CORNER BROOK PULP AND PAPER LTD.
BAKER'S BROOK ROCK QUARRY

Department of Municipal Affairs and Environment: Environmental Assessment Registration Number 2056

Department of Natural Resources: Quarry Permit 141102; File 711:12614

Environmental Protection Plan Document

Submitted by:
Corner Brook Pulp and Paper Ltd.
P.O. Box 2001
1 Mill Rd,
Corner Brook, NL
A2H 6J4

Prepared with the assistance of:
NCD Consulting Limited
34 Yellow Wood Drive
Paradise, NL
A1L 0X9

July 7, 2020
(revised October 14, 2020)

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1.0 NAME OF UNDERTAKING

Baker's Brook Quarry Expansion

- Quarry Permit Identification
  - File 711:12614 covering 14.1 ha

2.0 PROPONENT

2.1 Name of Corporate Body

Corner Brook Pulp and Paper Ltd. (CBPPL)

2.2 Address

P.O. Box 2001
1 Mill Rd,
Corner Brook, NL
A2H 6J4

2.3 Woodlands Manager

Mr. John MacLellan
Woodlands Manager, Woodlands Department
1 Mill Rd, Corner Brook, NL
A2H 6J4
Telephone: 709-637-3000
Email: John.Maclellan@kruger.com

2.4 Principal Contact Person

Mr. Faron Knott
Chief Forester, Woodlands Department
1 Mill Rd, Corner Brook, NL
A2H 6J4
Telephone: 709-637-3000
Email: Faron.Knott@kruger.com

3.0 INTRODUCTION

This Environmental Protection Plan (EPP) builds on the Environmental Assessment (EA) Registration document submitted to the Department of Municipal Affairs and Environment (DOE) in August of 2019. The content of the EPP is centered around addressing the conditions of the release from the EA review on January 15, 2020 as per the Minister's Decisions Letter under Registration Number 2056, File Number 2.2123.0203. **Appendix A** contains a copy of a Quarry Permit issued by the Department of Natural Resources.

The primary concerns identified in the EA review process were centered around blasting and the potential visual impacts of the quarry permit area and the historically active quarry area. Stantec Consulting were engaged to complete a detailed geotechnical assessment of the potential impacts on the Hughes Brook water supply reservoir dam and Stantec's report is included in **Appendix B**. Also included in **Appendix C** of this EPP is a Viewscape Study (VS) which is to be provided to the Department of Natural Resources (DNR) for review and approval. This is provided here as both the blasting impact study and visual impacts of the quarry both have the potential to affect nearby sensitive receptors. Also, this EPP will be submitted to DNR as most items discussed below pertain to the standard conditions of a quarry permit issuance.

Corner Brook Pulp and Paper (CBPPL) is committed to quarry development in a manner that is safe, environmentally responsible and has an in depth understanding of the potential socio-economic impacts. CBPPL recognizes that these elements are essential to developing a quarry site in a responsible manner. The EPP is intended to be a guide for CBPPL and subcontractors to follow during construction and operation phases of the extension of the existing Baker's Brook Quarry (BBQ) into the 14.1 ha quarry permit area. This EPP provides pertinent information that will enable contractors operating in the quarry area to be aware of potential development impacts.

It should be noted that this document is current as of its submission date. As development occurs and matters are identified this document may be revised and/or amended to reflect these changes. The EPP may be updated to reflect any unforeseen site conditions, changes in design and quarry development methods, and environmental performance as site development proceeds.

4.0 THE UNDERTAKING

4.1 Nature of the Undertaking

The 14.1 ha quarry permit area (File 711:12614) will be developed as a continuation of an existing and adjacent quarry, referred to as the Baker's Brook Quarry, located within the Fee Simple Mining Grant Act 5, George V, Chap. 4-5-6, 1915 and held by the proponent CBPPL. The continual development into the 14.1 ha area is anticipated to have an annual rock resource demand equivalent to previous development in the quarry area.

4.2 Purpose/Rationale/Requirement for the Undertaking

The main purpose and rationale for the 14.1 ha quarry area is to maximize rock resource extraction in a safe and sustainable manner. The resources will be utilized for the purpose of supplying civil construction material to the public and private sectors in the Corner Brook area and the surrounding communities. The site has been historically used to produce asphalt for the paving of nearby roads and highways and has been a local source of materials that has significantly reduced trucking distances from other distant quarries.

5.0 DESCRIPTION OF THE UNDERTAKING

5.1 Geographic Location

The proposed project is located roughly 6.5 km due northeast of the City of Corner Brook on NTS Map Sheet 12A/13 (**Figures 1** to **3**). The quarry is within the municipal boundary of the City of Corner Brook; its eastern boundary is adjacent CBPPL's Fee Simple Mining Grant. The 14.1 ha quarry permit area is entirely located within the City of Corner Brooks Mineral Workings Zone as per the 2011-2021 Development Regulations where quarrying is a permitted land use.

Sensitive receptors located near the proposed project area are shown on ***Figure 4*** and the closest receptor is a dwelling at just over 300 meters from the project's northern boundary.

5.2 Physical Features

5.2.1 Project Site Description

The proposed quarry permit area is located on a topographical high, the peak of which is west of the proposed quarry permit boundary. The quarry permit is generally bound to the north and east, by Highway 440 (formerly known as the North Shore Highway), with an undisturbed buffer in place and south and west by areas zoned Rural and Environmental Protection under the City of Corner Brook's Development Regulations (**Figure 2 & 3**).

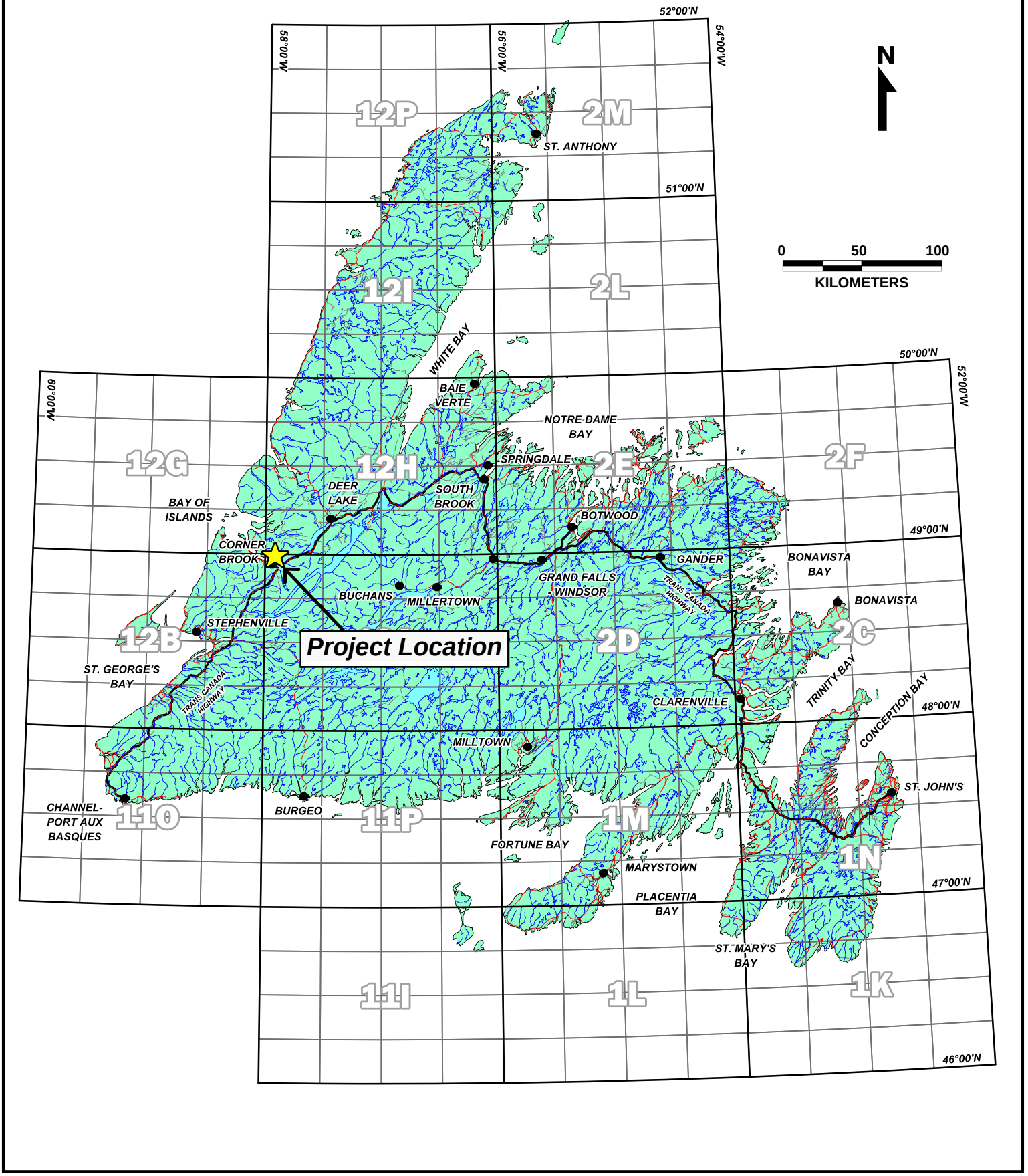


FIGURE 1: PROJECT LOCATION MAP (N.T.S. 12A/13)

