

Quarry Development Plan – Wuthrich Quarry

Site C Clean Energy Project

Revision 1: June 5, 2015

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1.0 Background

1.1 The Site C Clean Energy Project

The Site C Clean Energy Project (the Project) will be the third dam and generating station on the Peace River in northeast B.C. The Project will provide 1,100 megawatts of capacity and about 5,100 gigawatt hours of energy each year to the province's integrated electricity system. The Project will be a source of clean, reliable and cost-effective electricity for BC Hydro's customers for more than 100 years.

The key components of the Project are:

- an earthfill dam, approximately 1,050 metres long and 60 metres high above the riverbed;
- an 83 kilometre long reservoir that will be, on average, two to three times the width of the current river;
- a generating station with six 183 MW generating units;
- two new 500 kilovolt AC transmission lines that will connect the Project facilities to the Peace Canyon Substation, along an existing right-of-way;
- realignment of six segments of Highway 29 over a total distance of approximately 30 kilometers; and
- construction of a berm at Hudson's Hope.

The Project will also include the construction of temporary access roads, a temporary bridge across the Peace River, and worker accommodation at the dam site.

1.2 Wuthrich Quarry

Wuthrich Quarry is located approximately 2 km east of Charlie Lake and approximately 3 km north of the Alaska Highway 97 along 271 Road. It is approximately 6 km northwest of the City of Fort St. John and is approximately 10 km away from the proposed location of the Site C dam. The site location is shown in Figure 1. The property is currently owned and operated by the British Columbia Ministry of Transportation and Infrastructure (MOTI). The property is approximately 14 ha in size and has a rectangular pan handle shape. MOTI and BC Hydro have entered into an agreement that allows BC Hydro to obtain temporary riprap material from Wuthrich Quarry.

Geotechnical information from a November 1987 drill program (MOTI 1988) was used by MOTI to determine the viability of the quarry. A single drill core has also been logged following drilling conducted in Sept 2014. A standpipe piezometer has been installed into the drill hole and will be read periodically. The rock formation is part of the Dunvegan formation of the upper Cretaceous period. The sandstone rock is fairly fine grained and interlaced with thin bedded planes. Existing large blocks (2 to 3 cubic metres) in size are present near the rock face. The quarry was activated to produce riprap materials for MOTI construction projects and became a source of rock for the MOTI Peace District for maintenance purposes.

The Wuthrich Quarry site includes an exposed bedrock ridge rising out of a field to the east of 271 Road, and running back into the higher ground to the northeast. An existing access road enters the property at the northwest corner. The southwest corner of the property has previously been mined leaving an area of disturbance of about 2.2 ha. The site is mostly covered with small and large poplar trees and low vegetation, except for the active quarrying area. It is surrounded by agricultural lands. To the south of the property are two active well sites owned and operated

by third parties.

The project will require approximately 253 000 m³ of riprap and approximately 98 000 m³ of riprap bedding for construction of roads, the temporary construction bridge and dam components. Most of the material will be required in the first four years of the dam construction schedule, with a smaller amount required after reservoir filling has commenced. This volume of material will be produced and stored within the existing boundaries of the quarry.

The main excavation area will consist of the southern quarter and the panhandle. The most northerly portion will be used as storage for overburden. An area in the north half will be utilized as storage for “waste” rock (i.e. defined as the not riprap portion, which later could be useful for embankment construction by MOTI, if required). Finally, after exhausting the storage potential in the middle section and when the pit floor is available, the remainder of the waste material will be stored inside the excavation at the southern panhandle. The pit is to be mined to depth on the far south eastern corner advancing back towards the access road; this will provide the opportunity to start backfilling at the pit floors starting point prior to the end of the quarry life.

Following Project construction, the quarry may remain an active site and under the control of MOTI. Any of the surplus material and the remaining intact bedrock will be available for use by MOTI.

2.0 Purpose and Scope

The objectives of this plan are to support permitting requirements; and to guide use of the quarry site during construction.

The scope of this plan is quarry use throughout the life of the Project.

The plan has been developed in accordance with condition 71 of the Environmental Assessment Certificate:

The EAC Holder must manage environmental protection and management by implementing measures in the following Development Plans:

- Del Rio Pit Development Plan;
- Impervious Core Materials Source Development Plan;
- Portage Mountain Quarry Development Plan; and
- Wuthrich Quarry Development Plan.

Each Development Plan will include the following:

- Plan purpose;
- Plan scope;
- Plan details;
- Summary of safety and environmental management; and
- Site reclamation strategy.

The EAC Holder must provide the draft Development Plans to regulatory agencies, Peace River Regional District, City of Fort St. John, District of Hudson’s Hope and Aboriginal Groups for review a minimum of 90 days prior to the commencement of construction activities that require an applicable Development Plan.

The EAC Holder must file the Final Development Plans with EAO, regulatory agencies, Peace

River Regional District, City of Fort St. John, District of Hudson's Hope and Aboriginal Groups 30 days prior to the commencement of construction activities that require an applicable Plan.

The EAC Holder must develop, implement and adhere to the Final Development Plans, and any amendments, to the satisfaction of EAO.

This quarry development plan provides a reference concept on how the site will be utilized in a safe and environmentally sound manner. It is anticipated that alternative construction sequences and details may be presented by the contractor.

3.0 Quarry Operations

The planned material volumes for quarry use by the Project are shown in Table 1.

Table 1: Material Volumes

YEAR	RIPRAP (m ³)	RIPRAP BEDDING (m3)
1	16 000	-
2	89 000	-
3	132 000	32 000
4	16 000	61 000
5	-	-
6	-	-
7	-	5 000
TOTAL	253 000	98 000

3.1 Production Plan

In order to produce the amount of temporary riprap material that will be required for dam construction, areas for storage of surplus rock and overburden will need to be created within the quarry site. Figure 2 illustrates the current development of Wuthrich Quarry and the boundaries of the property. As the site is developed, overburden will be cleared from areas of rock extraction and stockpiled for eventual quarry site reclamation. In addition to the overburden material, a significant volume of surplus rock will also need to be stored.

The plan is to remove the existing vegetation, strip the organic soils and excavate and stockpile the overburden so that the surplus rock stockpile is stored directly on the bedrock material. The stripping of the organic-rich topsoil will be undertaken either through bulldozing the topsoil into heaps and then loading out, or directly loading the material out with a tracked excavator, depending on the terrain being prepared.

The topsoil stockpile will be a live stockpile such that topsoil could be placed on any areas (such as overburden stockpile at capacity, quarry benches or floor area) where active mining is complete and access is not required. The stockpile will be protected against water ingress. This will facilitate future operations of the quarry, once the surplus rock stockpile is depleted.

Where overburden is to be placed on sloping ground, the area on which the overburden is to be

placed must be cleared and grubbed, with the organic-rich topsoil layer stripped. The sloping ground must be benched to create a ridged base layer and interface on which the stripped overburden is placed.

Once competent bedrock is accessible, benches will be mined through drilling and blasting of either 5 m benches using double benching technique or 10 m benches using single benching. Bulldozer work and ancillary drilling and blasting may be required to enable access to steep areas by tracked blast hole drills. Blasting will be undertaken and planned in such a manner to create level working surfaces for loading equipment.

Loading will be done by either hydraulic excavators or wheel loaders. Pit haulage will be by dump truck or loader to a quarry run stockpile or directly offsite as product. Some quarry run may need to be fed through a mobile screen either in the pit or an alternative location within the property boundaries, as shown in Figure 2, with the surplus rock and rock fines stockpiled on the property. Riprap and riprap bedding material and rock fill material may be stored in live stockpiles for haulage offsite though the preference will be to haul directly from the quarry to the construction sites.

Drilling and blasting will be required for excavation of the sandstone rock in the quarry. The details of the blast hole patterns, sub-drilling, blast hole inclination, etc. are subject to blasting tests to be carried out in the initial stages of the mining development. The contractor and their blast engineer will determine the blasting parameters to achieve the required riprap and rock embankment products.

In accordance with the quantity distance tables provided under the Explosives Act and Regulations, the D4 and D7 distances will be 175 m and 480 m respectively, for 10 tonnes of storage of ammonium nitrate prill and 140 m and 380 m respectively, for 5 tonnes of storage of ammonium nitrate prill. Ammonium nitrate prill will be stored off-site. The blasting operation will conform to the applicable laws and/or regulation (e.g. timing of blasts during the day, etc.).

Blasted rock will either be loaded by a wheeled loader or a tracked excavator. To maximize the use of the mined rock from the quarry, it may be subject to screening to recover the riprap material classes required. This will be undertaken by tipping the mined material, either directly from the mine trucks or via a wheeled loader over a screen. The oversize material will then be stockpiled for transport off site for use in construction and the undersize portion may be further screened for reducing the fines or stockpiled on site.

