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2021 GRA Intervener Evidence, 9-September 2021

1) Counting only legally permitted generation facilities, YEC has failed meet N-1 requirements and has a shortfall of 2.95MW.

From the GRA Page 2-14, highlighting added:

“Installed YEC and AEY dependable grid capacity for the winter peak in 2021, based on existing capacity today and any planned additions/retirements and excluding Fish Lake hydro, is 139.1 MW in 2021 (70.5 MW of YEC hydro, 12.6 MW YEC LNG, **23.5 MW of YEC diesel**, 5.6 MW of AEY diesel and plus **27 MW<sup>20</sup> diesel from rented diesel units** in order to meet the N-1 criterion assessment).<sup>21</sup>”

and

“<sup>20</sup> 15 units at 1.8 MW for each unit to total 27 MW for 2021.”

Of the 23.5MW of YEC diesel, Faro FD1&FD7 provide 5.8MW, according to the 10-Year Renewable Plan, which YEC has cited in IR responses. Of the 15 rental units providing 27MW, 5 are in Faro, providing 9MW.

So for N-1 purposes, YEC attributes a total of 14.8MW to Faro diesel.  
(FD1+FD7=5.8MW + 5 Rentals @ 1.8MW Ea=9MW).

However, YEC has indicated that the output of Faro facility is limited to a total 10.6MW. (NY-YEC-1-10(b) and many others)

The 14.8 MW cited in N-1 calculations clearly exceeds the maximum 10.6MW claimed to be permitted by YEC.

Using 10.6MW as the maximum output of the Faro facility, instead of the 14.8MW in the GRA reduces dependable grid capacity by 4.2MW.

And from GRA Page 2-15 “In summary, under N-1, there is surplus of dependable capacity of approximately 1.25 MW in 2021. Without rented diesel units, the N-1 capacity shortfall would be 25.75 MW in 2021.”

So if the Faro facility is operated up to what YEC claims as the maximum permitted output, there is an N-1 capacity shortfall of 2.95 MW. (1.25MW – 4.2MW)

2) YEC has violated YESAA in the 2020 installation of seven rental generators in the Faro facility.

Any modification to a fossil fuel-fired electrical generating station is an “assessable activity” as listed on the excerpt of YESAA Schedule 1 Part 4 Item 2(b) as shown below.

**PART 4**  
Energy and Telecommunications

Column 1		Column 2
Item	Activity	Specific Exception
1	Construction, installation, operation, modification, decommissioning or abandonment of, or other activity in relation to, a power line or a telecommunications line	
2	Construction, operation, modification, decommissioning or abandonment of, or other activity in relation to, <b>(a)</b> a hydroelectric generating station; <b>(b)</b> a fossil fuel-fired electrical generating station; <b>(c)</b> a wind-powered electrical generating station; <b>(d)</b> a wood-fired electrical generating station; or <b>(e)</b> a wood-fuelled heating facility for the commercial sale of heat	Construction, operation, modification, decommissioning or abandonment of, or other activity in relation to, a wind-powered electrical generating station if its production capacity is, and in the case of a modification remains, 50 kW or less

YEC did eventually agree that the addition of seven rental diesel generators and associated infrastructure was a modification to the Faro generating station, (NY-YEC-1-7 – REVISED) thereby necessitating an assessment.

Further, YESAA requires that an assessment occur **before** such projects are undertaken according to YESAA Purposes of Act (2)(b) as shown below.

**Purposes of Act**

**(2)** The purposes of this Act are

- (a)** to provide a comprehensive, neutrally conducted assessment process applicable in Yukon;
- (b)** to require that, before projects are undertaken, their environmental and socio-economic effects be considered;

3) The Faro rental diesel project accounted for \$4.025 million of the \$10.971 million revenue shortfall cited in the GRA. This is 37% of the revenue shortfall.

Cost of 17 rentals is \$3.834 million, so the 7 rentals in Faro would be \$1.579 million.  
 Infrastructure costs (actual) attributable to Faro rental diesel infrastructure is \$2.446 million.

4) All following pages are YEC or YESAB documents that are entered here because I may use parts of some of them in my final written argument.

- a) Meeting Summary\_Faro Rental Diesels\_Dec 2 2020.
- b) Comments page from yesabregistry.ca for Faro Generating Station Capacity Expansion Project (2021-0115)
- c) Faro Generating Station Capacity Expansion Project – YESAA Project Proposal Document.
- d) Announcement of rentals installation provided to Faro residents Sep 2020, 1-2 weeks before installation began.
- e) Announcement of 2021 rentals and upcoming YESAB, provided to Faro residents June 2021. This was the only notice of YESAB to Faro residents, with no clues as to when one could actually “get involved.” Going to yesabregistry.ca as YEC suggested, there was nothing. Residents were not notified when the project was finally open to public comment.

**Meeting Summary: Faro Rental Diesels**

**December 2, 2020, 5:30 p.m. – 7 p.m.**

**Virtual Community Meeting (conducted virtual due to COVID-19 concerns and directives in Yukon)**

**Number of participants:**

- 10 with some leaving the virtual meeting at varying points in the discussion.

**Attendees:**

- Yukon Energy representatives: Stephanie Cunha, Travis Ritchie, Ed Peake
- Public Members: Six plus Stanley Noel, CEO of Dena Nezzidi Corporation

**Meeting purpose:**

- To share information about Yukon Energy's project to add seven temporary rental diesel units at its existing diesel power plant in Faro.
- To provide answers to questions previously asked of the Corporation by local residents.
- To answer questions and listen to concerns of participants on the call.

**Meeting format:**

- Presentation (45 minutes): Delivered by Stephanie and Travis on behalf of Yukon Energy (see pdf attached).
- Open Q&A period (45 minutes): All

**Key themes of questions and comments raised by public members:**

Key theme	Discussion
Noise levels from rentals	<ul style="list-style-type: none"> <li>• Multiple participants noted that the sound levels from the rental generators were much louder than the permanent diesel units in Faro. Individuals compared the sound to a jet engine.</li> <li>• A participant noted their view that the nearest resident to the Faro diesel plant was closer than 300 metres (the barracks as noted by Yukon Energy). The participant suggested the closest resident was more like 200 metres away. The participant asked about Yukon Energy plans for sound monitoring and future noise barriers.</li> <li>• Travis noted that the findings of Yukon Energy’s sound modelling study showed that if all rentals were to be running that predicted sound levels from the site at the nearest point of reception (occupied building) would be less than 1 dB more than what is emitted by the permanent generators.</li> <li>• Travis noted that the engines can be louder during start up.</li> <li>• Travis noted that Yukon Energy would be doing spot sound monitoring and follow-up at the site this winter to assess sound levels and confirm potential effect predictions.</li> </ul>
Consultation with Ross River Dena Council (RRDC)	<ul style="list-style-type: none"> <li>• Stanley expressed his deep concern and disappointment that Yukon Energy did not consult with Ross River Dena Council (RRDC) before adding the temporary diesel generators to the Faro site. Stanley noted that RRDC was not informed of the project or of the procurement opportunities.</li> <li>• Stanley stressed that it was incumbent on Yukon Energy to know whose Traditional Territories their facilities and projects are on and to ensure that those First Nations are consulted with on those projects in advance.</li> <li>• Stanley questioned why Yukon Energy undertook extensive consultation with Whitehorse area First Nations, municipalities and area residents about the new 20 MW thermal power plant or LNG facility and did not undertake the same actions with RRDC, the Town of Faro and Faro residents.</li> <li>• Stanley expressed that in his view, Yukon Energy was just choosing the path of least resistance by installing the additional rental diesel in Faro because it was easy and there were allowable air allowances rather than what was in the public interest of RRDC, the Town of Faro and local residents.</li> <li>• Stanley noted that as a First Nation that is not self-governing, RRDC is not notified or consulted with by YESAA of proposals submitted to them for review.</li> <li>• Stanley expressed that as a public utility, Yukon Energy should ensure they are spending the time to do what is in the best interest of Yukoners and to go beyond the thresholds of what is required for public consultation by YESAA.</li> </ul>

	<ul style="list-style-type: none"> <li>• Stephanie shared that Yukon Energy had contacted the Ross River Dena Council and Stanley about the Faro project on more than one occasion, and agreed with Stanley that it would be good for both parties to identify better ways to communicate in the future. Details noted in Appendix A.</li> <li>• Stephanie noted that Yukon Energy did meet with members of the Town of Faro Council in July 2020 as part of other discussions to inform them of this project, and that their feedback at the time was used to update the information piece that was mailed to all Faro residents in September.</li> <li>• Stephanie noted Stanley’s concerns and that they had been previously raised with Yukon Energy’s President and CEO and other senior leaders.</li> <li>• Stanley informed Stephanie that previous discussions between him and Andrew had been about a possible fuel supply contract to the Faro site and not these specific concerns about consultation.</li> <li>• Travis noted that Yukon Energy’s engagement and consultation processes are different based on the scope of the project, not based on location. When projects are undertaken within existing Yukon Energy property lines and within existing permits that consultation is not a requirement of YESAA and the external engagement may be more limited. For example, Yukon Energy’s 10 temporary rental units were added to the Whitehorse parking lot without formal consultation with local First Nations or governments because the project was within Yukon Energy’s fence line and within the allowable permits of the facility. However, for the LNG project, which required the acquisition of more property (land) and was a new technology at the time, fulsome consultation was conducted with both First Nations, local governments, stakeholders and the public.</li> </ul>
<p>Faro Air Permit (allowances, changes and subsequent consultation)</p>	<ul style="list-style-type: none"> <li>• Questions were raised by a participant on the call about Yukon Energy’s existing Air Permit for the Faro diesel plant. Questions centered around: <ul style="list-style-type: none"> <li>○ What permits and authorities does Yukon Energy have in place to run up to 10.6 MW of diesel at the site;</li> <li>○ Whether the addition of the temporary diesel units constitutes a modification to the power plant, and if so, what consultation and regulatory approvals are required; and</li> <li>○ Whether a new assessment of the Faro facility was required before the addition of the seven rental units.</li> </ul> </li> <li>• Travis responded that the existing air emissions permit for the facility allows for an operational capacity of 10.6 MW. More specifically, a YESAA decision document<sup>1</sup> exists for a past assessment of the facility at that capacity. As such, the regulatory authority (YG-Environment) can permit air emission activities related to diesel generation on site up to that capacity without additional assessment if there are otherwise no substantive changes to the previously assessed activities.</li> </ul>

<sup>1</sup> Pursuant to YESAA Project Assessment 2011.0246.

	<ul style="list-style-type: none"> <li>• Yukon Energy has moved some of that capacity to other locations as the need has revealed itself over the last dozen or so years and simply seeking now to re-install the previously assessed and permitted capacity.</li> <li>• Travis confirmed that, yes, the additional capacity beyond the 10.6 MW is a modification to the facility and is therefore required to be assessed under YESAA in the near future before the air emissions permit can be amended and the additional capacity can be operated at the site. For clarity he emphasized that the installed site capacity beyond 10.6 MW cannot and will not be operated until the YESAA and permitting processes are concluded successfully.</li> <li>• Stephanie shared her email address with participants on the call inviting additional feedback or questions.</li> </ul>
Follow-up	<ul style="list-style-type: none"> <li>• Stephanie noted that a copy of the presentation would be made available on Yukon Energy's website.</li> <li>• Stanley requested that notes from the meeting be shared with him.</li> <li>• Stanley and another participant on the call asked that a copy of the presentation be emailed to them.</li> </ul>

**Appendix A:**

Yukon Energy contact attempts to the Ross River Dena Council about the Faro rental diesel project and procurement opportunities (Emails included invitation to meet/discuss)

Date	YEC Contact	RRDC Contact	Topic	Method	Response
April 9, 2020	Michael Brandt	Stanley Noel	Faro project and procurement	Email	No
April 17, 2020	Michael Brandt	Stanley Noel	Faro project and procurement	Email	No
Sept 1, 2020	Stephanie Cunha	Councillor Nukon and Stanley Noel	Project specific; no procurement	Email to both	No

2021-0115

Faro Generating Station Capacity Expansion Project [+ Follow](#)[Details](#) [Activity](#) [Documents](#) [Comments 5](#)

Public Comment period is currently closed for this project.

