Phase 3: Groundwater Protection Study
District of Highlands

District of Highlands
Victoria, BC

Submitted to:

District of Highlands
1980 Millstream Road
Victoria, BC
V9B 6H1

07-1414-0014

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Golder Associates

Executive Summary

This report presents the results of the third phase (Phase 3) of a three-phase Groundwater Protection Study conducted by Golder Associates Ltd. (Golder) on behalf of the District of Highlands.

BACKGROUND

The District of Highlands (Highlands) is one of 13 member municipalities in the Capital Regional District (CRD) on southern Vancouver Island. As a rural community that obtains potable water from private, individual water wells, the Highlands recognizes the importance of protecting all water resources, including groundwater. The Highlands Official Community Plan (OCP) identifies groundwater availability as one of the major factors that will determine future land use development in the Highlands.

In 2007, the District of Highlands Local Government (the District) initiated a three-Phase Groundwater Protection Study (the Study) to assess groundwater conditions across the Highlands, to guide future land-use decisions and to develop groundwater protection measures to support stewardship and water conservation.

The scope of work for Phase 1 consisted of a compilation and detailed review of available information, including water well records, geological mapping, climate and precipitation data to develop a conceptual model of groundwater flow in the Highlands. Golder also conducted a stream flow monitoring program at key locations in the Highlands to assess baseflow at the end of the dry season to supplement the available background information. Golder assigned representative Hydrogeologic parameters to the bedrock units and developed and calibrated a District-wide numerical hydrogeological model (the model) to steady-state (i.e., average annual) conditions. The model was then used to conduct water balance analyses to assess the sustainability of current and future groundwater withdrawals, together with the potential impacts of climate change. At the time of model development, seasonal data were not available to calibrate the model to assess transient (i.e., seasonal) conditions. It was recommended that the model be considered as a “working tool” that would be refined to simulate transient conditions following the collection of seasonal water-level data. With consideration of the results from the water balance analyses, monitoring wells were established at strategic locations of the Highlands and a preliminary groundwater quality and water-level monitoring program was implemented to collect the data needed to assess baseline conditions and seasonal patterns.

Under Phase 2 of the Study, Golder compiled a regional contaminant inventory to identify potential sources of contamination in the Highlands. For the purposes of the contaminant inventory, the Highlands was categorized into three types of land use activities: Park and Rural Residential (P/RR); Commercial/Industrial (C/I); and Comprehensive Development (CD). For each land use category, existing and potential hazards to groundwater quality were identified and relative rankings were assigned to the identified hazards to provide the District with guidance on prioritizing groundwater protection efforts. Based on the results of the contaminant inventory, preliminary groundwater protection measures were developed to establish the framework for the groundwater protection measures that were developed during Phase 3 of the Study. During Phase 2 of the Study, the Highlands groundwater quality and water-level monitoring program was expanded based on the results of both the contaminant inventory and the water balance analyses (Phase 1).

PHASE 3 OF GROUNDWATER PROTECTION STUDY

This report presents the results from Phase 3 of the Groundwater Protection Study. During Phase 3, the results from monitoring programs were used to calibrate the numerical model that was developed during Phase 1 of the Study to assess seasonal variability. The refined model was then used to refine the predicted groundwater water balance for the Highlands and the potential impacts associated with future development and climate change. The results from the numerical model formed the basis for the development of groundwater protection measures that support groundwater conservation and protection in the Highlands.

Monitoring Programs

Golder conducted stream flow monitoring during the wet season of 2010 to supplement the dry season data that were collected during Phase 1 of the Study. Golder also compiled and reviewed the results from the Highlands monitoring program and monitoring programs conducted by external stakeholders including the Bear Mountain Golf Course and operators of the Hanington Creek Estates Water System. Groundwater levels in the monitored wells were generally consistent with seasonal precipitation patterns.

