YESAB
Yukon Environmental and
Socio-economic Assessment Board

Designated Office Evaluation Report

Faro Generating Station Capacity Expansion Project

Project Number: 2021-0115

Proponent: Yukon Energy Corporation

Assessment Completion Date: December 7, 2021

Watson Lake Designated Office

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Summary

The proposed project is the amendment of the existing Air Emissions Permit (Permit No. 60-010) for the Faro Generating Station to increase the operational capacity of the existing diesel electricity generators from 10.6 MW to 15.5 MW. The Project is located within the community of Faro and within the Traditional Territories of the Ross River Dena and the Liard First Nation. The maximum permit term under the *Environment Act* is 10 years, as such the Designated Office will assess the Project over a 10-year temporal scope of assessment, with an end date of 2031. The Designated Office recognizes the importance of generating facilities to produce back-up power and heat to customers, particularly during cold weather and emergency situations.

The Watson Lake Designated Office solicited views and information on the Project, from August 25 to September 8, 2021. Comment submissions were received from Government of Yukon and four members of the public. Based on comments received and other relevant matters, two valued components were identified: Air Quality and Community Wellness. The Designated Office determined that the Project is likely to result in significant adverse effects to both valued components and recommends the terms and conditions below to address these effects.

The Decision Body, Government of Yukon, will review the Recommendation and the accompanying reasons described in this Evaluation Report. The Decision Body will issue a Decision Document that will either a) accept the recommendation, b) vary the recommendation, or c) reject the recommendation.

Assessment Outcome

Under s. 56(1) (b) of the *Yukon Environmental and Socio-economic Assessment Act*, the Watson Lake Designated Office recommends to the Decision Body that the Project be allowed to proceed, subject to specified terms and conditions. The Designated Office determined that the Project is likely to have significant adverse environmental and socio-economic effects in or outside Yukon that can be mitigated by those terms and conditions.

1. The Proponent shall develop, in discussion with regulators, a suitable air quality monitoring plan and schedule, to ensure that air emissions comply with the applicable standards.

    a. The results of monitoring shall be analyzed by comparing measured air contaminant emissions to Yukon Ambient Air Quality Standards. If air contaminant levels are found to exceed ambient air quality standards, the Proponent shall implement corrective measures to ensure that standards are met.

    b. The monitoring and analysis results shall be made available to Government of Yukon, Environment.

2. The Proponent shall install a Complaint Management System and install signage at the Faro Generating Station with contact details for concerns/complaints. If noise complaints are received, an acoustic audit shall be performed consisting of onsite measurements. Once complete, the Proponent shall share the results with the Regulator, and if required, work with the Regulator to determine additional measures to be installed to reduce noise.

3. The Proponent shall ensure noise control measures for each rental generator (i.e. silencers/mufflers, acoustic linings or acoustic enclosures) are installed and in good working condition at all times.

For more information, please contact:

Watson Lake Designated Office

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PART A. BACKGROUND

Part A provides the context and background information required for the assessment of the Faro Generating Station Capacity Expansion Project (the Project). Section 1.0 identifies the requirement for an assessment under the *Yukon Environmental and Socio-economic Assessment Act* (YESAA), while Sections 2.0, 3.0 and 4.0 provide information and baseline data relating to the Project and project area. Section 5.0 identifies the scope of the assessment, including matters that were considered in evaluating the significance of potential effects of the Project.

1.0 REQUIREMENT FOR AN ASSESSMENT

The purpose of the proposed project is the amendment of the existing Air Emissions Permit for the Faro Generating Station to increase the operational capacity of the existing diesel electricity generators from 10.6 MW to 15.5 MW. While several activities are likely to be undertaken in conjunction with the Project, under s. 47 of the *Yukon Environmental and Socio-economic Assessment Act* (YESAA), the Project is subject to an assessment by the Watson Lake Designated Office due to the following circumstances:

- The proposed activity is listed in column 1 of Schedule 1 of the *Assessable Activities, Exceptions and Executive Committee Projects Regulations* (Activity Regulations) and not listed in column 2 as excepted. The proponent proposes to undertake activities listed in Part 4, item 2 of the Activity Regulations. The specific activity is listed as:

  Construction, operation, modification, decommissioning, or abandonment of, or other activity in relation to, b) a fossil fuel-fired electrical generation station.

- Is proposed to be undertaken in Yukon; and
- An authorization or the grant of an interest in land by a government agency, independent regulatory agency, municipal government, or First Nation is required for the activity to be undertaken.

1.1 Decision Body

Based upon the definition of Decision Body in YESAA, the Designated Office has identified Government of Yukon as the Decision Body for the Project. The Decision Body will review the Recommendation and the accompanying reasons described in this Evaluation Report. The Decision Body will issue a Decision Document that will either a) accept the recommendation, b) vary the recommendation, or c) reject the recommendation. The triggering authorizations that are required from the Decision Body are noted in Table 1.

Table 1: The Decision Body[1]

Decision Body	Authorization Required	Act or Regulation
Government of Yukon	Air Emissions Permit (Amendment)	*Environment Act, Air Emissions Regulation*

[1] This information is based on the project proposal and other information submitted to the Designated Office during the assessment.

2.0 PROJECT DESCRIPTION

2.1 Proponent Information

The Proponent for the Project is Yukon Energy Corporation. Contact information for the Proponent is available on the YESAB Online Registry (YOR) Project Proposal (YOR 2021-0115-0001).

2.2 Geographical Context

The Project is located in southeast Yukon within the municipal boundaries of the Town of Faro in the Traditional Territories of the Ross River Dena and the Liard First Nation (Figure 1).