**Edward Bergeron**# 2021-0115-0010  September 08, 2021

I am not opposed to this project, but I am dismayed by the lack of transparency. I was not notified by the proponent, I just heard about from a friend. This is not acceptable. The thing I am concerned about is the noise levels. The people of Faro don't need to hear this so called improvement. Keno comes to mind. The Robert Campbell highway is in bad enough condition already more fuel trucks is not going to help

**Lucy Moreira**# 2021-0115-0009  September 08, 2021

Aside from the noise level which has been rightly noted in previous comments (it really does sound like jets flying overhead) there is also the issue of air quality. From my living room window I see clouds of exhaust billowing above the plant when the generators are running. At a time when climate change is of top concern I find it, at best, short sighted that Yukon Energy would go this direction.

Please note Yukon Energy gave no notice of the proposed increase of generators to the residents of Faro, in fact many may still not be aware giving them no chance to comment. We will be directly impacted on many levels yet we were not informed of any details or explanation. This is not only inconsiderate but unacceptable.

I ask YESAB to turn down Yukon energy's proposal for added generators to the Faro station.

**Tricia Lefebvre**# 2021-0115-0008  September 07, 2021

I have lived in Faro for 5 years. I spend a couple of hours a day hiking around town on various trails. Before the rental generators arrived in town, I could often hear when the original diesel generators were running. It was a background level noise.

Last winter when the rental generators were running, it was definitely not just a background noise. Yukon Energy says that the noise level for running the rentals has increased less than 3 decibels. This sounds like turning up the volume on your radio 3 notches; but 3 decibels difference is actually 1000 times louder! Two decibels is 100 times louder. So this means the sound level is maybe 800 times louder. I have walked past the power plant when the rentals were running and it sounded like I was beside jets that were waiting to take off.

Luckily I live on the other side of Dawson Drive and I cannot hear them inside my house; but when I open my front door I can hear them. I know people who live on the other side of Dawson Drive and they can hear them inside their houses

One day a group of us were in front of the school which is over 1 km and at a different level than the power plant. A few people asked what the very loud sound was. It was the generators. Again it sounded like we were beside jets.

The sound does vary depending on which way the wind is blowing, but we cannot always count on the wind blowing the sound away from town.

**YG Environment**# 2021-0115-0006  September 07, 2021

Yukon Government Comments

# 2021-0115-0007 [YG Compiled Comments](#)**Nathaniel (Neil) Yee**# 2021-0115-0005  September 06, 2021

Here are a number of reasons that this application should be rejected, some subjective and some legal:

- While additional generation capacity is needed to support expansions in Whitehorse, the installation of seven noisy rental diesel generators in Faro is not the ideal solution for residents of Faro. These should be in/near Whitehorse.

- The rental generators are significantly louder than the old installed generators, and this has been noted by many in town. While Yukon Energy claims that the new generators do not add much noise or in some cases might be quieter, this is not what one experiences. It is perhaps that the tone is quite different, many comparing the sound to a jet engine. It is a high pitched whine that is more notable than the low rumble of the installed generators. Any sounds of nature disappear. The rental generators are audible inside of many houses.

- Yukon Energy is seeking to increase "operational capacity" by 4.9MW, to avoid assessment at the Executive Committee level which occurs at 5MW or more, as noted on page 11 of the proposal supporting document. However, according to item 26 of Schedule 3 of YESAA, it is "production capacity" that matters, not "operational capacity." The addition of 7 generators at 1.8MW each is an addition of 12.6MW of "production capacity," which far exceeds the 5MW threshold. Production capacity is defined as the maximum output that can be achieved, and it makes sense to use this number, otherwise companies would regularly do things like installing 12.6MW while claiming they are only going to use 4.9MW in order to avoid relevant assessments and regulations. This is clearly not the intent of YESAA.

—From YESAA Schedule 3 - Projects to Be Submitted to the Executive Committee:

"(26) Expansion of a hydroelectric generating station, or a fossil fuel-fired electrical generating station, that increases production capacity by 5 MW or more."

- In addition to "operational capacity" not being relevant from a regulatory standpoint, it also happens that no combination of the generators would actually produce the convenient 15.5MW "operational capacity" limit requested in this proposal. This is noted by WSP in the sound and dispersion studies. A 15.5MW total would be achieved by adding 2.722 rental generators, while the rest of the proposal is about adding 3 more rental generators.

- The most recent YESAB (2014-0119) concerning the Faro generators was for 8.15MW. This 2021 expansion is from 10.6MW to 15.5MW. It is not explained in this document how/when 10.6MW suddenly became permitted without a YESAB review?

- While the 2008 and 2011 assessments did allow 10.6MW, ignoring the most recent YESAB (8.15MW) in favour of numbers that work better for the company compromises the integrity of YESAA and the YESAB process.

- Page 19 of the proposal supporting document states that "Modification of the existing Site included the addition of seven portable rental diesel generators in 2020." However, YESAA requires a YESAB assessment to be done BEFORE the project is undertaken. "Purposes of Act (2)(b) to require that, before projects are undertaken, their environmental and socio-economic effects be considered;" Approving this YESAB would be approving the violation of YESAA.

- Additionally, from YESAA Schedule 1, any "modification" to a "fossil fuel-fired electrical generating station" is an assessable activity. Yukon Energy was well aware of this law, and chose to ignore YESAA and install 7 rental generators in 2020. Approval of this application would confirm that YESAA can be violated at will.

- Yukon Energy provided notice of an upcoming YESAB review on 21-June, a little more than two months before anyone could comment on the process – and long before the project could be found on yesabregistry.ca. There was no communication since June – and no communication of the dates of the comment period. This may explain why there are not many comments here? It is also noteworthy that there is no mention of the YESAB review on the Yukon Energy web page.

## Proponent

**Yukon Energy Corporation**

## Project Stage

**Review Information**

## Assessment District

**Watson Lake**

867-536-4040

watsonlake.do@yesab.ca

## Traditional Territories

**Liard First Nation****Ross River Dena Council**

## Decision Bodies

**YG Environment**

# Faro Generating Station

Capacity Expansion Project

YESAA Project Proposal Supporting Document

AUGUST 2021



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## List of Acronyms and Abbreviations

<b>ATCO</b>	ATCO Electric Yukon (Formerly Yukon Electrical Company Ltd.)
<b>AQDMG</b>	Air Quality Dispersion Modelling Guideline
<b>CAC</b>	Common Air Contaminants of Concern
<b>CO</b>	Carbon monoxide
<b>GWh</b>	Gigawatt hour
<b>km</b>	Kilometers
<b>m</b>	Metre
<b>MD</b>	Mayo-Dawson Power Generation and Transmission System
<b>MW</b>	Megawatt
<b>NAPS</b>	National Air Pollution Surveillance
<b>NO<sub>2</sub></b>	Nitrogen dioxide
<b>NPRI</b>	National Pollutant Release Inventory
<b>PM<sub>2.5</sub></b>	Fine particulate matter
<b>PM<sub>10</sub></b>	Course particulate matter
<b>PSL</b>	Permissible Sound Levels
<b>SO<sub>2</sub></b>	Sulphur dioxide
<b>UTM</b>	Universal Transverse Mercator
<b>VC</b>	Valued Component
<b>VOCs</b>	Volatile organic compounds
<b>WAF</b>	Whitehorse-Aishihik-Faro Power Generation and Transmission System
<b>WRGS</b>	Whitehorse Rapids Generating Station
<b>YECL</b>	Yukon Electrical Company Ltd. (Now Atco Electric Yukon Ltd.)
<b>YESAA</b>	Yukon Environmental & Socio-economic Assessment Act
<b>YESAB</b>	Yukon Environmental & Socio-economic Assessment Board
<b>YIS</b>	Yukon Integrated System
<b>YT</b>	Yukon Territory
<b>YUB</b>	Yukon Utilities Board

# 1 Introduction

## 1.1 Project Overview & Document Structure

The Yukon Energy Corporation (Yukon Energy) is applying under Parts 6 and 9 of the *Environment Act* and Part V of the *Air Emissions Regulations* for an amendment of Air Emissions Permit No. 60-010 authorizing Yukon Energy to modify the thermal generating component (the Project) of its Faro Diesel Facility (the Site).

Yukon Energy seeks an amendment of the Permit to allow for the addition of up to 4.9 MW of additional operational capacity (to a maximum total of 15.5 MW) for the diesel electricity generators. The Site is currently permitted to operate at a capacity of 10.6 MW. The additional generation capacity will act as insurance against the very unlikely event that Yukon Energy experiences an extended winter power outage with loss of generation or transmission from the Aishihik Generating Station<sup>1</sup>, if hydroelectricity can not meet energy demands and for maintenance purposes. An extended power outage has a very low probability, but the likely consequences require Yukon Energy to be prepared to immediately restore supply to customers on the grid to avoid rolling blackouts. Having access to portable diesel generators ensures that Yukon Energy can continue to provide reliable service during the winter in an emergency.

The need for this contingency measure came as a result of analysis of information prepared as part of Yukon Energy's 2016 Resource Plan (2017). 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). This Project is expected to be required until more permanent solutions to address the current N-1 capacity gap are implemented. Yukon Government's document *Our Clean Future: A Yukon strategy for climate change, energy and a green economy* (Government of Yukon 2020) identifies a renewable energy target of 97% by 2030. Yukon Energy's 10-Year Renewable Plan outlines key projects and partnerships that will help to address the energy and peak capacity shortfalls over the 10-year planning horizon. Several projects have been identified in the Future-Focused Portfolio (such as Whitehorse Hydro uprates, the battery energy storage system, the Southern and Mayo Lakes Enhanced Storage Projects), but these projects will take time to plan, design, permit, and construct, and Yukon Energy requires a temporary solution be put in place until new capacity can be added to the system. These back-up units would typically be at the bottom of stacking order and would only be operated in

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<sup>1</sup> **Emergency (or "N-1") Whitehorse-Aishihik-Faro (WAF) and Mayo-Dawson (MD) system capacity planning criteria:** Each grid system (WAF and MD) will be planned to be able to carry the forecast peak winter loads (excluding major industrial loads) under the largest single contingency (known as "N-1"). The N-1 criterion determines system capacity assuming the loss of the system's single largest generating or transmission-related generation source. In the case of WAF, this is presently the Aishihik transmission line, without which the WAF grid loses ability to access approximately 37 MW of generation.

the case of an emergency, planned and unplanned outages for maintenance, when hydroelectricity cannot meet demands, and for short durations for monthly exercise to confirm operational readiness.

The permit amendment request to expand the thermal generating capacity in Faro is subject to a Designated Office level environmental and socio-economic effects assessment by the Watson Lake Designated Office of the Yukon Environmental and Socio-economic Assessment Board (YESAB) under the *Yukon Environmental and Socio-economic Assessment Act (YESAA)*.

Pursuant to that assessment, Yukon Energy requests a recommendation from the Designated Office to allow the permit amendment to proceed, on the basis that the Project (i.e., the modifications to Yukon Energy's diesel generating facilities described in this proposal and operated in accordance with the terms and conditions of an air emissions Permit and the applicable provisions of the *Environment Act* and *Air Emissions Regulations*) **will not have significant adverse environmental or socio-economic effects** within the meaning of section 56(1)(a) of YESAA.

This document provides supporting information for the permit amendment process and the associated environmental and socio-economic assessment, and includes detailed information referenced in the YESAA Designated Office Evaluation Form 1, which has also been completed and is filed on the YESAB Online Registry.

Section 1 of this document contains general proposal information including:

- The intent and structure of this document and related information;
- The proponent, Yukon Energy Corporation;
- Project Location;
- The Project purpose and need; and
- An identification of the required assessment and regulatory approvals.

Section 2 contains information regarding the assessment approach and assessment scope, including:

- The identification of valued components for focussed effects assessment; and,
- The context and criteria Yukon Energy has used for determining the significance of any identified potential effects to the valued components.

Section 3 contains information describing the Faro Diesel Facility, as well as operation ranges and requirements, and regulatory context, and

- Facility overview;
- Operational requirements and ranges;
- Generation profiles;

- Operational resource usage and waste generation; and,
- Brief comments on the applicable regulatory context under the *Public Utilities Act* and applicable legal and regulatory constraints on the operation of the facilities under the existing permit and applicable environmental legislation.

Section 4 includes a description of the Project scope.

Section 5 provides details on the environmental and socio-economic setting including:

- Reference to previous studies and the emissions inventories; and,
- Baseline air quality and noise levels for Faro.

Section 6 presents the effects assessment and includes:

- Characterization of potential Project-related effects.
- A description of the modelled thermal generation profiles;
- An identification of sensitive air and noise emission receptor sites in the vicinity of the Faro Generating Station;
- Mitigations that will be used to reduce potential adverse effects; and,
- Assessment conclusions respecting the significance of the potential effects.