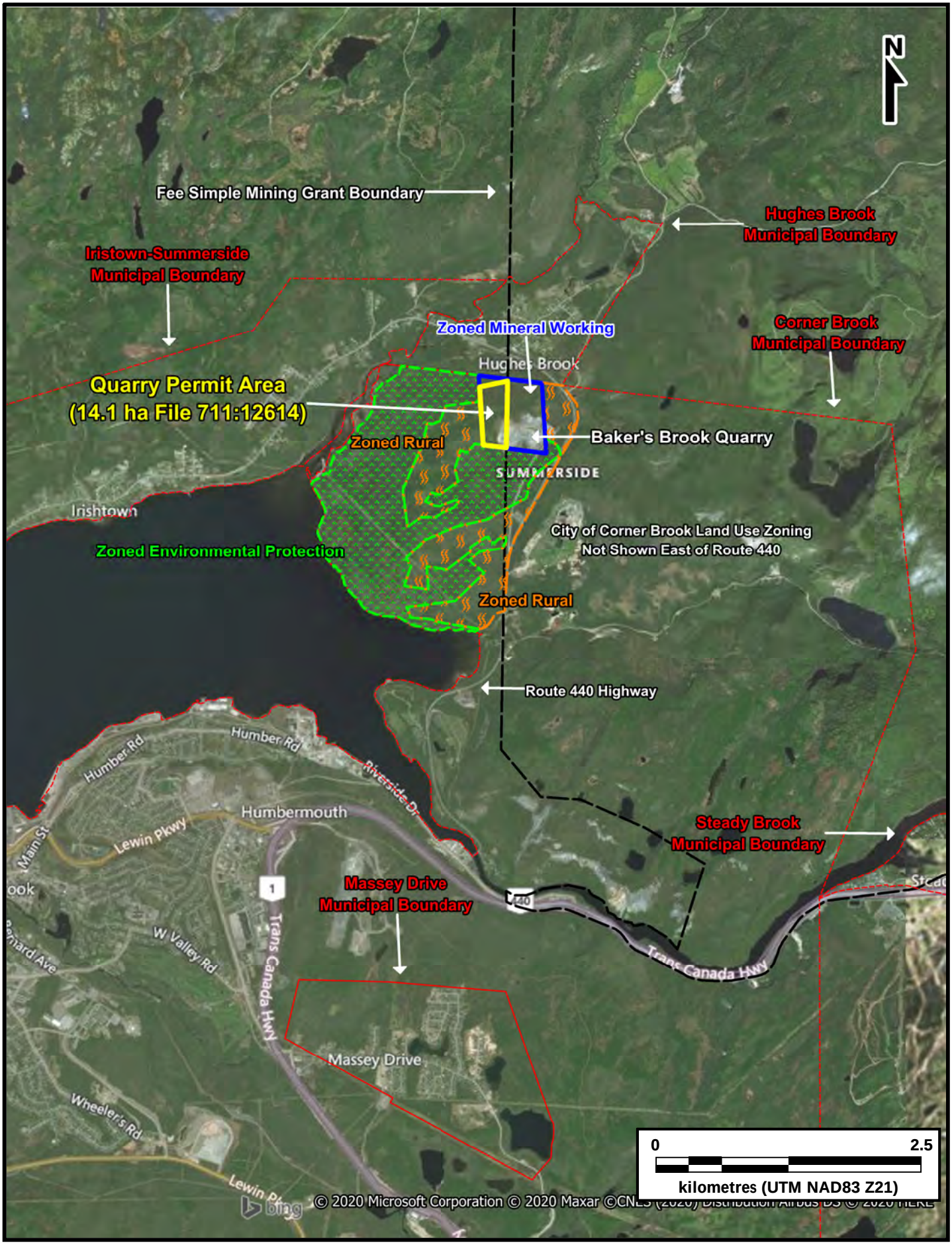


FIGURE 2: DETAILED PROJECT LOCATION MAP

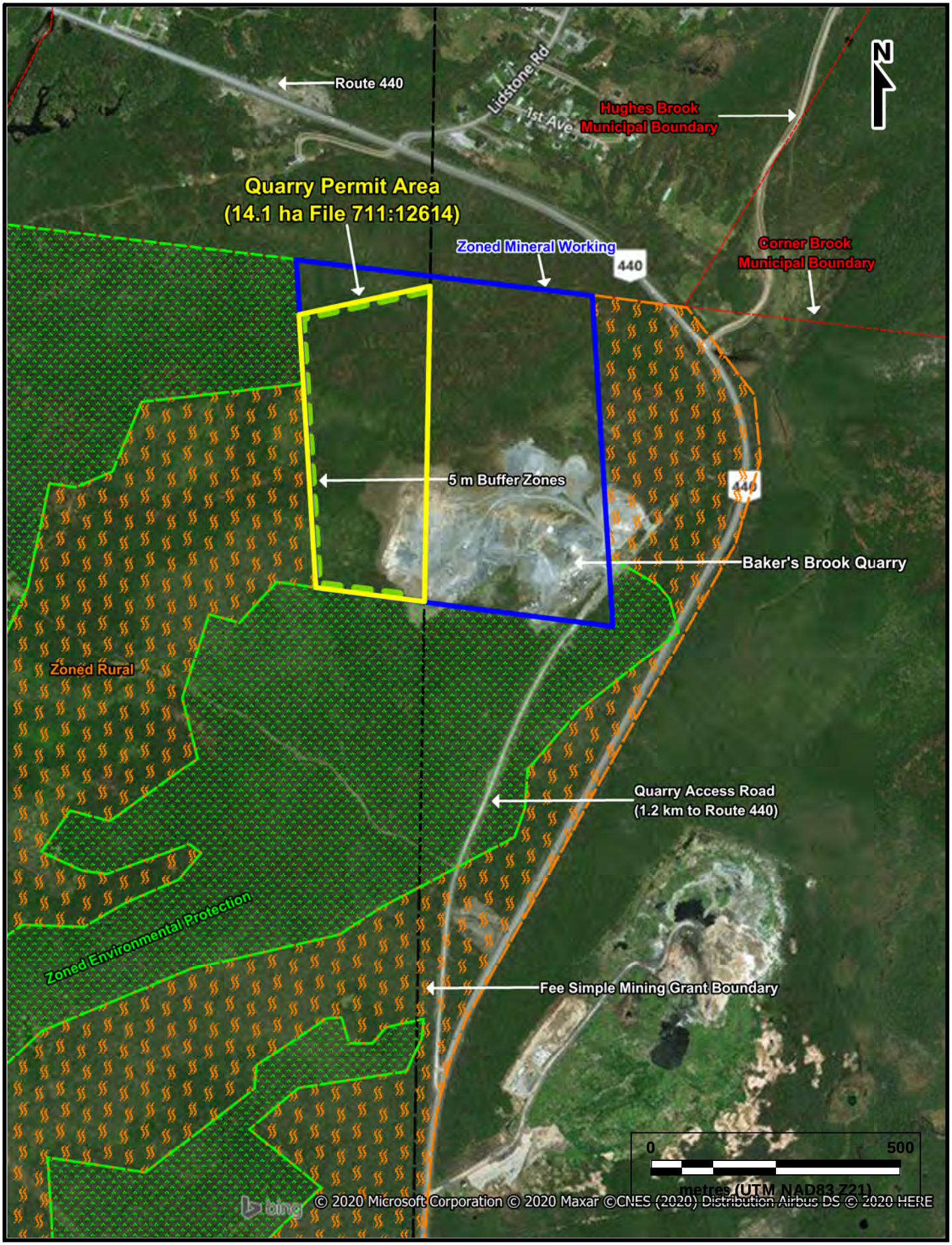


FIGURE 3: QUARRY PERMIT LOCATION MAP

FIGURE 4: RECEPTORS LOCATION MAP

5.2.2 Existing Biophysical Environment

The quarry site is located within the *Corner Brook subregion* of the *Western Newfoundland Forest Ecoregion.* This region is characterized by forested rolling hills and generally underlying marine derived bedrock, the climate is characterized by warm summers and cold winters with annual rainfall of 1,200 mm and annual snowfall of 2 – 4 m. Forests consist mostly of balsam fir with floor covering consisting of wood ferns. Elevation in the immediate area ranges from sea level to 250 m, with the quarry site located at a current ~200 m elevation on the east side of an approximately 250 m high ridge.

Drainage of the area is in 2 different directions, the southern part of the permit area drains to the southeast into the existing quarry area. The nearest brook is, Wild Cove Brook located 1.6 km away from the quarry site, which itself drains into Wild Cove. The northern area drains to the north towards Hughes Brook located 600 m away, which also drains into Wild Cove. In this area a natural vegetated buffer will remain in place to filter any site drainage which will be minimal as no washing of produced aggregate will occur within the quarry permit area.

5.2.3 Viewscape Study

Included in **Appendix C** is a Viewscape Study completed by NCD Consulting Ltd. using recent photography and drone imagery collected at pre-determined points and incorporating the topography of the area. This work was completed on June 11th and 12th of 2020 and adequately reflects the conditions at that time.

The Viewscape Study presents a development plan that will keep the quarry area mostly concealed from view with the west or back quarry wall being exposed at some points during the long-term development of the site over the next several decades. This exposure will be mitigated by progressively reclaiming the site from the south to north along the west wall as development advances. Also, it should be noted that the nearest receptor to be impacted would be at over 500 m away. **See Appendix C** for the complete report.

5.3 Construction and Operation

The construction aspect of the proposed project will consist of clearing the site from trees and grubbing before proceeding with additional new development in the quarry. Any organic material will be stockpiled for future reclamation work.

5.3.1 Site Access

Site access is already present and will not necessitate any further construction. Access to the site is via a 1.2 km gravel road extending from Route 440 directly to the quarry. This road is only utilized to access the site and is not accessible to the general public as a locked gate restricts entry, preventing potential safety issues and illegal dumping. The quarry access road is gated at the point where it meets Route 440 and is entirely within the Fee Simple Mining Grant Act 5, George V, Chap. 4-5-6, 1915; held by the proponent CBPPL. Upon leaving the access road and travelling onto Route 440 there is stop sign and clear lines of sight to the north and south along Route 440.

5.3.2 Site Clearing

Any merchantable timber will be cleared either by handheld chainsaws or mechanical harvesting equipment and will be garnered under a commercial cutting permit issued by the Department of Fisheries and Land Resources. The wood will be sent to the Corner Brook Pulp and Paper mill in Corner Brook for use as pulp or hog fuel. Surficial soils, subsoils and grubbing will be stripped and windrowed to the permit boundary. These organics will also be used to create a berm along the 170 meter contour to the north to reduce visual impacts if required. All preserved organics will be used for future reclamation.

5.3.3 Quarry Development and Operation

The location of the 14.1 ha proposed quarry area, directly adjacent to the proponent's existing quarry, was chosen to maximize the resources available in the area in order to develop the overall site efficiently. Development of the quarry will expand from the proponent's existing quarry faces at the southeastern corner of the quarry permit, towards the western boundary and then progress north. Annual production from the site is anticipated to be approximately 10,000 m^3 per year but this can vary depending on contract requirements. Development activities to be undertaken will consist of the removal and stockpiling of organics. Operational activities will consist of quarrying of rock resources by drilling, blasting and ripping. This will be performed by using heavy equipment such as excavators, front end loaders and dump trucks. Processing activities will include crushing and screening. Typical quarrying activities will take place between May and December of each year but will ultimately be dictated by the timing of seasonal spring melt and the onset of winter conditions. Should specific projects require resources from the quarry during the winter months then the site could become active during winter conditions.

Typical rock quarrying methods will be utilized at the site as have been since the area was initially developed. Blasting will be completed through a certified third-party subcontractor capable of producing the required rock size per blast. Quarry benches will

be blasted on <10m lifts. The generally small-scale volume requirements will minimize noise and potential safety concerns during blasting. All blasting will adhere to the Government of Newfoundland and Labradors Occupational Health and Safety Regulations under the Occupational Health and Safety Act and more specifically Part XIX pertaining to General Blasting.

Reclamation of the site will begin in the southwest corner of the quarry subsequent to all rock resources being extracted. Development will then move to the north with progressive reclamation being completed along the western quarry wall and limiting the amount of visual disturbance. The objective is to develop the quarry area in a safe, environmentally stable and visually pleasing manor that blends with the surrounding ecosystem while minimizing the required ground disturbance.

5.3.4 Blasting Operation Plan

A blasting operation plan is an evolving plan that will be updated as data collected from blasting dictates. Below is a plan designed for the Baker's Brook Quarry taking into consideration historical blasting parameters.

The volume of blasting will typically be ~10,000 m^3 per year. This volume will be either blasted in several phases or one single blast depending on the amount of vibration and noise produced and proximity to sensitive receptors. Based on previous blasting at the quarry an explosive charge of 600 kg was used. Initially this explosive charge will be used and monitored to determine if Peak Particle Velocity (PPV) levels are exceed at adjacent receptors. If this charge causes the PPV to be exceeded, as outlined in the Stantec Geotechnical Report, then the design of the blast will be altered to smaller maximum charge levels. As explained below the PPV levels are expected to be well below the maximum thresholds when blasting in the active quarry area and working to the west.

It should be noted that initial blasting will take place in the already developed and cleared area of the quarry with the nearest dwelling at approximately 700 m away. This is over twice the required 300 m as per the Standard Terms and Conditions of the Quarry Permit included in **Appendix A**.

The blasting plan initially will provide written notice to the Town of Hughes Brook by emailing info@hughesbrrok.com and calling the Town Clerk at 709-783-2921. The email notification will be addressed to the Town Clerk and clearly outline the date and time of blast. If changes are anticipated in the schedule, then these will be communicated directly to the Town. If any sensitive receptors are within 500 m of the blast written notice will be

provided to the property owner. Notice will also be given to the Occupational Health and Safety Division in Corner Brook at 709-637-2946 at least 24 hours prior to the blast being carried out. Blasting will only be completed during daylight hours between the hours of 7 am to 7 pm.

Prior to a blast taking place a pre blast survey will completed of nearby sensitive receptors. A formal written request to complete the survey will be provided to the property owner prior to being completed. More specifically video documentation of a home located 300 m north of the quarry permit boundary, structures in the vicinity of First Avenue and a newly built house at the intersection of Route 440 and Goose Arm Road including the Town of Hughes Brook Water Supply Dam will be documented prior to blasting. This pre blast survey will be completed by the quarry permit holder, a contractor/subcontractor active in the quarry, the certified third-party blasting company or by a third-party consulting company. Subsequent to the blast if there are any concerns raised within two weeks of the blast date a follow-up survey will be completed to determine the impacts.

It should be noted that concerns can be directed directly to the Quarry Materials Division, Department of Natural Resources an independent third party that oversees the issuance and management of quarry resources in Newfoundland and Labrador. Complaints would be directed to Mr. Gerald Kennedy the Quarry Materials Manager at 709-729-6447 or geraldkennedy@gov.nl.ca.

The process of monitoring the seismic waves (vibration) and air overpressure (noise) at the nearby dwellings and water supply dam during the next phase of blasting in the developed quarry area will provide a base line dataset to build on as development proceeds gradually to the west away from all sensitive receptors.

The certified third-party blasting company will be responsible for laying out the blasting grid design with the appropriate amount of blasting material, charge per delay, etc. to meet the rock volume requirements. This will be incorporated into the overall blast operation plan.

The third-party blasting contractor, such as NL Hard-Rok, who have completed most of the previous blasting in the area, will be required to complete geophone monitoring to record vibrations and microphone monitoring to record the decibel levels of the blasts. They will also video record the blast to identify any potential fly rock that maybe generated. The geophones and microphones will be setup at four locations. One will be at the Hughes Brook Water Supply Dam, a second at a house 300 m north of the northern

quarry permit boundary, a third in the vicinity of First Avenue in Hughes Brook and a forth near a new dwelling adjacent to the undeveloped Nature's Path Estates housing area at the intersection of Route 440 and Goose Arm Road.

Based on the geotechnical report completed by Stantec blast vibrations are not anticipated to be of concern during blasting in the previously cleared and developed area of the quarry. Thus, geophone monitoring will help determine if vibrations may become an issue as development moves towards the north. If a concern is identified, then the maximum explosive charge will need to be reduced.

If during video recording of blasting it becomes evident that that fly rock is of concern to adjacent sensitive receptors, then blasting mats will be used to mitigate this issue. Adjustments maybe made to the design of the blast also to mitigate this problem.

5.3.5 Geotechnical Assessment

A geotechnical assessment of the Hughes Brook Water Supply Dam was completed by Stantec Consulting in June of 2020. The report is included in **Appendix B** and looks at the effects of blasting at the closest points within the quarry permit area to the house located 300 m to the north and the dam located 976 m to the northeast.

The report provides information on acceptable ground vibrations and what is expected at the Baker's Brook Quarry based on previous explosive charge information supplied by NL Hard-Rok to Stantec. The calculated maximum PPV at the Hughes Brook Water Supply Dam is well below the acceptable limit. The house located north of the quarry permit boundary had a minimum and average PPV within the acceptable limits if blasting was completed at a 300 m distance. The maximum or upper calculated PPV limit value exceeds the acceptable limit when the calculation is done at a 300 m distance. If the calculation is completed at a distance of 700 m away, where current blasting is occurring, then the maximum value will fall well below the 25 mm/s threshold.

The next phase of blasting will be in the southern portion of the quarry permit area at over 700 m from the house to the north and 1,200 m from the dam location. This will provide an opportunity to safely monitor peak particle velocities at these locations and overpressure helping with future blast designs.

5.3.6 Dust Control Procedure

Quarry sites inherently produce dust during dry conditions as organic mater is removed and stockpiled exposing the underlying mineral soils and rock. Also, the manufacturing of

aggregates by crushing of rock for road building/finishing, asphalt production and many other purposes also produces a certain amount of dust during dry conditions. These stockpiled aggregates will be sprayed with water as required to reduce dust and after being sprayed it is anticipated that potential dust issues will be limited as finer materials will have settled into the stockpiled aggregates.

Clearing and grubbing operations typically take place in a quarry site after snow melting in the spring or in late fall during damper times of the year. This limits the amount of dust produced. If crushing and the transportation of aggregates generates excessive dust that is directed towards the Community of Hughes Brook then water will be used to suppress the dust via a water truck and spray system installed on the crusher/conveyer setup. It may be necessary to temporarily halt operations if there is a strong southwesterly wind directing dust from the quarry site towards the community that cannot be controlled.

In order to be as proactive as possible and to limit possible dust issues during blasting the bore holes will be filled with crushed stone to control the dust produced. Blasting will also be competed on days when there is air flow away from the community of Hughes Brook. Typically, winds would be light to moderate ranging between northwest to east, thus directing any dust away from the Community.

5.3.7 Noise Control Procedure

Generally, the site will be developed at the same scale as seen in the past. The area has been worked for several decades and with modern technology the noise produced by the operation of heavy equipment is typically lower. More efficient engines produce less exhaust emissions and produce less noise.

Blasting will be carried out on clear days to allow overpressure to carry vertically as much as possible limiting the noise effects in the surrounding areas.

Regarding crushing operations there is not anticipated to be more noise produced then has been in the past. The quarry site itself has been used in the past primarily for specific contracts and therefore crushing operations are limited to shorter intervals.

All equipment will be kept in good operating condition and fitted with noise suppression equipment where possible. This may include for example sound panels around an engine, improved exhaust systems, etc. It should also be pointed out that sound generated in the quarry will typically be deflected to the southeast off of the west and north quarry face walls. Noise will thus propagate away from the Community of Hughes’s Brook.

Quarry operations such as drilling, ripping, crushing and screening will only take place between the hours of 7 am to 7 pm. Due to the short nature of the construction season

this work will possibly be completed 7 days a week to meet contract requirements and facilitate possible rotational workers. Every effort will be made to limit the work to weekdays where possible.

5.4 Potential Sources of Pollution During Construction and Operation

The construction and operational phases of the development will utilize equipment such as chainsaws, timber harvesting equipment, front end loaders and excavators. This equipment represents a potential source of noise disturbance, exhaust emissions, the potential release of petroleum hydrocarbons, dust, domestic waste, and general refuse. Also, construction and operational activities introduce the possibility of erosion and transport of fine-grained particles such as clay and silt to nearby water bodies.

Air pollution will be controlled by having all equipment on site fitted with the appropriate emission-control equipment, and dust will be kept at a minimum by avoiding development during extended dry conditions. Site clearing will primarily be completed in the spring and/or fall of the year, at the beginning/end of the construction season, and will generally see about 0.5 ha cleared per year reducing the overall potential pollution impacts. As the site is adjacent to the proponent's existing quarry, there will not be any additional equipment required since the equipment needed is the same as current development activities that have been ongoing for decades.