Haulage off site will be done by highway legal trucks; on site haulage will be done using rock trucks up to 40 tonne capacity. Roads could be maintained into the quarry for highway legal trucks such that the required quantity of blasted rock can be hauled directly to the construction sites as opposed to re-handling from a quarry stockpile. An assumed minimum mining width of 25 m to allow trucks to turn within the pit, as well as a safety berm of roughly 3 m in width will be required.

3.2 Quarry Operations

The quarry is an existing operation run by MOTI and will be operated in a consistent manner with their pit operations. The Province's Aggregate Management Principles have been established to ensure that aggregate activities are undertaken in compliance with health and safety standards and environmental protection requirements. Quarrying activities will be conducted in accordance with these requirements. The reference documents are:

- Aggregate Operators Best Management Practices Handbook for British Columbia, 2002, Ministry of Energy and Mines (MOEM 2002)
- Health and Safety: A Practical Guide for Aggregate Operations, 2007, Ministry of

Energy, Mines and Petroleum Resources, Mining and Minerals Division (MOEM 2007)

The following is a summary of quarry operation considerations:

- The main areas for excavation will be in the southern portion of the site and stockpiling will be in the northern half of the site as shown in Figure 2
- The maximum volumes proposed for extraction will be based on the suitability and quality of the materials as they were processed. The materials unsuitable for use for dam construction will remain within the site and will be stockpiled for future use by the MOTI
- The site may contain a trailer office, maintenance and storage area and sediment/erosion control measures
- Potable water for the office and service area and water for dust control will be brought to the site from an offsite location
- Extraction requires drilling, blasting and processing, such as screening, prior to riprap being removed from the site. More than one area will be active with room in between sites to maintain equipment maneuverability and production rates
- Blasting materials will be commercially available. Delivery will be by bulk mix and loading pump trucks. No explosives will be stored on site. Blasting activities will be in accordance with WorksafeBC, the Mines Act (BC) the Explosives Act (Canada), the Transportation of Dangerous Goods Regulations (Canada) and the Motor Vehicle Act (BC)
- The material will be delivered to the dam using highway-legal haul trucks. Haul trucks or loaders will move between the areas on the site, as required
- The equipment required for operations will be as follows with the number of equipment pieces to be determined at a later stage:
 - Loaders (to loosen and remove material and process material at the screening and crushing plants, and stock pile)
 - Bulldozers (to push material for stripping stockpiles and loosen blasted materials)
 - Rock drills
 - Highway legal haul trucks (to transport the material to the dam site)
 - Water Trucks (to control dust as required)
 - Personnel Site Pick-ups (for onsite mobility)
 - Service vehicle (mechanic, fuel trucks, blasting materials)

- The facilities which could be located on site include:
 - A small mobile office with lunch room, wash rooms and safety room;
 - Potable water storage;
 - Mining vehicle laydown area;
 - Mobile screen (500 tph);
 - Mobile fines screening plant (400 tph), if main screen is unable to handle fines;
 - Gated access;
 - Mobile scale;
 - Staff parking area; and
 - Wash bay with dirty water retention pond.

3.3 Access

Access will be closed to the public during the length of the extraction operations. Truck haul will be limited to the public roads near the quarry area to the dam site, namely 271 Road, Alaska Highway and Old Fort Road.

3.4 Safety and Environmental Management

The contractor will be expected to adhere to the environment and safety requirements described in the Construction Environmental Management Plan (CEMP) and the Construction Safety Management Plan (CSMP).

Management measures to be implemented during quarry operation will include:

- Gate access will be maintained to control access
- Berms will be constructed at the top edges of excavations to control movement within the quarry
- Portable toilet facilities will be used within the quarry area and near the project site offices. These facilities will be maintained as required. If trailer type washroom stations are used onsite, the grey water created will be disposed of into a suitable tank and then pumped out and trucked to the municipal treatment location
- Provide for environmental management in accordance with the CEMP for erosion, sediment control, oil/ water separation, control of noxious weeds, control of air emissions, drainage and future reclamation.

The planning and installation of a lighting system, if required, for the safe operation of the site will follow guidelines in the Aggregate Operators Best Management Practices Handbook (MOEM 2002). The goal will be to facilitate safe and secure operations for the extraction, processing and stockpiling locations while minimizing offsite visual nuisance. Lighting will be directed downward or shielded by buildings to minimize off-site spill and glare. The lighting of road junctions and site entrances will be kept to the minimum required for safety purposes.

3.5 Site Reclamation and Future Use

Following use by the Project, Wuthrich Quarry will continue to operate as a rock quarry under

the jurisdiction of the MOTI. Slopes will be placed in a stabilized manner and drainage features will be established to control drainage. Seeding to control noxious weeds will be done on soil slopes and overburden stockpiles.

Usable materials will be available for future mining of the quarry after the Project is completed. All temporary slopes not required for continued operations will be profiled for long term stability. Overburden materials could be used to construct embankment against excavated slopes to profile and cover up the exposed depleted rock faces and then covered with topsoil previously retained on site. Slopes will be hydro seeded and control of noxious weeds will be undertaken until ecologically stable.

4.0 References

Front Counter BC - Notice of Work – Tracking number 100111634 (Form)

Ministry of Transportation and Infrastructure (July 30, 2014) – Letter of Approval –MOTI
Quarries: West Pine, Wuthrich and Del Rio (file:36835-3ProjMan) (Letter)

British Columbia Agricultural and Land Commission (1990, October). RE: *Application #21-W-24300 (Letter)*

Province of British Columbia Ministry of Transportation and Highways (1991, April). RE: *Quarry Development Design for Wuthrich Rock Quarry* (Memorandum)

Province of British Columbia Ministry of Transportation and Highways (1988, May). *Quarry Rock Investigation – Wuthrich Property* (Memorandum)

Klohn Crippen Berger & SNC Lavalin (2011, May). *Peace River Development – Site C Clean Energy Project – Study of Riprap Transportation Quarry* (Report)

Klohn Crippen Berger & SNC Lavalin (2011, June). *Peace River Development – Site C Clean Energy Project – Optimization of Project Layout and Configuration of Structures – Study of the Production and Transportation of the Temporarily Riprap Sourced from Tea Creek Area* (Report)

Ministry of Energy, Mines and Petroleum Resources, *Mining and Minerals Division* (MOEM).

2009. November 2009. *Aggregate Management Principles*,
<http://www.empr.gov.bc.ca/Mining/Aggregate/BMP/Pages/default.aspx>

Ministry of Energy, Mines and Petroleum Resources (MOEM), Mining and Minerals Division, 2007. *Health and Safety: A Practical Guide for Aggregate Operations*

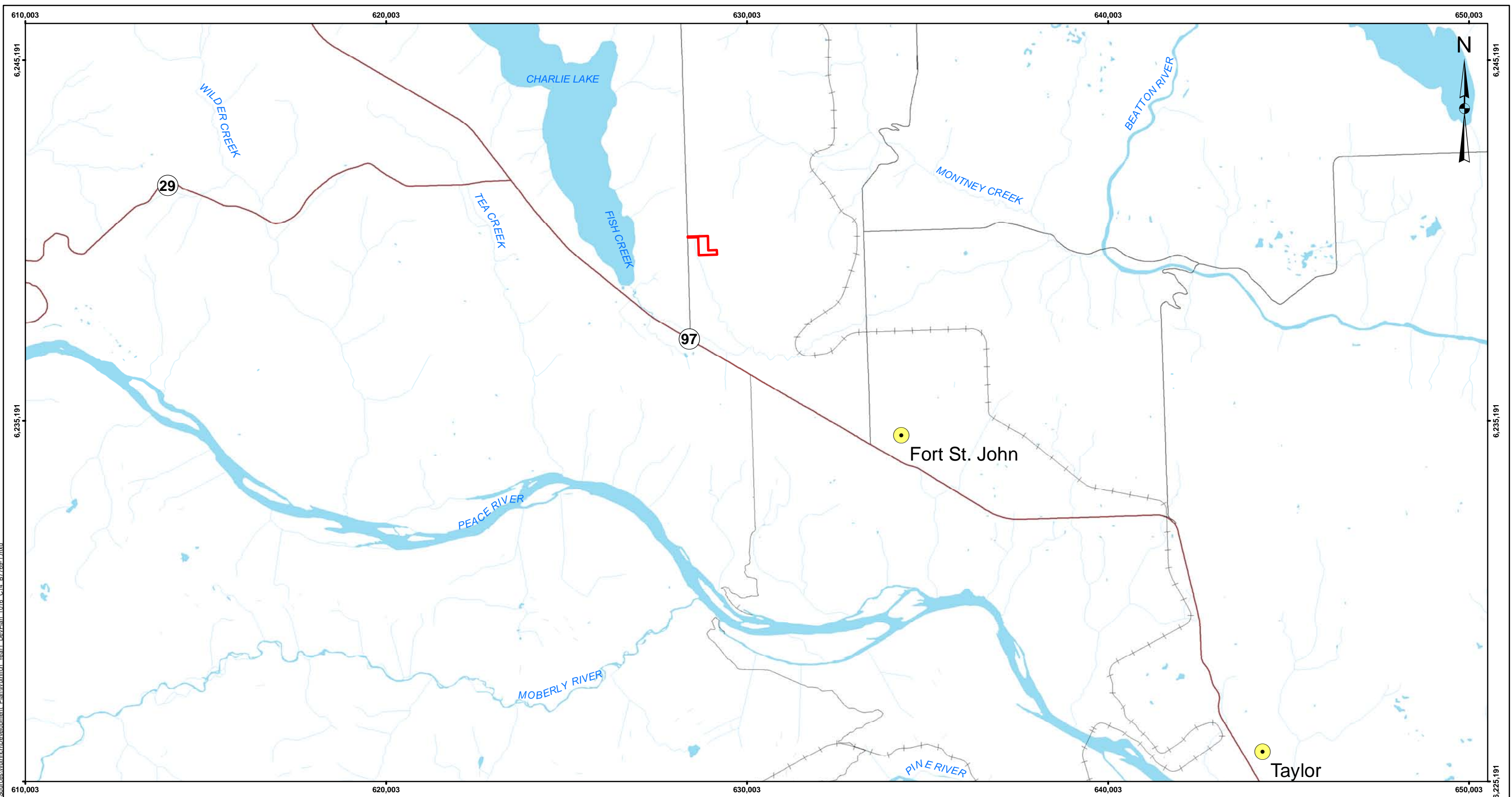
Ministry of Energy and Mines (MOEM), April 2002. *Aggregate Operators Best Management Practices Handbook for British Columbia. Volumes 1 (Introduction and Planning) and Volume 2 Best Management Practices*,