Five appendices are included as follows:

- Appendix A Air Emissions Permit No. 60-010
- Appendix B Air Dispersion Modelling Assessment for the Faro Generating Station (WSP, 2020a);
- Appendix C Noise Impact Assessment, Faro Generating Station (WSP, 2020b).
- Appendix D Sound Level Measurements, Faro Generating Station (Hemmera, 2021)
- Appendix E Dena Cho Environmental Ltd. YESAA Project Proposal Technical Review Report

## 1.2 Proponent Information

Yukon Energy is the Project proponent.

Established in 1987, Yukon Energy is a public electric utility that operates as a business, at arm's length from the Yukon Government, and is wholly owned by the Yukon Development Corporation (a Crown corporation).

Yukon Energy's headquarters are located near the Whitehorse Rapids Generating Station (WRGS) in Whitehorse, with community offices in Mayo, Faro, and Dawson City. It employs approximately 100 highly skilled and motivated Yukoners who are committed to offering the highest quality service possible. Yukon Energy works hard to meet the challenge of providing reliable electricity and related energy services to Yukoners in the most affordable, yet environmentally and socially responsible way.

Yukon Energy is the main generator and transmitter of electrical energy in the Yukon, and works with its parent company, Yukon Development Corporation, to provide Yukoners with a sufficient supply of safe, reliable electricity and related energy services. Yukon Energy owns and operates the 138 kV Yukon Integrated System (YIS), formerly known as the Whitehorse-Aishihik-Faro (WAF), and 69 kV Mayo-Dawson (MD) transmission grids, which have been connected as a single grid since 2011, as well as over 90% of the electric generation resources on these grids; it is also the public utility with primary responsibility for planning and development of new generation and transmission facilities in Yukon.

There are almost 15,000 electricity consumers in the territory. Yukon Energy directly serves about 1,800 of these customers, most of who live in and around Dawson City, Mayo and Faro. Indirectly, we provide power to approximately 15,000 other Yukon customers in Whitehorse, Carcross, Carmacks, Haines Junction, Ross River, Teslin, and Pelly Crossing, through the sale of energy to the ATCO Electric Yukon (ATCO). ATCO buys wholesale power from Yukon Energy and sells it to retail customers in the territory via its own distribution network.

Yukon Energy currently has the capacity to generate approximately 132 megawatts (MW) of power:

- At present, 92 MW of that capacity are provided by Yukon Energy's hydro generation facilities in Whitehorse, Mayo and Aishihik Lake (40 MW at Whitehorse, 37 MW at Aishihik, and 15 MW at Mayo);
- Approximately 40 MW of capacity are provided by Yukon Energy's thermal (fossil fuel-fired) generators, including seven generators in Whitehorse (five diesel and two natural gas), three diesels in Mayo, five diesels in Dawson City, two diesels in Faro, and several relatively small portable generators. Rental diesel units are also temporarily/seasonally located in Whitehorse (9 units) and Faro (7 units).

In contrast to the diesel generation facilities operated by ATCO in communities such as Watson Lake and Old Crow, which are isolated from the transmission grid and must therefore operate continuously (24 hours per day, 365 days per year), Yukon Energy only uses its fossil fuel-fired generators:

- As back up during renewable energy system outages (planned and unplanned);
- To supplement energy demand during colder periods of the year; and
- To exercise the units for very short durations on a monthly basis to ensure operational readiness.

This is because most of the needs of customers on the system are satisfied by Yukon Energy's three hydro generating stations. For the vast majority of the time, the thermal generators do not operate. However, Yukon Energy's thermal generation facilities are essential to its ability to provide a reliable supply of electricity to customers whenever demand exceeds hydro supply (e.g., as a result of planned maintenance, emergency repair, or peaking demand during cold temperatures).<sup>2</sup>

Yukon Energy is regulated principally under the Yukon *Business Corporations Act*, *Public Utilities Act*, *Waters Act*, and the federal *Fisheries Act*. In particular, under the *Public Utilities Act*, Yukon Energy has an obligation to supply electricity service to its customers, and its rates and operations are subject to regulation by the Yukon Utilities Board. Yukon Energy's thermal generation facilities are also subject to regulation under the Yukon *Environment Act* and *Air Emissions Regulations*, as well as YESAA.

### 1.3 Project Location

The Project is located in the community of Faro, Yukon near the town entrance. This area is within the unceded traditional territory of the Ross River Dena Council. The proposed capacity expansion activities are located within the existing generating station boundaries. No new land or site clearing is required.

The legal description of the property is:

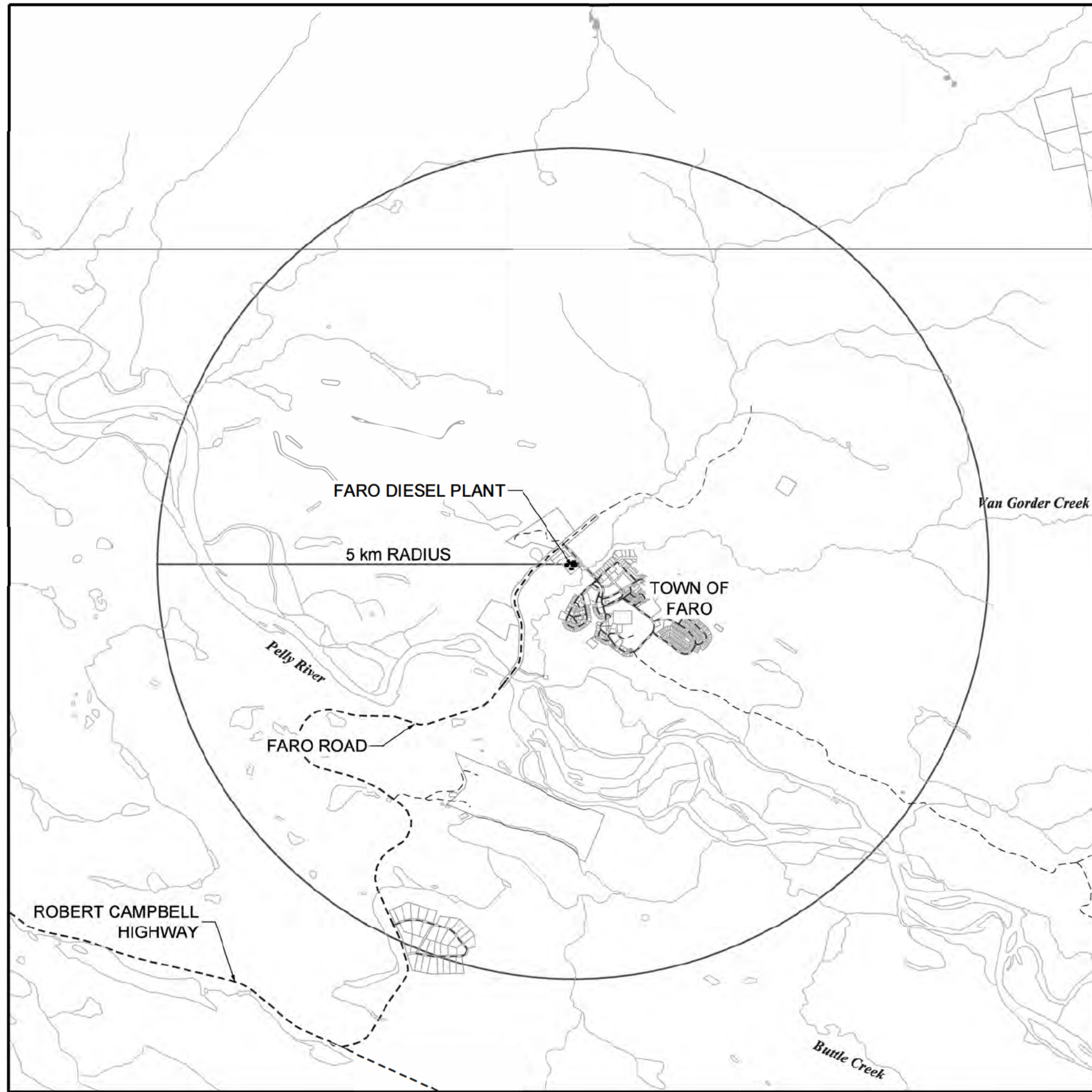
- Lot 114, Plan 49716 LTO DCT No. 93Y377
- NTS Map Sheet # 105 K/03

Approximate UTM coordinates are:

- UTM Zone: 8
- Northing: 6901266.50
- Easting: 585174.54

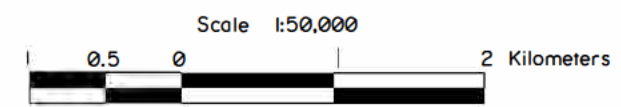
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<sup>2</sup> For example, Yukon Energy's reliance on the thermal generation facilities was essential when a major power outage occurred on the WAF grid in January 2006 due to a failure on the connection to the Aishihik hydro generating facility. If Yukon Energy had not had the ability to operate its diesel units in those circumstances, customers would have been left without power in the middle of the winter.



LEGEND

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 UTM Zone 8 NAD83



Rev. No.	Date	Description	Approv'd
1	SEPT 4, 2000	INITIAL REVIEW	TR
2	SEPT 19, 2000	FINAL	TR



FARO GENERATING STATION CAPACITY EXPANSION  
 PROJECT YESAA PROJECT PROPOSAL  
 SUPPORTING DOCUMENTATION

FIGURE 1:  
 OVERVIEW OF YEC FARO DIESEL PLANT AREA

Drawn: C.McGILLIVRAY	Date: August 2021
Scale: 1:50000	Map Sheet No. 105K03
Revision Number: 3	Dwg Name: FIGURE 1

## 1.4 Project Purpose

Yukon Energy's diesel (thermal) electric generating plants are installed and operated to ensure the ongoing operation of the integrated power system and so all customers on these systems can receive reliable power consistent with Yukon Energy's corporate and regulatory obligations.

Given the current generation mix (hydro and thermal) and system design, Yukon Energy's ability to operate the installed thermal plants, particularly during conditions where demand for electricity cannot be adequately met by hydro (e.g., planned maintenance, emergency repair, demand during cold winter temperatures), is essential to avoid scenarios where there would be a requirement to impose blackout conditions to various customers. This is particularly relevant during times where the lack of such ability would at best be very inconvenient, and at worst dangerous to infrastructure and human health and safety, such as would be the case during cold winter temperatures.

The current need for thermal generation is related to several factors including:

1. The need to meet demand for electricity during those times when hydro-electric facilities are offline as a result of an emergency condition;
2. The need to meet demand for electricity during those times when hydro-electric facilities are taken offline for routine maintenance;
3. The need to meet demand for electricity during those times when there is a grid separation (i.e., transmission outage) and electricity from hydro-electric facilities is not available;
4. The need to exercise a particular diesel unit as a part of routine maintenance; and
5. The need to meet demand for electricity during those times when hydro-electric facilities are otherwise unable to meet current demand for energy.

This Project includes an amendment to the existing Air Emissions Permit (Permit No. 60-010) to operate any combination of existing generators and six of the seven additional temporary rental diesel units up to a total operational site capacity of 15.5 MW, as required. Slightly more capacity than 15.5 MW will be installed at site for backup and redundancy purposes. Operations will not exceed the 15.5 MW permitted site capacity ceiling.

## 1.5 Required Authorizations and Regulatory Approvals

Yukon Energy requires an amendment of its existing Air Emissions Permit No. 60-010 to have the ability to operate additional thermal generation resources and ensure the continuity of a reliable supply of power to Yukoners as described earlier in this proposal. A Permit can be issued by the Minister responsible for the Department of the Environment pursuant to Section 12 of the *Air Emissions*

*Regulations* under the *Environment Act*. It is expected that the existing permit would be amended to allow the requested modification to the Faro Generating Station.

To amend the Permit in this manner, the Yukon Government must issue a decision document based on the environmental and socio-economic assessment of the amendment application under YESAA. An environmental and socio-economic assessment is required under Schedule 1, Part 4, Item 2(b) of the *Assessable Activities, Exceptions and Executive Committee Projects Regulations* under YESAA, because the Permit is for the “operation ... of ... a fossil fuel-fired electrical generating station”.