Noise levels are not anticipated to exceed previous maximum levels reached. Workers will have the proper hearing protection and the work site, as noted above, is a controlled work environment.

Domestic waste generated during construction will be collected and disposed of in accordance with the Environmental Protection Act 2002. There is no need for additional portable lavatories in the proposed quarry boundaries as these are already present within the neighboring quarry when required. Waste will be removed by an approved sewage service provider.

Fuel will not be stored on site but will be brought in as required by a petroleum product service company. The handling of petroleum products on site will comply with the Storage and Handling of Gasoline and Associated Products Regulations. Complete and regularly checked emergency spill kits will be available on site at all times for containment and cleanup of any hydrocarbon leaks. Any leaks or spills in excess of 70 liters will be reported to the Environmental Emergency Telephone Line and will be promptly cleaned up.

The erosion and transport of fine-grained particles during construction and operational activities will be controlled by using appropriate mitigating measures such as erosion control ditches, check dams, hay bales, and silt fencing as required. Site runoff will ultimately be directed towards vegetated areas, acting as a filter for fine particles (See **Section 5.5** below).

5.5 Potential Resource Conflicts During Construction and Operation

Potential resource conflicts during operations could include the use of the area for recreational purposes. The area is not known to be used for such purposes, there are currently no dirt roads or ATV trails inside the permit boundaries.

Other aspects to be addressed with this undertaking are related to the visual aspect of the quarry on the surrounding residents and for individuals travelling on nearby highways, sediment erosion and control within the quarry, and any impact on wildlife. The project is located well beyond the required 30 m buffer from any water bodies that appear on the 1:50,000 NTS map sheet and sediment erosion is not considered a potential problem, however some design considerations are warranted as preventative measures. The proposed project area is located within Newfoundland Marten critical/core habitat. The following design considerations and mitigation measures will be followed to address the aforementioned concerns:

- The quarry permit area would be below the height of the land to the west and to the south. Tree screens will be left in place to restrict the line of site from both directions. This will avoid any visual impacts to the residents of the City of Corner Brook located to the southwest of the project. Individuals travelling along Route 440 would generally not be significantly visually impacted as tree heights are typically over 12 m high along the road and restrict line of sight views. Route 440, at its closest point to the quarry boundary would be 250 m away, keeping the quarry site mostly hidden by undeveloped forested land in between. The site would be partially visible from the community of Hughes Brook. An existing tree buffer between the community and the quarry site would limit this impact and keep the site generally no more visible then the current development in the existing quarry area except for the west/back quarry wall as discussed in **Appendix C**.
- Within the proposed 14.1 ha area, a 5 m wide buffer will be left within the northern, western and southern permit boundaries where no resources will be excavated (**see Figure 3**). Berms constructed from the windrowed organics will be placed within the 5 m buffer area and will serve as additional protection against sediment runoff.
- The pit floor will be kept lower than the perimeter berms where present as it progresses so as to contain precipitation water within the quarry site and contain any suspended solids in the quarry area.
- Should water runoff become a problem, erosion and sediment control measures in line with industry best management practices will be utilized. This will include silt

fencing, check dams, hay bales and erosion control ditches to prevent suspended solid drainage from leaving the site. Also, a settling depression may be constructed, if required, to temporarily hold water within the quarry and allow for suspended sediment to deposit prior to water being released into vegetated areas. Because existing sloping is towards the main Baker's Brook Quarry from the quarry permit area, these erosion control measures may be applied within that quarry as required.

- Any encounter with wildlife shall follow regulations stated in the Wildlife Regulations under the *Wild Life Act (CC. 96-809)*. During site clearing, if a marten den is encountered, it will be protected from disturbance during the denning of female and young marten between early April to end of June, as stated by the *NL Endangered Species Act* and the federal *Species at Risk Act*.

5.6 Occupation

The occupations required for the proponent's site are listed below and classified as per the National Occupational Classification (2011):

Construction

- 1 Quarry Supervisor (8221)
- 1 Heavy Equipment Operator – Loader/Excavator (7521)
- 1 Heavy Equipment Operator – Tree Harvester (7521)

Operation

- 1 Quarry Supervisor (8221)
- 2 Heavy Equipment Operators – Loader, Excavator (7521)
- 3 Heavy Equipment Operators – Screening/Crusher (7521)
- Heavy Equipment Operator (Amount based on demand) – Tandem, Tandem-Tandem and/or Semi Dump Trailers (7521)

Operation of the quarry will require approximately 6 full time employees. These employees will be utilized to both clear the quarry site area during the construction phase and extract/process material during the operational phase. This dual role is possible based on the phased development of the site over several decades which enables the quarry site to operate efficiently.

The noted required occupations for the site will be filled with current staff, no new employment will be created from the expansion of the existing quarry. Should there be a significant increase in the requirement for development/extraction due to a large-scale construction project in the region, an increase in the number of employees can be expected.

5.7 Reclamation and Closure

Upon completion of the project, the quarry will be rehabilitated within the Department of Natural Resources' quarry permit guidelines. Quarry faces will be resurfaced to implement 30-degree sloping. Subsequently, the previously windrowed and preserved organic material that was stripped during the construction phase will be re-spread to promote natural revegetation. Also, once the quarry reaches a development phase that will not require additional expansion, then progressive reclamation will begin to allow for revegetation of the site as quickly as possible.

6.0 APPROVAL OF THE UNDERTAKING

As of February 21, 2020 a quarry permit for the 14.1 ha area was issued. The quarry permit has several conditions one of which is the approval of this EPP and VS prior to development of the 14.1 ha area.

The project is located within the municipal boundary of the City of Corner Brook in a Mineral Workings Zone whereby mineral workings is a permitted use. Also, an operating permit is required for construction activities during the forest fire season. This permit is issued by the Department of Fisheries and Land Resources.

7.0 SCHEDULE

The proposed schedule for this project is as follows:

Submission of EPP Document	Early July 2020
Review of Submission Document by Government	July/August 2020
Commencement of Construction and Operations	August 2020

8.0 FUNDING

Funding for the construction and operation of project will be provided entirely by the proponent.

9.0 IMPORTANT CONTACT INFORMATION

Provided in this section is the contact information for several agencies in the event an unplanned incident occurs and/or for reference.

Corner Brook Pulp & Paper

Mr. Faron Knott, RPFNL, EP, Chief Forester

(709) 637-3155

Fire and Hazardous Material Spill

Provincial Forrest Fire Communication Center

(866) 709- FIRE (3473)

Service NL - Environmental Emergencies

(709) 772-2083

(800) 563-9089

Migratory Bird and Wildlife Encounters

Fisheries and Land Resources, Wildlife – Headquarters

(709) 637-2025

Discovery of Historic Resources

Provincial Archeology Office

(709) 729-0057

Industrial Accident

Royal Newfoundland Constabulary

(800) 363-4334 or 911

Royal Canadian Mounted Police

(800) 709-7267 or 911

Western Memorial Regional Hospital

(709) 637-3999

Occupational Health & Safety – Service NL

(709) 729-4444

Workplace NL Corner Brook

(709) 637-2700

(800) 563-2772

Town of Hughes Brook – Emergency & Blasting Notification

Town Clerk – Amanda Bennett

(709) 783-2921

Occupational Health & Safety – Service NL – Blasting Notification

Corner Book Office

(709) 637-2946

10.0 LIMITATIONS

This environmental protection plan was prepared by NCD Consulting Ltd. in consultation with Corner Brook Pulp and Paper Ltd. for their use under the terms defined in a written contract between the two parties. The information included in this document was obtained from the client, Stantec Consulting and NCD Consulting. It relates to an EPP that addresses concerns raised in the conditional EA Release of the 14.1 ha quarry permit area. It should be noted that this EPP is to be reviewed and followed by the quarry permit holder and subcontractors that are active in the quarry. The EPP may need to be updated as additional information becomes available to reflect design changes and unforeseen circumstances at the time of drafting this report. NCD Consulting Ltd. has worked with the client and utilized NCD's combined extensive knowledge in quarry development, visual impacts and potential environment related concerns to, as accurately as possible and with the information available, layout the development of the site in a safe, environmentally sustainable and socio-economic acceptable manner.

Name: Mr. John MacLellan
Position: Woodlands Manager,
Corner Brook Pulp and Paper Ltd.

Date 7/20

APPENDIX A

PERMITS AND APPROVALS

Government of Newfoundland and Labrador
Department of Natural Resources

Mineral Lands Division

QUARRY PERMIT NUMBER: 141102

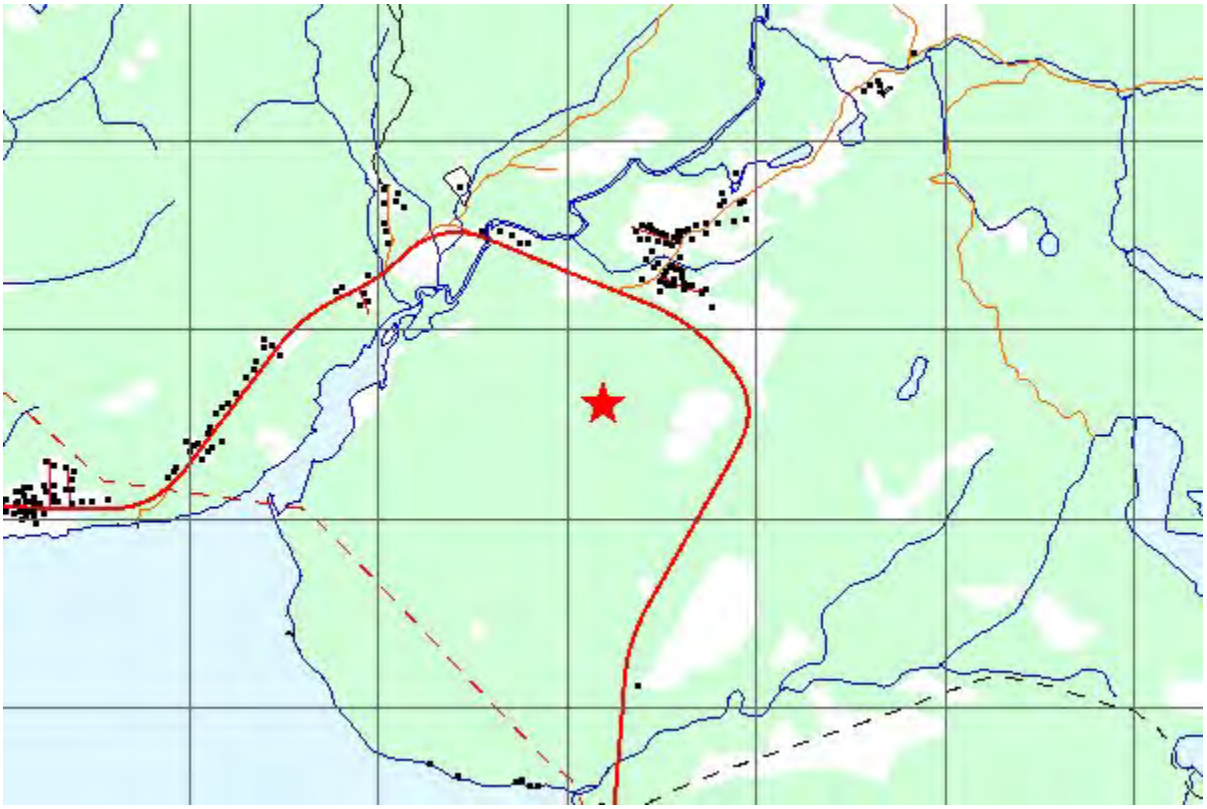
This quarry permit, issued under the provisions of The Quarry Materials Act, 1998 entitles: Corner Brook Pulp & Paper of Corner Brook, NL .

to dig for, excavate, remove, and dispose of Rock, by Crushing, Drilling & Blasting, Ripping, Screening,

for an area comprising approximately 14.1 hectare(s) located in the district of: Humber - Bay of Islands

and being more particularly indicated on a map under File Number 71112614 in the Department of Natural Resources and generally described and shown as indicated on the attached map at: 0.6km SSW of Hughes Brook .

Removal of topsoil is not allowed under this permit.
This permit is non-transferrable and expires on: **06-Feb-2021**



P.O. Box 8700, St. John's, NL A1B 4J6, Telephone (709) 729-4044, Fax (709) 729-6782

Subject to the following terms and conditions:
Definitions

"the Act" means the *Quarry Materials Act, 1998*.

"angle of repose" means the steepest angle of descent or dip relative to the horizontal plane to which a material can be excavated or stockpiled without slumping. The angle of repose can range from 0° to 90° or be described as a ratio of horizontal and vertical distances (e.g. 2:1 means 2 horizontal units of measure for 1 vertical unit of measure).

"blaster" means a person who holds a valid blaster's certificate granted by the Department of Advanced Education, Skills and Labour.

"Crown" means any department of the Province of Newfoundland and Labrador.

"Department" means the Department of Natural Resources.

"designated blast area" includes the danger area, which is the zone in which there exists a possibility of hazard to a person or property from fly rock, fume, air blast or ground vibrations, and is the area where the blaster has made arrangements to evacuate all persons whose safety might be threatened by the blasting operation.

"final rehabilitation" means rehabilitation carried out upon exhaustion/depletion of a part or all of the Quarry Permit area in accordance with the Act, the Regulations, and terms and conditions of the Quarry Permit and is supplemental to any progressive rehabilitation that has been completed.

"flyrock" means rock that becomes airborne as a direct result of a blast.

"grubbing" means the stumps, organic material and topsoil that are stripped to access quarry materials.

"inert" means material that is deemed acceptable for disposal at a location other than at an approved waste disposal facility in accordance with the Department of Environment and Climate Change's legislation and regulations.

"Minister" means the Minister of Natural Resources.

"overburden" means any unconsolidated materials located between the grubbing and bedrock.

"peak particle velocity (PPV)" means the maximum component velocity in millimetres per second that ground particles move as a result of energy released from explosive detonations.

"permittee" means the person or company to which a Quarry Permit has been issued. Where applicable, permittee means the person or company to which a Subordinate Quarry Permit has been issued.

"pre-blast survey" means a detailed record, accompanied by film or video, as necessary, of the condition of private or public property prior to the commencement of blasting operations.

"progressive rehabilitation" means rehabilitation done sequentially during the term of the Quarry Permit, within a reasonable time following individual quarry operations, in accordance with the Act, the Regulations, and terms and conditions of the Quarry Permit.

"quarry material" is defined under Section 2(1)(j) of the Act.

"the Regulations" means the *Quarry Materials Regulations, 1996*.

"rehabilitate" means to treat land from which quarry materials have been excavated so that the use or condition of the land is:

a) restored to its former use or condition; or
b) changed to another use or condition that is or will be compatible with the use of adjacent land.

"sensitive receptor" means a place of residence or commercial place of business, where people normally occupy at any given time.

A - General

1) This Quarry Permit does not relieve the permittee from:
   a) adhering to other Provincial and Federal legislation or regulations; and

   b) obtaining all other permits and authorizations that may be required for the quarry operation (e.g. municipal development permits, development control permits, crown land access and highway access permits, forestry cutting and operating permits, environmental permits for asphalt plants, stream crossing, etc.).