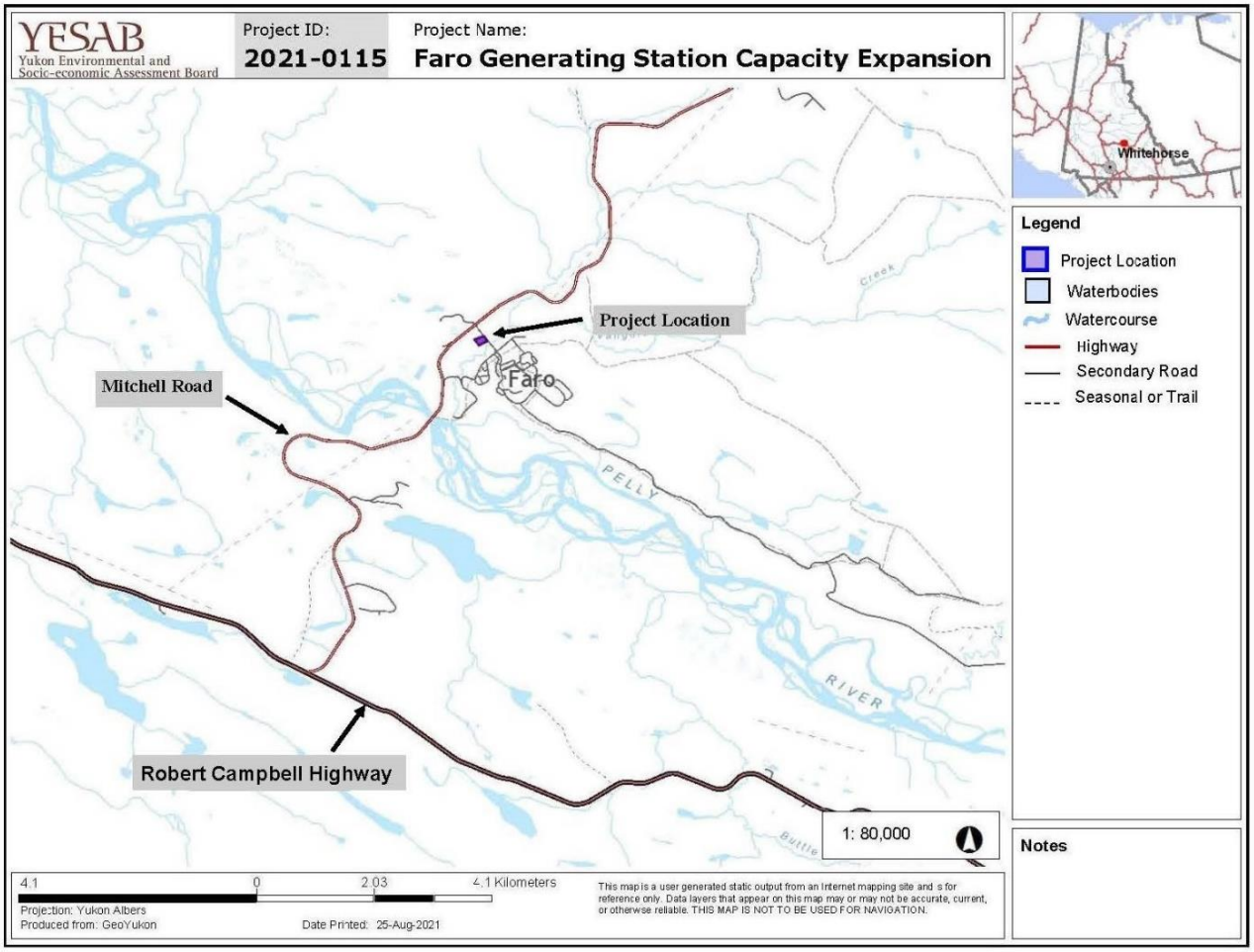

Figure 1: Project location (GeoYukon 2021)

Table 2: Project Location, Coordinates and Geographical Parameters

Project Coordinates: Map Sheet: 105K03	Decimal Degrees NW 62.2325˚ N 133.3620˚ W NE 62.2332˚ N 133.3592˚ W SW 62.2339˚ N 133.3603˚ W SE 62.2334˚ N 133.3636˚ W
First Nation Traditional Territories Involved:	Ross River Dena Liard First Nation
Drainage Region:	Major Drainage Area: *Yukon Drainage Area* Sub Drainage Area: *Pelly* Sub-sub Drainage Area: *Lower Pelly*
Nearby Watercourses or Waterbodies:	Pelly River, Van Gorder Creek

2.3 Project History

The Project is the amendment of the existing Air Emissions Permit (#60-010) from an operational capacity of 10.6 MW to an operational capacity of 15.5 MW for the Faro Generating Station. Past assessments of the Faro Generating Station include 2008-0230, 2011-0246 and 2014-0119. The most recent assessments in 2011 and 2014 were renewals of the Air Emissions Permit to operate existing diesel generators (four generators in 2011, and in 2014, the two existing generators, FD1 and FD7) at an operational capacity of 10.5 MW and 8.15 MW, respectively. In both assessments, the Designated Office identified Air Quality and Environmental Quality as valued components that may be adversely affected by the Project. The Designated Office determined that the projects would not result in significant adverse effects to either valued component and no further mitigation was recommended.

Project 2014-0119 was the most recent assessment of the Faro Generating Station (FGS). In 2020, the Regulator (Government of Yukon, Environment) authorized an amendment to YEC's existing Air Emissions Permit for the FGS, reinstalling of approximately 5.65 MW of capacity to the FGS permitting a capacity of up to 10.6 MW without the need for a YESAB assessment (YOR 2021-0115-0014). Additionally, in 2020, the Proponent installed seven additional rental generators at the FGS. At this time, the Watson Lake Designated Office received a number of calls regarding the installation of the generators and as the Designated Office did not have any information regarding this activity, directed callers to YEC and YG. The generators have been in operation in conjunction with the existing generators (FD1 and FD7). A new substation and four new rental fuel tanks were also moved to the project area.

As stated in the Project Proposal Supporting Document, the Proponent shared information about the Project with the Town of Faro and Faro residents between April 2020 and June 2021. The Proponent received concerns about noise, air emissions, use of diesel and the lack of consultation prior to installation of the seven additional generators (YOR 2021-0115-0002).

3.0 PROJECT SCOPE

The project scope defines the project to be assessed and includes all activities described in the project proposal and any subsequent information provided by the Proponent. The project scope includes project activities and project design features that prevent, control or reduce adverse project effects (Section 3.1).

The proposed project is the amendment of the existing Air Emissions Permit (Permit No. 60-010) for the Faro Generating Station (FGS) to increase the operational capacity of the existing diesel electricity generators from 10.6 MW to a maximum of 15.5 MW. The Project is located within the community of Faro and within the Traditional Territories of the Ross River Dena and the Liard First Nation. The amendment will allow operation of any combination of existing generators and six of seven additional temporary rental diesel units to a total operational site capacity of 15.5 MW.

The maximum permit term under the *Environment Act* is 10 years, as such the Designated Office will assess the Project over a 10-year temporal scope of assessment, with an end date of 2031.

4.0 ENVIRONMENTAL AND SOCIO-ECONOMIC SETTING

4.1 Physical Environment

The project area is located within the Yukon Plateau-North Ecoregion of the Boreal Cordillera Ecozone. The area consists of relatively rolling highlands with an east-west orientation. A dominant land feature in this ecoregion is the 450 km long Tintina Trench, an ancient fault trace blanketed, often quite thickly, by Pleistocene glacial deposits. Several large river valleys traverse the ecoregion including the Pelly, Ross, Macmillan, Stewart, Hess, McQuesten and Klondike (Smith et al. 2004).

The proposed project is located in the Town of Faro. Faro is located northeast of the Pelly River, in the Pelly River Valley in the Anvil Mountains, which is 356 km northeast of Whitehorse. The community lies on the Tintina Trench fault line on the edge of the Yukon Plateau-North Ecoregion.

Permafrost is discontinuous in the Yukon Plateau-North Ecoregion where its location is dependent on microclimatic factors such as ground surface moisture content and organic-layer thickness (Smith et al. 2004).

4.2 Biological Environment

Vegetation

The vegetation of the Yukon Plateau-North Ecoregion ranges from boreal to alpine with northern boreal forest reaching elevations up to 1 500 m. The dominant forest type of the boreal zone is characterized by open canopy black spruce with a moist or drier lichen understory. White spruce forests, occasionally with aspen or lodgepole pine, occur in warmer and better-drained sites. Various willows, sedges and aquatic plants are present in or around wetland areas (Smith et al. 2004). The Proponent has indicated that the site has been previously cleared of vegetation (YOR 2021-0115-0002).

Wildlife

The Yukon Plateau-North Ecoregion provides habitat for a variety of wildlife and bird species typical of the boreal forest. The ecoregion supports populations of grizzly and black bears, caribou, moose, wolverine, marten, wolf, Stone and Fannin sheep, lynx, red fox, beavers, and other small mammals (Smith et al.

2004). The Tintina Trench is also an important migration corridor for a large number of bird species. Wetlands in the ecoregion are used for both breeding and staging areas. Many forest bird species reach the northern limits of their range in this ecoregion, with many species being year-round residents (Smith et al. 2004).

Wildlife Key Areas & Species of Concern

A desktop review of the project area was conducted in relation to mapped Wildlife Key Areas (WKAs) and species of conservation concern. WKAs are mapped geographical locations used by wildlife for important seasonal life functions. Species of conservation concern are species identified and mapped by Yukon Conservation Data Centre (CDC). The project site was found not to overlap with either WKAs or any species of conservation concern.