Water-levels were generally stable during the wet season between November and April, declined during relatively drier months from May to September and increased between September and November in response to the onset of the wet season. The results from groundwater quality monitoring were generally consistent with mineralised and relatively hard groundwater that is typical in crystalline bedrock aquifers. Detectable concentrations of coliform bacteria reported for samples from most of the wells in the Highlands demonstrate the importance of regular water quality sampling for private well owners to confirm the potability of the water and to identify changes to water quality that may require further investigation.

In 2006, operators Bear Mountain Golf Course installed pressure transducers in observation wells 413 and 414 to collect continuous water-level data. During the summer of 2011, flow meters were installed to measure flow rates and volumes pumped from production wells 407 and 411. Pressure transducers were also installed in the production wells. Golder reviewed the flow meter and water-level data to assess groundwater use and the responses of the water-levels. Golder also received production data for the Hanington Creek Estates Water System (Hanington System) for 2011. The flow meter data were used to estimate average residential groundwater use in the Highlands during the summer and the winter seasons.

Numerical Model

Using data from the monitoring programs, Golder refined the numerical model that was developed during Phase 1 of the Study to simulate the seasonal variability observed in groundwater levels across the Highlands. The refined model was used to assess the sustainability of groundwater withdrawals under current and future conditions that included future development and the potential impacts of climate change. For the purpose of the numerical modelling, future development scenarios were developed based on future build-out estimates provided by the District. Although there is relatively high uncertainty regarding the potential impacts of climate change, longer summer drought conditions are generally anticipated for southern Vancouver Island, resulting in a decrease in groundwater recharge through less precipitation and increased evapotranspiration.

Transient model simulations were conducted to determine the water balance under current conditions and for four future build-out scenarios: full-build out with 20% secondary suites; full-build out with 50% secondary suites; full-build out with 20% secondary suites and impacts of climate change; and full-build out with 50% secondary suites and impacts of climate change. Predicted groundwater elevations at the end of the wet and dry seasons for the future scenarios were compared to the predicted water levels for the current conditions.

The results of the water balance analyses suggested that the simulated growth (full build-out) will not have a significant influence on the groundwater elevations in the Highlands, with little to no widespread differences to groundwater elevations were observed under Scenarios 1 and 2. At the end of the dry season, the decline to groundwater levels in the recharge areas at higher elevations of the western portion of the Highlands was predicted to be approximately 1 to 2 m compared to current conditions (the Base Case), with localized (i.e., small area) changes observed in the southwestern portion of the Highlands in the vicinity of the major groundwater users. The model simulations for future conditions suggested that the potential impacts of climate change could have a significant impact on average groundwater conditions within the Highlands. In Scenarios 3 and 4, the effects of climate change resulted in a general decrease in groundwater levels in the Highlands, particularly during the dry season. Groundwater levels at higher elevations were predicted to decrease 1 to 3 m by the end of the wet season when compared to the Base Case. At the end of the dry season, groundwater elevations were predicted to decrease on the order of 5 to 10 m at higher elevations, with localized decreases of up to 20 m, along the western and central portions of the Highlands when compared to current conditions. Less influence to water levels was observed in groundwater discharge areas at lower elevations.

Groundwater Protection Planning

Based on the results of the contaminant inventory that was compiled in Phase 2 and the refined numerical model, conservation and groundwater protection measures were developed to support stewardship and water conservation in the Highlands. With consideration of the legislative framework in BC and a water governance model that is most applicable to the Highlands, Golder identified a variety of regulatory and non-regulatory mechanisms and market approaches, that the District could implement. Complementary initiatives being implemented within the Highlands by the Highlands Sustainability Task Force (HSTF) and by other local governments were also considered to identify opportunities for collaboration. In particular, opportunities were identified to encourage collaboration and cooperation between stakeholders to implement tools that are available from other local governments and provincial agencies and applicable to the local context.

Conservation Planning

The goal of the groundwater conservation planning exercise was to develop the framework for a conservation strategy that the District could implement to encourage conservation and efficient groundwater use and also to enhance groundwater recharge to the bedrock aquifer in order to mitigate potential decreases in future groundwater supply.