2) A rental fee of $120.00 per hectare and an annual quarry permit application fee of $100 are payable in advance.

3) A royalty of $0.75 per cubic metre for quarry material removed is payable within two months from the expiration of this Quarry Permit.

4) The permittee shall retain any existing tree screens between quarrying and adjacent roads, highways, waterbodies (including wetlands), or other land uses.

5) Where no tree screens exist, earth berms and/or other measures approved by the Department shall be implemented to screen the operation from the general public on adjacent roads, highways, or other land uses.

6) The Crown reserves the right to quarry and remove from the Quarry Permit, at any time, any required quarry materials free of charge without obligation to compensate the permittee in any way.

7) A copy of this Quarry Permit shall be at the quarry site and available for inspection at all times during operations.

8) Any person authorized by the Minister may at any time enter upon the Quarry Permit for Departmental purposes in order to inspect, map or examine the quarry operation.

9) This Quarry Permit may be cancelled by the Minister without notice if operations fail to comply with any of the terms and conditions of this Quarry Permit, the Act, or Regulations.

10) Any Subordinate Quarry Permit issued for this site is subject to all applicable terms and conditions of the Quarry Permit.

B - Restrictions

1) There shall be no quarrying within:
   a) 300 metres of a sensitive receptor without permission in writing from the Minister;

   b) 15 metres of private property without the written permission of the private property owner(s) Land title documentation shall be provided to the Department for verification;

   c) 90 metres of the road centerline of a protected roadway as designated under the Protected Road Zoning Regulations;

d) the building control line of a protected roadway without a development permit issued under the Protected Road Zoning Regulations. As set out in the Protected Road Zoning Regulations, building control lines are located at the following distances measured perpendicular from the road centreline:

   i. 100 metres within a municipal boundary;
   ii. 150 metres within a municipal planning area but outside of a municipal boundary;
   iii. 400 metres within an unincorporated community or outside of a settled area;

e) 50 metres of a road not specified in subsections (a), (b), (c), and (d); and

f) 50 metres of any waterbody or 30 metres of wetlands and ephemeral watercourses.

2) Removal of grubbing (e.g. topsoil) is prohibited, unless otherwise stated.

3) The permittee shall prevent unauthorized access to the Quarry Permit area.

4) The permittee shall neither pollute nor permit the pollution of any pond, brook, river or other waters, including wetlands.

5) The Fisheries Act requires that projects avoid causing serious harm to fish unless authorized by the Minister of Fisheries and Oceans Canada. This applies to work being conducted in or near waterbodies that support fish that are part of or that support a commercial, recreational or Aboriginal fishery. If quarrying related activities (e.g. access road construction) are to take place in or near a waterbody, please complete the Department of Fisheries and Oceans (DFO) Self-Assessment at: http://www.dfo-mpo.gc.ca/pnw-ppe/index-eng.html.

   a) As per Section 38(5) of the Fisheries Act, every person has a duty to notify DFO of an occurrence that results in serious harm to fish, or the deposit of a deleterious substance in water frequented by fish. Should such an occurrence take place, the Proponent shall contact DFO at 709-772-4140 or FPP-NL@dfo-mpo.gc.ca.

6) Except with the consent in writing by the Minister of Environment and Conservation, the permittee shall not interfere with any pond, brook, river or other waters, including wetlands.

7) All access roads to the Quarry Permit that traverse watercourses (e.g. streams, creeks, rivers) shall be constructed in accordance with the Department of Environment and Climate Change's regulations and policies.

8) Except with the written permission from the Minister, quarrying is not permitted to result in excavation below the water table and cause the accumulation or ponding of water. Creation of settling ponds for quarry production purposes requires both the written permission of the Minister and the Department of Environment and Climate Change.

9) Buildings or structures shall only be erected in the Quarry Permit area with written permission from the Minister. Any erected buildings, structures and equipment approved for this permit shall be temporary in nature and kept in good repair and working order.

10) The Quarry Permit area shall be kept free of scrap materials including, but not limited to refuse and abandoned or derelict vehicles, equipment, and buildings.

C - Site Preparation

1) The permittee, prior to commencing operations, shall establish suitable corner posts or rock cairns at least one-metre high and carry out suitable blazing of trees, placement of flagging, erection of fencing, or other appropriate methods to outline the area under Quarry Permit.

2) All boundary markings shall be maintained during the term of the Quarry Permit.

3) The area to be excavated shall be cleared of all vegetation prior to the removal of any quarry materials. Unless otherwise approved by the Minister, only an area necessary for the term of the Quarry Permit shall be cleared. The nearest Forestry Management office must be contacted to obtain any necessary wood cutting permits and instructions regarding the salvage of wood.

D - Quarry Operations

1) The permittee shall conduct quarry operations in an efficient manner.

2) All trees must be removed and grubbing carried out within five metres of the active quarry and stockpile areas; these activities shall remain within the boundaries of the quarry permit. Prior to stockpiling the grubbing material, any topsoil shall be separated and stockpiled separately. The permittee shall ensure that the quality of the topsoil is not affected by dilution with other materials.

3) Quarrying shall be conducted in a systematic manner taking in to account the life expectancy of the operation, the eventual slopes upon completion, the potential after-use of the site, and the various potential end-product uses of quarry materials available at the site.

4) Where mobile crushing and/or screening equipment is used to process quarry materials, Section 414 of the Occupational Health and Safety Regulations require, as applicable, equipment to have dust controls, adequate mechanical exhaust system(s), and adequate water spray system(s).

5) Noise and dust shall be mitigated on site if a sensitive receptor is within 500 metres from the Quarry Permit operation and/or for environmental reasons and in accordance with applicable industrial and environmental standards, regulations, and guidelines.

6) If blasting is required, it shall be performed under the direct supervision of a blaster who is present at the project and who holds a valid blaster's certificate which authorizes the performance of the particular type of work that the blaster is to conduct or supervise.

7) If blasting is required, the permittee and/or blaster must notify, in writing, all sensitive receptors within 500 m of the blast site.

8) If blasting is required, a drill and blast design plan shall be prepared by a qualified individual and monitoring for ground vibration and overpressure shall be carried out by the blaster to ensure compliance with appropriate guidelines. The drill and blast design plan shall include, as a minimum, the following:

   a) PPV and design peak sound pressure level at 300 m radius from the area of the blast or to nearest utility, residence, structure, or facility;

   b) Number, pattern, orientation, spacing, size, and depth of drill holes;

   c) Collar and toe load, number and time of delays, and mass and type of charge per delay;

d) Setback distances to affected fish habitat;

e) The explosive products to be used; and

f) The designated blast area.

The drill and blast design plan shall be kept on site at all times.

9) If blasting is required, a pre-blast survey shall be prepared for all buildings, utilities, structures, water wells, sewage disposal systems, and other facilities likely to be affected by the blast. The standard inspection procedure shall include the provision of an explanatory letter to the owner or occupant with a formal request for permission to carry out an inspection and to obtain any necessary water samples for analysis and flow testing. The pre-blast survey shall include, as a minimum, the following information:

a) Type of structure, including type of construction and if possible, the date when built;
b) Identification and description of existing differential settlements, including visible cracks in walls, floors, and ceilings, including a diagram, if applicable, room-by-room. All other apparent structural and cosmetic damage or defect shall also be noted. Defects shall be described, including dimensions, wherever possible; and
c) Digital photographs or digital video or both, as necessary, to record areas of significant concern.

Photographs and videos shall be clear and shall accurately represent the condition of the property. Each photograph or video shall be clearly labelled with the location and date taken.

A copy of the pre-blast survey, including copies of any photographs or videos that may form part of the report shall be provided to the owner of that residence or property, upon request.

10) If blasting is required, it shall only be carried out during daylight hours and at a time when atmospheric conditions provide clear observation of the blast from a minimum distance of 500 metres.

11) If blasting is required, it shall not be carried out on a holiday or between the hours of 6 PM on any day and 8 AM the following day. These time constraints do not apply if it can be demonstrated that a sensitive receptor does not exist within 1000 metres of the Quarry Permit.

12) If blasting is required, all fly rock shall be contained within the Quarry Permit via the use of blast mats, adjustment of drill and blast plan, or other appropriate operational measures.

13) Benching or other operational processes may be necessary to allow for the extraction of specific types of quarry materials or to prevent the contamination of relatively high quality materials by low quality materials. High quality materials shall not be used when lower quality would be adequate (e.g. materials suitable for hot-mix asphalt applications shall not be used for fill or road subgrade applications), unless contract requirements specify otherwise.

14) Without written permission of the Minister, quarry faces and bench heights shall be maintained in accordance with Section 409(2) of the Occupational Health and Safety Regulations. Specifically,
a) the bench/face height quarries developed in unconsolidated material shall not exceed five metres and not be higher than can be reached safely with the equipment in use;

b) the bench/face height of quarries developed in consolidated (bedrock) shall not exceed ten metres and not be higher than can be reached safely with the equipment in use;

c) where there are two or more benches, berms shall be constructed on the second and higher benches to prevent material from falling to a lower bench;

15) Progressive rehabilitation is required for all operations throughout the term of the Quarry Permit.

E - Termination of Operations and Rehabilitation

1) Not less than thirty days prior to removing equipment from the Quarry Permit, the permittee shall notify the Department to arrange for an inspection of the site.

2) Prior to progressive or final rehabilitation of any part of the site, the site shall be inspected for waste materials (e.g. petroleum products, garbage, plastics, metal, and waste equipment). Any waste materials shall be removed from the site and taken to an approved waste disposal facility.

3) Upon completion of the operation or during extended periods of shutdown, where the quarry haul road accesses directly onto a provincial road/highway, municipal road, or publicly accessible road, the quarry haul road shall be barricaded (e.g. ditch/berm, gate) to the satisfaction of the Department.

4) The Department may require the permittee to perform maintenance on the portion of the quarry haul road that accesses directly onto a provincially maintained road/highway, municipal road, or publicly accessible road. Any maintenance to be performed on the quarry haul road or access from the road shall be at the expense of the permittee.

5) For final rehabilitation, quarries developed in unconsolidated material (sand and gravel) shall be sloped at 3:1; and quarries developed in consolidated (bedrock) sloped at 2:1. If approved by the Department, the slopes may conform to that which existed prior to quarrying and/or be left at a safe angle of repose. Surplus overburden may also be used to attain proper slopes; grubbing shall then be spread uniformly over the slopes.

6) If approved by the Department, if there is insufficient overburden available on site, clean inert fill may be imported for the purposes of carrying out final rehabilitation described in Paragraph E(5).

7) If approved by the Department, if there is insufficient grubbing to completely re-cover the site after sloping is complete, an additional organic substitute material shall be used to complete the process, provided that no invasive species are introduced. Acceptable substitute materials are straw, hay, trees having been cut in other parts of the quarry area, or ground vegetation produced by seeding.

8) If approved by the Department, final rehabilitation of the quarry site as outlined in Condition E(5) may not be required, where the Department confirms that the excavated portion(s) of the Quarry Permit contains sufficient reserves of quarry materials for future use. In this case, final rehabilitation may be required only for depleted areas of the site. Sloping and seeding of remaining topsoil and overburden stockpiles may be required.

9) Upon surrender, cancellation or expiration of the Quarry Permit, the permittee shall, within thirty days after the surrender, cancellation or expiration, remove from the permit area any buildings, machinery, chattels, personal property and quarry material which have been extracted. In default of doing so, the Minister may sell or otherwise dispose of the said buildings, machinery, chattels, personal property and quarry material under such terms and conditions as is considered appropriate. In the event that the cost of disposing of the said buildings, machinery, chattels, personal property and quarry material exceeds the amount recovered by the Minister, the permittee shall pay to the Minister any deficiency.

10) A complete report, on the form available from the Department, stating the actual quantity and type of material removed under this permit shall be filed with the royalty payment referred to in Condition A(3) of this Quarry Permit.

"Special Terms" additional to the above terms and conditions:

Copies of all required permits or other authorizations must be submitted to this office prior to commencing any work. Failure to abide by this condition will result in cancellation of the quarry permit.

When scheduling blasting activities, the proponent shall provide the coordinates and time of blasting to NAV CANADA so that it may be issued in a Notice to Airmen (NOTAM). This would also serve as a notice to other low flying aircraft (ie. helicopters, off-shore aircraft, etc.) to avoid these areas at specified times.

In the event blasting is required, ensure that the Blasting Requirements of Part XIX of the NL OHS Regulations are followed.

By holding a permit on this site, Corner Brook Pulp & Paper is inheriting the responsibility for remediation of all future disturbances (e.g., draining water, final rehabilitation, etc.).

Corner Brook Pulp & Paper must prepare and submit an Environmental Protection Plan (EPP) for the construction and operation phases of the undertaking to be approved by the Minister of Municipal Affairs and Environment prior to construction. The EPP shall include, but not be limited to the following conditions:

1. A blasting operations plan that meets the Standard Terms and Conditions of a quarry permit, and which also includes the notification process to nearby residents, methods for monitoring and dampening blast vibrations, methods for controllong fly rock and dust, video recording of each blast for fly rock assessment, and a pre-blast survey. The pre-blast survey must include a determination of the impact of blasting on the Town of Hughes Brook water supply reservoir dam.

This determination must be supported by a geotechnical/seismic assessment conducted by a qualified geotechnical engineer. The blasting operations plan shall also commit to notifying the Occupational Health and Safety Division - Corner Brook Office (709-637-2946), prior to the day of any blasting activity.

2. Control measures to reduce dust generation from all quarry operations.

3. Control measures to mitigate noise from the site to surrounding areas.

Corner Brook Pulp & Paper must submit a viewscape management plan that systematically evaluates visibility of the proposed quarry from all locations of potential concern, including locations within the Town of Hughes Brook. This plan must be reviewed and approved by the Department of Natural Resources (DNR)(Quarries Section) prior to any construction activities. Depending on the results of the viewscape management plan, modifications to the quarry development plan may be required. For the requirements of this plan, please contact DNR at (709) 729-5748.

The Local Governance and Land Use Planning Division advises that a development permit from the City of Corner Brook is required for this undertaking. CBPP must comply with the conditions of the Mineral Workings Zone, which includes the minimum sepaeration distances of 50m from public highways or streets, 300m from existing or proposed residential development, and 150m from areas that may be developed during the llife of the mineral working. For further information, please contact the City of Corner Brook at (709) 637-1666.

CBPP are hereby advised that although there are no concerns at this time, the proposed project is within an area having potential for oil & gas exploration/production. It is recommended you consult with Newfoundland and Labrador Hydro and Newfoundland Power to locate any electricity related assets/infrastructure near the project such as dams, to avoid any potential conflict. For further information, please contact the Department of Natural Resources at (709) 729-5811.

Must use existing access.

The proposed quarry falls within Newfoundland Marten critical and core habitat. Newfoundland Marten are listed as Threatened under the Newfoundland and Labrador Endangered Species Act (NLESA). Section 16 (1) of NLESA states, "A person shall not disturb, harass, injure, or kill an individual of a species designated as threatened, endangered, or extirpated".