Fish

The major rivers and their tributaries of the Yukon Plateau-North Ecoregion, including the Pelly River in the Ross River Lowlands, provide important fish habitat supporting numerous species of fish (Smith et al. 2004). Vangorda Creek supports fish though there are upstream barriers to fish migration. Fish in Vangorda Creek include Chinook salmon, Arctic grayling, round whitefish, longnose sucker, burbot, slimy sculpin, and lake chub.

4.3 Socio-economic Environment

Nearby Communities and Development

The project site is located in the Town of Faro, located 10 km off the Robert Campbell Highway, 358 km northeast of Whitehorse and 423 km northwest of Watson Lake. The Faro Mine Complex is located north of the town.

First Nations

The Project falls within the Traditional Territories of the Ross River Dena (RRD) and the Liard First Nation (LFN). LFN and RRD have not entered into land claims agreements and activities carried out by members of LFN and RRD are based on the exercise of aboriginal rights.

Administrative Boundaries and Other Land Use Activities

The project area overlaps Game Management Area #4-51, Outfitting Concession #9, and Registered (Group) Trapping Concession #405.

5.0 SCOPE OF THE ASSESSMENT

The scope of the assessment identifies the matters considered in an assessment. It is determined by considering the activities described in the scope of the Project (identified in Section 0) and, based on consideration of the matters set out in s. 42(1) of YESAA, identifying the valued environmental and socio-economic components (VESECs) that may be affected by project activities. Views and information submitted during the assessment help to identify VESECs and potential effects of the Project to these VESECs.

5.1 Views and Information Submitted

The Watson Lake Designated Office solicited views and information on the Project, from August 25 to September 8, 2021. Comment submissions were received from Government of Yukon and four members of the public. The Designated Office has identified the following relevant concerns, interests and project effects from comments submitted and included key regulatory requirements, best management practices or any other information submitted that is relevant to the assessment.

5.1.1 Acoustic Quality

- Several members of the public noted concerns about the level of noise coming from the rental generators indicating that noise from the rental generators is significantly louder than the two existing generators.

5.1.2 Air Quality

- A member of the public provided concern for effects to air quality as a result of the Project.

5.1.3 Public Safety

- A member of the public noted concerns about increased traffic on the Robert Campbell Highway and its poor condition.

5.2 Determination of Significance

In order to mitigate a potential adverse effect, the Designated Office must first find significance. In addressing what may constitute a “significant” adverse effect, the Designated Office considered the following factors:

Magnitude: The extent of a change from baseline conditions as a result of a proposed project.

Likelihood: The probability that an adverse effect will occur.

Geographic Extent: The spatial area(s) in which an effect is predicted to be detectable.

Duration: The length of time an effect is predicted to last.

Frequency: How often an effect is predicted to occur.

Timing: When an effect is predicted to occur.

Reversibility: The degree to which a valued environmental or socio-economic component can be returned to baseline conditions or other established reference point after proposed activities have ceased.

Not all the factors are relevant to all effects; a specific effect’s characterization and corresponding significance determination may rely on a subset of these criteria.

5.2.1 Consideration of Cumulative Effects

With regards to cumulative effects, subsection 42(1)(d) of the *Yukon Environmental and Socio-economic Assessment Act* (YESAA) instructs Designated Offices to consider:

> 42(1)(d) the significance of any adverse cumulative environmental or socio-economic effects that have occurred or might occur in connection with the project or existing project in combination with the effects of other projects for which proposals have been submitted under subsection 50(1) or any activities that have been carried out, are being carried out or are likely to be carried out in or outside Yukon;
>
> (d)(1) any studies or research undertaken under subsection 112(1) that are relevant to the project or existing project;
>
> (d)(2) the need for effects monitoring.

The consideration of cumulative effects is a key contextual factor in determining the significance of potential project effects.

5.3 Other Matters Considered

5.3.1 Consideration of the Current Air Emissions Permit (#60-010)

During this assessment, the terms and conditions listed in the current Air Emission Permit (#60-010) were considered when making a determination of significance in relation to significant adverse environmental and socio-economic effects as a result of proposed activities. The Designated Office expects, and has considered that these conditions, at a minimum, will remain in any amendment approved by the Regulator for the term of the Permit.

5.3.2 Global Health Considerations

At the time of issuance of this Evaluation Report, the World Health Organization has declared a pandemic regarding the novel coronavirus COVID-19. Various levels of government, including YG, have enacted measures and are likely to enact additional measures to limit the spread of the COVID-19 virus. The situation is fluid and it is impossible to predict outcomes or what the situation may be like at the time the Project is proposed to be carried out. The determinations and recommendations made in this Evaluation Report are made with the expectation that proponents will follow all recommended measures by Yukon's Chief Medical Officer of Health and/or other relevant regulatory regimes that will require measures in response to COVID-19 to be undertaken. Consequently, COVID-19, its possible effects, and responses to it are not addressed further in this Evaluation Report.

5.3.3 YESAA, Assessable Activities, and Level of Assessment

During the Seeking Views and Information stage, concerns were brought forward regarding the accessibility of the Project at a Designated Office level rather than an Executive Committee level based on the definition of *production capacity* (YOR 2021-0115-0005). There was also confusion about the capacity increase to 10.6 MW from 8.15 MW without a YESAB review.

The Designated Office has determined that the level of assessment of this Project does not depend on the definition of production capacity, rather the trigger for the assessment would be whether there is an expansion to an existing fossil fuel-fired electrical generating station that would result in the increased production capacity of 5 MW or more. The Proponent noted in Information Request Response #1 that in 2020, Government of Yukon reinstalled the site capacity to 10.6 MW under their existing Air Emissions Permit, without requiring a YESAA assessment (YOR 2021-0115-0014). The current assessment is for an increase in capacity of 4.9 MW to a maximum capacity of 15.5 MW. It was determined that the Project would continue as a Designated Office level assessment based on these factors:

- The seven rental generators have already been transported to the project area, installed and have been in operation with full transparency to the regulator (Government of Yukon, Environment) as the Air Emission Permit requires the Proponent to obtain approval before adding, modifying, removing, or replacing any equipment or components relating to the release, abatement, control or treatment of air emissions (YOR 2021-0115-0002).

- The substation and fuel tanks have already been installed at the project site. The Proponent has indicated that the Project is located on Yukon Energy lands (private land) and therefore, requires no permits or authorizations for these installations. It is assumed by the Designated Office that the Regulator has approved this activity.

As stated by the Designated Office in Information Request #2, "… YESAB does not assess activities already undertaken and only assesses activities proposed to be undertaken in Yukon (Section 47(2))" [Emphasis added] (YOR 2020-0115-0016). Given that the installation and use of the rental tanks, fuel tanks, and substation have already been undertaken and the Regulator has previously authorized the reinstallation of capacity to 10.6 MW in the Proponent's Air Emissions Permit, the assessment will continue as proposed as a Designated Office level evaluation as described in the Project Scope (Section 3.0).

For clarity purposes, the assessment of the current Project includes only the increased operational capacity of the Faro Generating Station by 4.9 MW, from 10.6 MW to a maximum of 15.5 MW, using the two existing generators as well as the rental generators. The assessment does not involve any other activities, such as:

- fuel use and storage;
- equipment use;
- previous modification of the project site; or
- previous installation and use of generators at the project site.

5.4 Valued Environmental and Socio-economic Components

The Designated Office has identified the following VESECs as being adversely affected by the Project:

- Air Quality (This VESEC will be further discussed in Section 6.0 of this report.)

  The burning of diesel fuel during the operation of the Faro Generating Station has the potential to reduce air quality in the project area due to the emission of diesel exhaust.

- Community Wellness (This VESEC will be further discussed in Section 7.0 of this report.)

  The increase in noise levels as a result of the Project has the potential to lead to effects to community wellness through impacts to quality of life and public health.