Regulatory mechanisms that could support the Highlands OCP include revision of Zoning Bylaw No. 100 to rezone groundwater recharge areas with a land use designation that includes additional groundwater conservation measures. Recharge areas could also be addressed with Development Permit Areas (DPAs) that could require new developments to limit site disturbance and amount of impervious surfaces, preserve natural soils and vegetation, and require landscaping designs and alternative water sources such as rainwater. Supporting bylaws for water services, storm water management and roads could be refined and new bylaws developed to reinforce groundwater conservation.

Public education and outreach programs are required not only to educate well owners about the importance of groundwater conservation, but also to provide them with the tools to assess current water use, evaluate potential groundwater conservation opportunities and implement appropriate measures. The District could develop a suite of non-regulatory measures that include both initiatives that are developed for the Highlands and linkages to existing tools and sources of information that are available from other jurisdictions and organisations. Application of a combination of new and available tools will facilitate implementation of groundwater conservation measures that are relevant to the local context in a cost-effective manner. The District may consider developing a conservation strategy that develops and advocates a household audit program and landscape planning and irrigation initiatives to reduce groundwater demand and encourage the use of alternative water supplies for non-potable uses. The District could consider providing financial incentives such as rebates, subsidies, grants and/or funding to reward well owners who implement groundwater conservation measures and to encourage demonstration projects.

Groundwater Quality Protection Planning

The contaminant inventory that was compiled during Phase 2 of the Study identified and ranked potential sources of contamination in the Highlands. Groundwater quality protection measures were developed to prevent contamination of groundwater supplies from the identified hazards. In addition to collaborating with operators of Commercial/Industrial (C/I) properties in the southern portion of the Highlands, the District may wish to consider legislative tools that are available to support groundwater quality protection. These tools include amendments to Zoning Bylaw No. 100 to preclude home-based businesses (e.g., automotive repair, service and salvaging, excavation and/or construction, metal recycling, cabinetry and woodworking, etc.) that involve the use, storage and potentially disposal of chemicals and hazardous products, and recreational and agricultural operations that apply chemicals such as fertilisers, pesticides and/or herbicides. Alternatively, specific land uses, including home-based businesses, could be regulated through the use of DPAs to regulate land use activities to prevent contamination, mandate use of best management practices (BMPs) and environmental inspections and maintenance practices for fuel tanks and septic systems. Specific standards could be established in the form of bylaws for storm water management, roads, engineered filtration systems, well closure and fuel tank containment measures.

The public education programs that the District currently implements could be supplemented with non-regulatory measures that are designed to address the potential hazards identified in the contaminant inventory. The household audit program that is discussed in the preceding section could also include measures to assess potential sources of contamination and provide supporting information regarding groundwater protection measures. This would provide the District with the opportunity to reinforce public education programs and help well owners identify specific groundwater protection measures that could be implemented on their properties.

Supporting information could be delivered to well owners through technical assistance programs that are tailored for specific land uses. For example, the District could assess environmental practices currently used different properties in the Highlands (e.g., C/I properties, Bear Mountain Golf Course, home-based businesses, etc.) and, if required, identify best management plans (BMPs) and waste disposal programs that could be implemented to support groundwater protection. A hazardous waste collection program could also be developed to encourage property owners to regularly remove hazardous products from their property for appropriate disposal.

It is anticipated that market approaches may be required to encourage residents and business operators in the Highlands to adopt and implement the groundwater quality protection measures discussed above. The District may wish to consider financial incentives to encourage developers, C/I operators, the Bear Mountain Golf Course, home-based businesses and hobby farms to implement groundwater protection measures and BMPs, and to upgrade facilities to reduce the potential for groundwater contamination. It is recommended that the District collaborate with other local governments and agencies to assess sources of funding that may be available for initiatives and agencies, identify opportunities to collaborate and potentially share resources.

Preliminary Contingency Planning

The objective of contingency planning is to identify alternative water supplies that could be used if there were to be a decrease in the available groundwater supply or a decline in groundwater quality in the future due to potential impacts from climate change or a general deterioration of groundwater quality across large areas of the Highlands.