Denning of female marten and young occurs from early April to the end of June and dens must be protected from damage and disturbance during this time period as dens are protected under the provincial NL Endangered Species Act and the federal Species at Risk Act. Habitat disturbance impacts also other wildlife negatively.

To help reduce any negative impacts on any species, the FORESTRY & WILDLIFE BRANCH recommends that vegetation clearing or excessive noise be undertaken outside of the nesting, breeding and brood rearing period, which runs from early-

April to mid-July as disturbance could result in negative impacts on survival or condition of young or denning females (Marten Recovery Plan 2010).

Activities, disturbance and habitat destruction must be minimized as much as possible in order to avoid causing harm to individuals or degrading important marten habitat. This includes minimizing the number of trips using snowmobiles, ATVs or other means of transportation and to travel with caution within the area at all times.

The Wildlife Division advises the applicant to operate under the established regulations and guidelines with respect to mitigating disturbance of wildlife and its habitat (e.g., nesting birds, caribou, waterfowl, wetlands, inland fish, rare plants, riparian species) - see Section 106 of the Wildlife Regulations to the Wildlife Act (O.C. 96-809): www.env.gov.nl.ca/env/wildlife/index.html).

Pursuant to Section 106 of the Wild Life Regulations: A person shall not operate an aircraft, motor vehicle, vessel, snow machine or all-terrain vehicle in a manner that will harass any wildlife.

Habitat disturbance and noise impact the wildlife (birds and animals) and should be kept to a minimum, especially during the nesting, breeding and brood-rearing season (approximately May to mid-July) and, in order to reduce negative impacts on any species, vegetation clearing and excessive noise should only occur outside of this most critical period. Where vegetation clearing cannot be avoided and an active nest is found during the breeding season, the nest and surrounding vegetation are to be left undisturbed and construction activities minimized in the immediate vicinity of the nest until the young have fledged and left the area.

The Wildlife Division recommends no activity within 30 metres of waterbodies and wetland areas to protect sensitive riparian and aquatic species and their habitat.

No vegetation clearing is to occur within 800 metres of a bald eagle or osprey nest during the nesting season (March 15 to July 31) and 200 metres during the remainder of the year. The 200m buffer also applies to all other raptor nests (e.g. Northern Goshawk, Sharp-shinned Hawk, Merlin, American Kestrel, Great-horned Owl, Boreal Owl, Northern Saw-whet Owl). The location of any raptor nest site must be reported to the Wildlife Division.

The Migratory Birds Convention Act, 1994, Migratory Bird Regulations, Wild Life Act and Wild Life Regulations protect birds and prohibit the disturbance or destruction of bird nests and eggs in Canada. Proponents are advised to develop and implement appropriate preventative and mitigation measures to avoid incidental taking of birds, nests and eggs.

Certain species of migratory birds (e.g. Bank Swallows) may nest in large piles of soil left unattended-unvegetated or quarry excavation faces during the most critical period of the breeding season (April 15th through August 15th). To discourage this activity, the proponent must consider preventative measures such as sloping of excavation faces and stockpiles to prevent migratory birds (e.g. bank swallows) from establishing nests in excavation faces/stockpiles.

Should migratory birds occupy stockpiles or excavation faces, any industrial activities (including hydro seeding) will cause disturbance to these migratory birds and inadvertently cause the destruction of nests and eggs. Alternate measures will then need to be taken to reduce potential for erosion, and to ensure that nests are protected until chicks have fledged and left the area.

For species such as Bank Swallows, the period when the nests would be considered active would include not only the time when birds are incubating eggs or taking care of flightless chicks, but also a period of time after chicks have learned to fly, because Bank Swallows return to their colony to roost.

There is no open season for any wildlife species that is not named in the annual hunting and trapping orders. The proponent must follow appropriate hunting and trapping protocols as set in the annual Hunting and Trapping Guide. Proponents are advised to develop and implement appropriate preventative and mitigation measures to avoid incidental take of wildlife species.

The proponent must, generally, ensure that activities associated with the Quarry Operations are conducted in compliance with the Occupational Health & Safety Act and its Regulations. This includes the responsibility for ensuring that contractors hired to perform the work also comply with this regulation, as per OHS Act s.10.

A Permit is required under the Water Resources Act, 2002, specifically Section 48 http://assembly.nl.ca/Legislation/sr/statutes/w04-01.htm for any work in any body of water (including wetland) including but not limited to culverts, bridges, diversion channels, etc. Contact: Manager, Water Rights, Investigations and Modelling Section - (709)729-2295 or waterinvestigations@gov.nl.ca.

Effluent or runoff leaving a site must conform to the Environmental Control Water and Sewage Regulations, NLR 65/03. (http://assembly.nl.ca/Legislation/sr/regulations/rc030065.htm). This will include, but may not be limited to water removed from the quarry, aggregate wash water, surface runoff and groundwater.

All heavy equipment used in the construction and operating phase of this project should be operated in a manner to maximize fuel efficiency, thereby reducing greenhouse gas emissions that could contribute to climate change.

All on-site fuel storage must be registered with Service NL.

At no time are fuel tanks to be located such that refueling is conducted by gravity flow.

Spills in excess of 70 litres and all leaks must be reported immediately to the 24-hour spill-report number (call 709-772-2083) or 1-800-563-9089.

All spills and leaks, regardless of volume, must be cleaned up immediately and the affected area inspected and given clearance by Service NL.

A commercial cutting permit is required prior to any clearing at the site and, during the declared fire season (usually May 1st to October 15th), an operating permit also is required.

For Minister of Natural Resources

Date: 07-Feb-2020

APPENDIX B

STANTEC CONSULTING LIMITED
GEOTECHNICAL REPORT

Stantec Consulting Ltd.
141 Kelsey Drive, St. John's, NL A1B 0L2
Tel: (709) 576-1458 Fax: (709) 576-2126

June 9, 2020
File: 121623057

Attention: Brad Dyke, P.Geo.
NCD Consulting Ltd.
34 Yellow Wood Drive
Paradise, NL
A1L 0X9

Dear Mr. Dyke,

Reference: Report for Geotechnical Assessment of Bakers Brook Rock Quarry Expansion for Impact of Blasting on Water Supply Reservoir Dam, Town of Hughes Brook, NL

Further to your request, Stantec Consulting Limited (Stantec) has completed an assessment for the impact of blasting on the Hughes Brook Water Supply Reservoir Dam during expansion and future operations of the existing Bakers Brook Rock Quarry. It supports the EPP being prepared by NCD Consulting for Corner Brook Pulp and Paper Limited. The work consisted of predictive blast vibration analysis at the dam using the quarry blasting details provided; a site visit to obtain a general overview of the existing quarry and general condition assessment of the existing dam; and preparation of a report to include the results of our analyses, site visit findings and recommendations with respect to the conditions of release stipulated by the Department of Municipal Affairs and Environment in the Environmental Assessment (EA) completed for the project and required for the EPP.

BACKGROUND

The expansion of Baker's Brook Rock Quarry has been released by the Department of Municipal Affairs and Environment from further environmental assessment subject to several conditions. The subject of this report forms part of the requirements for preparation of an EPP, which includes a determination of the impact of blasting at the quarry on the Town of Hughes Brook Water Supply Reservoir Dam. The work is to be supported by a geotechnical/seismic assessment conducted by a qualified geotechnical engineer.

The scope of work for the project consisted of the following items:

- Review of all available pertinent geotechnical/geological information on the quarry site and dam site.
- Review of available historical information on blasting operations at the site.
- Review of any seismic monitoring data gathered at the site during blasting operations.
- Conduct a site visit to the quarry and existing Hughes Brook dam to identify any obvious signs of distress at the dam site.
- Conduct engineering analysis for prediction of any vibration (generally in terms of Peak Particle Velocity, PPV) at the dam as a result of blasting at the Baker's Brook Quarry.
- Comparison of the predictive vibration analysis to regulatory guidelines and generally accepted engineering guidelines for acceptable limits of vibrations on dams and structures.
- Preparation of a study report to include the results of the site visit, engineering analysis and our recommendations regarding any impacts identified from this project.

Reference: Report for Geotechnical Assessment of Bakers Brook Rock Quarry Expansion for Impact of Blasting on Water Supply Reservoir Dam, Town of Hughes Brook, NL

SITE AND GEOLOGY

The Bakers Brook Rock Quarry is located about 6.5 km northeast of Corner Brook and adjacent to the Town of Hughes Brook as shown on the attached Site Location Plan provided by NCD Consulting. The plan indicates the Towns Water Supply Reservoir Dam is approximately 976 m from the proposed quarry expansion at its closest point. Although not marked on the plan, the nearest home within Hughes Brook is located about 300 m from the proposed quarry expansion area.

A review of the geological map for the area indicates that bedrock within the Bakers Brook Rock Quarry consists of limestone beds interbedded with thinner dolostone beds of the Ordovician aged Corner Brook Formation within the St. Georges Group. Folding and deformation can be observed within the beds with variations of bedding dipping about 20 to 40 degrees and ranging between northeast and northwest dip directions.

Within the area of the water supply dam nearby, the bedrock consists of dolostone, shaley dolostone and chert lenses of the similar aged Hughes Brook Formation, also within the St. Georges Group. Steeper dipping beds of 60 to 70 degrees to the northeast have been reported in this area.

The Hughes Brook Water Supply Reservoir Dam is located along the east side of the Hughes Brook gravel bypass road. It sits on a mountainside about 50 m horizontal distance above the road. Based on a review of the Municipal Plan provided by the Town, the reservoir dam was constructed in 1986 by capturing stream flow from a small brook emanating down over the mountain and through limestone bedrock. The dam is basically three-sided and uses the steep bedrock at the back of the mountain as formwork for the reservoir. It is generally constructed of 300 mm thick concrete walls except at the overflow spillway where a thicker concrete buttress design reinforces the outflow area. The height of the dam perimeter concrete walls varies from about 1 m up to 4 m at its highest section along the spillway. Along the Hughes Brook Road about 120 m north from the dam, the Town recently completed (2019) a new chlorination building which is now operational and fed from the dam.

A series of photographs are attached to this report to illustrate the quarry, dam and general area observed during the site visit.

BLAST VIBRATION ANALYSIS

During blasting operations, seismic waves are generated in the ground which can result in a structural response and in some cases, damage to structures, such as buildings or dams. Air overpressures (noise) from blasting also occur which can cause structural damages (namely to windows or shaking walls) but more often, the perception of the overpressures to humans can be very disturbing. Due to our sensitivity to noise and vibration, the perception of the noise often “feels worse” than what is actually happening or required for damage to occur. It is for these reasons that a construction blast may be engineered and monitored to help ensure that neither of the effects of blasting cause damage to property or persons.

Reference: Report for Geotechnical Assessment of Bakers Brook Rock Quarry Expansion for Impact of Blasting on Water Supply Reservoir Dam, Town of Hughes Brook, NL

The seismic response or vibration received at a structure has been studied by empirical methods and research which has provided for safe blasting criteria and typically based on peak particle velocity (PPV) measured from the wave event. Ground vibrations can be monitored and the PPV recorded using a digital seismograph and geophone. Similarly, air overpressures may be recorded by the same device using a microphone. The generally accepted formula presented by Oriard (1970) for predicting the PPV is as follows:

$PPV = K (D_s)^{-1.6}$

Where:

PPV = *peak particle velocity*

D_s = *square-root scaled distance (distance to receiver divided by square root of charge weight)*

K = *ground response factor* (*a variable subject to many factors including confinement, elastic properties of rock,* etc.)

The K factors have been derived mainly for blast confinement conditions as the others are inherent rock mass or soil properties or those which you have no control over. Upper and lower bound solutions (limits) have been determined and the following ranges are generally accepted by industry for prediction and blast design protection guidelines:

K Factors

Lower limit, little or no confinement:	172
Average or Normal Value, typical confinement:	1140
Upper limit, heavy confinement:	1725

Based on the above formula and the blast design information provided by the blaster (NL Hard-Rok), the following range of values of PPV have been calculated (predicted) at the dam located 976 m from the closest quarry boundary and using an explosive charge of 600 kg (maximum charge/delay):

PPV (Lower Limit):	0.47 mm/s
PPV (Average or Normal Value):	3.14 mm/s
PPV (Upper Limit):	4.74 mm/s

A prediction of PPV has also been calculated for the nearest structure to the blast, a home located 300 m from the closest quarry boundary and using an explosive charge of 600 kg (maximum charge/delay):

PPV (Lower Limit):	3.12 mm/s
PPV (Average or Normal Value):	20.70 mm/s
PPV (Upper Limit):	31.33 mm/s

DISSCUSSION AND RECOMMENDATIONS

The assessment of blasting levels is generally governed by the necessity to limit ground vibration or noise levels to minimize or eliminate the possibility of damage to nearby structures, limit the disturbance to neighbors and hence reduce complaints and claims of damage. Guidelines have been established for both mining and residential construction environments within various jurisdictions with the following generally accepted practices.

Ground Vibration for Mining Applications (geophone): less than 50 mm/s (PPV)

Ground Vibration for Residential Construction Applications (geophone): less than 25 mm/s (PPV)

Sound Pressure Level (Microphone): 125 dB (Typical Residential Environment)

Sound Pressure Level (Microphone): 140 dB (Considered “No Damage” Level for Windows)

Within the Mining Act for Newfoundland and Labrador, guidelines related to blasting are not provided in terms of limitations to vibration or noise. For comparison purposes, the Nova Scotia Environment and Labour Pit and Quarry Guidelines limit blasting activity for ground vibration (PPV) to not exceed 12.5 mm/s and noise level to not exceed 128 dB, within 7m of the nearest structure not located on the property.

The City of St. John’s Blasting Guideline is intended for the protection of residential/commercial structures and to limit disturbance of residents during construction blasting activities. The guideline specifies a Peak Particle Velocity (PPV) of less than 25 mm/s. This is generally consistent with other jurisdiction’s that we have reviewed within available publications and literature on the topic. Lesser values of PPV are assigned for example, where structures are very old, their condition is suspect or highly sensitive electronic equipment are to be protected from excessive vibration.

Based on the location of the dam within the Hughes Brook Municipal Boundary, a ground vibration (PPV) limitation of 25 mm/s is recommended. As well, based on the observed condition of the concrete dam structure at Hughes Brook, a guideline PPV of 25 mm/s is reasonable for this project. The predicted PPV value of 4.74 mm/s for maximum confinement (upper level) is well within the accepted guideline. It is also prudent to note that significantly higher values of PPV are typically required or recognized for causing damage to concrete structures. As such, we believe that the dam should not receive any damage or be at risk from the proposed blasting operations at the quarry.

However, as described above, a residential structure is located about 300 m from the proposed quarry expansion boundary and is therefore of similar concern as the closest structure to the blast. The predicted PPV value of 31.33 mm/s for maximum confinement (upper level) exceeds the guideline, while the normal or typical confinement value of PPV predicted is 20.70 mm/s. It is further understood from the Town Office that complaints have been received from the residents in the past following blasting operations. Should a pre-blast inspection of the subject home/s suggest that the buildings are of older residential construction, of precarious condition or are historic buildings, then a lessor guideline PPV of 12.5 mm/s has often been adopted to minimize possible damage. Many municipalities have adopted this approach for such conditions.