5.4.1 Concerns and Interests Considered but not Assessed Further

The Designated Office considered the following concerns and interests but determined there are no known pathways of effects. The following section(s) further explains how the Designated Office considered identified concerns, project design features, and relevant legislation that eliminate pathways of adverse effects.

5.4.1.1 Public Safety

The Project is located within the community of Faro and involves the transportation of fuel from Whitehorse to Faro via the Robert Campbell Highway. The Project has the potential to lead to effects to public safety as a result of increased use and degradation of the Robert Campbell Highway.

A member of the public shared concerns about increased traffic on the Robert Campbell Highway and its poor condition (YOR 2021-0115-0010). In response to these concerns, the Designated Office contacted the Proponent and asked what volume of traffic from fuel trucks is expected as a result of the Project. The Proponent noted that the project location has sufficient fuel storage capacity for several days to operate up to permitted production capacity and for several weeks to operate under light demands. In non-winter months when the generators are only used for monthly exercise, the storage capacity can be extended to many months. As such, the Proponent estimated up to one fuel truck delivery per day in winter when generators are used more heavily and averaged two loads per month over the course of the year in total (YOR 2021-0115-0020). In addition, the Robert Campbell Highway is a public highway managed and maintained by the Government of Yukon as per the *Highways Act* and associated legislation. Use of the highway is legislated through compliance with the *Motor Vehicles Act* and associated legislation.

It is the Designated Office's view that the pathways of effects for potential effects to public safety as a result of the Project are limited. Public safety is not considered further in this report.

PART B. ASSESSMENT AND REASONS FOR RECOMMENDATION

Part B of this evaluation report presents the effects assessment of the Project on VESECs identified in Section 5.0. For each VESEC identified, an overview is provided followed by a discussion on relevant contextual factors, an effects characterization analysis and a determination of significance. Where adverse project effects are determined to be significant, terms and conditions are recommended.

6.0 AIR QUALITY

6.1 Overview

The burning of diesel fuel during the operation of the Faro Generating Station (FGS) has the potential to result in reduced air quality beyond the project area due to the emission of diesel exhaust, which contains approximately 40 toxic substances. Reduced air quality can affect the surrounding natural environment in many ways, including altering the chemical composition of soils, contributing to acidification of lakes and other waterways, causing acid rain, and contributing to global warming and climate change, which includes increasing occurrences of heat waves, droughts, wildfires and more.

The Watson Lake Designated Office has determined that the Project is likely to result in significant adverse effects to air quality.

6.2 Relevant Legislation

The Designated Office considered the following legislative requirements. This list is not exhaustive; rather, the Designated Office reviewed this specific legislation because of its direct relevance to air quality.

- *Canadian Environmental Protection Act* (1999)
    - *Sulphur in Diesel Fuel Regulations*
- *Environment Act* (Yukon)
    - *Air Emissions Regulations*
        - Section 3 regulates a 40% maximum opacity of visible emissions from a source not regulated by the terms and conditions of a permit under the regulations.
        - Section 4 prohibits the use of fuel that has a sulphur content in excess of 1.1% except as authorized by a permit under the regulations.
        - Section 6 prohibits the release of any air contaminant to such extent or degree as (a) may cause or be likely to cause irreparable damage to the natural environment; or (b) in the opinion of a health officer, cause actual or imminent harm to public health or safety.
- *Occupational Health Regulations,* which stipulate exposure limits for air contaminants, usually based on an 8-hour permissible exposure limit.

- *Canadian Environmental Protection Act,* 1999, which speaks to the reporting requirements of the National Pollutant Release Inventory.

6.3 Consideration of Past, Present, and Likely Activities

As stated in the Project Proposal Supporting Document (YOR 2021-0115-0002),

> *The 2016 plan identified that there is a capacity gap of approximately 8 MW between maximum probable (winter) load and the installed capacity of the system under an N-1 event. Yukon Energy's updated 10-Year Renewable Electricity Plan, updated in December 2020, identifies an even greater gap (>20 MW) between existing resources and forecasted peak energy demand (Yukon Energy 2020).*

Yukon Energy's 10-Year Renewable Electricity Plan involves the construction of a new pumped storage facility on Moon Lake, the expansion of the Atlin hydro plant and the expansion of the transmission network in the Southern Lakes region. These projects are expected to decrease the dependency on fossil fuels during the winter and meet expected peak demands. Yukon Energy's high case portfolio charts for energy and capacity indicate that with all expected expansions and planned resources, Yukon Energy will just meet demand (Yukon Energy 2020; Figures 21-22). YEC noted in their 10-Year Plan that replacing retired diesel generators can reduce the need for rental diesel generators. Rental diesel generators are also not included in YEC's plan from 2028/29 onwards. However, YEC also notes that regulatory uncertainties could lead to proposed projects being delayed or cancelled, resulting in an increased reliance on thermal generation for energy and ongoing rentals of temporary diesel engines. As such, the Designated Office must consider the continued use of the FGS past this assessment as a possibility and consider this while assessing potential effects to air quality as a result of the Project.

The proposed project is located at the FGS in the Town of Faro. Activities associated with the operation of the FGS include fuel use and storage. These activities have low potential to contribute to reduced air quality in the project area. The spatial scope of potential cumulative effects on air quality is a 5 km radius around the project area to capture existing development and activities. Nearby activities that may result on residual effects on air quality within this spatial scope include existing highway traffic on the Robert Campbell Highway, heating of nearby residences, and other industrial activity such as the Faro Solid Waste Disposal Facility and an existing quarry.

6.4 Characterization of Project Effects – Decreased Ambient Air Quality

Operation of diesel generators to produce energy requires the combustion of diesel and the creation of diesel exhaust. Diesel exhaust is a complex mixture of combustion products (Ullman 1989). The composition of the mixture is dependent on fuel composition, the design of the engine, operating conditions, lubricating oil, additives, and the emission control system (Olbert 1973).

Diesel exhaust is known to include approximately 40 toxic substances. Among these toxic substances are total particulate matter (TPM), inhalable particulate matter less than or equal to 10 microns (PM_{10}), respirable particulate matter less than or equal to 2.5 microns ($PM_{2.5}$), sulphur oxides (SOx), nitrogen oxides (NOx), carbon oxides (COx), ground level ozone (O_3), and volatile organic compounds (VOC's). The release of toxic substances into the atmosphere can affect the surrounding environment in many ways, such as altering the chemical composition of soils, contributing to acidification of lakes and other waterways, causing acid rain, and contributing to global warming and climate change, which includes increasing occurrences of heat waves, droughts, wildfires and more.

The most recent assessments by YESAB for the FGS (2011-0246 and 2014-0119) identified air quality as a valued component that may be adversely affected by the Project. In both assessments, the Designated Office determined that the projects would not result in significant adverse effects to air quality.

In 2010, Environment Yukon adopted the Yukon Ambient Air Quality Standards (YAAQS) for SO_2, O_3, TSP, CO, $PM_{2.5}$ and NO_2, which were the standards considered in the previous assessments. In 2019, these standards were updated, including reducing the standards for NO_2 from 401 µg/m^3 to 113 µg/m^3. These are in line with Canada-wide minimum standards, although some jurisdictions including British Columbia, have enacted more stringent requirements. The standards are the maximum concentrations of pollutants acceptable in ambient air throughout the Yukon (see Table 3 below). They are to be used to determine the acceptability of emissions from proposed and existing developments (Government of Yukon 2019).