<http://www.empr.gov.bc.ca/Mining/Aggregate/BMP/Pages/default.aspx>

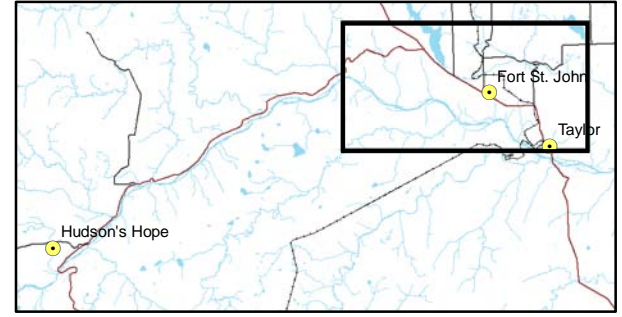
Figures

Figure 1: Key Plan – Location of Wuthrich Quarry

Figure 2: Development Plan – Wuthrich Quarry



Path: X:\GIS\Projects\EnvironmentalConstruction_Material_Sources\Wuthrich\Development_Plan\Wuthrich_Year1_Development_Plan_C14_B7769-1.mxd



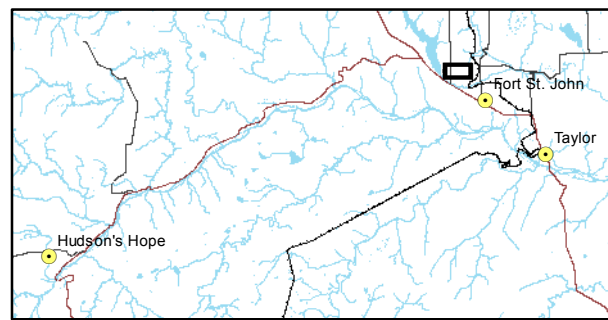
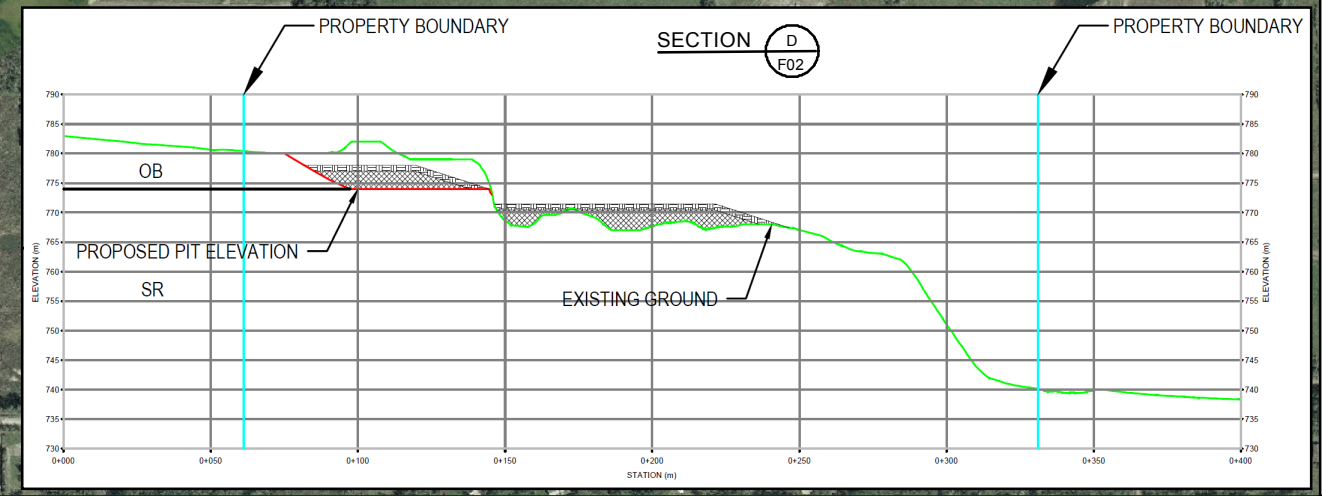
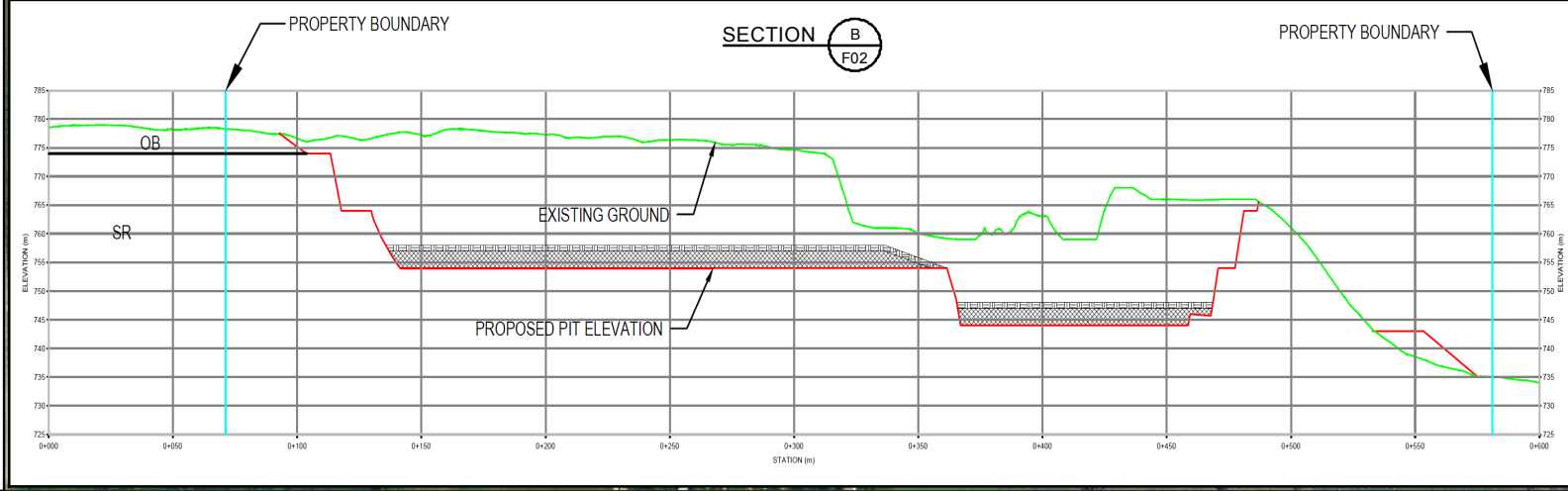
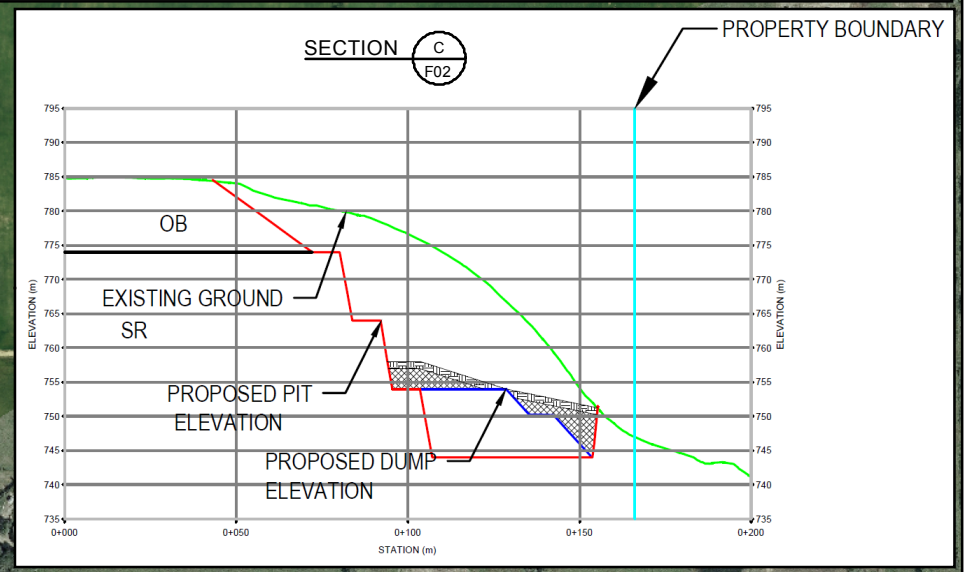
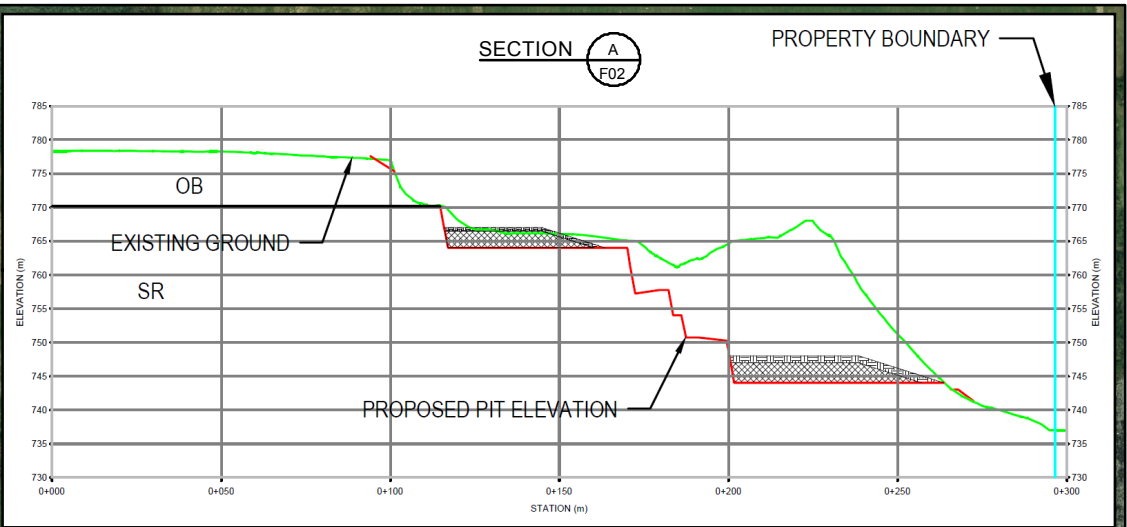
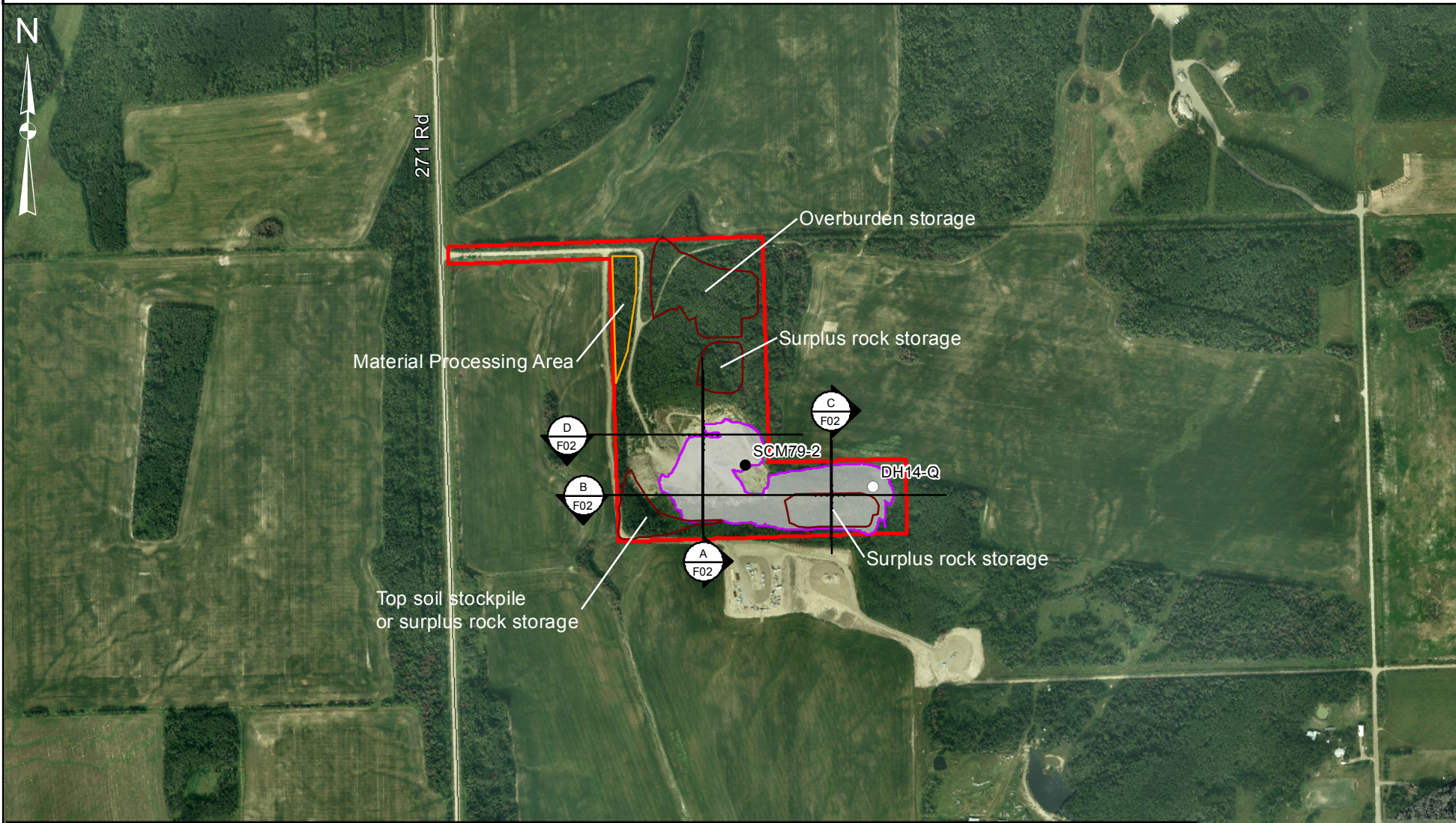
Map Notes:
 1. Datum: NAD83
 2. Projection: UTM Zone 10N
 3. Base Data: Province of B.C.

- Legend**
- Wuthrich Quarry Boundary
 - Existing Highway
 - Existing Access Roads
 - Existing Railway

1:100,000

0
5km

<p>Figure 1 Key Plan - Location of Wuthrich Quarry</p>			
Date	November 3, 2014	DWG NO	1016-C14-B7769-1 R 0



Map Notes:
 1. Datum: NAD83
 2. Projection: UTM Zone 10N
 3. Base Data: Province of B.C.

Legend

- 2014 Geotechnical Investigation
- Historic Geotechnical Investigation
- ▭ Wuthrich Quarry Boundary
- ▭ Main Excavation Area
- ▭ Stockpile Areas
- ▭ MaterialProcessingArea
- Existing Access Roads

1:10,000 0 250m

Figure 2 Development Plan - Wuthrich Quarry			
Date	November 14, 2014	DWG NO	1016-C14-B7769-2
			R 0

Quarry Development Plan - Wuthrich Quarry
Site C Clean Energy Project

Appendix A. *Mines Act* Notice of Work



Notice of Work

Tracking Number: 100111634

APPLICANT INFORMATION

Name: British Columbia Hydro and Power Authority
Doing Business As: Site C Clean Energy Project, Regulatory Manager (Bettina Sander)
Phone: 604-695-5234
Fax: 604-695-5290
Email: bettina.sander@bchydro.com
Incorporation Number: n/a
BC Business Registration Number:
Business Registration Number:
Society Number:
GST Registration Number: R1214541
Contact Name: Bettina Sander
Mailing Address: Suite 100, Four Bentall Centre, 1055 Dunsmuir Street
 PO BOX 49260
 Vancouver BC V7X 1V5

SETUP QUESTIONS

Please enter some preliminary information for your application.