It is recommended that the selected blast design of the contractor be reviewed to confirm the information provided and described herein. As well, the blasts should be monitored from several locations using a digital seismograph including the closest home (building) and at the Hughes Brook Water Supply Dam to verify the predictions of PPV presented herein and to develop specific blast data for this site, its geology and terrain.

Reference: Report for Geotechnical Assessment of Bakers Brook Rock Quarry Expansion for Impact of Blasting on Water Supply Reservoir Dam, Town of Hughes Brook, NL

CLOSURE

We trust this report meets your current requirements and remain available to answer questions for the work described within or to provide further consultation or vibration monitoring during this project.

Yours truly,

STANTEC CONSULTING LTD.

Lorne Boone, M.Eng., P.Eng., P.Geo.
Principal, Senior Geotechnical Engineer
Phone: (709) 576-1458
Fax: (709) 576-2126
Lorne.Boone@stantec.com

Attachment: Location Plan
Site Photographs


NCD CONSULTING
N
W
E
S
976 meters
Water Supply Reservior Dam
~Fee Simple Mining Grant Boundary
House
Hughes Brook
300 meters
Existing Quarry
Crown Land
Water Supply Area
SUMMERSIDE
14.1 ha Quarry Permit App Area
Zoned Mineral Workings
Access Point
0
1,000
metres (UTM NAD83 Z21)
Scale 1:25,000
bing
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Photo 1.

Overview of Bakers Brook Quarry looking southwest.

Photo 2.

Overview of Bakers Brook Quarry looking northwest.

Photo 3.

General view looking southwest on Hughes Brook Road and new chlorination building completed in 2019. Note on top left corner of photo - water which flows from stream down below reservoir dam located in the hillside above.

Photo 4.

General view of concrete dam and spillway.

Photo 5.

General accumulation of organic debris and rocks in spillway catchment.

Photo 6.

General view of dam reservoir area. Note stream which flows down over bedrock face

APPENDIX C

VIEWSCAPE STUDY

Baker's Brook Quarry – Viewscape Study

June 26, 2020

Introduction

This Viewscape Study (VS) has been completed by NCD Consulting for Corner Brook Pulp and Paper as a condition of the Environmental Assessment Release for the Baker's Brook Quarry expansion for Project #2056 (File #2.2123.0203). The project falls under a 14.1 ha quarry permit, File 711:12614, issued by the Department of Natural Resources, Quarry Materials Division. This VS is to be submitted to DNR for review and approval prior to any construction activities.

During June 11th and 12th of 2020 a field program was carried out in and around the Baker's Brook Quarry (BBQ). The work focused on assessing the visual impacts of future quarry development to nearby sensitive receptors as depicted on **Figure 1** below. A rotary drone was used to capture photographs at predetermined locations and elevations. Also, photographs were taken from a ~1.5 m height using an iPhone to depict the view of an individual standing in a particular area or travelling in a vehicle. A digital laser measuring tool was used to accurately determine tree heights.

The photographs collected were subsequently incorporated into a GIS database to aid in providing the best representation of the potential visual impacts to nearby sensitive receptors. These receptors include but are not limited to:

1) A home located 300 m north of the northern quarry permit boundary.
2) The residents of Hughes Brook and more specifically the residents in the First Avenue area.
3) A newly constructed home at the intersection of Route 440 and Goose Arm Road.
4) A proposed residential development called Nature's Path Estates which currently does not have any houses developed or infrastructure in place besides a gravel access road.

Development Plan

The development of the BBQ is not intended to be a large-scale excavation over a short period of time. Rather the quarry is intended to be used for numerous decades, similar to its historical use over the past several decades. This process will enable for visual impacts to be reassessed as development progresses.

The quarry area will ultimately be developed to the 140 m level but initially will see the upper quarry floor dropped from the 177 m level to the 170 m elevation as development progresses to the west towards the back or west quarry wall (**Figure 1**). After development reaches the west wall it will progress from the south to north with the quarry floor being further expanded on the 170m level. As the floor and quarry development face advances forward, reclamation of the west quarry wall will begin in the southwestern corner to allow revegetation to begin as quickly as possible. The northerly advancement will extend as far as the 170 m contour as depicted on **Figure 1** thus creating a developed area that is concealed. At the 170 m contour existing trees will remain in place and extend over 12 to 15 m in height concealing the quarry

activities. The west quarry wall will be partially visible and with reclamation sloping along this west wall advancing from the south to the north, the visual impacts to the surrounding area will be kept to a minimum.

It should be noted that from this west wall it is over 500 m to the nearest receptor that would be impacted. Also, the final quarry floor is anticipated to be at ~140 m as seen in the current development, providing an even more concealed site. If there is inadequate tree screening along the 170 m contour, then an earth berm will be constructed to aid with reducing the visual impacts of the site.

3D Modelling

The 3D modelling presented on **Plates 1 & 2** was generated using MapInfo Discover 3D Software and incorporated an existing Digital Elevation Model (DEM) which excludes tree heights and represents bare ground. It also includes the local road network, quarry permit boundary and a very crude projection of development to depth.

The modelling shows that the quarry permit area has a crest of land that drops off as you move to the northern boundary. When considering this 3D topographical view with the information provided on **Figure 1** it demonstrates that development in the subsurface from the south to the north will be concealed at the 170 m level extending to the 170 m contour near the northern boundary. There will however be some exposure of the west quarry fall as noted above.

Drone Images – High Level

Several high-level drone photos were taken to aid in presenting the overall slope of the land in the quarry area. These are presented on **Plates 3 to 4**. The images show that the current development is fairly well hidden from the surrounding area and that as development advances to the north the site will remain behind a crest of land that drops off dramatically to the north towards a house as shown on **Plate 4**. The image presented in **Plate 5** shows the current quarry floor at the 177 m level and demonstrates that development will remain mostly concealed.

Drone Images – From Quarry Site

Plates 6 to 11 depict views from 3 different locations within the quarry area as presented on **Figure** 1. The images were captured at about 3 to 5 m above the tree line or as close as possible to the treetops while operating the drone safely. These points were selected as they generally represent the view from the western quarry permit boundary if there were no trees present. The photo points were taken from an altitude that factored in tree height, drone tree top clearance and the horizontal offset down slope to replicate as accurately as possible the view from the far western quarry permit boundary if trees were cleared from the site.

The drone photos from the quarry site demonstrate that in the middle and southern portion of the development there are minimal visual impacts with the view of the western quarry wall becoming more obvious near the northern extent of the quarry permit area. **Plates 7 & 9** help depict the crest of land.

Photos and Drone Images – From Sensitive Receptors

Plates 12 to 20 help provide a visual impression of what the development might look like from various locations in and around Hughes Brook. A photo was initially taken at each location, as identified on **Figure 1**, using an iPhone at a roughly 1.5 m height equivalent to someone standing. A second photo was then taken using the drone at an ~6 m height equivalent to the average height of a two-story house. When reviewing these photos, the reader needs to take into consideration that the current quarry floor elevation behind the crest of land will be lowered to 170 m and developed to the north. The fact that the current operations are not visible is indicative of future development. It should be noted that it is anticipated that the west quarry wall will be partially visible but progressive reclamation from the south to north along this wall should help limit the duration of the visual impacts.

Plate 20 provides an example of the crest of land as depicted on **Plate 4** and helps with visualizing how the development will be concealed from a house just north of the quarry permit boundary.

Tree Heights

Tree heights were photographed using a digital laser from several locations within the quarry area and along Route 440. These photos indicate trees heights are from 10.8 to 14.7 m in the area. The photos also show that the quarry site is screened from Route 440 where the road extends adjacent to the quarry area.

Discussion

Overall, the VS has presented numerous photos and drone images that give a through representation of the quarry area and future development. The photos and VS have demonstrated that, by developing the quarry on the 170 m level, or lower, to the current 170 m DEM contour, the site would have limited visual impacts to the surrounding area and quarry equipment would be concealed. If tree heights in the 12-15 m range at the 170 m contour are not sufficient then an earth berm could also be constructed which would contain organics for subsequent reclamation. The assessment also determined that a portion of the west or back quarry wall will be visible. This will be limited as much as possible by completing progressive reclamation with organics in the south and working north along the west wall as development proceeds. It should be noted that this west quarry wall is over 500 m away from the closest sensitive receptor.

The VS is an interpretation of available topography combined with accurate photos and drone images. It is extremely difficult to consider all the various angles of the overall development when completing such an assessment and therefore the visual impacts of the quarry area should be considered on an ongoing

basis and design changes made as required. These visual impacts, like a blast design plan, are continually being assessed as more information is available.

Sincerely,

Brad Dyke, P.Geo.
Owner/Operator
Office: 709-781-3773 | Cell: 709-685-1800
Email: brad.dyke@ncdconsulting.ca
Web: www.ncdconsulting.ca
NCD Consulting Ltd.