Table 3: Yukon Ambient Air Quality Standards 2019-2025 (Government of Yukon 2019)

Pollutant	Averaging Time	Current Standard	2025 Standard (effective Jan 1, 2025)
Ground Level Ozone (O_3)	8 Hour	123 ug/m^3	119 ug/m^3
Nitrogen Dioxide (NO_2)	1 Hour	113 ug/m^3	79 ug/m^3
	Annual	32 ug/m^3	23 ug/m^3
Particulate Matter Coarse (PM_{10})	24 Hour	50 ug/m^3	50 ug/m^3
Particulate Matter Fine ($PM_{2.5}$)	24 Hour	27 ug/m^3	27 ug/m^3
	Annual	8.8 ug/m^3	8.8 ug/m^3
Sulphur Dioxide (SO_2)	1 Hour	183 ug/m^3	170 ug/m^3
	Annual	13 ug/m^3	11 ug/m^3
Total Suspended Particulate (TSP)	24 Hour	120 ug/m^3	120 ug/m^3
	Annual	60 ug/m^3	60 ug/m^3

Notes:
All ambient air quality measurements are referenced to a standard temperature of 25°C and pressure of 101.3 kiloPascals. For comparison purposes, results should be expressed in these standard conditions.
ug/m^3 - micrograms per cubic meter.

The Proponent has provided an Air Dispersion Modelling Assessment for the Faro facility, prepared by WSP Canada Inc. (YOR 2021-0115-0002; Appendix B). In this assessment, five criteria air contaminants were evaluated and modelled between 2016 and 2018 for two modelling scenarios: Existing Permitted Emission Capacity Scenario (10.6 MW) and Future Expanded Emission Capacity Scenario (16 MW). The assessment showed that although the air contaminant concentrations were higher in the Future Scenario, the maximum concentrations of air contaminants were below their respective ambient air quality criteria under the YAAQS, with the exception of short-term (1-hour) NO_2 exceedances in both scenarios. According to the assessment, the exposure levels of NO_2 exceedances to humans are predicted to be low as they are expected to occur during nighttime (6:00pm to 7:00am) in the cooler months of the year (January through April and September through December), when outdoor human activity is limited. The assessment also noted that the emissions from the FGS are expected to be much lower than modelled

and overall air quality impacts on the Town of Faro are not expected to be significant, as the modelling scenarios assumed maximum operating conditions and continuous, year-round use, which is not expected (YOR 2021-0115-0002; Appendix B). However, as illustrated above in Table 3, the standards for NO_2 will be further reduced in 2025, resulting in much higher NO_2 exceedances when compared to the 2025 standards for NO_2. Given the Project's temporal scope of 10 years (until approximately 2031), most of the Project will rely on the 2025 YAAQS.

As stated by the Canadian Council of Ministers of the Environment (CCME),

> *Short-term exposure to NO_2 can elicit a range of adverse respiratory effects including decreased lung function, increased respiratory symptoms, and airway inflammation, and cause aggravation of respiratory diseases, particularly asthma and chronic obstructive pulmonary disease. Long-term exposure to NO_2 may contribute to allergic responses, asthma development and may increase susceptibility to respiratory infections. Inhalation of NO_2 has also been linked to effects on the cardiovascular system, and some reproductive effects.*[2]

Due to the potential effects resulting from both short and long-term exposure to NO_2, the Designated Office views any exceedance of NO_2 to represent a high magnitude effect to air quality and the health of exposed Faro residents.

As uncovered in the Air Dispersion Modelling Assessment by WSP, maximum predicted NO_2 concentrations significantly exceed the YAAQS for both existing and future scenarios in the short-term averaging period (1-hour). The summary of modelling results for both emission scenarios can be found in Table 4 below. Model-predicted NO_2 concentrations indicate that over an averaging period of 1 hour, the concentration of NO_2 found at the receptor with the highest predicted ambient concentration across all modelled receptors for the future scenario (capacity of up to 16 MW) was 215% of the current YAAQS. When taking into consideration the expected reduction of the YAAQS in 2025 to 79 µg/m^3 for NO_2, the exceedances from the Project will be even higher at 308% (243.2 µg/m^3 / 79 µg/m^3 x 100%).

Table 4: Summary of Maximum Cumulative Modelling Results at the MPOI[3] from both Emission Scenarios
(YOR 2021-0115-0002; Air Dispersion Modelling Assessment Table 6-1)

AIR CONTAMINANT	AVERAGING PERIOD	AMBIENT AIR QUALITY STANDARD (µg/m^3)	JURSIDICTION	BASELINE CONCENTRATION		MAXIMUM CUMULATIVE MODEL PREDICTED CONCENTRATION AT THE MPOI			
						Existing Scenario		Future Scenario	
				Value (µg/m^3)	% of Criteria	Value (µg/m^3)	% of Criteria	Value (µg/m^3)	% of Criteria
Nitrogen Dioxide (NO_2)	1-hour	113	Yukon	0.67	0.6%	160.3	142%	243.2	215%
	Annual	32	Yukon	0.11	0.3%	11.0	34%	18.3	57%
Particulate Matter Coarse (PM_{10})	24-hour	50	Yukon	0.46	0.9%	19.7	39%	24.1	48%
Particulate Matter Fine ($PM_{2.5}$)	24-hour	27	Yukon	0.25	0.9%	9.3	34%	12.7	47%
	Annual	8.8	Yukon	0.05	0.5%	1.6	18%	2.2	25%
Sulphur Dioxide (SO_2)	1-hour	183	Yukon	N/A	N/A	3.3	2%	4.3	2%
	Annual	13	Yukon	N/A	N/A	0.2	2%	0.3	3%
Carbon Monoxide (CO)	1-hour	14300	BC	N/A	N/A	480.3	3%	489.0	3%
	8-hour	5500	BC	N/A	N/A	248.8	5%	310.4	6%

[2] https://ccme.ca/en/air-quality-report

[3] Maximum Point of Impingement: the receptor with the highest predicted ambient concentration across all modelled receptors (YOR 2021-0115-0002; Appendix B)

The Proponent provided an extensive list of mitigation measures that they are subject to follow under their existing Air Emissions Permit (YOR 2021-0115-0002). Relevant mitigations to reduce the Project's effects to air quality are listed below:

- If an inspection reveals that the site or source(s) is in any way not in compliance with the Permit, Yukon Energy is required to repair the damage or take other actions required to bring the site or source(s) into compliance.
- Yukon Energy is required to maintain and operate the sources, as well as any stand-alone air pollution control equipment and testing and monitoring equipment, in accordance with manufacturers recommendations and best management practices, as necessary to provide optimum control of air contaminant emission during all operating periods.
- Yukon Energy is also required to run the sources at the site in order of highest possible efficiency in the circumstances, except for maintenance or test purposes.
- Yukon Energy is required to ensure that the fuel used by the source(s) conforms to the most recent Canadian federal Sulphur in Diesel Fuel Regulations for off-road applications (paragraph 4.3).
- Yukon Energy is prohibited from allowing visible emissions from any source to exceed an opacity of 20% as measured by an environment al protection officer, and must comply with further requirements to notify an environmental protection officer of any measured exceedance within 15 days or such time as may be directed by an environmental protection officer, and to take reasonable measures to reduce opacity of emissions within 5 days of any measured exceedance, or in such time as may be directed by an environmental protection officer.
- Yukon Energy must ensure that particulates collected using emission control equipment are contained so that there is no release of contaminants int o the atmosphere or any open body of water.
- Yukon Energy is required to conduct visual inspections and maintenance on all source components as per manufacturer's instructions.
- Yukon Energy is required to contact either an environmental protection officer or the Yukon Spill Report Centre as soon as possible under the circumstances in the event of an unauthorized release or emission, such as fugitive emissions or emissions resulting from burning fuel other than that allowed under the Permit.