Are you an individual or an organization? Organization
Are you applying on behalf of the applicant? No

TECHNICAL INFORMATION

APPLICATION INFORMATION

Type of Notice of Work: Quarry - Construction Aggregate
Is this a New Permit or an Amendment? New Permit

MINE INFORMATION

Do you have an existing mine number? No
Name of the property: Wuthrich Quarry - an active quarry owned, in fee simple, and operated by BC Ministry of Transportation and Infrastructure (BC MOTI).
Tenure Numbers:
Crown Grant / District Lot Numbers: PID - 014-667-100
Directions to site from nearest municipality: Access to the BC MOTI-owned Wuthrich Quarry site is by public roads from Highway 97. Access into the Quarry is currently restricted by BC MOTI by means of a gated access and signage, and access will continue to be closed to the public and/or controlled during the length of the extraction operations. Truck haul will be limited to the public roads near the quarry area to the dam site, and will follow 271 Road south to Highway 97, east on Highway 97 to Old Fort Road, and south on Old Fort Road accessing the site from Old Fort Road south of 240 Road.
Geographic Coordinates of Mine: **Latitude:** 56.2878000 **Longitude:** -120.9170000

INFORMATION ABOUT PROPOSED ACTIVITIES

Activities to be undertaken: Blasting
 Camps, Bldgs, Staging Areas and/or Fuel / Lubricants Storage

FIRST AID

Proposed First Aid equipment on site: Level 2 first aid kit and dressing station with an attendant certified with Level 2 First Aid. Worksafe BC category: less than 20 minutes from a hospital, high risk, and approximately 16 to 30 workers.

Level of First Aid Certificate held by attendant: Occupational First Aid Level 2

DESCRIPTION OF EXPLORATION PROGRAM

If you prefer to upload a document, please enter "see attached document" and attach the document in the "Document Upload" step later in the application under "Other".

Sufficient details of your work program to enable a good understanding of the types and scope of the activities that will be conducted:

See attached document: "Site C Clean Energy Project, Component Application Package - Wuthrich Quarry, For Provincial Permits Required for Construction and Operations"

TIME OF PROPOSED ACTIVITIES

Proposed start and end date: Jan 1, 2015 to Dec 31, 2021

Is the work year round or only seasonal? Seasonal

Please remember that you need to give 10 days notice to the Inspector of Mines of your intention to start work, and 7 days notice of your intention to stop work.

ACCESS

Access presently gated: Yes

Key provided to the Inspector: No

Be sure to provide the inspector with a key to the gate.

PRESENT STATE OF LAND

Please identify what the present state of the land is where you would like to undertake your activities. If some of the questions do not apply to you please enter n/a in the space provided.

Present condition of the land: The Wuthrich Quarry site is on a bedrock ridge which rises out of a field and runs back into higher ground to the northeast. The rock formation is part of the Dunvegan formation of the upper Cretaceous period. Currently the land is an active quarry owned in fee simple and operated by BC MOTI. Also see attached document: "Site C Clean Energy Project, Component Application Package - Wuthrich Quarry, For Provincial Permits Required for Construction and Operations"

Type of vegetation: There are currently no buildings on the site. The area is mostly treed, except for the active quarrying area, with small and large poplar trees along with low vegetation surrounded by agricultural lands. Also see attached document: "Site C Clean Energy Project, Component Application Package - Wuthrich Quarry, For Provincial Permits Required for Construction and Operations"

Physiography: The site lies at an elevation of 720 m to 800 m. No wetlands exist within the site area. Wuthrich Quarry is situated approximately 2 km east of Charlie Lake, approximately 6 km northwest of the City of Fort St. John and is approximately 10 km away from the proposed location of the Site C dam. Numerous first order streams exist around the quarry, many of which flow into the Beatton River, a larger tributary of the Peace River.

Current means of access: Access to the Wuthrich Quarry site is by public roads from Highway 97. An existing access road enters the property at the northwest corner. Access into the Quarry is currently restricted by BC MOTI by means of a gated access and signage. Access would continue to be closed to the public and/or controlled during the length of the extraction operations. Truck haul would be limited to the public roads near the quarry area to the dam site, namely 271 Road, Alaska Highway and Old Fort Road.

Old equipment: The land is an active quarry operated by BC MOTI. There are currently no buildings on the site.
Recreational trails / use: None

ACCESS TO TENURE

Do you need to build a road, create stream crossings or other surface disturbance that will not be on your tenure? No

LAND OWNERSHIP

Application area in a community watershed: No
Proposed activities on private land: No

Proposed activities on Crown land: No

Activities in a park: No

CULTURAL HERITAGE RESOURCES

Cultural Heritage applies to a large spectrum of heritage resources that is defined as "an object, a site or the location of a traditional societal practice that is of historical, cultural or archaeological significance to British Columbia, a community or an aboriginal people."

The Archaeology Branch of the Ministry of Forests, Land and Natural Resource Operations is responsible for the administration of the Heritage Conservation Act as it applies to archaeological sites. The Archaeology Branch has developed guidelines for companies engaged in natural resource extraction to aid in planning for and avoiding or managing impacts to protected archaeological sites.

Are you aware of any protected archaeological sites that may be affected by the proposed project? Yes

Please enter a description into the field below or attach a copy of the plan describing how you propose to protect the protected archaeological site by uploading it at the "Document Upload" step later in the application process. If you are attaching a plan later please enter in the text box "See plan attached"

Plan to protect the archaeological site: One archaeological site, HbRf-70, was recorded in Wuthrich Quarry. According to the BC Archaeology Branch Remote Access to Archaeological Data (RAAD) database, HbRf-70 is a legacy site which means that none of the site remains. BC Hydro completed an archaeological impact assessment of the Wuthrich Quarry under Heritage Conservation Act permit 2010-0378 - no additional sites were discovered and no further archaeological work is required.

FIRST NATIONS ENGAGEMENT

In making decisions on authorizations, the government will be fulfilling its responsibility to consult, and where appropriate, accommodate First Nations. The government takes this responsibility seriously and encourages the applicant to engage First Nations early and often as part of any planned development.

Establishing good relations with First Nations who might be affected by a proposed development is a key part of any successful mining operation. The Ministry of Energy and Mines encourages applicants to engage and information share with First Nations that might be affected by a proposed development prior to submitting an application. The earlier in the life of a proposed activity that the avenues of communication are established the greater the likelihood that the relationships formed will be constructive and beneficial to all parties. A lack of information sharing and engagement by the applicant may result in extended timeframes for decision.

Applicants should keep a detailed record of information sharing and engagement with First Nations on their project in the event the government needs to review it. Information on First Nations information sharing and engagement should include the following: a list of First Nations contacted, whether the activity was modified based on feedback from First Nations, and whether the applicant has entered into any informal or formal agreements with First Nations in connection with the project.

The Consultative Areas Database Public Map Service is an online, interactive mapping tool that allows you to identify First Nations who have treaty rights or asserted or proven rights or title on the land base. More information can be found at <http://www.empr.gov.bc.ca/TITLES/MINERALTITLES/FIRSTNATION/Pages/CAD.aspx>.

Have you shared information and engaged with First Nations in the area of the proposed activity? Yes

Please tell us about your engagements in the field below or attach a your record of engagement by uploading it at the "Document Upload" step later in the application process. If you are attaching your record later, please enter in the text box "See record attached". Please ensure your record does not contain an individual's personal information such as contact information.

Describe your First Nations engagement activities: See attached document: "Site C Clean Energy Project, Component Application Package - Wuthrich Quarry, For Provincial Permits Required for Construction and Operations"

As a result of the engagement, are you aware of any cultural heritage resources in the area where the work is proposed? No

BLASTING

MAPS

Please mark the location(s) of the proposed magazine(s) on the map. Unless this is an area based application also mark the proposed locations of the blast site(s) on the map. The maps will be uploaded at the document upload step later in the application process.

ACTIVITIES WHERE BLASTING WILL TAKE PLACE

Please select the activities to which blasting is related: Sand & Gravel / Quarry Operations

ON SITE STORAGE OF EXPLOSIVES

Are you proposing to store explosives on site? No
Describe how you will get the explosives to the site: Blasting materials would be available from commercial material supply companies. Delivery would be by bulk mix and loading pump trucks and properly equipped trucks to deliver the primary explosives. The materials would be delivered prior to loading the holes with the explosives, then the equipment would leave the site.