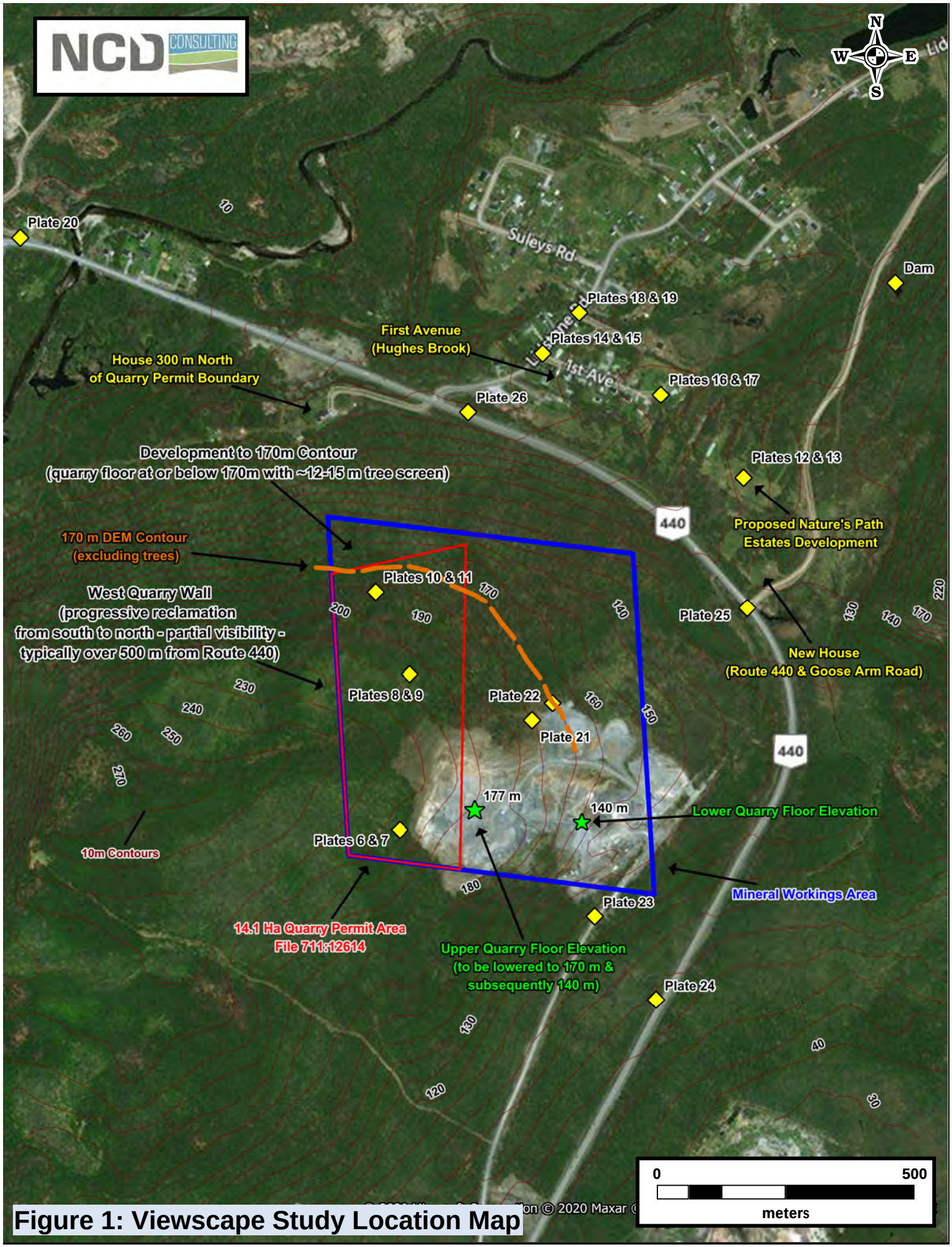

Figure 1: Viewscape Study Location Map

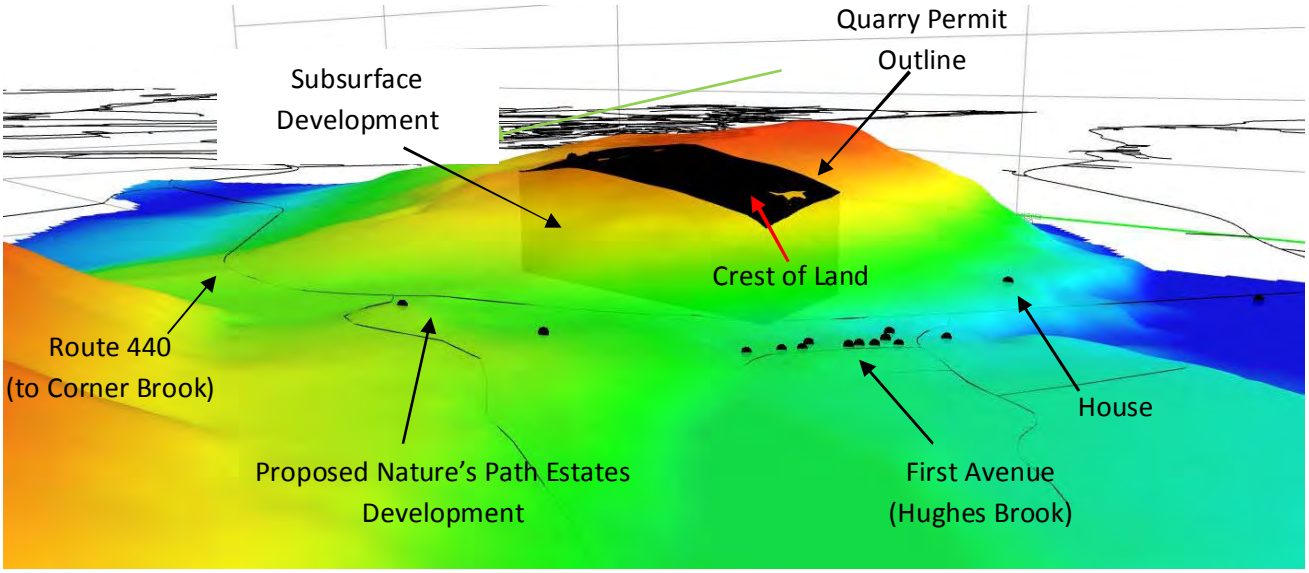

Plate 1: 3D View Looking Southwest

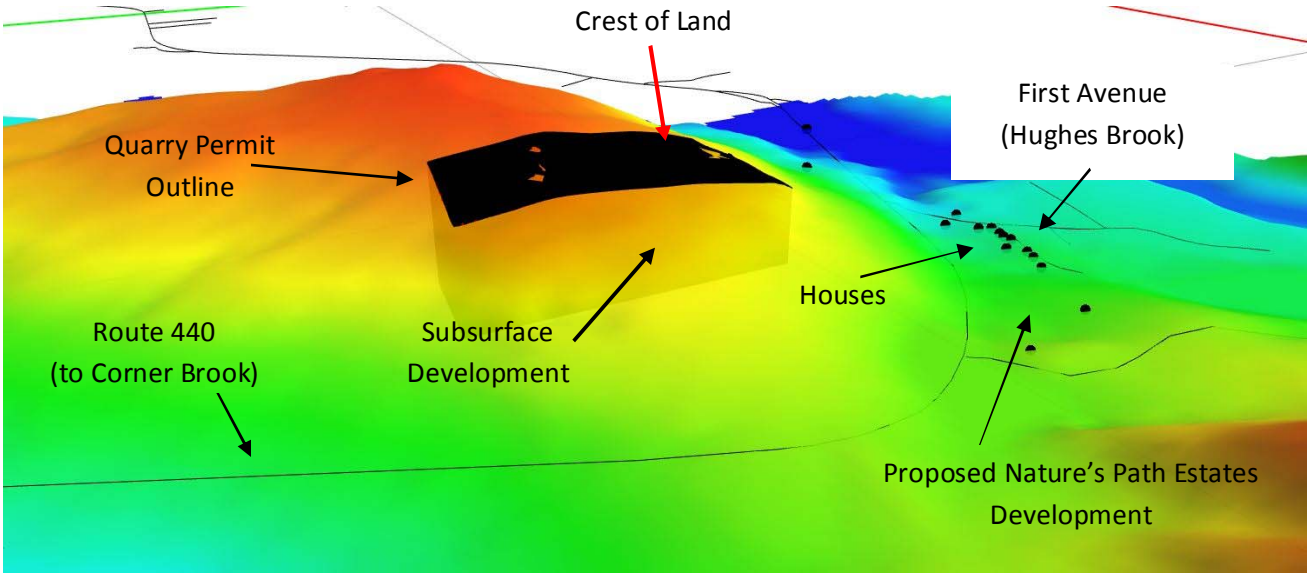

Plate 2: 3D View Looking Northwest

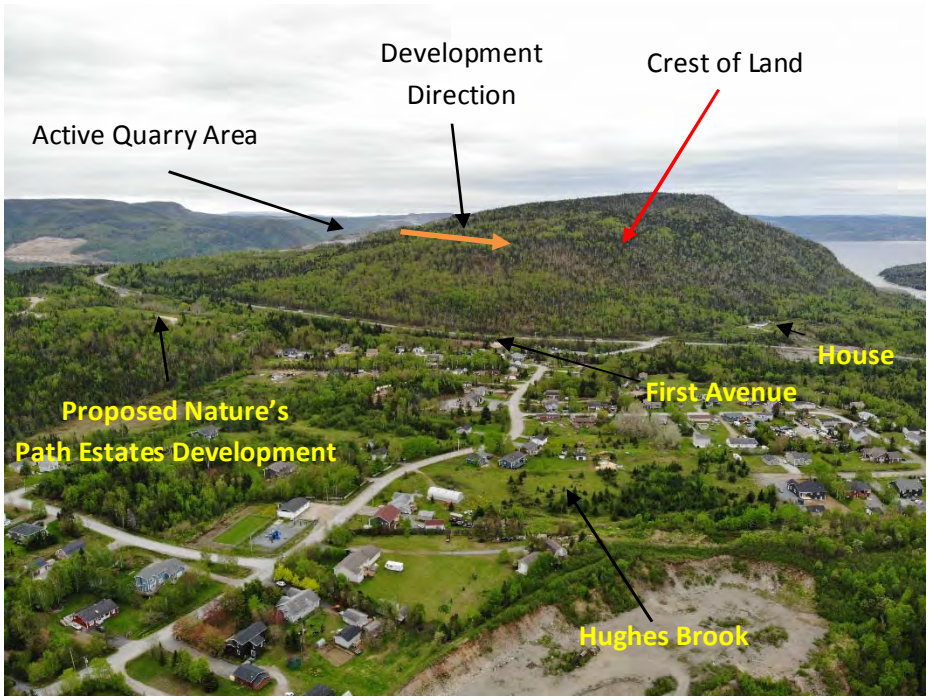

Plate 3: Drone Photo Looking Southwest (at ~100 m above ground level)

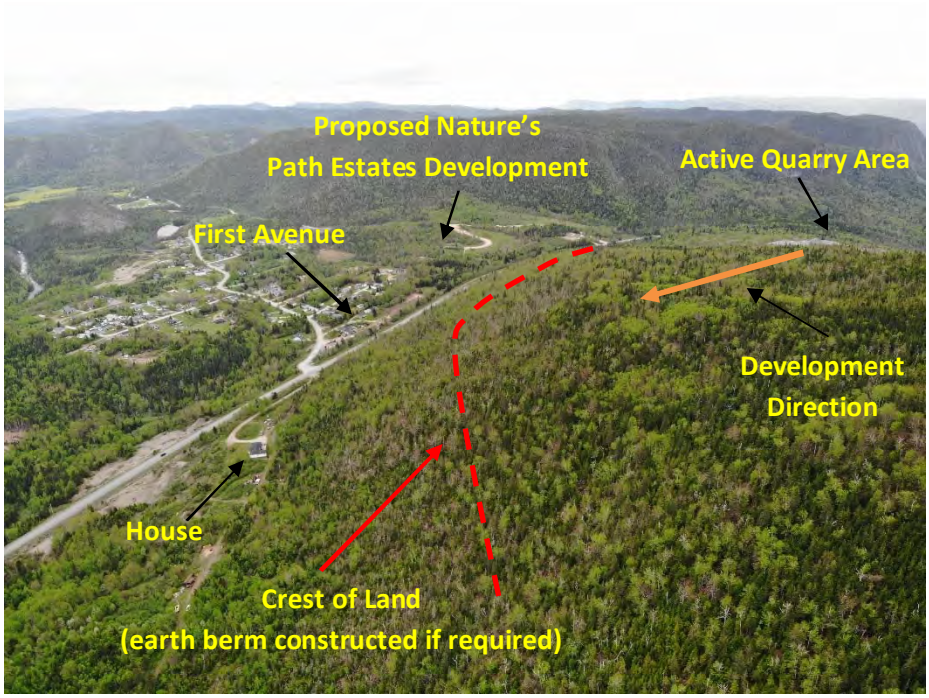

Plate 4: Drone Photo Looking Northeast (at ~100 m above ground level)

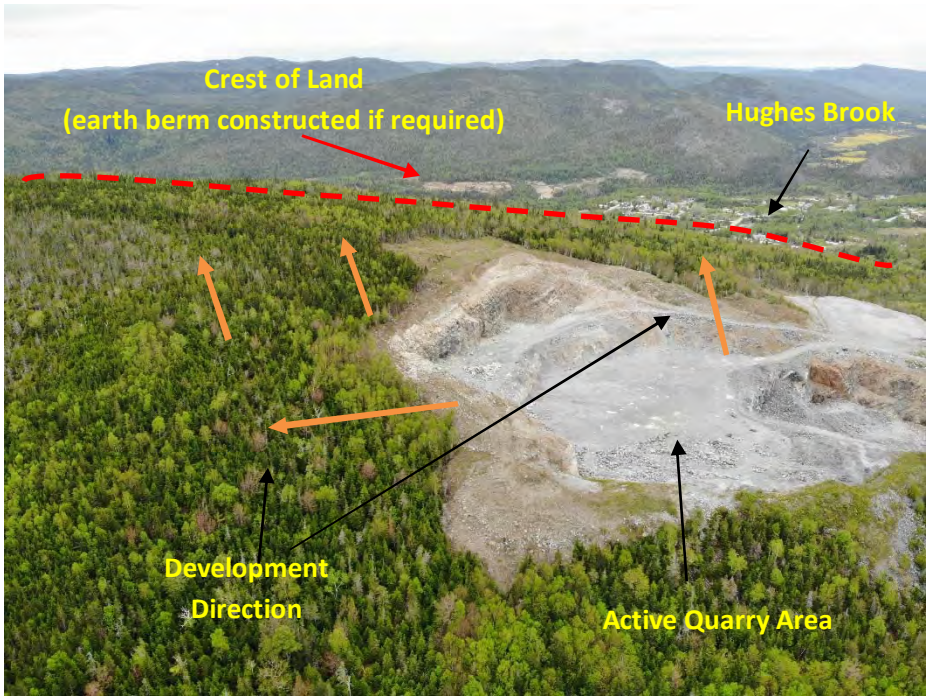

Plate 5: Drone Photo Looking North (at ~70 m above ground level)

See Figure 1 for Photo Location

Plate 6: Drone Photo Looking Towards Hughes Brook (~3-5m above trees)

See Figure 1 for Photo Location

Plate 7: Drone Photo Looking Towards House to North (~3-5m above trees)

See Figure 1 for Photo Location

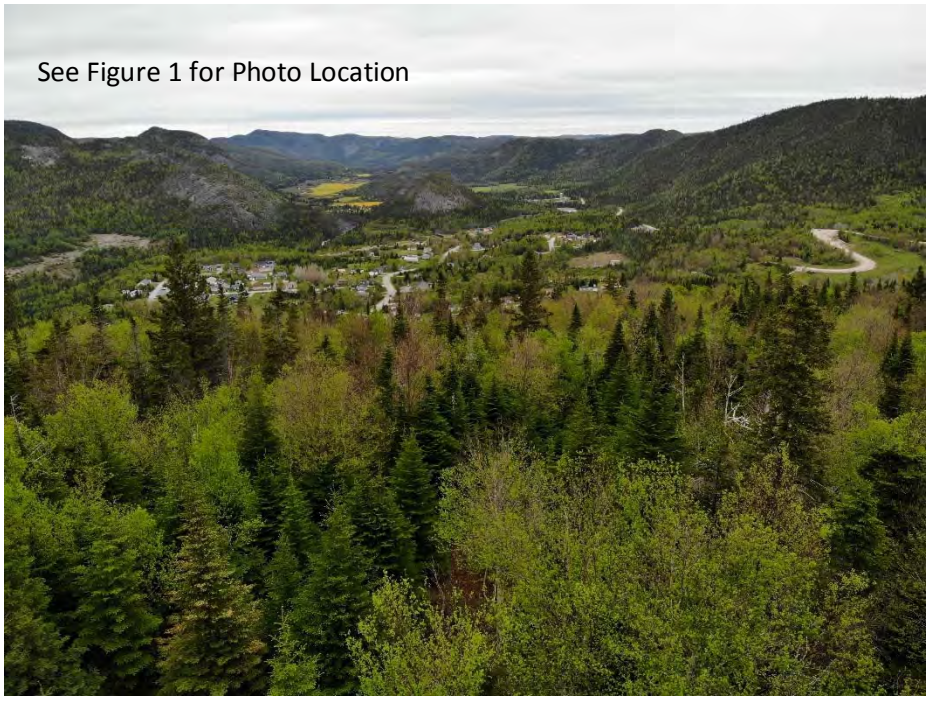

Plate 8: Drone Photo Looking Towards Hughes Brook (~3-5m above trees)

Plate 9: Drone Photo Looking Towards House to North (~3-5m above trees)

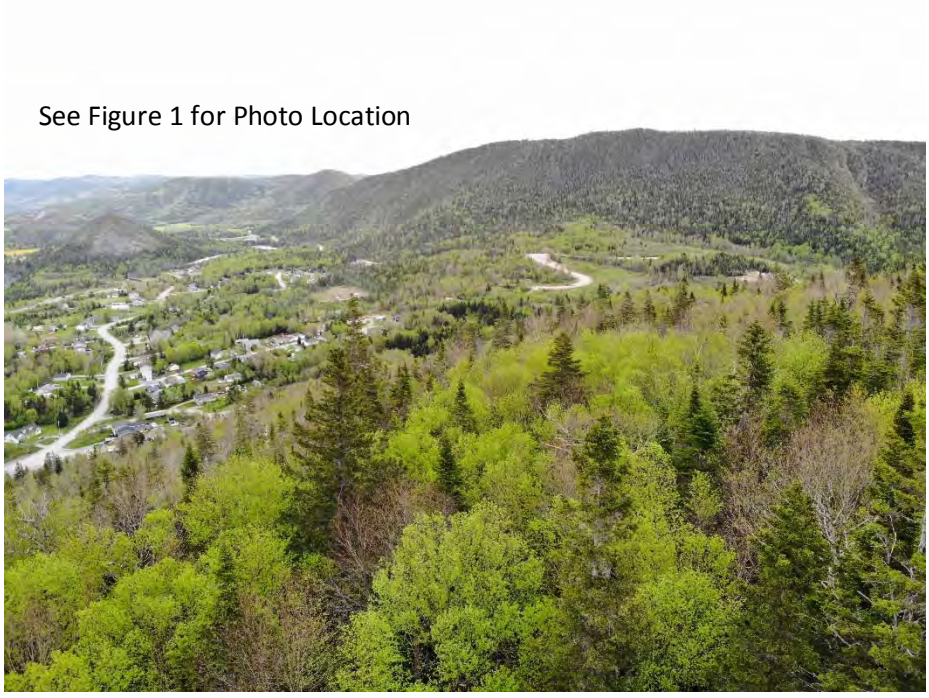

Plate 10: Drone Photo Looking Towards Hughes Brook (~3-5m above trees)

Plate 11: Drone Photo Looking Towards House to North (~3-5m above trees)