For a full list of Proponents commitments, please refer to the Project Proposal Supporting Document (YOR 2021-0115-0002). Although mitigations provided by the Proponent help to reduce project effects to air quality, and exposure levels of NO_2 exceedances to humans are predicted to be low as they are expected to occur during nighttime in the winter, exceedances of NO_2 at current YAAQS are significant. Further, YAAQS for NO_2 are expected to be reduced in 2025, resulting in an even larger gap between NO_2 levels from the Project and YAAQS.

The Designated Office considered the modelled exceedances and the conclusions of the Air Dispersion Modelling Assessment when determining significance of project effects to air quality. The assessment provided discussion regarding the predicted concentrations of NO_2 indicating that the modeled concentrations met the previous standards (prior to 2019) but not the current YAAQS. Again, it is

important to note that these standards will be further decreased in 2025 and therefore, it is important for the Proponent to ensure the facility works towards ensuring these standards are met in the future operations.

The assessment states that the modelling results represent a worse-case scenario. This is a reasonable approach; however, the challenge is understanding the more likely scenario for NO_2. The assessment also states,

> *…the conditions giving rise to predicted short-term NO_2 exceedances would be very unlikely to happen because the emission sources at the facility are highly unlikely to operate continuously year-round at the maximum possible emission rates, nor would it be likely that these maximum emissions coincide exactly with the particular meteorological conditions that give rise to the event as they occur, on average, for less than 20 hours per year modelled.* (YOR 2021-0115-0002; Appendix B)

A more likely scenario, as well as the actual likelihood of the worst-case scenario, are unknown, particularly given the further reduction of NO_2 standards expected in 2025. In addition, when considering the modeled exceedances along with the range of adverse respiratory effects that may be produced by unacceptable levels of NO_2 as well as the measured exceedance for the receptor with the highest predicted ambient concentration (215% of the YAAQS for NO_2 at current standards), the Designated Office considers the effects to air quality and the health of Faro residents to be of high likelihood and magnitude. This is of further relevance for those who are outdoors afterwork in the winter or that enjoy recreational time in the outdoors (after 6:00pm) during the cooler months of the year (September through April) when the majority of predicted exceedances are likely to be observed, dependent on weather conditions (YOR 2021-0015-0002; Appendix B).

6.5 Significance Determination

In making a significance determination, the Designated Office has considered the information in Section 6, including the local setting (Section 6.3), the project details, the Air Dispersion Modelling Assessment, the commitments from the Proponent (which include the conditions in the Air Emissions Permit), and the relevant legislation (Section 6.2). Particularly, Section 6 of *Air Emissions Regulations* prohibits the release of any air contaminant to such extent or degree as (a) may cause or be likely to cause irreparable damage to the natural environment; or (b) in the opinion of a health officer, cause actual or imminent harm to public health or safety.

In the case of the FGS, NO_2 is predicted to exceed the current YAAQS. Additionally, NO_2 standards for YAAQS will be further reduced in 2025, resulting in an even larger gap between NO_2 levels from the Project and YAAQS, and higher exceedances. As discussed above, short- and long-term exceedances of NO_2 have the potential to lead to various adverse respiratory effects (CCME)[4]. Given the uncertainties around the worst-case scenario, the more likely scenario, the current exceedances, and likely continued exceedances when changes to the YAAQS are put in place, it is important for the Proponent to ensure measures are in place to comply with the standards and to reduce NO_2 exceedances to ensure residents, especially those who utilize the outdoors in the evening in the winter, spring, and fall are not affected by air quality as a result of the Project.

[4] https://ccme.ca/en/air-quality-report

The Watson Lake Designated Office has determined that the Project is likely to have significant adverse environmental and socio-economic effects on air quality that require additional mitigation.

1. The Proponent shall develop, in discussion with regulators, a suitable air quality monitoring plan and schedule, to ensure that air emissions comply with the applicable standards.

    a. The results of monitoring shall be analyzed by comparing measured air contaminant emissions to Yukon Ambient Air Quality Standards. If air contaminant levels are found to exceed ambient air quality standards, the Proponent shall implement corrective measures to ensure that standards are met.

    b. The monitoring and analysis results shall be made available to Government of Yukon, Environment.

7.0 COMMUNITY WELLNESS

7.1 Overview

The Project involves activities that can lead to adverse effects from noise disturbance for the duration of the Project (10 years). The Project is in close proximity to residences, businesses and other facilities with the nearest residence approximately 380 m to the southeast of the Project. The Designated Office has considered the following range of effects associated with community wellness as a result of noise disturbance from the Project:

- Reduced quality of life for Faro residents: sound generated by project activities may interact with other users of the land in such a way to impact their quality of life.
- Reduced health: public health may be affected by project operations and long-term activity at the site.

The Designated Office heard concerns from residents and members of the public about the potential noise created from the Project and impacts to quality of life and public health.

The Designated Office has determined that the Project is likely to result in significant adverse effects to community wellness.

7.2 Relevant Legislation

The Designated Office considered the following legislative requirements. This list is not exhaustive; rather, the Designated Office reviewed this specific legislation because of its direct relevance to community wellness.

There is no relevant regulatory noise guidance or criteria in the Yukon. In the absence of this legislation, the Designated Office is identifying the regulations that guided the Noise Impact Assessment provided by the Proponent (YOR 2021-0115-0002; Appendix C):

- *British Columbia Noise Control Best Practices Guideline*

- *Guidance for Evaluating Human Health Impacts in Environmental Assessments: Noise*

7.3 Consideration of Past, Present, and Likely Activities

Yukon Energy's 10-Year Renewable Electricity Plan involves the construction of a new pumped storage facility on Moon Lake, the expansion of the Atlin hydro plant and the expansion of the transmission network in the Southern Lakes region. These projects are expected to decrease the dependency on fossil fuels during the winter and meet expected peak demands. In turn, this would decrease the future noise disturbance coming from the FGS. Yukon Energy's high case portfolio charts for energy and capacity indicate that with all expected expansions and planned resources, Yukon Energy will just meet demand (Yukon Energy 2020; Figures 21-22). As discussed in Section 6.3, YEC noted in their 10-Year Plan that replacing retired diesel generators can reduce the need for rental diesel generators. Rental diesel generators are also not included in YEC's plan from 2028/29 onwards. However, YEC also notes that regulatory uncertainties could lead to proposed projects being delayed or cancelled, resulting in an increased reliance on thermal generation for energy and ongoing rentals of temporary diesel engines. As such, the Designated Office must consider the continued use of the FGS past this assessment as a possibility, as well as the continued noise disturbance coming from the FGS.

Activities associated with the operation of the FGS include fuel use and storage. These activities have low potential to contribute to reduced community wellness in and around the project area. The spatial scope of potential cumulative effects on community wellness from noise disturbance is a 5 km radius around the project area to capture existing development and activities over the 10-year temporal scope of the Project. Nearby activities that may result in residual effects on community wellness from noise disturbance within this spatial scope include existing highway traffic on the Robert Campbell Highway, the Faro Solid Waste Disposal Facility, and an existing quarry.

7.4 Characterization of Project Effects – Noise Disturbance

The Project will result in increased noise in close proximity to private residences. The Project involves the increased capacity of the FGS from 10.6 MW to 15.5 MW with the use of two existing and seven rental generators, used primarily in the winter months, for 10 years. This noise represents a disturbance to peace and quiet on nearby residential properties, which can change the tone and atmosphere of the surrounding area. In addition, this noise may have ramifications on public health. Comments received by the Designated Office highlighted concerns regarding potential impacts from noise emissions to quality of life. Residents commented that they have been disturbed by the noise levels of the additional rental generators.

The Proponent included a record of past engagement and consultation with the Town of Faro in their Project Proposal Supporting Document. The Proponent recorded concerns from residents about noise dating back to September of 2020 (YOR 2021-0115-0002).