While the amendment request is to authorize changes to the Faro Generating Station to have up to 15.5 MW of standby/back-up diesel generating capacity, the activity is a expansion (<5MW) to an existing facility and does not involve the construction, decommissioning, or abandonment of a fossil-fuel fired electrical generating station, as such the proposed activity is not immediately assessable at the Executive Committee level.

As noted in Section 1.1 Project Overview, Yukon Energy is requesting a recommendation by the Designated Office to allow the Permit amendment to proceed, on the basis that the Project (i.e., the continuing operation of the Yukon Energy’s Faro Diesel Facility with the addition of 4.9 MW of additional diesel generating capacity (total of 15.5 MW of generating capacity) in accordance with the terms and conditions of the amended Permit and the applicable provisions of the *Environment Act* and *Air Emissions Regulations*) will not have a significant adverse environmental or socio-economic effect within the meaning of section 56(1)(a) of YESAA.

## 2 Assessment Approach and Scope

### 2.1 Identification of Valued Components

For the purpose of identifying and assessing potential environmental and socio-economic effects, value may be attributed to a component of the environment and/or the socio-economic system for economic, social, environmental, aesthetic or ethical reasons.

Valued environmental and socio-economic components (VCs) are parts of the local environment and socio-economic fabric that are valued because of their ecological and/or socio-economic importance. VCs can represent a species or species group, a type of ecosystem, or an important component of a social and/or economic system and are used in the assessment of potential Project-related effects arising from Project activities

Based on its understanding of the environmental and socio-economic setting of its generating facilities, and upon an examination of known and typical interests related to air emissions, Yukon Energy has identified three VCs for this Project:

- Human health and safety (air emissions)
- Aural aesthetics (noise emissions)
- Environmental quality (effects of accidents and malfunctions associated with fuel/oil storage and use)

Human Health and Safety relates to the potential for decreased ambient air quality and ensures Project activities will not have a significant adverse effect on the health and safety of those living, working and playing in and around Faro.

Aural Aesthetics (Noise) relates to increase noise levels associated with the Project. An assessment on Aural Aesthetics ensures that noise levels resulting from Project activities are within acceptable levels.

Other components of the environment, such as water, soils, and general maintenance of environmental quality, are more appropriately related to such things as the potential for petroleum hydrocarbon releases, and have not been examined beyond the scoping stage of this assessment, as such matters are adequately addressed by operational and non-discretionary regulatory controls currently in place such as Yukon Energy's Special Waste Permit, Storage Tank Permit, etc., and not by the Air Emissions Permit amendment that Yukon Energy is applying for at this time.

## 2.2 Analysis & Significance of Potential Effects

The Designated Office must evaluate the potential effects, if any, on VCs resulting from the amendment of Yukon Energy's Air Emissions Permit for the purposes previously described and must make a recommendation to the Decision Body based on that evaluation, in accordance with section 56(1) of YESAA.

In particular, under section 56(1)(a), if the Designated Office is satisfied that Yukon Energy's operation of the modified thermal generator complement, in compliance with the terms and conditions of its Air Emissions Permit and all other relevant legislative and regulatory requirements (e.g., under the *Environment Act* and *Air Emissions Regulations*), will not have "significant adverse environmental or socio-economic effects in or outside the Yukon", the Office must recommend that the renewal of the Permit be allowed to proceed.<sup>3</sup>

This assessment uses the approach applied to both ATCO's and Yukon Energy's Air Emissions Permit renewal projects previously submitted to YESAB's Designated Offices for evaluation since 2005.

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<sup>3</sup> Alternatively, the Designated Office also has authority to recommend that the Permit be amended subject to specified terms and conditions, if it determines that the operation of the modified thermal generator complement "will have significant adverse environmental or socio-economic effects...that can be mitigated by those terms and conditions" within the meaning of section 56(1)(b).

In its September 8, 2009 Designated Office Evaluation Report on Project Number 2009-0107 (YECL<sup>4</sup> Air Emissions Permit Renewal – Watson Lake, YT), the Watson Lake Designated Office determined it was appropriate to exercise its authority under section 56(1)(a) with reference to both “the application of existing legislation as well as the mitigation measures proposed by the proponent” (at page 1).

This was in the context of an application by ATCO to renew the air emissions permit for the diesel generator station it operates on a full-time basis, year-round as the sole source of electrical supply for the communities of Watson Lake, Upper Liard, and Lower Post, BC (in contrast to Yukon Energy’s diesel generating facilities, which are operated only as back-up during hydro system and transmission system outages, and, occasionally, to supplement energy demand during colder periods of the year).

Accordingly, in Project Number 2009-0107, where the Watson Lake Designated Office found that the application of existing legislation as well as mitigation measures proposed by the proponent would be “adequate to eliminate, reduce or control the significant adverse effects of the project” resulting from the continuous, year round operation of ATCO’s diesel generator station in Watson Lake, the Designated Office concluded that the project “will not have significant adverse environmental or socio-economic effects in or outside Yukon”, and recommended under section 56(1)(a) that the project be allowed to proceed.

The same approach to section 56(1)(a) was adopted with respect to ATCO’s other air emission permit renewal applications, by:

- The Dawson City Designated Office in its September 9, 2009 Evaluation Report on Project Number 2009-0104 (YECL Air Emissions Permit Renewal – Old Crow) (in the context of another YECL diesel generating station operated on a full-time basis year-round, as the sole source of electrical supply for the community of Old Crow);
- The Teslin Designated Office in its September 4, 2009 Evaluation Report on Project Number 2009-0105 (Teslin Electrical Generating Station Air Emissions Permit Renewal);
- The Watson Lake Designated Office in its September 4, 2009 Evaluation Report on Project Number 2009-0106 (YECL Air Emissions Permit Renewal – Ross River, YT);
- The Haines Junction Designated Office in its September 8, 2009 Evaluation Report on Project Number 2009-0108 (Air Emissions Permit Renewal – Haines Junction, YT); and
- The Mayo Designated Office in its September 4, 2009 Evaluation Report on Project Number 2009-0109 (Air Emissions Permit Renewal – Carmacks).

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<sup>4</sup> Yukon Electrical Company Ltd. was renamed Atco Electric Yukon after the 2009 assessment.

To ensure consistency in the interpretation and application of section 56(1) of YESAA, the same approach must be applied by the Designated Office in assessing and issuing a recommendation with respect to Yukon Energy's proposed renewal of its Air Emissions Permit: i.e., the potential effects (if any) of the project must be assessed on the basis of Yukon Energy continuing to operate its facilities (on an emergency back-up/secondary supply basis only) in compliance with the terms and conditions of the Permit and all other legislative and regulatory requirements, in addition to the principal mitigation measures proposed by Yukon Energy, which include the following:

- Generators being operated and maintained regularly as per manufacturer's specifications to provide a reliable and efficient source of electricity;
- Visual opacity limits and monitoring; and
- Use of ultra-low sulphur fuel only.

In assessing whether any effect resulting from such continuing operation of Yukon Energy's facilities may be considered "significant" within the meaning of section 56(1) of YESAA, the Designated Office should further apply the framework of analysis adopted by the YESAB Executive Committee in Part 4.3 of its November 2, 2007 Screening Report & Recommendation on Project Assessment 2006-0286 (Yukon Energy Corporation Carmacks-Stewart/Minto Spur Transmission Project; page 15):

The determination of whether or not a particular effect is significant is undertaken in the context of the effect, and the circumstances encountered. In developing mitigative measures to address effects, the character of the effect (duration, frequency, magnitude, extent, reversibility), the socio-economic context (i.e., as linked to social expectations), and the likelihood of the effect occurring are key criteria that facilitate the determination of which effects are significant and thus should be mitigated. Societal expectations are often a reflection of the adversity of an effect as compared to the level of effort required to address the effect.

Two broad categories of effects exist along the spectrum of significance: insignificant, and significant ...

Category A [Insignificant] consists of those potential effects for which mitigation is not necessary. This category would include beneficial effects as well as adverse effects that are within established norms (e.g., natural variation of baseline conditions, codes and standards), and levels of acceptable change/socio-economic context.

Category B [Significant] consists of all those effects that do not fall under category A. In this category, there exists a broad spectrum of adverse effects that are considered significant, which may range from minor adverse effects outside of local environmental norms/societal expectations to major consequential effects and have a moderate to high likelihood of occurring. Mitigative measures have been recommended for all adverse effects in this category, as required by YESAA.

The significance of a Project's potential effects on a particular VESEC (such as human health and safety) should also be assessed under section 56(1) of YESAA with reference to any relevant effect attributes, which could include the direction of change (i.e., positive, neutral, negative, or both positive and negative), the magnitude of a potential effect, its geographic extent, duration, frequency, reversibility, and likelihood of occurrence, and the applicable socio-economic context.

Having regard to the foregoing:

- The determination of the "significance" of the potential effects of the continuing operation of Yukon Energy's diesel facilities on human health and safety requires the identification and assessment of both the potential beneficial and adverse effects;
- In that exercise, potential adverse effects should be assessed with reference to those effect attributes that are relevant to the character of the effect and acceptability of the effect;
- Attributes relevant to the character of an effect may include the reasonably contemplated frequency, duration, magnitude, extent, and reversibility of the effect over the term of the amended Permit; and
- The level of acceptability of an effect should also be assessed with reference to the environmental standards now established under the Yukon Ambient Air Quality Standards and the likelihood of the standards being exceeded, which have been developed in consideration of those common effect attributes and reasonable societal expectations as the basis for the development of any such applicable codes and standards.

## 2.3 Engagement & Consultation

Between April 2020 and June 2021, Yukon Energy shared information with the Town of Faro and Faro residents about the addition of diesel-powered electricity generation at the existing Faro diesel power plant and encouraged residents to provide their feedback. Objectives of the engagement activities were to:

- Inform the public about the addition of seven temporary diesel rental units at the Faro diesel plant, why the rentals were needed, why the Faro site was selected, and how the rentals would be used;
- Inform the public about the results of the noise monitoring and air quality modelling work completed for the project;
- Inform the public that Yukon Energy would be applying for an amended air emissions permit at the Faro Generating Station, and how the public could be involved in the YESAA process; and
- Gather input about public interests and/or concerns.

Tables 1-3, below, summarize the engagement activities undertaken for this project.

**Table 1 Summary of Engagement with the Town of Faro Administration**

Date	Engagement Approach	Feedback Received
April 14, 2020	Email to Town of Faro advising of the Corporation’s plans to add rental diesels in Faro in 2020. The email included a request for a follow-up discussion.	None.
July 27, 2020	Yukon Energy met with the Town of Faro Council to discuss its 10-Year Renewable Electricity Plan. As part of this meeting, Yukon Energy shared information about the rental diesel project with Council.	Council provided feedback that residents would most likely be concerned about noise from the rentals and air quality.
October 2, 2020	Yukon Energy management hosted a site visit with members of Faro Council at the Faro diesel plant.	Council members present relayed that they had heard that some residents had concerns about noise and air emissions from the rentals and consultation about their installation.
March 2021	Yukon Energy requested a meeting with Town of Faro Council to discuss the Corporation’s proposal for an amended air emissions permit at the Faro diesel plant.	Town of Faro CAO advised Yukon Energy that there wasn’t consensus from Council to meet.

\* Additional activities during this time included emails to Town of Faro staff and Council about the project, public mailers and meetings, and noise monitoring and air modelling results.

**Table 2 Summary of Engagement with the Public**

Date	Engagement Approach	Feedback Received
September 2020	An information sheet about the addition of seven temporary diesel units being installed at the Faro plant were mailed to all residents in Faro. Information was also posted on Yukon Energy’s website.	Fewer than six individuals contacted Yukon Energy to express concerns about noise from the rentals, air emission and consultation about the addition of the units.
December 2, 2020	Yukon Energy hosted a public information meeting about the addition of diesel generation at the Faro plant. The session was hosted online due to COVID-19 concerns. The meeting was advertised with community posters, radio and print ads, and social media. A copy of the presentation was posted on Yukon Energy’s website after the event.	Six members of the public attended.  Key themes of questions and comments raised by public members were: noise levels from rentals, air quality, consultation with local residents, consultation with Ross River Dena Council, and Faro Air Permits (allowances, changes and subsequent consultation.
March 11, 2021	Yukon Energy hosted an in-person drop-in event at the Faro Recreation Centre to share information about diesel in Faro, share information about the noise monitoring and air quality modelling conducted and its upcoming proposal for an amended air emissions permit. The event was advertised with community posters and Facebook.	No member of the public attended.
June 2021	An information sheet reporting back on the use of the rental diesels in winter 20/21, and with information about Yukon Energy’s upcoming proposal for an amended air emissions permit in Faro was mailed to all residents in Faro. Information was also posted on Yukon Energy’s website.	No feedback received.