In the Highlands, each individual private well owners and commercial/communal well operators are responsible for their water supply. The role of the Highlands is to advocate groundwater conservation and protection and to provide information to well owners in the event that one or more alternative water supplies are required. Bulk water delivery may be a practical option to supplement the yield from an existing well during the dry, summer season. Bulk water can be scheduled as needed and can be delivered either as bottled water or with tanker trucks, if the water user has a tank with sufficient volume.

Although an existing well could potentially be drilled to a greater depth to encounter more fractures in the bedrock, this is expected to result in variable, and potentially marginal, improvements to the well yield. Alternatively, a new well could potentially be drilled on a property to supplement or replace an existing well that has a relatively low yield; however, in the Highlands, well yields are variable. As such there is uncertainty in locating and drilling a new well that has a higher yield.

Surface water could potentially be used to as an alternative water supply source. Based on a search of the BC Ministry of Environment Water Resources Atlas database, it is anticipated that only a limited number of additional surface water licenses would be available within the Highlands. If additional water licenses were to be available, surface water would represent a viable option for properties that are adjacent to, or have access to (e.g., via a right-of-way), a surface water body. Treatment requirements would also have to be considered, as surface water generally requires more treatment than groundwater.

If configured appropriately, a rainwater harvesting system (RWH system) could be used to reduce demand for groundwater. RWH systems should comply with the BC Building Code and consideration should also be given to water treatment requirements and monitoring programs to assess the quality of the water from the RWH system. Precipitation is significantly lower during the summer months when water demand is greatest. Therefore, predicted precipitation patterns and other site-specific factors should be considered when sizing the volume of the storage reservoir for a RWH system.

The intent of the Highlands is for water supply to continue to be sourced primarily from privately owned individual wells in the majority of the Highlands. If required, the Greater Victoria Drinking Water System may represent an alternative water supply source for the Highlands; however, the capital costs required to extend the system in the majority of the Highlands would be relatively high on a per capita basis.

Emergency Response Planning

The District of Highlands Emergency Program (Emergency Program) outlines the District's responsibility during emergencies and the communications procedures to be followed. Although the District does not have jurisdiction over individual private water supplies in the event of an emergency, the District's role is to provide well owners with information, advocate preparedness and, in the event of an emergency, support first response activities, issue public warnings and provide information to residents.

A framework was developed to refine the Emergency Program to support timely and coordinated responses to emergency events that could contaminate groundwater supplies in the Highlands. It is recommended that a Hazard-Specific Plan be prepared to specifically address groundwater contamination. Measures should be developed to support both first response activities that consider the nature of the hazardous materials and immediate impacts to nearby wells, and follow-up phases of work that are required to identify receptors (including drinking water wells), assess potential flow paths from the area of the spill and the time before contaminants are expected to arrive at the receptors. Investigation of a spill and its effect on adjacent drinking water wells should be conducted in consultation with a contaminant hydrogeologist.

The District could consider developing a communications protocol specifically to address events that result in groundwater contamination. This protocol would identify lines of communication with the appropriate internal and external stakeholders such as MoE and the Vancouver Island Health Authority (VIHA), and companies that can provide specialised technical services such as remediation contractors and contaminant hydrogeologists.

Recommendations

The following recommendations are provided for the District to implement the groundwater protection measures presented above and to support long-term management of groundwater resources in the Highlands.

Public Education and Communications Strategy

Public education and involvement is required to raise awareness and provide information and tools that are necessary to educate well owners and residents about the importance of groundwater conservation and protection, and to provide information and tools that encourage changes in behaviour. Technical information from programs such as the current Study and the Highlands Integrated Community Sustainability Plan (ICSP) represent a clear and factual basis for a public education strategy that uses existing tools both internal and external to the Highlands and includes provisions to develop specific tools, as required, to customize the information for the local context. A variety of educational methods and tools could be implemented including:

- fact sheets and technical resources available from external resources;
- the Highlands newsletter and brochures;
- the "Highlands Sustainability" page on the District's website with information on local initiatives and links to a variety of on-line tools that are available from external stakeholders;
- publically available reports and studies to share technical information with residents;
- public presentations, seminars and workshops to encourage collaboration between local governments and organizations and to provide residents with opportunities to learn about groundwater protection topics such as pesticide-free gardening practices, rainwater harvesting and grey water use, well and septic system maintenance, irrigation practices, etc.; and
- educational materials such as the Highlands Community Green Map could be displayed at local events such as the Highlands Farmer's Market and the annual Highlands Fling.