7.4.1 Consideration of Noise Impact Assessment (YOR 2021-0115-0002; Appendix C)

The Proponent provided a Noise Impact Assessment prepared by WSP Inc. (WPS) with their Project Proposal Supporting Document. The assessment was prepared in February of 2021 and evaluated the potential noise impacts of increasing the capacity of the FGS to 16 MW.

Table 2.1 in the Noise Impact Assessment describes all sources of noise for the FGS, their associated sound power levels (dBA), location and noise control measures (options: silencer/muffler, acoustic lining,

acoustic enclosure, or uncontrolled). A large majority of the sources of noise are 'uncontrolled' (e.g. generator radiators, combustion exhausts, generator intakes, building intakes, building discharge fans, etc.). The Noise Impact Assessment also included a summary of noise receptors near the Faro Generating Station. The nearest receptors are a one storey residence on Dawson Drive and a one storey army barracks on Kitza Ave, both approximately 359 m from the project location (Table 3.1 in the Noise Impact Assessment; YOR 2021-0115-0002; Appendix C).

The British Columbia Noise Control Best Practices Guideline, as referred to in the Noise Impact Assessment, considers facilities constructed prior to 1998 "deferred facilities". These facilities are considered to meet the community noise tolerance levels, without any outstanding noise complaints. WSP noted that in their understanding, the FGS does not have any outstanding noise complaints and uses this determination to consider the existing operation at 10.6 MW as the Permissible Sound Level (PSL) at the receptor locations described above. The capacity of 10.6 MW is the current permissible capacity of the facility in the Air Emissions Permit (YOR 2021-0115-0014), and as such, is the value utilized for the PSL.

Due to the definition of PSL at the project area, the assessment used the sound level of existing permitted operation (10.6 MW) and compared it to noise levels with increased capacity to 16 MW. The results indicated that the change of noise levels were less than 1 dBA at the nearest community receptor. This led to the determination of an insignificant change in noise levels. However, it is the Designated Office's view that the definition of PSL is incorrect due to outstanding noise complaints (discussed shortly) and a larger change in sound level is probable. To clarify, as noted, the Noise Impact Assessment utilized 10.6 MW as the PSL given that this is what is currently permitted, without any outstanding noise complaints to WSP's knowledge. As discussed in Section 2.3, the Air Emission's Permit was amended by the Regulator in October 2020 to allow reinstallation capacity of 5.65 MW to a cumulative capacity of 10.6 MW, thus allowing operation of the installed rental generators. It is the noise of the installed rental generators that has resulted in resident noise complaints and concerns, which does not appear to have been considered when determining the PSL. The information provided by the Proponent in YOR 2021-0115-0014 indicated the Regulator reinstalled capacity of 5.65 MW in October 2020, which would indicate that the previous permitted capacity was approximately 4.95 MW. It is not known to the Designated Office if using a PSL of the permissible capacity prior to October 2020 amendment would result in the same conclusion as the Noise Impact Assessment but anticipates that the conclusion would be more reflective of the experience of nearby Faro residents concerning noise disturbances.

Further, the Designated Office considers the FGS to have had outstanding noise complaints under the amended Air Emissions Permit as a result of operation of the rental generators, as noted in the comments from the public in the Seeking Views and Information stage of the assessment and the community engagement conducted by the Proponent in 2020-2021. Prior to 2014 when FGS began operating only the two existing generators, the generating capacity was 10.5 MW using four generators (YESAB 2011-0246); prior to 2011, the generating capacity was even less. Between 2014 and October 2020, only two generators were utilized to provide back up power to meet energy demands and in emergencies. During this time there were no complaints known to the Designated Office; however, since the use of the new rental generators, complaints have occurred.

Although it was determined in the Noise Impact Assessment that minimal changes in sound level will occur when comparing existing operational output and future operational output, WSP provided recommendations to ensure compliance with the manufacturer's sound level data, noting that the following shall be implemented when selecting new generators. As a note, the Noise Impact Assessment states in the Executive Summary, "The Facility has been, and is currently operating much below the

permitted facility capacity of 10.6MW with only two existing diesel generators on-site" (YOR 2021-0115-0002; Appendix C). The rental generators were already selected and had been installed in October 2020 prior to the issuance of the Noise Impact Assessment. WSP's recommendations are as follows:

1. The existing generator, Model: Mirrlees KV16 with rated capacity of 5.15 MW, located within FD1 building shall be operated at or below the capacity of 2.4 MW

2. The existing generator, Model: Caterpillar (CAT) 3612 with rated capacity of 3.3 MW, located within FD7 building shall be operated at or below the capacity of 2.8 MW

3. The proposed new generators (YM20 to YM26) shall be 6 regulars plus 1 standby generator each with rated capacity of 1.8 MW and each with enclosures providing an overall maximum sound level of 78 dBA at 7 metres (23 feet);

4. Prior to installation, a shop drawing can be requested from supplier confirming the sound data to be less than 78 dBA at 7 metres (23 feet);

5. If a complaint is received after installation, an acoustic audit shall be performed consisting of onsite measurements. (YOR 2021-0115-0002; Appendix C)

In the Project Proposal Supporting Document, the Proponent indicated that no mitigations are proposed since the increase in sound level was determined to be negligible (YOR 2021-0115-0002). However, to help ensure that noise levels stay below predictions made in the Noise Impact Assessment, the Designated Office recommends that the Proponent perform an acoustic audit consisting of onsite measurements if a complaint is received.

7.4.2 Consideration of Noise Monitoring at Faro Generating Station (YOR 2021-0115-0002; Appendix D)

Noise monitoring was conducted at the project location in March 2021 by Hemmera Envirochem Inc. (Hemmera). Short-term noise monitoring was conducted for two operating scenarios: 1) the operation of the two main generators FD1 and FD7, and 2) the operation of the six rental generating units, YM20 to YM26. The report states, *"*Yukon Energy Corporation is planning to expand the generating capacity at the Facility with six generating units (YM20 to YM 26) with a combined generating capacity of 10.3 MW*…"* The Designated Office would like to clarify that YM20 to YM26 is actually seven generators with a combined capacity of 12.6 MW, recognizing however, that the FGS will not be operating all nine (including the two existing generators) concurrently and will not exceed 15.5 MW generating capacity. It is unclear to the Designated Office if the second scenario included the use of only six rental generators or all seven in combination with FD1 and FD7.[5] However, even though all seven are listed, it is assumed only six were included as the information speaks to six generators and given that YM26 will only be used in the case of a power failure of one of the other generators (YOR 2021-0115-0002; Appendix C; footnote of Table 1.1).

[5] The Hemmera noise monitoring document is unclear regarding the second scenario. Under section 2 (Methods) the second scenario states, "Operation of the six rental generating units YM20 to YM26)." Section 3.0 (Results) note the second scenario as, existing (FD1 and FD7) plus six rental generators YM20-YM26. It is assumed by the Designated Office that the second scenario utilized is the latter, given that this is what is listed in the results and Table 2.

Noise monitoring included in the report was conducted at a nearby residence on 130 Dawson Drive as well as 7 m from the rental generating units to compare actual noise levels. Baseline noise levels were also conducted when no diesel generators were in operation.

The 'Noise Monitoring Results' of this monitoring, shown in Table 1 of Appendix D, state that for Scenario 2 at the Southwest corner (fenceline), the "usable duration was only 7 seconds due to equipment malfunction and may not be representative of average noise". The 'Comparison of Actual and Modelled Noise Levels' (Table 2) indicates that the 'Actual' change between existing and future noise levels in the Southwest Corner (fenceline) is 11.9 dBA. However, it is noted that the value may not be representative of actual noise levels due to equipment malfunction. This change in noise levels, if accurate, represents a 'very significant' impact rating when referring to Table 4.2 in the Noise Impact Assessment (Appendix C). The noise monitoring report concludes that the actual measured noise levels at the nearest receptor (130 Dawson Drive) is lower than the modelled noise levels in the Noise Impact Assessment (Appendix C) discussed in Section 7.4.1.