Copies of the above noted information pieces and presentation can be found on Yukon Energy’s website. <https://yukonenergy.ca/energy-in-yukon/projects-facilities/diesel-facilities/portable-diesel-rental/>

**Table 3 Summary of Engagement with the Ross River Dena Council and Development Corporation**

Date	Engagement Approach	Feedback Received
April 2020 to April 2021	More than a dozen emails and phone calls to Dena Nezzidi Limited Partnership (DNLP) 34 (designate for the Ross River Dena Council) to share information about the Faro rental diesel project and to request a meeting with Ross River Dena Council to discuss the project.	The Dena Nezzidi Limited Partnership representative attended Yukon Energy’s December 2, 2020 public information meeting. The representative expressed concerns that Ross River Dena was not consulted before the installation of rental diesel units in Faro.
May 6, 2021	Discussion with Ross River Dena Council and Dena Nezzidi Limited Partnership leaders.	DNLP noted that this discussion could not be interpreted as consultation with Council or viewed as Council’s support of the project. Other concerns were raised about the additional use of diesel. RRDC and DNLP expressed desires to review the YESAA proposal before submission, and discuss investment and procurement opportunities as part of the project.
July 2021	DNLP review of Yukon Energy Draft YESAA proposal	
Throughout 2021	Discussions about procurement opportunities for RRDC related to the project (fuel supply, investment in future projects)	

At the request of the Ross River Dena Council, Yukon Energy engaged the services of Dena Cho Environmental Ltd. to conduct a technical review of this YESAA Project Proposal Supporting Document. Each of the recommendations contained in the report from Dena Cho Environmental Ltd. were accepted

have been incorporated into this document or otherwise into the ongoing planning and communication activities for the Project. The referenced letter report is contained in Appendix E.

## 3 Facility Description

This section has been included to provide context for the assessment and to provide the reader with an understanding of the existing Faro Diesel Facility.

### 3.1 Facility Overview

The Project is located within the fenced area of the existing Faro Diesel Facility. This property is registered to Yukon Energy Corporation.

The existing facility includes:

- A fenced yard;
- Generator Building (ID: FD1)
- Generator Building (ID: FD7)
- Stations for seven portable rental diesel generators installed in 2020;
- Fuel storage (permanent storage tanks for FD1 and FD7, temporary storage for rental generators);
- Substation;
- Office; and
- Control Building.

Figure 2 provides an overview of the Site with the rental diesel units installed.

Modification of the existing Site included the addition of seven portable rental diesel generators in 2020. A summary of all the diesel units located at the Faro Facility are summarized in Table 3. These generators are temporarily installed at Site but only operated in combination with the existing, permanent units on site up to an operational capacity of 10.6 MW. This is the site operating ceiling until the existing Air Emissions Permit has been amended to allow for the additional operational capacity of up to 15.5 MW.

Figure 2: Faro Generating Station Site Overview



Table 4: Yukon Energy Thermal Generation Inventory at the Faro Generating Station

Unit No.	Manufacturer	Name Plate Capacity (MW)	Derated Capacity (MW)
FD1	Mirrlees	5.15	2.4
FD7	Caterpillar (CAT) 3612	3.3	2.8
YM20	Caterpillar (CAT) 3612C	1.8	n/a
YM21	Caterpillar (CAT) 3612C	1.8	n/a
YM22	Caterpillar (CAT) 3612C	1.8	n/a
YM23	Caterpillar (CAT) 3612C	1.8	n/a
YM24	Caterpillar (CAT) 3612C	1.8	n/a
YM25	Caterpillar (CAT) 3612C	1.8	n/a

### 3.2 Operational Ranges & Requirements

Yukon Energy’s thermal electric generating plants are installed and operated to ensure the overall Yukon integrated electrical system, and so all customers on these systems can receive reliable power consistent with Yukon Energy’s corporate and regulatory obligations. Hydro generation stations on the Yukon grid are typically supplemented as necessary by thermal for peaking or maintenance purposes.

The current need for thermal generation is related to several factors including:

- The need to meet demand for electricity during those times when hydro-electric facilities are taken offline for routine maintenance;
- The need to meet demand for electricity during those times when hydro-electric facilities are offline as a result of an emergency condition;
- The need to meet demand for electricity during those times when hydro-electric facilities are otherwise unable to meet current demand for energy;
- The need to ‘exercise’ a particular thermal unit as a part of routine maintenance;

Table 2 summarizes the annual thermal generation required over the last three years (2017–2019).

**Table 5: Summary of Annual Diesel Generation 2018–2020 for the Faro Diesel Facility**

Unit	2020		2019		2019	
	Run Time (unit hours)	Energy Produced (kW)	Run Time (unit hours)	Energy Produced (kW)	Run Time (unit hours)	Energy Produced (kW)
FD1	29	38,604	29.0	57,874	10.5	25,017
FD7	497	896,280	496.5	743,820	173.4	276,780
YM20	21	34,469	-	-	-	-
YM21	44	71,702	-	-	-	-
YM22	6	9,105	-	-	-	-
YM23	136	221,122	-	-	-	-
YM24	6	9,755	-	-	-	-
YM25	44	71,540	-	-	-	-
YM26	117	190,230	-	-	-	-

Demand for electricity is growing in Yukon. There is an existing gap today between the available dependable capacity on the grid and the amount of electricity Yukoners require during a winter peak

under emergency conditions. To continue providing most of the territory’s energy from renewable sources and to accommodate the increased demand for electricity, Yukon Energy is investing in new dependable renewable electricity sources that add firm winter capacity to the grid. This will allow YEC to continue meeting Yukoners’ growing demands for renewable electricity – even on the coldest and darkest of days – while also supporting Yukon government’s emission reduction targets. However, until those additional and dependable renewable energy resources can be brought into service, Yukon Energy is forecasting increased need to support its hydro assets with thermal electricity to meet the needs of Yukoners today.

Having regard to this increased demand, Table 3 presents the forecasted diesel generation for Yukon Energy’s thermal facility in Faro, which was analyzed for the purpose of completing the effects assessment contained in this Project Proposal. As can be seen from the table, forecast average generation is lower than the actual average generation over the last 10 years, this is due to more thermal load being met by the natural gas generators at the Whitehorse Rapids Generating Station in recent years. This is also a reminder of the fact that the principal purpose of this project is not to meet routine system loads with thermal generation in Faro, but rather to be prepared with sufficient firm dispatchable energy in an emergency situation on the system as discussed in Section 3.3, below.

- **Scenario 1:** Actual average generation levels over the last 10 years.
- **Scenario 2:** Forecast “average case” levels of thermal generation required at the Faro Diesel Facility through to 2023. This scenario reflects Yukon Energy’s projections of the most likely levels of thermal generation over the 2021–2023 period, given current hydrological conditions and electricity demand predictions.
- **Scenario 3:** Hypothetical “worst case” scenario. This scenario reflects Yukon Energy’s projections of the maximum demand that might theoretically need to be met from thermal generation, in the event of an emergency like an N-1 event. This scenario represents an extreme case, which is very unlikely to occur over the term required to close the current generation capacity gap.

**Table 6: Summary of Forecasted Diesel Generation 2021–2023 for the Faro Diesel Facility**

Permit Year	2021			2022			2023		
	1	2	3	1	2	3	1	2	3
Diesel Generation (MWh/yr)	515	261	3100	515	313.2	3100	515	208.8	3100

### 3.3 Regulatory Context

#### 3.3.1 Regulation under the *Public Utilities Act*

Yukon Energy's thermal generating stations are operated as a critical component of the Corporation's facilities required to satisfy its obligation to supply electricity service to its customers under the *Public Utilities Act*. As such, the stations are regulated by the Yukon Utilities Board (YUB) both in terms of the requirement for installed capacity, and the ability of Yukon Energy to recover any costs spent on these facilities through electrical rates.

To satisfy Yukon Energy's obligations, the generating stations must be designed and installed to ensure that the power systems are able to supply utility-grade reliable power to customers. This requires the thermal stations to meet the capacity planning criteria<sup>5</sup> reviewed by the YUB in its review of Yukon Energy's 20-year Resource Plan 2011–2030 (Yukon Energy 2011), and the consequent recommendations from the YUB to the Minister of Justice dated January 15, 2007.

Yukon Energy must be able to meet utility standard planning criteria in terms of the quantity of installed thermal generation on the system, and at the right locations on the system, as well as the ability to operate the diesel generators as required to the full capability of their rated output. If Yukon Energy is not able to meet these requirements, it could experience one or more of the following conditions:

- In **very cold weather conditions**, Yukon Energy would be unable to meet the peak loads of the integrated transmission grid. This would give rise to interruptions of service on substantial components of the power grid, likely during peak load hours (e.g., daytime hours). Further, once such outages occur it becomes very difficult to resume service due to a condition known as 'cold load pick-up' where the generation available must be well in excess of the normal average load on a feeder in order to be able to restore service (due, for example, to the fact that after even a brief outage in such weather, basically every furnace fan or heat tape installed on the system will automatically be drawing load when the system is restored).

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<sup>5</sup> The criteria adopted by Yukon Energy and set out in the 20-year Resource Plan 2011–2030 are as follows:

<sup>1</sup> WAF and MD System-wide capacity planning criteria: Each system (WAF and MD) will be planned not to exceed a Loss of Load Expectation (or LOLE) of two hours per year.

<sup>2</sup> Emergency (or "N-1") WAF and MD system capacity planning criteria: Each grid system (WAF and MD) will be planned to be able to carry the forecast peak winter loads (excluding major industrial loads) under the largest single contingency (known as "N-1"). The N-1 criterion determines system capacity assuming the loss of the system's single largest generating or transmission-related generation source. In the case of WAF, this is presently the Aishihik transmission line, without which the WAF grid loses ability to access approximately 37 MW of generation.

<sup>3</sup> WAF and MD "community" criteria: For communities on the WAF or MD grids, any location with a load large enough to justify a diesel unit of about 1 MW or more will be considered as a preferred location for new diesel units if that community does not already have back-up from another source (e.g., having an existing diesel unit). The new diesel units would provide grid support, and in times of line failures would provide local generation for the communities where they are located.

- In **unplanned system outages**, particularly in winter conditions, Yukon Energy would similarly be unable to supply load. Outages due to unplanned system outages could be for an extended duration. Extended outages have occurred historically and include:
  - A major failure of the power cables at the Aishihik hydro plant on January 29, 2006, where up to six WAF diesels operated for two days to maintain power to the system. For a further eight days the WAF system operated in a constrained mode without diesels operating, but needed to be ready to operate at any time. The system was not fully restored to normal status until February 21, more than three weeks after the incident.
  - A fire at the Whitehorse Rapids hydro plant occurred in October 1997, and diesel generation was used to supply substantial components of the load.
  - A number of times in recent years and in various locations, when forest fires are in close proximity to grid locations and transmission lines are, at times, required to be de-energized.
- During periodic **drought conditions**, even at the current load levels, the diesel units could be required for energy-related reasons to maintain service to load and ensure the hydro plants can maintain their water levels within licenced ranges. For example, diesel generation for this purpose was required in the late winter of 1999 due to the severe drought conditions experienced at Aishihik in 1998 and similar conditions in Mayo in 2018 and 2019. While this can lead to sustained diesel generation, the output is typically at a low level. For example, during the early part of 1999, the average output of all combined diesel generation on WAF was 3 MW, or less than 10% of the installed diesel capability on WAF.

In **planned system outages**, such as transmission line maintenance, communities such as Faro and Dawson, which are located away from the integrated system's hydro plants require diesel generation to maintain continuity of service. If Yukon Energy's ability to use and operate the required thermal generators were to be constrained (before new permanent capacity can be brought into service) in any way that could prevent the Corporation from being able to rely on the facilities to provide a dependable supply of back-up power to customers in accordance with utility standard planning criteria, such constraints could result in one or more of the foregoing situations arising, in which Yukon Energy would be unable to supply customers with power in accordance with its obligations under the *Public Utilities Act*. This would present an obvious and acute risk of harm to human health and safety and public and private infrastructure, particularly during cold winter temperatures.