ADDITIONAL INFORMATION

Only a person with a valid certificate granted under Section 8.2.1 of the Code is permitted to conduct a blasting operation.

CAMPS, BUILDINGS, STAGING AREAS AND FUEL / LUBRICANTS STORAGE

This section covers the construction of new camps and/or buildings as well as the storage of fuel/lubricants on the exploration/mine site.

The construction and operation of industrial camps (where more than five people will be accommodated) are regulated under the Health Act and its supporting regulations. Permits may be required for different aspects of camp operation. Contact the nearest Regional Health Authority to determine which requirements will apply to your camp.

You must also contact the BC Safety Authority and WorkSafe BC. For more information regarding Industrial Camp Regulation please see <http://www.health.gov.bc.ca/protect/industrial-camps.html>.

If water for camp operation is taken from any surface source other than a well, a licence or an approval maybe required under the Water Act. For further information please contact FrontCounter BC.

MAPS

If known, mark the locations of camps, buildings and fuel storage on the maps, show the distance of activity from known streams, wetlands or lakes on the map.

You will upload the maps at the document upload step later in the application process.

If locations are not determined you must provide a location map with your start up notification at least 10 days prior to start-up. Camps, buildings and fuel storage must comply with riparian setbacks as set out in Section 9 of the Code and the guidance provided in the Handbook for Mineral & Coal Exploration.

EXISTING DISTURBANCE FOR CAMPS, BUILDINGS, AND STAGING AREAS

Please provide us with the total area of existing disturbance by camps, buildings, and/or staging areas.

Total existing disturbance: 3.60 ha

CAMPS

Click on the "Add Camp" button to add a camp. If you have multiple camps please give each camp a distinctive name like Camp 1 which you can reference on the maps you submit with your application.

BUILDINGS

Click on the "Add Building" button to add a building. If you have multiple building please give each building a distinctive and descriptive name like "Shop" or "Storage 1" which you can reference on the maps and drawings you submit with your application. Please note that all buildings must adhere to the following Codes, BC Building Code, BC Fire Code and CSA Standard M421-00 "Use of Electricity in Mines in conjunction with the Canadian Electrical Code. All plans must be submitted at least 60 days prior to the proposed start of construction to the Inspector. The Inspector will advise if additional documents are required.

STAGING AREA

Click on the "Add Staging Area" button to add a staging area. If you have multiple staging areas please give each staging area a distinctive and descriptive name like "Area 1" or "Area 2" which you can reference on the maps and drawings you submit with your application.

FUEL / LUBRICANT STORAGE

If you are planning to handle, transport or store fuel and/or lubricants you must adhere to B.C. Environmental standards as detailed in "Summary of Environmental Standards and Guidelines for Fuel Handling, Transportation and Storage".

Do you propose to store fuel / lubricants on site? No

RECLAMATION PROGRAM

Description of the proposed reclamation and timing of reclamation work: Wuthrich Quarry will remain a Ministry of Transportation and Infrastructure (MOTI) quarry site after Site C Construction needs are met. MOTI has provided a letter indicating this (attached to the Development Plan), and will be responsible for the reclamation of hte pit as per the requirements of their tenure and governing legislation.

\$0.00

**Estimated cost of reclamation activities
described above:**

SAND & GRAVEL / QUARRY OPERATIONS

MAPS

All plans and sections must indicate the scale and orientation of the drawing and must include:

1) Plan View of Proposed Development illustrating:

- Property boundaries and set back of excavation from property boundary
- Watercourses and drainage (wet, dry or intermittent) on the property and within 150 metres of its boundaries
- All previous surface workings, the final boundaries of proposed excavation, and boundaries of excavation at the end of development described in the Notice of Work
- Access roads, including development roads within the pit and access to the public roads
- All proposed and existing stockpiles (topsoil, overburden, product etc.)
- All settling ponds (for both surface run off and process water) and source of process water
- Buildings and other facilities (fuel/lubricant storage, sanitary facilities, weigh scale, etc.)
- Sediment control structures and the location of any point discharges from the property
- Fencing, berms and/or vegetative buffers.

2) Cross and longitudinal sections of Proposed Development illustrating:

- The original land surface and, if applicable, the groundwater table elevation
- Typical configuration during mining, indicating angle of slope and, where applicable, bench locations
- Proposed configuration on completion of reclamation

3) A copy of the land title/crown land tenure map must be provided.

EXISTING DISTURBANCE FOR SURFACE SAND SAMPLE

Please provide us with the total area of any existing disturbances.

Total existing disturbance: 3.60 ha

SOIL CONSERVATION

Average depth of overburden: 4.00 m
Average depth of topsoil: 1.00 m
**Measures to stabilize soil overburden
stockpiles and control noxious weeds:** At completion of quarrying, slopes will be stabilized. A truck wash station will be provided to clean equipment and machinery of seeds. See also attached documents: "Site C Clean Energy Project, Component Application Package - Wuthrich Quarry, For Provincial Permits Required for Construction and Operations" and "Site C Clean Energy Project, Construction Environmental Management Plan".

LAND USE

Is the site within the Agricultural Land Reserve? Yes
Permit application number:
Does the local government have a Soil Removal Bylaw? No
Official Community Plan for the site:
Current land use zoning for the site:
Proposed end land use is: Quarry
Estimate total minable reserves over the life of the mine:
Estimate annual extraction from site: 75,600 m3/year

Application must be made to the Environmental Assessment Office if estimated extraction for sand/gravel production is 500,000 tonnes/year or 1,000,000 tonnes over 4 years; or if estimated extraction is 250,000 tonnes/year for quarried product.

ACTIVITIES

Click on the "Add Activity" button to add one or more activities. Select your activity out of the list and enter the tonnes, the total disturbed area and the total merchantable timber volume.

Please note that you must notify the Inspector at least two weeks before if you are planning to bring a crusher on site.

Activity	Total Disturbed Area (ha)	Merchantable timber volume (m ³)
Crushing	1.00	2,614.00
Excavation of Pit Run	1.00	0.00
Mechanical Screening	0.00	0.00
Washing	1.00	0.00
Total:	3.00	2,614.00

Brief description of operation, including proposed work schedule:

See attached document: "Site C Clean Energy Project, Component Application Package - Wuthrich Quarry, For Provincial Permits Required for Construction and Operations". For a description of the amount of total merchantable timber volume in Wuthrich and the plan for clearing, refer to "Site C Clean Energy Project, Volume 1 Appendix A: Vegetation Clearing and Debris Management Plan" at http://a100.gov.bc.ca/appsdata/epic/documents/p371/d35993/1377112322034_3f6818f00391108d24816e17b74b6b4dc04df98c77657ac56b1e7335f3fe1194.pdf

EQUIPMENT

Click on the "Add Equipment" button to add one or more equipment.

Type	Quantity	Size / Capacity
Loader	1	1
Other: grader	1	1
Other: personnel site trucks	1	1
Other: screener and/or crushing plants	1	1
Other: service vehicles	1	1
Other: water trucks	1	1
Bulldozer/Crawler Tractors	1	1
Crusher	1	1
Other: highway legal haul trucks	1	1

Will progressive reclamation be carried out? No

RECLAMATION PROGRAM

Description of the proposed reclamation and timing of reclamation work:

As operations progress, slopes will be stabilized and drainage features will be established to control drainage. To control noxious weed growth, seeding will be done on soil slopes and overburden stockpiles. Wuthrich Quarry will remain a Ministry of Transportation and Infrastructure (MOTI) quarry site after Site C construction needs are met. MOTI has provided a letter indicating this (attached to the Development Plan), and will be responsible for the reclamation of the pit as per the requirements of their tenure and governing legislation.

If backfilling of pits or pit slopes is proposed in the final configuration for reclamation, details of materials to be used and placement procedures:

Estimated cost of reclamation activities described \$0.00

above:

GROUNDWATER PROTECTION

Average depth to the high groundwater table at the proposed excavation:

Elevation of the groundwater table was determined from: Existing area wells
 Test pits
 Test wells drilled for this purpose
 Other: Existing information

Measures proposed to protect groundwater from potential impacts of the proposed mining activity:
with the Project Construction

BC Hydro will require contractors to prepare Environmental Protection Plans which address groundwater protection, in accordance with the Project Construction Environmental Management Plan. See attached document: "Site C Clean Energy Project, Construction Environmental Management Plan".