7.4.3 Project Effect: Quality of Life

Comments received by the Designated Office highlighted concerns regarding potential impacts from noise emissions to quality of life. Residents commented concerns about noise levels and tones that can be compared to jet engines. One commenter stated, "The rental generators are significantly louder than the old installed generators, and this has been noted by many in town." The commenter also noted that "any sounds of nature disappear" and the generators are audible inside many resident's houses (YOR 2021-0115-0005). Another commenter shared complaints about the increase of noise when the rental generators are running, increasing the noise from background level noise and disrupting recreational activities such as hiking. This commenter also likened the noise from the generators to jets waiting to take off (YOR 2021-0115-0008). During a conversation with the Proponent, it was explained to the Designated Office that when the rental generators first start up, they do sound like jet engines. However, the Proponent stated that the sound decreases as the generators warm up.[6]

As provided by residents of Faro, the quality of life of individuals and adjacent land users have already been impacted by this increase in noise levels and change of tone in and around the project area. As the purpose of the Project is to increase the use of the generators to a higher capacity, the Designated Office considers the likelihood and magnitude of effects to quality of life as a result of noise disturbance to be high.

7.4.4 Project Effect: Public Health

The Project will result in increased noise in close proximity to private residences for 10 years. As illustrated in the noise monitoring results by Hemmera, generator use will generate noise above natural ambient levels when compared to Table 4.2 in WSP's Noise Impact Assessment, which indicates the impact rating to different changes in sound levels (YOR 2021-0115-0002; Appendix C; Table 4.2). Noise generated at the project location can be heard from various receptors, the closest of which being a residence on Dawson Drive, approximately 359 m from the project area (YOR 2021-0015-0002; Appendix C). This noise represents a disturbance to peace and quiet on residential properties, which can change the tone and atmosphere of the surrounding area.

[6] The Designated Office contacted the Proponent on November 2, 2021 to discuss the noise concerns, Noise Modelling Assessments, and the Noise Monitoring Assessment

Effects from noise disturbance can result in the following acute or chronic impacts to public health:

- annoyance
- sleep disturbance
- disruption of normal functions (e.g. communication and interaction, activities)
- distraction and reduced task performance
- anxiety and stress
- startle reflex (e.g. reactions ranging from mild surprise to severe shock)
- physiological changes (e.g. blood pressure, heart beat, constriction of blood vessels); and
- physiological effects (e.g. nausea, headache, insomnia, loss of appetite, hypertension, heart disease, tinnitus, hearing damage, noise-induced hearing loss). (Singal 2000).

As noted above, continued noise disturbance can result in chronic health conditions, which could adversely affect the health of nearby residents; the probability of which is high considering the frequency and duration of project activities. While effects such as annoyance and sleep disturbance can be reversed when project activities cease, anxiety, stress, physiological changes, and physiological effects may not be reversible depending on the extent of their impact. In consideration of comment submissions, effects to public health from noise are likely to be experienced by Faro residents closest to the project area, located on Dawson Drive (YOR 2021-0115-0008).

According to the Proponent, changes in sound levels with the addition of the rental generators is expected to be within an acceptable range and at an insignificant level. The Proponent has not proposed any additional mitigations for noise disturbance. While it appears that the Noise Impact Assessment and Noise Monitoring provided by the Proponent indicate that noise disturbance is insignificant, comment submissions suggest that despite this determination, noise disturbance has been experienced from the project location at the time that the additional generators were in operation and therefore, can be expected from the Project at an increasing level. Given the Project will only increase the noise levels coming from the rental generators, the probability of effects to public health to nearby residents as a result of noise disturbance is considered high.

7.5 Significance Determination

Based on the Designated Office's interpretation of the provided Noise Impact Assessment and Noise Monitoring, comments received during the Seeking Views and Information stage of the Project, and the engagement and consultation conducted by the Proponent, the Designated Office considers potential effects of the Project to community wellness to be of high likelihood and magnitude. As discussed in Sections 7.4.3 and 7.4.4, the Designated Office considers the Project to have a high likelihood to effect Faro residents' quality of life and public health as a result of noise disturbance. Although the generators are only to be utilized to meet high load demands (most likely in the winter), during emergencies, and for routine maintenance, the use of generators at the FGS is expected to increase as the Proponent has noted a growing demand for electricity in the Yukon. When in use, consistent noise disturbance likened to the sound of jet engines by Faro residents during the Seeking Views and Information stage of the assessment, are likely to effect daily activities including recreational activities such as hiking or even relaxing at home for some residents closest to the FGS, located on Dawson Drive.

As complaints were received and continue to be received after the installation of the additional generators, noise disturbance is expected to be significant during use of the rental generators at FGS.

The Designated Office recommends that the Proponent ensure a Complaint Management System is in place and that an acoustic audit shall be performed consisting of onsite measurements, as outlined by WSP if noise complaints are received. Given that the rental generators come with enclosures (see page 164 of the Project Proposal Supporting Document; YOR 2021-0115-0002; Appendix C), silencers, and mufflers that are designed to control noise emissions (YOR 2021-0115-0002; Appendix C), it is assumed that these measures are in place. The Designated Office recommends that the Proponent ensure that these measures are in good working order.

The Watson Lake Designated Office has determined that the Project is likely to have significant adverse socio-economic effects on community wellness that require additional mitigation.

2. The Proponent shall install a Complaint Management System and install signage at the Faro Generating Station with contact details for concerns/complaints. If noise complaints are received, an acoustic audit shall be performed consisting of onsite measurements. Once complete, the Proponent shall share the results with the Regulator, and if required, work with the Regulator to determine additional measures to be installed to reduce noise.

3. The Proponent shall ensure noise control measures for each rental generator (i.e. silencers/mufflers, acoustic linings or acoustic enclosures) are installed and in good working condition at all times.

8.0 CONCLUSION OF THE ASSESSMENT

Under s. 56(1) (b) of the *Yukon Environmental and Socio-economic Assessment Act*, the Watson Lake Designated Office recommends to the Decision Body that the Project be allowed to proceed, subject to specified terms and conditions. The Designated Office determined that the Project is likely to have significant adverse environmental and socio-economic effects in or outside Yukon that can be mitigated by those terms and conditions.

1. The Proponent shall develop, in discussion with regulators, a suitable air quality monitoring plan and schedule, to ensure that air emissions comply with the applicable standards.

    a. The results of monitoring shall be analyzed by comparing measured air contaminant emissions to Yukon Ambient Air Quality Standards. If air contaminant levels are found to exceed ambient air quality standards, the Proponent shall implement corrective measures to ensure that standards are met.

    b. The monitoring and analysis results shall be made available to Government of Yukon, Environment.

2. The Proponent shall install a Complaint Management System and install signage at the Faro Generating Station with contact details for concerns/complaints. If noise complaints are received, an acoustic audit shall be performed consisting of onsite measurements. Once complete, the Proponent shall share the results with the Regulator, and if required, work with the Regulator to determine additional measures to be installed to reduce noise.

3. The Proponent shall ensure noise control measures for each rental generator (i.e. silencers/mufflers, acoustic linings or acoustic enclosures) are installed and in good working condition at all times.

8.1 Authorization of Recommendation / Referral

The undersigned is authorized pursuant to s. 23(2) of YESAA to make this Recommendation:

Kathie Thibaudeau

December 7, 2021

Manager, Watson Lake DO

Appendix A REFERENCES

All references to documents on the YESAB Online Registry (YOR) can be found by searching for the Project and document number on the YOR at https://www.yesabregistry.ca.

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