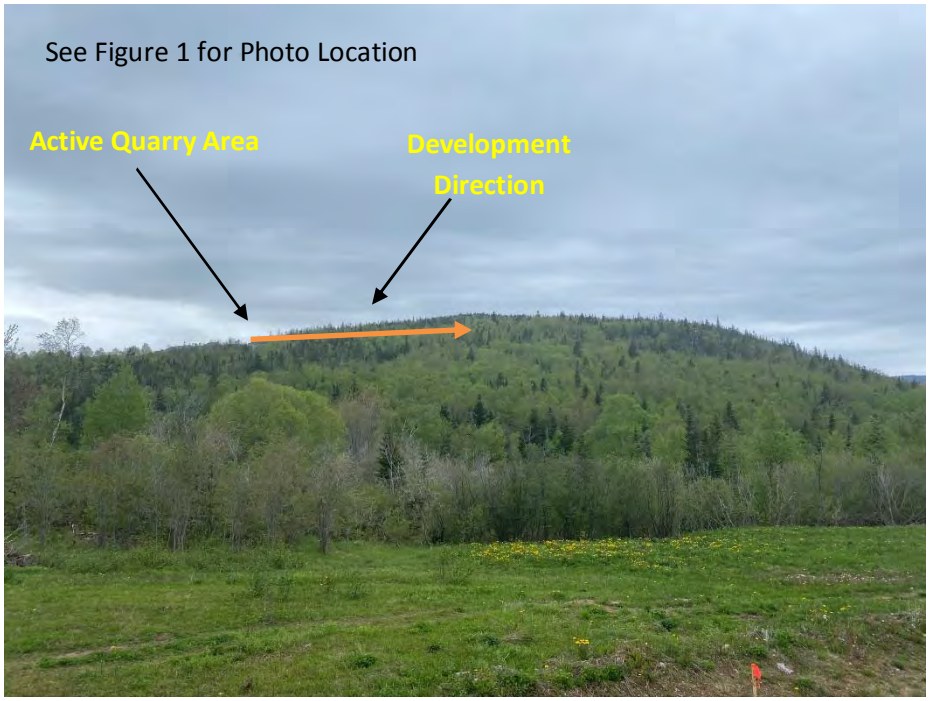

Plate 12: Photo Taken from Person Height Looking at Quarry Area (570 m to quarry boundary)

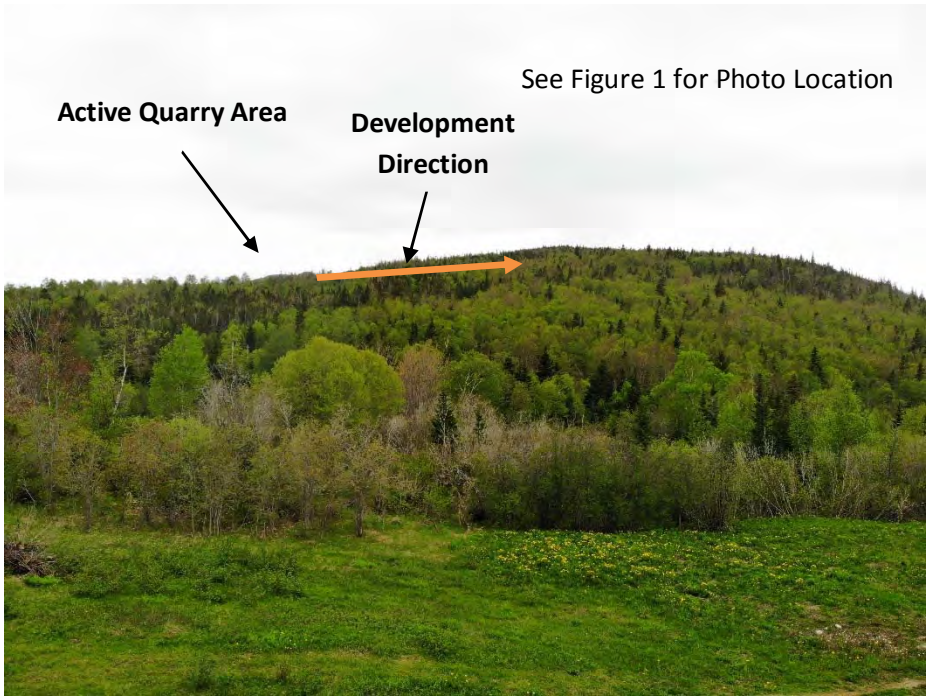

Plate 13: Drone Photo Taken from ~6 m Height Looking at Quarry Area (570 m to quarry boundary)

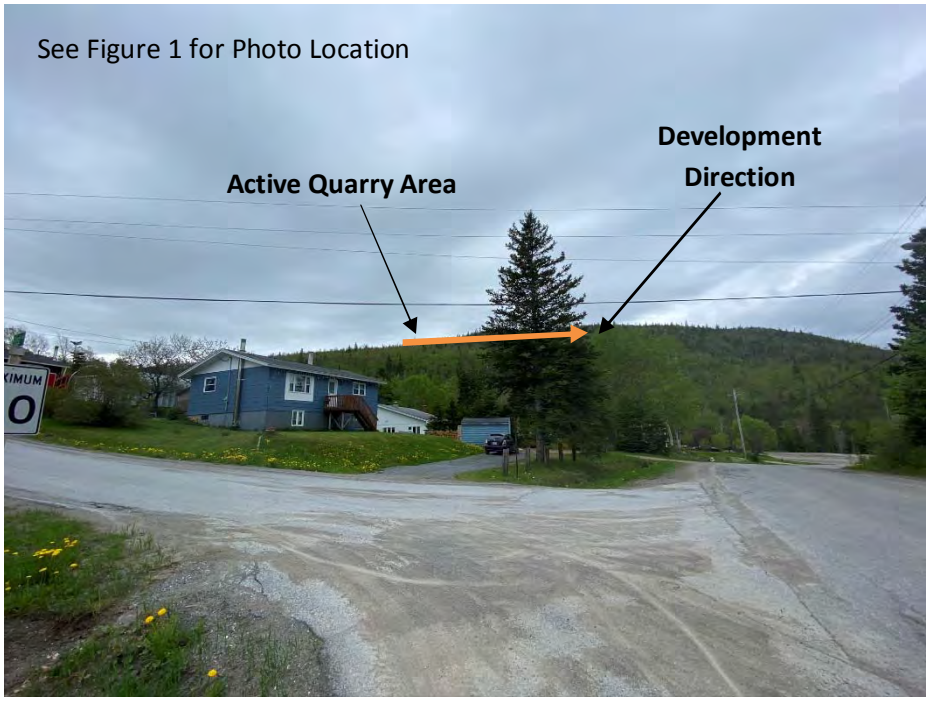

Plate 14: Photo Taken from Person Height Looking at Quarry Area (400 m to quarry boundary)

Plate 15: Drone Photo Taken from ~6 m Height Looking at Quarry Area (400 m to quarry boundary)

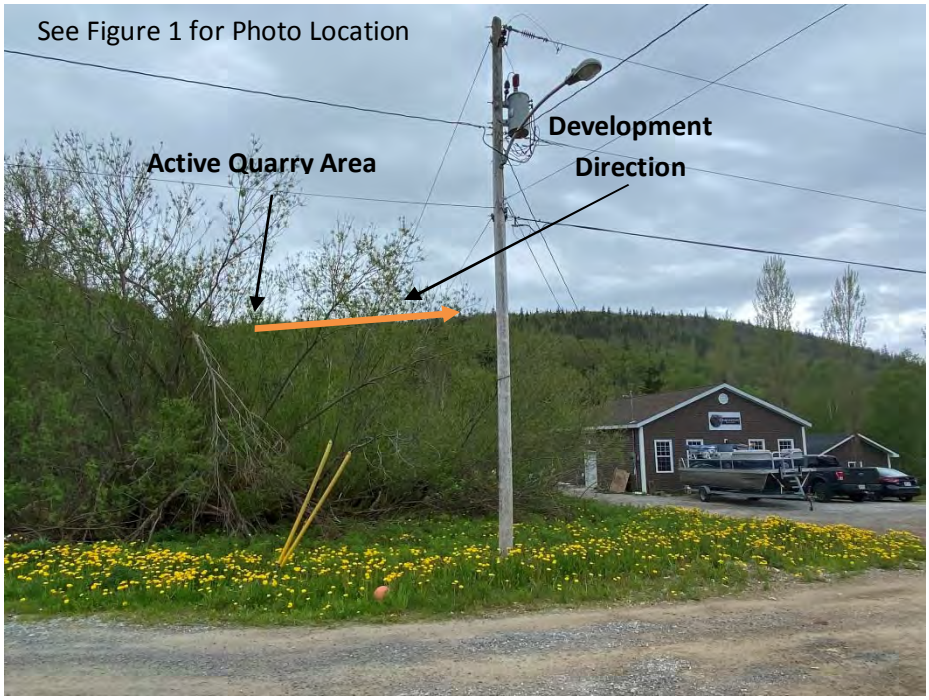

Plate 16: Photo Taken from Person Height Looking at Quarry Area (480 m to quarry boundary)

Plate 17: Drone Photo Taken from ~6 m Height Looking at Quarry Area (480 m to quarry boundary)

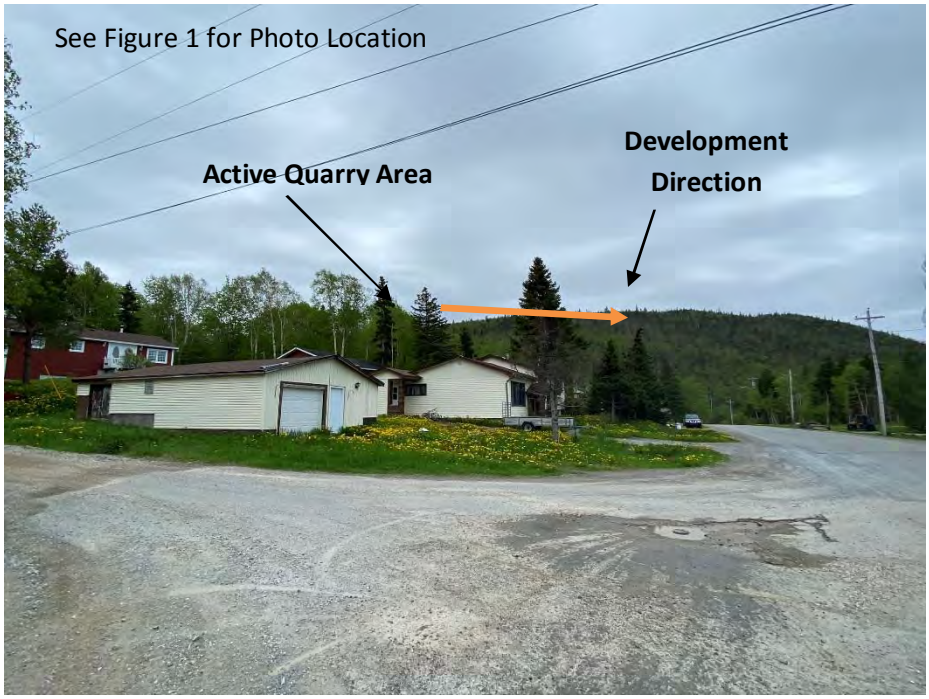

Plate 18: Photo Taken from Person Height Looking at Quarry Area (500 m to quarry boundary)

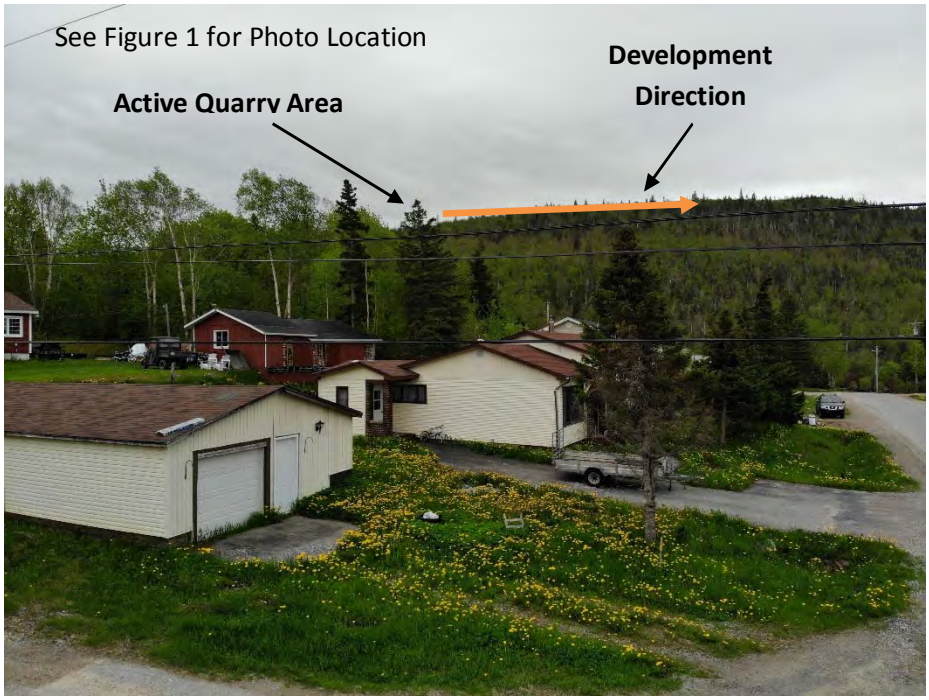

Plate 19: Drone Photo Taken from ~6 m Height Looking at Quarry Area (500 m to quarry boundary)

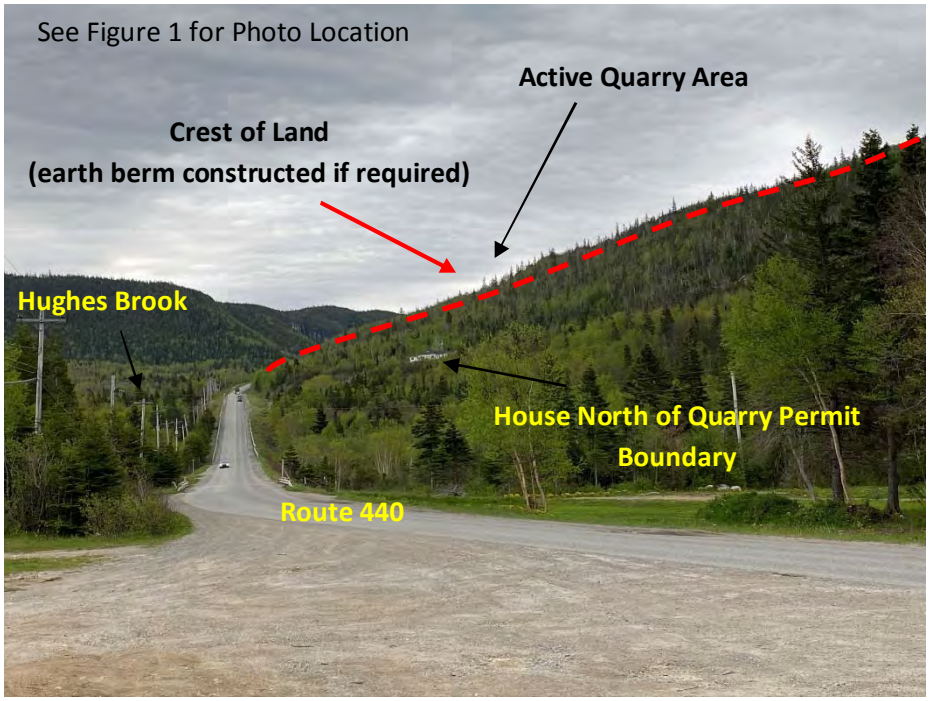

Plate 20: Photo Taken from Person Height Looking Southeast

Plate 21: Tree Height (within quarry)

Plate 22: Tree Height (within quarry)

Plate 23: Tree Height (within quarry)

Plate 24: Tree Height (along Route 440 looking up at quarry area)

Plate 25: Tree Height (along Route 440 looking up at quarry area)

Plate 26: Tree Height (along Route 440 looking up at quarry area)