The District should consider the merits, costs and challenges associated with the various options discussed in the preceding section to develop an education strategy that includes the right combination of methods and tools.

Groundwater Monitoring

Golder recommends that the District continue to monitor groundwater conditions in the Highlands using a coordinated approach that includes ongoing collection of continuous water-level data from Highlands monitoring wells and continued collaboration with stakeholders to obtain flow meter, water-level and precipitation data from the respective monitoring programs. The District should also obtain water quality data from select land owners to monitor potential changes to water quality in the southern portion of the Highlands. Data from the Highlands and stakeholder monitoring programs should be compiled and reviewed on an annual basis to assess long-term trends. If trends are observed, the results would provide the basis to guide implementation of management strategies including the conservation and groundwater protection measures.

Contaminant Inventory Review

It is recommended that the District work with property owners to implement the use of BMPs for the land uses at their respective properties. Based on the results of these activities, and in conjunction with the monitoring activities described above, the District should refine and review the results of the contaminant inventory on an annual basis to revise groundwater protection efforts such as implementation of technical assistance programs and the communications strategy.

Database System

The District may wish to consider building upon the Highlands database and establish a centralised database system to store and manage data from the monitoring programs and supporting information including land use practices and the results from the contaminant inventory, results from conservation and groundwater protection measures, records regarding spills and/or emergency response programs.

Legislative Review

It is recommended that, in support of the review process that is currently underway to integrate the ICSP into the OCP, the District consider regulatory measures that would support aquifer-scale planning and implementation of the groundwater conservation and protection measures described above.

Emergency Response Planning

Golder recommends that the Highlands review and revise the Emergency Response Program where necessary to address events that could potentially result in a loss of water supply or contamination of groundwater resources. The roles and responsibilities associated with groundwater related activities should be reflected in the Highlands Emergency Plan, including the Response Guidelines. The existing Hazard-Specific Plans for Dangerous Goods Release, Flood, and Transportation Accident – Road should be revised to reflect first response measures that consider groundwater contamination. It is also recommended that the District prepare a Hazard-Specific Plan for groundwater contamination to outline the first response and follow-up activities that are required to prevent groundwater contamination. The database system discussed above should provide a list of specialists, suppliers and contractors that provide spill response, remediation and water treatment services.

Glossary of Acronyms

AO	Aesthetic Objective
BMP	Best Management Plan
CAVI	Convening Action on Vancouver Island
C/I	Commercial/Industrial
COA	Certificate of Analysis
CRD	Capital Regional District
CVRD	Cowichan Valley Regional District
DF	Difference Factor
DOH	District of Highlands
DPA	Development Permit Area
EOC	Emergency Operations Centre
Fm	Fractured Media
GCDWQ	Guidelines for Canadian Drinking Water Quality
GCM	Global Climate Model
GWPR	Ground Water Protection Regulation
HSF	Highlands Stewardship Foundation
HSTF	Highlands Sustainability Task Force
ICSP	Integrated Community Sustainability Plan
IPM	Integrated Pest Management
MAC	Maximum Allowable Concentration

MoA	Ministry of Agriculture
MoE	Ministry of Environment
MoH	Ministry of Health
NRC	Natural Resources Canada
NTU	Nephelometric Turbidity Unit
OBWB	Okanagan Basin Water Board
OCP	Official Community Plan
OG	Operational Guideline
RCMP	Royal Canadian Mounted Police
RDN	Regional District of Nanaimo
RPD	Relative Percent Difference
RRU	Royal Roads University
RWH	Rainwater Harvesting
TDS	Total Dissolved Solids
UBCM	Union of BC Municipalities
UVic	University of Victoria
VIHA	Vancouver Island Health Authority
VIU	Vancouver Island University
WRA	Water Resources Atlas

Table of Contents

TABLES

FIGURES

APPENDICES

Notice of Work

Millstream Road Quarry

Tracking Number: 100202890

Application Information

If approved, will the authorization be issued to an Individual or Company/Organization?	Company/Organization
What is your relationship to the company/organization?	Agent

APPLICANT COMPANY/ORGANIZATION CONTACT INFORMATION

Applicant is an Individual or an Organization to whom this authorization Permit / Tenure / Licence will be issued, if approved.