IMPACT MINIMIZATION

Shortest distance between proposed excavation to nearest residence: 1,100 m

Shortest distance between proposed excavation to nearest residential water source:

Measures proposed to prevent inadvertent access of unauthorized persons to the mine site:

Access to Wuthrich Quarry is currently restricted by MOTI by means of a gated access and signage. Access would continue to be closed to the public and/or controlled during the length of the extraction operations. Safety issues on the site would be related to the increased traffic and blasting within the quarry operation. Truck haul would be limited to the public roads near the quarry area to the dam site, namely 271 Road, Alaska Highway and Old Fort Road.

BC Hydro will require Contractor(s) to prepare a Traffic Management Plan that will manage and control traffic in and around the construction sites in a manner that protects the safety of the public and workers, and protects wildlife while minimizing effects on productivity. See attached document: "Site C Clean Energy Project, Construction Safety Management Program, Framework Document".

Measures proposed to minimize noise impacts of the operation:

BC Hydro will notify local residents prior to the start of work that an increase in noise and vibration levels may be experienced for a specified period of time, in accordance with the Construction Communications Plan. See attached document: "Site C Clean Energy Project, Construction Environmental Management Plan".

Measures proposed to minimize the dust impacts of the operation:

BC Hydro will require Contractor(s) to address in their Environmental Protection Plans potential dust impacts of the operation in accordance with the Project Construction Environmental Management Plan. See attached document: "Site C Clean Energy Project, Construction Environmental Management Plan".

Measures proposed to minimize visual impacts of the operation:

The planning and installation of a lighting system, if required, for the safe operation of the site would follow guidelines in the Aggregate Operators Best Management Practices Handbook (MOEM 2002). The goal would be to facilitate safe and secure operations for the extraction, processing and stockpiling locations while minimizing offsite visual nuisance. Lighting would be needed for the quarry property, inside buildings and their entrances, extraction faces, haul roads, stockpiles, equipment, and vehicles. Lighting would be directed downward or shielded by buildings to minimize off-site spill and glare. The lighting of road junctions and site entrances would be kept to the minimum required for safety purposes.

TIMBER CUTTING

Total merchantable timber volume: 2,614.00 m3

Occupant Licence to CutBased on the information that you provided, you will require an Occupant Licence to Cut as the total volume of merchantable timber exceeds 50 m3. This will require a separate application package from your Notice of Work. The services of a forest professional will be necessary in order to submit the required appraisal information.

SUMMARY OF RECLAMATION

Based on the information you have provided on the previous screens the Summary of Reclamation is:

Activity	Total Affected area (ha)	Estimated cost of reclamation (\$)
Sand & Gravel / Quarry	3.00	0.00
Subtotal:	3.00	0.00
Unreclaimed disturbance from previous year:	7.20	
Disturbance planned for reclamation this year:	0.00	
Total:	10.20	0.00

OTHER CONTACTS

Please enter the contacts that are applicable to your application.

Contact Info	Type of Contact
Name: British Columbia Hydro and Power Authority, Site C Clean Energy Project, Regulatory Manager (Bettina Sander)	Permittee
Doing Business As:	
Phone: 604-695-5234	
Fax:	
Email: bettina.sander@bchydro.com	
BC Inc. Number: n/a	
BC Registration Number:	
GST Registration Number: R1214541	
Contact Name: Bettina Sander, Regulatory Manager	
Mailing Address: Suite 1100, Four Bentall Centre, 1055 Dunsmuir St. PO BOX 49260 Vancouver BC V7X1V5	

OTHER INFORMATION

Is there any other information you would like us to know? n/a

LOCATION INFORMATION

LAND IDENTIFICATION

Do you have the legal description of the land or the civic address then click on 'Add Land Information'.

Description

Crown Land

Legal Description: Northwest 1/4, Section 15, Township 84, Range 19, W6M, Peace River District

You are required to complete at least one of the following options for spatial information.

PRIVACY DECLARATION

PRIVACY NOTE FOR THE COLLECTION, USE AND DISCLOSURE OF PERSONAL INFORMATION

Personal information is collected by FrontCounter BC under the legal authority of section 26 (c) and 27 (1) of the Freedom of Information and Protection of Privacy Act (the Act).

The collection, use, and disclosure of personal information is subject to the provisions of the Act. The personal information collected by FrontCounter BC will be used to process your inquiry or application(s). It may also be shared when strictly necessary with partner agencies that are also subject to the provisions of the Act. The personal information supplied in the application package may be used for referrals or notifications as required. Personal information may be used by FrontCounter BC for survey purposes. For more information regarding the collection, use, and/or disclosure of your personal information by FrontCounter BC, please contact FrontCounter BC at 1-877-855-3222 or at:

FrontCounter BC Program Director
FrontCounter BC, Provincial Operation
441 Columbia Street
Kamloops, BC V2C 2T3

Check here to indicate that you have read and agree to the privacy declaration stated above.

REFERRAL INFORMATION

Some applications may also be passed on to other agencies, ministries or other affected parties for referral or consultation purposes. A referral or notification is necessary when the approval of your application might affect someone else's rights or resources or those of the citizens of BC. An example of someone who could receive your application for referral purposes is a habitat officer who looks after the fish and wildlife in the area of your application. This does not apply to all applications and is done only when required.

We have prepopulated some of the fields for your convenience but you can change in the information at any time. Please note that the information might become available to the public if required.

Company / Organization: British Columbia Hydro and Power Authority
Contact Name: Bettina Sander
Contact Address: Site C Clean Energy Project
Suite 100, Four Bentall Centre, 1055 Dunsmuir Street
PO BOX 49260
Vancouver BC V7X 1V5
Contact Phone: 604-695-5234
Contact Email: bettina.sander@bchydro.com

I hereby grant permission for the public release of the information provided above. This information will be used to fulfill, if required, the referral and advertising requirements of my application.

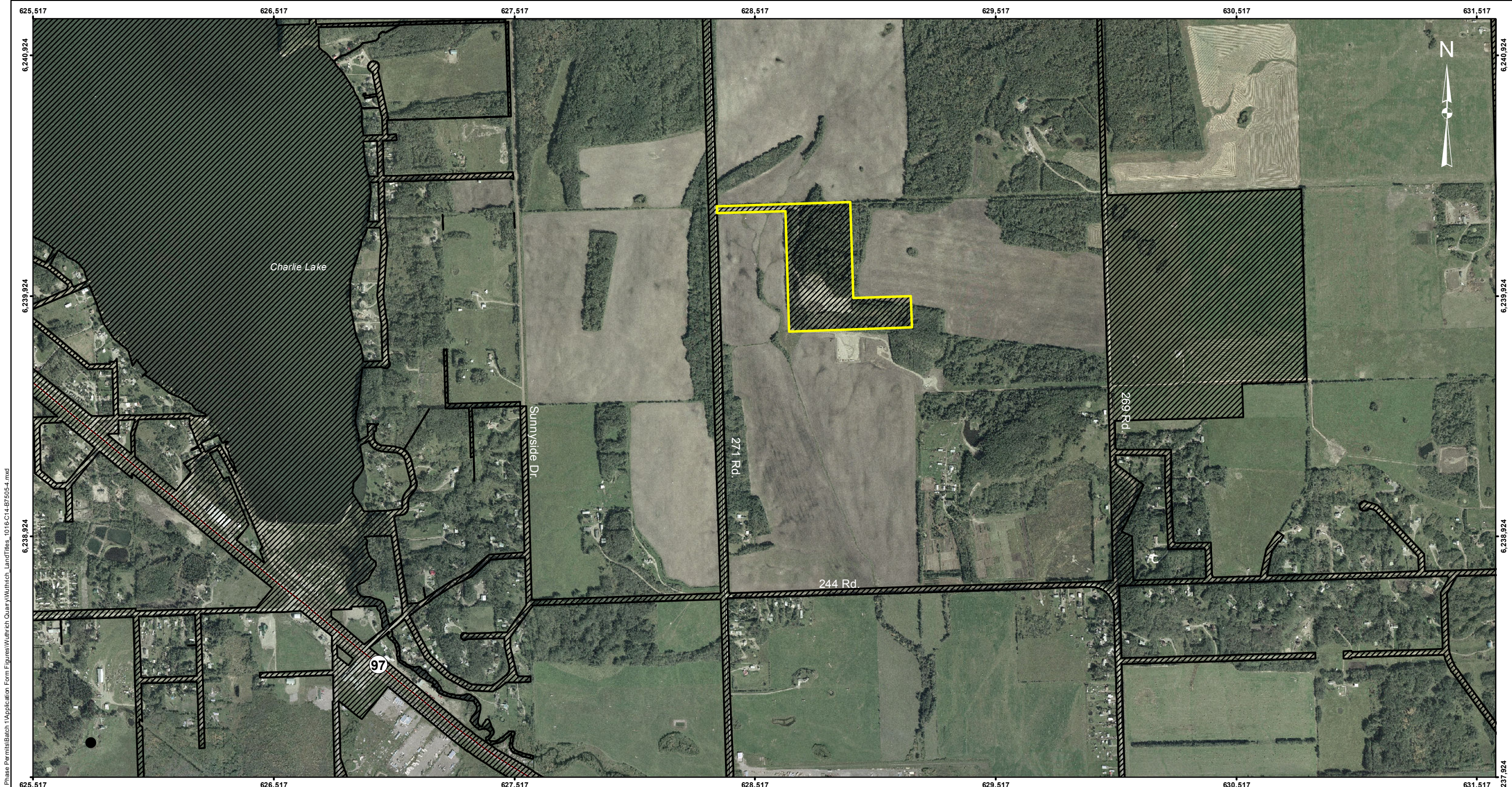
OFFICE

Office to submit application to:

