooling air intake and exhaust and, lastly, the radiators.

Noise surveys will be conducted near these noise emission sources. Based on these surveys, we will then model the noise propagation using the SoundPlan 8.2 ® software. Outdoor noise propagation will be calculated using the ISO 9613 method, which allows us to calculate the attenuation of sound as it propagates in order to forecast the noise level at a given distance from the emission source. The method takes into account geometric divergence, atmospheric absorption, the effect of hard or porous soil, reflection from surfaces, the screening effect and topography. It predicts the noise level under meteorological conditions that are favorable to the propagation of sound from its emission sources to its receivers. Only continuous noise is considered.

Thanks to the propagation modeling, validated by the sound surveys, the compliance of noise emissions will be confirmed at all receiving points in the village.

In the event of non-compliance, the propagation model will be used to identify the dominant noise sources, and mitigation measures will be considered. These measures may include (though are not limited to) adding absorbent material along the inner walls of the engine bays or adding mufflers on air intake and output openings.

The noise monitoring will be conducted by a qualified professional (e.g., acoustic engineer).

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