Name:	Barry Chalmers
Doing Business As:	OK Industries Ltd
Phone:	250-652-9211
Fax:	250-652-9210
Email:	bchalmers@islandpaving.com
BC Incorporation Number:	
Extra Provincial Inc. No:	
Society Number:	
GST Registration Number:	
Contact Name:	Barry Chalmers
Mailing Address:	6792 Rajpur @ Keating X Road PO Box 1324 Victoria BC V8W 2W3

AGENT INFORMATION

Please enter the contact information of the Individual/Organization who is acting on behalf of the applicant.

Name:	TAJE, Edward
Doing Business As:	
Phone:	250-743-2590
Fax:	
Email:	s.22
BC Incorporation Number:	
Extra Provincial Inc. No:	
Society Number:	
GST Registration Number:	
Contact Name:	Ed Albert Taje
Mailing Address:	15-1751 Northgate Road Road Cobble Hill BC V0R 1L6
Letter(s) Attached:	Yes (millstream agent letter.pdf)

CORRESPONDENCE E-MAIL ADDRESS

If you would like to receive correspondence at a different email address than shown above, please provide the correspondence email address here. If left blank, all correspondence will be sent to the above given email address.

Email:	
Contact Name:	Ed Taje

TECHNICAL INFORMATION

APPLICATION INFORMATION

Type of Notice of Work:	Quarry - Construction Aggregate
Is this a New Permit or an Amendment to an existing permit for this property?	New Permit

MINE INFORMATION

Do you have an existing mine number?	No
Name of the property:	Millstream Road Quarry
Tenure Numbers:	CA4187362
Crown Grant / District Lot Numbers:	Lot 1 Section 5 Range 3 West Highlands District Plan VIP702242
Directions to site from nearest municipality:	From Victoria, take Millstream exit and stay on Millstream road , the site is the property just south of The Tervita Landfill, and opposite Hannington Road. Private access not in place as of this time, The access to be constructed as easement is in place.
Geographic Coordinates of Mine:	**Latitude:** 48.48010 **Longitude:** -123.50110
Maximum Annual Tonnage Extracted:	150000 tonnes

INFORMATION ABOUT PROPOSED ACTIVITIES

Activities to be undertaken: Blasting
Sand & Gravel / Quarry Operations

FIRST AID

Proposed First Aid equipment on site:	Level II First Aid Kit with stretcher. Direct communications to Provincial Ambulance, Medical services
Level of First Aid Certificate held by attendant:	Occupational First Aid Level 1 with Transportation Endorsement

DESCRIPTION OF WORK 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:

The basic program consists of mining the property through a series of 5 phases. Overall the property has an estimated reserve of 3,000,000 tonnes. Initially an access road will be constructed to the site on an easement to the property line at Phase 1(EV 6988). This will involve some blasting and removal of rock. Any rock excavated will be used for road construction, and will be sized to spec at the existing 2121Millstream road owned and operated by the proponent. Following access to the Quarry site, Phase I will be mined to elevation 95M. This will be in a series of 10 M benches. On the "South excavation within this Phase there will be two benches of 10 M. The " East excavation" of this Phase will be one bench of 10M with minor variances due to topography. Variances are necessary to establish consistent face heights of 10M. Material from this phase will be trucked to the operator's site at 2121 Millstream Road for crushing screening washing until such time as room as been established to locate the necessary infrastructure on site. It is anticipated Phase one will provide sufficient material at the projected production rate for 6 years, at which time a new updated mine plan will be submitted as per the requirements of the Health Safety and Reclamation Code for Mines in British Columbia (HSRC). It must be noted that some encroachment into Phase II is expected to ensure continuity of benches in the next submitted plan. Water for Drilling and dust control will be hauled to the site. A second Access Road along the South boundary of the property will be constructed , and as this road is largely within the mine footprint will be constructed in accordance with the Requirements of the HSRC. This road will remain on conclusion of mining operations and is not factored into final reclamation costs. Roads and phases of mining are shown on attached maps. Note pit run as checked off on this form refers to shot rock prior to crushing or screening.