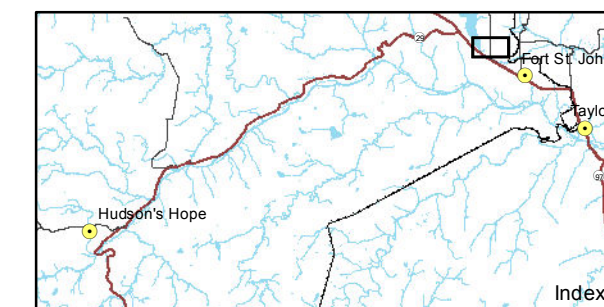
PROJECT INFORMATION

Is this application related to another application(s) or authorization(s) you have previously submitted? No

OFFICE USE ONLY		
Office	File Number	Project Number
	Disposition ID	Client Number



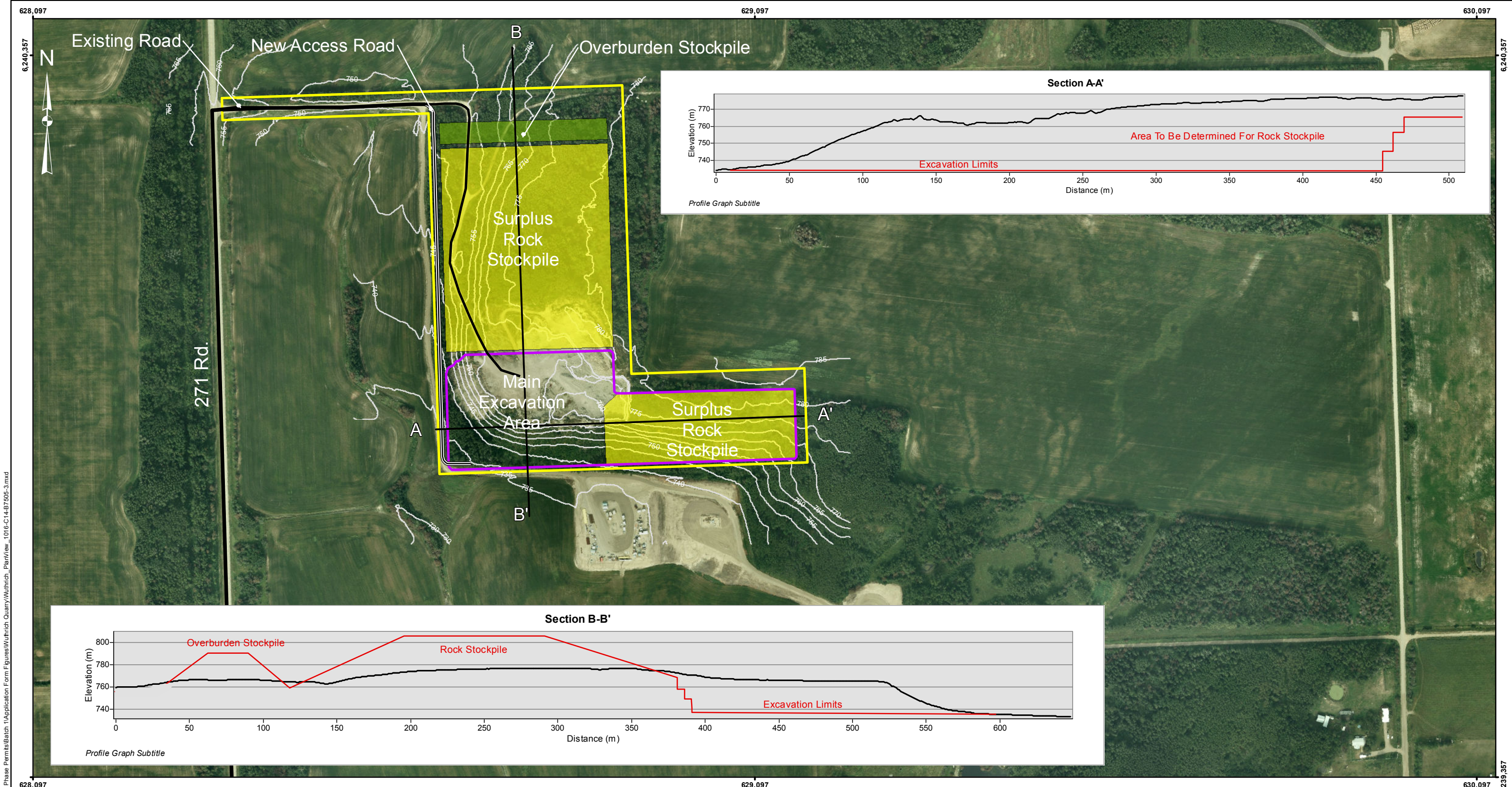
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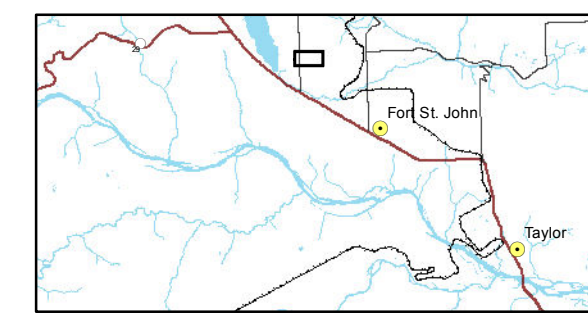
Map Notes:
 1. Datum: NAD83
 2. Projection: UTM Zone 10N
 3. Orthophotos: TRIM
 4. Crown land shown is the inverse of the Private lands. Property data current as of Feb 17th, 2014.

- Legend**
- Wutrich Quarry Boundary
 - Crown Land (Surveyed and Unsurveyed)
 - Road
 - Highway

1:15,000		0 750 m	
Land Title/Crown Tenure			
Wutrich Quarry			
Date	March 12, 2014	DWG NO	1016-C14-B7505-4 R 0



Path: X:\ArcGISProjects\Permitting\BatchPermits\Construction Phase\Permits\Batch 1\Application Form\Figures\Wuthrich Quarry\Wuthrich_PlanView_1016-C14-B7505-3.mxd



Map Notes:
 1. Datum: NAD83
 2. Projection: UTM Zone 10N
 3. Orthophotos created from 1:15,000 photos taken Aug. 26th 2011

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- Legend**
- Wuthrich Quarry Boundary
 - Surplus Rock Stockpile
 - Overburden Stockpile
 - Main Excavation Area
 - New Access Road
 - Existing Access
 - Contour - Major 5m

1:5,000 0 250m

Plan View of Proposed Development at Wuthrich Quarry			
Date	March 12, 2014	DWG NO	1016-C14-B7505-3 R 0

Construction of the Site C Clean Energy Project is subject to required regulatory approvals including environmental certification

Drawings are indicative and provided for the purpose of informing applications for permits and approvals, and are not intended for construction.

Appendix B. Agreement Between MOTI and BC Hydro



July 30, 2014

Sent via email

Don Wharf,
Program Manager, Roads Infrastructure
Site C Clean Energy Project
BC Hydro, Vancouver BC

Your File: 36835-3ProjMan

Dear Don:

Re: MOTI Quarries/Pits: West Pine, Wuthrich and Del Rio

The Ministry of Transportation and Infrastructure (MOTI) approves the use of West Pine Quarry, Wuthrich Quarry and Del Rio Pit by BC Hydro for the Site C Clean Energy Project. These quarries and pit may also be utilized by MOTI for operational purposes during the time of BC Hydro's use.

MOTI confirms that these quarries and pit will be used by MOTI as quarries and pit following BC Hydro's use and after the construction of BC Hydro's Site C Clean Energy Project, should the project receive environmental certification, regulatory approvals and proceed to construction.

MOTI will be responsible for the reclamation of the quarries and pit as per the requirements of their tenure and governing legislation.

Regards,

A (Tony) N. Bennett
Senior Project Manager
Northern Region
Ministry of Transportation and Infrastructure

Cc: Don Shaw, Project Director MOTI
John Bodnarchuk, Project Manager BC Hydro