### 3.3.2 Legal & Regulatory Constraints under Environment Act and Air Emissions Regulation

Aside from the regulation of Yukon Energy's thermal generating stations by the YUB under the *Public Utilities Act*, Yukon Energy's use and reliance on its thermal facilities is constrained by the terms and

conditions of its existing Air Emissions Permit, as well as the requirements of relevant legislation that applies to the Project, including the *Environment Act* and the *Air Emissions Regulations*.

As noted in Part 2.3 above, for the purpose of assessing what, if any, potential effects the amendment of the Permit could have on human health and safety, the Designated Office should assume that Yukon Energy will continue to operate its thermal generation facilities in compliance with all relevant legislative and regulatory requirements, and that the decisions bodies and regulators will continue to enforce such requirements, in order to help ensure that no significant adverse effects occur as a result of the operation of the facilities.

Assuming Yukon Energy's Air Emissions Permit is amended to allow for the use of additional diesel generators in compliance with the terms and conditions like those contained in the existing Permit No. 60-010 (Appendix A), Yukon Energy's operation of the facilities will continue to be subject to the following requirements under the Permit:

- All associated personnel (employees, contractors or volunteers) a) have access to a copy of this permit; b) are knowledgeable of the terms and conditions of the Permit; and c) receive appropriate training for the purposes of carrying out the requirements of the Permit (paragraph 2.3);
- Yukon Energy is required to provide written notice to an environmental protection analyst before any significant change of circumstances at the site, including, without limitation, a) discontinuation of any regulated activity at the site; b) change of ownership of the site or any of the sources; and c) change to the mailing address of phone number of the permittee (paragraph 2.4);
- Yukon Energy is required to obtain approval from an environmental protection analyst prior to a) adding, modifying, removing or replacing any equipment or components relating to the release, abatement, control or treatment of air emissions; and b) before any change in location of the source(s) (paragraph 2.5);
- 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 (paragraph 2.7);
- Yukon Energy shall, in accordance with the manufacturer's recommendations and best management practices, inspect, maintain and operate the sources, any stand-alone air pollution control equipment, and testing and monitoring equipment as necessary to provide optimum control of air contaminant emissions during all operating periods (paragraph 3.2);

- Except for maintenance or test purposes, Yukon Energy shall run the sources at each site in order of highest possible efficiency under the circumstances (paragraph 3.3);
- Yukon Energy shall 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 3.3);
- Yukon Energy shall ensure that the visible emissions from any source shall not exceed an opacity of 20% as measured by an environmental protection officer (paragraph 4.1);
- In the event that the opacity of emissions from any source exceeds an opacity of 20% as measured by the environmental protection officer, Yukon Energy shall take measures to reduce the opacity of the emissions below that criterion as directed by an environmental protection officer (paragraph 4.2);
- Yukon Energy shall ensure that particulates collected using emission control equipment are contained so that there is no release of contaminants to the atmosphere or into an open body of water (paragraph 4.3);
- If ambient air quality monitoring data within the area of influence of Yukon Energy's facility indicates that one or more of Yukon's Ambient Air Quality Standards is being exceeded, and the environmental protection officer is satisfied that Yukon Energy's facility is the cause or a significant contributor to the prevailing ambient air quality condition, Yukon Energy shall undertake such mitigation measures as may be specified by the environmental protection officer to improve the ambient air quality condition (paragraph 4.4);
- If any diesel generator exceeds 3% of its annual potential to emit in a calendar year, and, in that same calendar year, if the total operating time of all the generators at that site exceeds 3% of their total annual potential to emit, Yukon Energy will create a emissions management plan to be submitted to the analyst for approval (paragraph 5.1);
- Yukon Energy will carry out any commitments in the approved emissions management plan on a schedule that is approved by the analyst (paragraph 5.2);
- Yukon Energy will submit a report to an environmental protection analyst which includes (from paragraph 6.1):
  - Total annual operating hours for all sources at all sites;
  - The estimated total annual emissions of SO<sub>2</sub>, PM<sub>2.5</sub>, CO, NO<sub>2</sub>, and N<sub>2</sub>O from each source at each of the sites, including the calculation used to determine those results;
  - Total annual emissions of volatile organic compounds (VOCs) as required in part 5.3 of this permit; and,

- A summary of the fugitive CH<sub>4</sub> monitoring program including methodology, data, and total fugitive emissions as required in part 5.4 of this permit; by March 31st of each year of this permit for the previous calendar year.
- 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 (paragraph 7.1);
- Yukon Energy is required to maintain records for at least three years in a format acceptable to an environmental protection officer, and to make them available on request for inspection by an environmental protection officer, including every plan developed under the Permit, summaries of all inspections carried out under the Permit, notes concerning any spills, leaks or unauthorized emissions, any deficiencies identified in an inspection and how and when they were remedied, and notes concerning any instance where the most efficient source was not used, and the reason for use of the less efficient source (paragraphs 8.1 and 8.2).

Yukon Energy's operation of the modified facility will also continue to be subject to all applicable requirements and prohibitions under the *Environment Act* and *Air Emissions Regulations*, including:

- The general prohibition under section 6 of the *Regulations* against Yukon Energy releasing or allowing the release of any contaminant to such extent or degree as may: (a) 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;
- Yukon Energy's obligation under section 12(3) of the *Regulations* to provide written notice to the Minister, as soon as is reasonably feasible, of any significant change of circumstances involving the permitted activity;
- The authority of an environmental protection officer under section 12(4) of the *Regulations* to conduct periodic inspections of Yukon Energy's facilities to ensure compliance with the terms and conditions of the Permit;
- The authority of an environmental protection officer to issue a "hold order" under section 153 of the *Act*, or an "environmental protection order" under section 159 of the *Act*, in any of the circumstances described in those sections;
- The authority of the Minister to issue an "environmental protection order" under section 160 of the *Act*; and
- The overriding authority of the Minister to suspend or cancel the Permit under section 91 of the *Act*, if Yukon Energy contravenes a term or condition of the Permit or a provision of the *Act* or *Regulations*, or if, in the Minister's opinion, Yukon Energy's operation of its diesel facilities "has

caused or is likely to cause irreparable or costly damage to the natural environment”, or if, on the advice of a health officer, it is the Minister’s opinion that Yukon Energy’s operation or its diesel facilities “has caused or is likely to cause a threat to public health or safety”.

It should be emphasized that if, during the term of the amended Permit, a situation arises in which the continuing operation of Yukon Energy’s could ever cause actual or imminent harm to public health or safety because of any change in circumstances or operating conditions that is not contemplated at this time, the *Environment Act* and *Regulations* will give overriding authority to an environmental protection officer and/or the Minister, in the circumstances specified, to require Yukon Energy to cease operating one or more of the diesel units, or take other action that may be deemed necessary to prevent, remedy or otherwise mitigate that harm.

Other relevant legislative requirements include:

- Section 27 of the *Occupational Health Regulations*, which stipulates workers’ exposure limits for airborne contaminants, usually based on an 8-hour permissible exposure limit;
- Sections 46 to 50 of the *Canadian Environmental Protection Act, 1999*, which speaks to the reporting requirements of the National Pollutant Release Inventory (NPRI);
- Yukon Special Waste Regulations;
- Yukon Contaminated Site Regulations;
- Yukon Storage Tank Regulations.

## 4 Project Scope

The scope of this Project is to amend the existing Air Emissions Permit (No. 60-010) to increase the operational capacity from 10.6 MW to 15.5 MW. Seven additional rental diesel generators have been added to the Site. These diesel generators will be used, as required, within the terms and conditions of the existing Air Emissions Permit. Until the permit is amended to include the additional operational capacity, the maximum operational capacity of 10.6 MW will be followed using any combination of the units installed at the station.

The temporal scope of this Project is for the foreseeable future, but given that the maximum permit term under the *Environment Act* is 10 years, that is the established temporal scope of this proposal.

## 5 Environmental and Socio-economic Setting

### 5.1 Environment Setting

The Town of Faro is situated on the unceded Traditional Territory of Ross River Dena Council, and is geographically located in the Pelly River Valley in the Anvil Mountains, which is 356 km northeast of Whitehorse on the Tintina Trench fault line on the edge of the Yukon Plateau-North Ecoregion. It is located at an elevation of approximately 690 m above sea level. The soil surrounding the facility is composed of sand and gravel layers with some silt.

#### 5.1.1 Vegetation

The Project is located within the Yukon Plateau-North Ecoregion of the Boreal Cordillera ecozone. The vegetation 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.

The Site is located within the existing Faro Diesel Facility and has been previously cleared.

#### 5.1.2 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. There is a large abundance of grizzlies in the Faro area. The Tintina Trench serves as an important migratory corridor for large numbers of sandhill cranes that breed in Alaska. The region's wetlands are also used as breeding grounds for raptors, songbirds, forest birds, and waterfowl.

#### 5.1.3 Fish and Aquatic Ecosystems

The Site is located within the Pelly River watershed. The Project is located approximately 2 km away from the Pelly River. Van Gorda Creek is the closest waterbody and is located approximately 0.15 km to the southeast.

Some of the fish species inhabiting the Pelly River are Chinook, Coho, and Chum salmon, lake trout, Arctic grayling, northern pike, burbot, and whitefish.

#### 5.1.4 Air Quality

The British Columbia Air Quality Dispersion Modelling Guideline (AQDMG; BC MOE 2015) considers baseline air quality be the concentrations from emissions of both natural and anthropogenic sources, excluding the source being modelled.

For this assessment WSP (2020a) assessed baseline air quality for the Site (see Appendix B). Typically, this is done within the modelled airshed, however, in Yukon, ambient air quality monitoring data is only available for one station located in downtown Whitehorse. Environment Canada operates an air quality monitoring station located at 1091 - 1<sup>st</sup> Avenue, as part of the National Air Pollution Surveillance (NAPS) network. There is no monitoring station in Faro.

To determine the baseline air contaminant concentrations for the Project's airshed (i.e., Faro), WSP (2020a) scaled the baseline concentrations from the Whitehorse Air Quality Station based on the emissions inventories previously developed for YEC's air assessment (SENES 2011).

The most recent 3-year data record includes monitoring for NO<sub>x</sub>, NO<sub>2</sub> and PM<sub>2.5</sub> for the period 2016–2018. Baseline data for SO<sub>2</sub> and CO were not available and were therefore not applied in WSP's assessment. The data used and analyzed for the air quality assessment is presented in WSP's report in Appendix B.

The data from the station indicate that for the three-year period (2016–2018), the maximum levels of NO<sub>2</sub>, PM<sub>2.5</sub> and PM<sub>10</sub> in Faro are well below the ambient air quality standards used by Yukon Environment.

##### 5.1.4.1 Emissions Inventory

In 2008, SENES completed an emissions inventory for Yukon Energy for the purposes of its Air Emissions Permit renewal application. Individual inventories were developed for each community in which Yukon Energy maintains diesel generators (SENES 2008).

The Town of Faro contains a small fraction of the population within the Yukon and its inventory uses scaled activity from the Whitehorse inventory in situations where local data were not available. The following are points of interest from the SENES' 2008 inventory for Faro:

- Within the inventory bounds there is very little agricultural activity both for land use activity and agricultural equipment usage.
- There were no significant point sources identified for Faro other than the Yukon Energy power plant.

- The highway traffic accounts for vehicles travelling along a 15 km stretch of the Campbell Highway.
- A population of 388 was estimated for the inventory year.
- A total of 786 flights were recorded at the local airport.
- A total of 367 cords of wood were estimated to have been burned during the year.
- Yukon Energy diesel operations contributed approximately 0.4%, 16%, and 2% of the total community emissions of PM<sub>2.5</sub>, NO<sub>x</sub>, and CO<sub>2</sub>, respectively.

### 5.1.5 Noise

WSP (2020b) completed a noise impact assessment for the Faro Diesel Facility. This study assessed existing noise sources to use as baseline levels of noise, to which Project effects would be measured against.

Currently, the Yukon does not have any specific regulatory noise guidance or criteria. For this assessment the British Columbia Oil and Gas Commission's (BC OGC) *British Columbia Noise Control Best Practices Guideline* (2009) and Health Canada's *Guidance for Evaluation Human Health Impacts in Environmental Assessments: Noise* (2017) were used.

The BC OGC Guidelines defines Permissible Sound Levels (PSL) at receptor locations using methods outlined in their document. In accordance with the BC OGC Guidelines, facilities constructed and operated before October 1998 are considered "deferred facilities" and, without outstanding noise complaints, are considered to meet the communities noise tolerance levels. The Faro Facility was constructed and operated prior to 1998 and therefore sound from the existing facility is considered to be the PSL for this Project.

Noise sources within the Facility boundaries include:

- FD1 Generator (Mirrlees KV16 Model)
- FD7 Generator (Caterpillar (CAT) 3612).

Both FD1 and FD7 are contained within generator buildings and noise sources from these buildings include air intake louvres and dampers, exhaust fans, noise breakout through façade and combustion air. For the generator buildings, there are also remote radiators located outside the building. The noise sources, along with sound power level are summarized in WSP (2020b).

Other than the generator buildings, the other buildings on site are considered sources of with negligible effects.

Hemmera (2021; Appendix D) completed actual noise monitoring measurements at the Faro Generating Station and in the Town of Faro between March 10<sup>th</sup> and 11<sup>th</sup>, 2021 to collect baseline noise data and to support the modelled assessment of potential noise impacts from the Project.

This monitoring measured sound levels for two operational scenarios in addition to collecting ambient sound levels:

- 1) Operation of the two existing generators (FD1 and FD7), and
- 2) Operation of the six rental generating units (YM20 to YM26).

For each of these scenarios, short-term noise monitoring was conducted at the southwestern corner of the generating station and at a near by residence located at 130 Dawson Drive. Baseline noise levels were established by sound measurements made at 130 Dawson Drive by conducting 24 hours of noise monitoring when no diesel generators were operating at the facility. Results of this assessment are provided in Appendix D and summarized in Table 5.

**Table 7: Noise Monitoring Results (Hemmera 2021)**

Location	Baseline (Ambient)	Operational Scenario 1	Operational Scenario 2
Facility fence line	-	60.6	72.2
130 Dawson Drive	39.4	42.8	41.7

## 5.2 Socio-economic Setting

### 5.2.1 Nearby Communities

The Faro Generating Station is located within the unceded territory of the Ross River Dena Council. The Town of Faro is located just off the Robert Campbell Highway, 356 km northeast of Whitehorse and 423 km from Watson Lake. In 2016, the population of Faro was 348 (Statistics Canada, 2017). Essential services in Faro include a municipal landfill; an RCMP detachment; the Faro Nursing Station; a hotel; schools; an airport; volunteer fire, ambulance and search-and-rescue services; and other businesses, including a bank.

### 5.2.2 First Nations

The project is located within the unceded traditional territory of the Ross River Dena Council.

### 5.2.3 Administrative Boundaries and Other Land Use Activities

Administrative boundaries that overlap with the project include group trapline concession #405 and outfitting concession #9. Hikers and other recreational users may occasionally frequent the wooded areas surrounding the Project. Land uses near the community include mining, recreation, hunting, trapping, and other traditional land uses.

## 6 Environmental and Socio-economic Effects Assessment

Given the setting and nature of the Project, three VC's were identified for this Project as having the potential for significant adverse effects: Human Health and Safety, Aural Aesthetics, and Environmental Quality. Beneficial effects from Yukon Energy's Faro Diesel Facility are also discussed here.

As mentioned in Section 2.1, potential effects to Environmental Quality are related to such things as the petroleum hydrocarbon (fuel/oil) releases. These potential effects are possible with the Project and are considered significant if they were to occur, but they are adequately addressed by standard mitigation measures (applicable codes and standards) that are part of non-discretionary legislation and regulations such as the Spills Regulations, Storage Tank Regulations, and Special Waste Regulations (pursuant to the Yukon Environment Act). In addition, operational controls currently in place under Yukon Energy's Special Waste Permit, Storage Tank Permit, Air Emissions Permit, including the amendment that Yukon Energy is applying for at this time are considered sufficient to mitigate such potential effects. As such, they are not considered further in this assessment.

### 6.1 Human Health and Safety

#### 6.1.1 Potential Effects

This Project includes increasing the operational capacity of diesel generators from the current operational capacity of 10.5 MW to 15.5 MW. The diesel generators in Faro are used to supplement Yukon Energy's hydro-electricity supply and as otherwise described earlier in this document.

Potential effects of the increase operational capacity on air quality include:

- Periodic effects to local air quality; and,
- Adverse effects to human health resulting from exposure to airborne contaminants.

The potential for significant adverse effects to Human Health and Safety as a result of Project-related activities (i.e., increasing the operation capacity from 10.6 to 15.5 MW) have been assessed by Yukon

Energy. The assessment has concluded that no significant adverse effects to Human Health and Safety will arise from the increased operating capacity for diesel generation operations in Faro.

In addition to potential adverse Project-related effects, Yukon Energy's thermal generation facilities, including the Faro Generating Station, have an obvious beneficial effect on Human Health and Safety, given Yukon Energy's reliance on those facilities for back-up power generation capacity. The diesel facilities are essential to Yukon Energy's ability to provide a reliable supply of electricity to customers on those occasions when Yukon Energy is unable to satisfy total customer demand through hydro generation alone, i.e., in emergency situations, as well as during periods of planned maintenance, or when demand otherwise outstrips hydro supply as a result of peaking demand during cold winter temperatures.

If Yukon Energy were not able to use and rely on its thermal generation facilities to provide a reliable supply of back-up power to customers in these circumstances, this would put both infrastructure and human health and safety at very serious risk, particularly during the cold winter months. Notwithstanding the potential effects of not being able to meet customer demand in such circumstances it is essential that electricity generating activities do not put other human, community, and/or environmental values at risk of serious irreversible harm.

#### 6.1.2 Effects Characterization

Diesel-fired generators produce contaminants in the combustion gases. Adverse effects can result from short-term exposure, including irritation of the tissues of the eyes, and upper and lower respiratory systems. The toxicity is dependent on the chemical concentration in the air rather than the total internal dose received by multiple exposure pathways. For criteria air contaminants (CACs) in combustion gases such as carbon monoxide (CO), particulate matter (PM<sub>2.5</sub>), nitrogen dioxide (NO<sub>2</sub>) and sulphur dioxide (SO<sub>2</sub>), exposure limits are represented by air quality standards/guidelines/objectives and are used to assess potential effects on human health. In Yukon, the Ambient Air Quality Standards are used to determine allowable exposure limits and to regulate emission rates.

It should also be noted that the effects of diesel generation emissions on human health result from the cumulative interaction of emissions from Yukon Energy and all other sources of contaminants in the airshed, including community sources such as local vehicular traffic, home heating (using either fuel oil or wood stoves), and other (non-Yukon Energy) industrial activity. Those other sources, which are not within the Corporation's control, collectively produce the majority of contaminants in the community (SENES 2008). Any potential effects on human health would be as a result of overall ambient air quality.

The nearest resident to the Faro Diesel Facility is approximately 380 m to the southeast. The nearest business is located approximately 360 m to the east-southeast. The nearest childcare facility is 785 m to

the southeast, school is 825 m to the southeast and health care facility is 860 m to the southeast (WSP 2020a).

The updated Air Quality Dispersion Modeling Assessment for the Faro Diesel Facility, completed by WSP (2020a; Appendix B), includes a thorough and comprehensive dispersion modelling analysis to assess the potential effects within the Faro airshed of five CACs produced from the diesel generators including:

- Carbon monoxide (CO),
- Sulphur dioxide (SO<sub>2</sub>),
- Nitrogen dioxide (NO<sub>2</sub>),
- Fine particulate matter (PM<sub>2.5</sub>); and
- Course particulate mater (PM<sub>10</sub>).

The potential effects of Yukon Energy emissions of those contaminants was modelled, analyzed, and assessed based on two generation/emission scenarios for the Faro Diesel Facility:

1. Existing Permitted Generation/Emission Capacity Scenario (10.6 MW); and
2. Theoretical Future Expansion Generation/Emission Capacity Scenario (16 MW).

WSP's (2020a) model evaluated compliance of the five CACs with the Yukon Ambient Air Quality Standards (YAAQS) and shows the changes in potential air quality impacts between the existing and future scenarios.

Both the existing and future expansion scenarios were evaluated assuming maximum emissions from the facility resulting from 1) maximum operating conditions; and 2) using the nameplate capacities. The modelling also assumed that the generators are emitting simultaneously and continuously year-round, which never be the case. In this way, the impact assessment is conservative. As discussed in Section 3.5.1, this additional capacity is required to meet the utility standard planning criteria and is only planned for use during extreme weather conditions (i.e., very cold temperatures), during system outages, during draught conditions and during maintenance.

Results from WSP's (2020a) model are summarized as follows:

“Despite these conservative assumptions, the ambient air quality dispersion modelling results showed that, with the exception of short-term (1-hour) NO<sub>2</sub> results, the maximum cumulative predicted concentrations for all air contaminants (PM<sub>2.5</sub> PM<sub>10</sub>, SO<sub>2</sub>, and CO) were well below their respective ambient air quality criteria. The maximum points of impingement (worst-case receptors) were all found either near the Facility or outside the Town of Faro, in both scenarios. Overall, the cumulative predicted

air contaminant concentrations from the Future Scenario were higher than those of the Existing Scenario given the increased power generation of the facility expansion.

While the dispersion modelling results predicted short-term NO<sub>2</sub> exceedances for both scenarios, the primary objective of the air quality assessment was to evaluate the potential risks on the human population residing near the facility (in the Town of Faro). The modelling results for the Existing Scenario at the maximally impacted receptor within the Faro Town showed that the cumulative predicted concentrations for all pollutants evaluated were in compliance with the YAAQS.

While the dispersion modelling predicted short-term (1-hour) NO<sub>2</sub> exceedances in the Future Scenario, the predicted air quality impacts for all the other air pollutants – including both fine and coarse particulate matter (PM<sub>2.5</sub> and PM<sub>10</sub>), SO<sub>2</sub>, and CO – were well below the YAAQS. With regard to the NO<sub>2</sub> predicted short-term (1-hour) NO<sub>2</sub> exceedances, it is important to note that the YAAQS for NO<sub>2</sub> were reduced drastically in late 2019 from 401 µg/m<sup>3</sup> previously to 113 µg/m<sup>3</sup> presently. The maximum cumulative predicted 1-hour NO<sub>2</sub> concentrations from both existing and future permit scenarios would be well below the previous NO<sub>2</sub> criteria. When compared to the newly revised NO<sub>2</sub> YAAQS, the maximum cumulative predicted 1-hour NO<sub>2</sub> concentration was 129% of the Yukon Ambient Air Quality Standards for NO<sub>2</sub> at the maximally impacted Faro Town receptor in the Future Scenario. Moreover, the predicted 1-hour NO<sub>2</sub> exceedances were found spatially limited to a confined area surrounding the Facility areas on the outskirts of Faro, with a low frequency of occurrence of 0.21% of the time (56 hours out of 26,304 modelled hours) at the maximally impacted Faro Town receptor.

These short-term (1-hour) NO<sub>2</sub> exceedances were found entirely under calm stable meteorological conditions, which typically hinder atmospheric dispersion; primarily during nighttime and in the colder months of the year; and, exclusively under west-northwest winds. Outdoor human activity would be limited during cold nighttime hours and this lowers the probability of human to be exposed to the short term NO<sub>2</sub> impacts. Combined with the low frequency of model predictions exceeding the NO<sub>2</sub> YAAQS (56 hours out of 26,304 modelled hours), there is an even lower probability of exposure to levels above the YAAQS.

Finally, it is important to note that the modelling results represent the worst-case potential air quality impacts based upon the facility's maximum operating conditions. As such, the model predicted air contaminant concentrations are conservative. Furthermore, the conditions giving rise to predicted short-term NO<sub>2</sub> 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. The typical facility emissions are expected to be much lower and would not be anticipated to result in adverse air quality impacts given the low risk of predicted exceedance under even conservative

assumptions. With model predictions indicating an extremely low risk of predicted short-term NO<sub>2</sub> impacts and low potential impacts from the other air pollutants, the overall air quality impacts from the future expanded facility are not anticipated to pose a significant risk to the Town of Faro and air quality would be anticipated to remain in compliance with YAAQS.”

### 6.1.3 Mitigation Measures

Yukon Energy’s use and reliance on its diesel facilities during the authorization period will be constrained by the terms and conditions of its Air Emissions Permit, as well as the requirements of relevant legislation that applies to the project, including the Environment Act and the Air Emissions Regulations.

Yukon Energy’s operation of the Faro Diesel Plant will continue to be subject to following requirements under the existing Air Emissions Permit:

- All associated personnel (employees, contractors or volunteers) are required to be knowledgeable of the terms and conditions of the Permit, and to receive appropriate training for the purposes of carrying out the requirements of the Permit;
- Yukon Energy is required to provide written notice to an environmental protection analyst before any significant change of circumstances at the site, including, without limitation, discontinuation of any regulated activity at the site, or any change of ownership of the site or any of the sources;
- Yukon Energy is required to obtain approval from an environmental protection analyst before adding, modifying, removing or replacing any equipment or components relating to the release, abatement, control or treatment of air emissions, and before any change in location of the source(s);
- 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 develop and maintain a fire safety/emergency plan and a current site plan in accordance with the Permit and any requirements established by the Environmental Programs Branch of Environment Yukon; such plans (and any amendments) must be approved by an environmental protection analyst, and Yukon Energy is also required to implement approved plans, and to ensure all associated personnel are familiar with them;
- 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 environmental 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 into 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;<sup>6</sup>
- Yukon Energy is required to maintain records for at least three years in a format acceptable to an environmental protection officer, and to make them available on request for inspection by an environmental protection officer, including every plan developed under the Permit, summaries of all inspections carried out under the Permit, notes concerning any spills, leaks or unauthorized emissions, any deficiencies identified in an inspection and how and when they were remedied, and notes concerning any instance where the most efficient source was not used, and the reason for use of the less efficient source.

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<sup>6</sup> Yukon Energy also commits to notifying the Ross River Dena Council Department of Lands and Resources in the case of a reportable hazardous material release (e.g., fuel/oil spill).

Yukon Energy's operation of the facilities will also continue to be subject to all applicable requirements and prohibitions under the *Environment Act* and Air Emissions Regulations, including:

- The general prohibition under section 6 of the Regulations against Yukon Energy releasing or allowing the release of any contaminant to such extent or degree as may:
  - a) cause or be likely to cause irreparable damage to the natural environment; or
  - b) b) in the opinion of a health officer, cause actual or imminent harm to public health or safety;
- Yukon Energy's obligation under section 12(3) of the Regulations to provide written notice to the Minister, as soon as is reasonably feasible, of any significant change of circumstances involving the permitted activity;
- The authority of an environmental protection officer under section 12(4) of the Regulations to conduct periodic inspections of Yukon Energy's facilities to ensure compliance with the terms and conditions of the Permit;
- The authority of an environmental protection officer to issue a hold order under section 153 of the *Act*, or an environmental protection order under section 159 of the *Act*, in any of the circumstances described in those sections;
- The authority of the Minister to issue an environmental protection order under section 160 of the *Act*; and
- The overriding authority of the Minister to suspend or cancel the Permit under section 91 of the *Act*, if Yukon Energy contravenes a term or condition of the Permit or a provision of the *Act* or Regulations, or if, in the Ministers opinion, Yukon Energy's operation of its diesel facilities has caused or is likely to cause irreparable or costly damage to the natural environment, or if, on the advice of a health officer, it is the Ministers opinion that Yukon Energy's operation or its diesel facilities has caused or is likely to cause a threat to public health or safety.

It should be emphasized that if, during the term of the Permit, a situation arises in which the continuing operation of generating equipment could ever cause actual or imminent harm to public health or safety because of any change in circumstances or operating conditions that is not contemplated at this time, the *Environment Act* and Regulations will give overriding authority to an environmental protection officer and/or the Minister, in the circumstances specified, to require Yukon Energy to cease operating one or more of the diesel units, or take other action that may be deemed necessary to prevent, remedy or otherwise mitigate that harm.

Other relevant legislative requirements include:

- Section 27 of the Occupational Health Regulations, which stipulates workers exposure limits for airborne contaminants, usually based on an 8-hour permissible exposure limit;
- Sections 46 to 50 of the Canadian *Environmental Protection Act*, 1999, which speaks to the reporting requirements of the National Pollutant Release Inventory (NPRI);
- Yukon Special Waste Regulations;
- Yukon Contaminated Site Regulations; and
- Yukon Storage Tank Regulations.

#### 6.1.4 Significance Determination

In consideration of the effects characterization, the applied mitigation measures, and applicable legislation, no significant adverse effects are expected to result from Project-related activities on the VC of Human Health and Safety.

## 6.2 Aural Aesthetics (Noise)

### 6.2.1 Potential Effects

Increasing the operation capacity of the diesel may increase noise levels as extra generators may be operated up to the capacity of 15.5 MW.

### 6.2.2 Effects Characterization

A noise impact assessment was completed for the Faro Diesel Facility (WSP 2020b; Appendix C). Noise levels of existing sources were compared to the noise levels with an increased operational capacity of up to 16 MW (note: WSP modelled to an increased capacity of 16 MW, however, Yukon Energy will use a maximum operating capacity of up to 15.5 MW, as per this assessment). WSP used the sound level of the existing operation (of 10.6 MW) as the Permissible Sound Level, in accordance with the VC OCG's British Columbia Noise Control Best Practices Guideline (BC OCG 2009). WSP then conducted standardized noise level modelling for existing operations and future expanded operations using the software package CADNA/A (Ver. 2020) and compared results.

The changes in the sound levels with the addition of generators to reach an operating capacity of 16 MW are predicted to be less than 1 dBA at the nearest community receptor, which is not considered to be a significant change and is within the acceptable range. The detailed reporting of the noise impact assessment is contained in Appendix C.

YEC also retained Hemmera to conduct direct sound level measurements at the generating station. The results of this monitoring are included in Appendix D. This monitoring found that:

*“The measured noise levels from the Facility for both the existing units and the additional rental units were measurably lower than modelled noise levels in the noise impact assessment previously completed at a desktop level. Measurements confirmed the modelling results that noise levels at nearby receptors do not perceptibly increase with the addition of the six rental units from existing conditions with the two main units (i.e., no perceptible changes with the site expansion to 15.5 MW). This represents a satisfactory confirmation of the previous findings of the noise impact assessment that the proposed site expansion in generating capacity does not result in any significant adverse effects.”*

### 6.2.3 Mitigation Measures

No additional mitigations are proposed since the increase in sound level due to the proposed increase in operating capacity is negligible.

### 6.2.4 Significance Determination

In consideration of the effects characterization, no significant adverse effects are expected to result from Project-related activities on the VC of Aural Aesthetics.

## 6.3 Effects Assessment Summary & Conclusions

As presented in earlier in this section, the Project has the potential to affect three specific valued components, including i) human health and safety, ii) aural aesthetics (noise), and iii) Environmental quality (land, water, plants and animals).

Potential effects to human health and safety result from the Project’s emissions of air contaminants (air pollution) when the generators are running to produce electricity. Yukon Energy examined the potential air emissions from the facility and found that even under the most extreme operational case human health and safety was not likely to be impacted by the Project.

Potential effects to people related to noise from the facility during operations were also examined. With the proposed addition of more generators at the site it is possible that this would increase the noise from the site such that it would cause an unacceptable negative impact to people nearby. The assessment found that the proposed addition of generators would not increase the noise levels to unacceptable levels when compared to applicable guidelines established by Health Canada and other relevant guidelines.

Finally, projects of this nature use fuel, oil, and coolants. When using such hazardous materials there is always the risk of releases to the environment, which can impact the land and water. Such activities are regulated by the Yukon and Federal Governments and require proponents like Yukon Energy to construct and operate facilities like the Faro Generating Station in keeping with strict regulatory codes

and standards. In addition, special authorizations are required to undertake such activities and Yukon Energy maintains the appropriate authorizations to guide and regulate the use of such materials and to report immediately if a release occurs. Yukon Energy has committed to extend such reporting to the Ross River Dena Council government via their Lands & Resources Department.

Having regard to the foregoing review of the potential effects of Yukon Energy increasing the diesel generation capacity at the Faro Diesel Facility, it must be concluded that no significant adverse effects to the identified valued components, within the meaning of section 56(1) of YESAA, are reasonably anticipated to result from Yukon Energy's operation of the thermal units under an amended Permit.

Accordingly, Yukon Energy requests that the Designated Office issue a recommendation to the Yukon Government under section 56(1)(a) of YESAA to allow the amendment of Yukon Energy's Air Emissions Permit to proceed, on the basis that Yukon Energy's operation of a modified thermal generation complement at the Faro Generating Station, in compliance with the terms of the amended Permit and the requirements of the *Environment Act* and *Air Emissions Regulations*, will not have significant adverse environmental or socio-economic effects in or outside the Yukon.

## 7 Acknowledgement and Certification

The information submitted in this Project Proposal is required for the purpose of conducting an evaluation under the *Yukon Environmental and Socio-economic Assessment Act*.

I acknowledge that, pursuant to sections 119 and 120 of the *Act*, a copy of this Project Proposal will be placed on a public register and be available to any member of the public to review. I understand that misrepresenting or omitting information required for the evaluation may cause delays in the evaluation or render the recommendations invalid.

I certify that the information provided is true and correct to the best of my knowledge and belief.

REDACTED

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Travis Ritchie  
Manager – Environment, Assessment & Licensing  
August 12, 2021

## 8 References

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## next steps

Over the next few months, we'll be working to get our Faro diesel plant site ready for the arrival of the rental generators. During that time you can expect to see the following.



Yukon Energy crews and contractors at the Faro diesel plant doing groundwork and installing additional electrical equipment in the yard



The arrival of the seven generators



The delivery of additional shipments of fuel now and throughout the winter

## planning for cold weather, emergencies and increased demand

THE INSTALLATION OF RENTAL DIESEL GENERATORS AT THE EXISTING FARO DIESEL PLANT

## staying safe during COVID-19

Yukon is our home too. Like you, we are committed to the health and safety of our employees, families and customers. We have developed a strict COVID-19 safety plan that makes the Faro diesel generator project COVID-safe. We will:



Maintain two metres of separation between workers



Use Personal Protective Equipment at all times



Disinfect equipment regularly



Stagger work breaks to help enforce social distancing

At Yukon Energy, it's our job to supply the electricity Yukoners need when and where they need it. Our ability to keep the lights on is especially important during Yukon's cold and dark winters when demand for electricity is the highest.

This means we're always planning for cold weather, emergencies and increased demands for electricity. That's why we rent diesel generators each year as our insurance policy against prolonged power outages until we can build more dependable renewable resources.

This winter, we're renting 17 portable diesel generators; seven more than last year. If the cold snap in January 2020 reinforced anything for us, it's that, collectively, Yukoners are using more electricity than ever before, and that more sources of dependable electricity are needed at the flip of a switch during the winter.

Ten of the rental diesel generators will be installed in our Whitehorse parking lot like last year. The other seven will be installed at our diesel power plant in Faro.

For more information, visit [yukonenergy.ca](http://yukonenergy.ca) or contact [communications@yec.yk.ca](mailto:communications@yec.yk.ca).



THERMAL ENERGY PART OF OUR  
Future-Focused Portfolio



## preparing for this winter

As demand for electricity continues to grow in Yukon, we need to make sure that all the tools in our toolbox are ready to use in case we need them.

To do that, we will be submitting a project proposal for a *Yukon Environment and Socio-economic Assessment Act (YESAA)* evaluation of the Faro power plant in the next month. If approved, we will make a regulatory application to amend our air emissions permit in Faro. The amended air emissions permit will increase the amount of electricity we are allowed to generate in Faro from **10.6 megawatts to 15.5 megawatts**. This in turn would allow us to run all of the rental units and our existing permanent diesel generators at the same time, if needed, to keep the lights on in an emergency situation.

## get involved

Our proposal will be posted on the YESAB Online Registry (YOR) website, [yesabregistry.ca](http://yesabregistry.ca).

If you would like to be involved in the YESAA process and share your views, please register on the YOR website.

The YESAA review process usually takes two to four months to complete. At the end of it, the Designated Office will provide a report and recommendation about our application.

If approved, we could have an amended air emissions licence in place by this winter.

For more information, visit [yukonenergy.ca](http://yukonenergy.ca) or contact [communications@yec.yk.ca](mailto:communications@yec.yk.ca).



Rec 210621

## reporting back on a winter with rental diesels in Faro

Yukon's electricity system is one of the greenest in Canada, as most of our electricity is generated using hydro. But, there's not always enough water to generate the electricity Yukoners need. That's why we also use a small amount of liquefied natural gas and diesel each year.

Diesel, in particular, plays an important role in helping us keep the lights on during cold weather when demand for electricity is high, and during emergencies.



For the last couple of years, we've rented portable diesel generators each winter to protect Yukoners from these types of situations. This past winter, we rented 17 portable diesel generators, seven of which were installed at our diesel power plant in Faro.