TIME OF PROPOSED ACTIVITIES

Original Start Date:	Mar 22, 2017
Proposed start and end date:	Mar 22, 2017 to Mar 22, 2042

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: No

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:	Raw undeveloped land
Type of vegetation:	Grasses, shrubs, limited timber
Physiography:	varying elevations, (see topo Map), no known wet lands within proposed mining activities, no glaciers, elevations vary from Aprox 95 meters to 116 meters phase I with a low elevation of Aprox 70 meters NE corner of Phase III (see Aqua Tex report attached). Final proposed elevation for all phases on completion to be 95 meters.
Current means of access:	Access to site will be private road off Millstream road. Constuction of road will be on approved easement see attached maps. In addition a second road through the mine site will be constructed off Millstream Road, through the mine footprint subject to local access approvals and in addition this road shown on the attached maps will comply with the requirements of the HSRC
Old equipment:	None on site
Recreational trails / use:	None within proposed mine footprint

ACCESS TO TENURE

Do you need to build a road, create stream crossings or other surface disturbance that will not be on your tenure?	Yes
Required access authorizations in place:	Yes
Type and authorization number:	Easement District of Highlands EV6988. Principle access . Second Access within mine site, will require final authorization

LAND OWNERSHIP

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

Please note that under Section 19 of the Mineral Tenure Act and Section 2.1 of the Mineral Tenure Act Regulation you must not begin any mining activities until 8 days after giving notice to every owner of the surface area on which the recorded holder intends to carry out that activity.

Please attach a copy of the letter of authorization signed by the landowner The document can be uploaded at the "Document Upload" step later in the application process.

Legal description of land:	Lot 1 Section 5 Range 3 West Highland District Plan VIP70242
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? No

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://maps.gov.bc.ca/ess/sv/cadb/.

Have you shared information and engaged with First Nations in the area of the proposed activity? 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: Explosives will be transported to site and unused explosives will be removed from site by Licensed blasting contractor.

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.

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 orginial 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.

SOIL CONSERVATION

Average depth of overburden:	0.50 m
Average depth of topsoil:	0.01 m
Measures to stabilize soil overburden stockpiles and control noxious weeds:	Limited overburden will be stripped stockpile and vegetated as may be required. If necessary covered to prevent spread or germination of Noxious weeds

LAND USE

Is the site within the Agricultural Land Reserve?	No
Does the local government have a Soil Removal Bylaw?	Yes
Official Community Plan for the site:	Commercial and Industrial
Current land use zoning for the site:	Greenbelt
Proposed end land use is:	Comercial/ Industrial Subdivisions
Estimate total minable reserves over the life of the mine:	3,000,000 tonnes
Estimate annual extraction from site:	150,000 tonnes/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	0.30	0.00
Excavation of Pit Run	5.90	0.00
Mechanical Screening	0.30	0.00
Total:	**6.50**	**0.00**

Is the work year round or only seasonal?	Year round
Brief description of operation, including proposed work schedule:	Drilling and blasting in Benches of 10 meters as noted earlier. When area is mined and room is created infrastructure to accommodate crushing ,and screening , will be located on site, plans as may be required will be provided at that time. All equipment installed will meet requirements of HSRC.

RECLAMATION PROGRAM

Describe the proposed reclamation and timing for this specific activity:	There is no proposed reclamation at this time as the area will be required for infrastructure during the period of this 6 year mining plan.
If backfilling of pits or pit slopes is proposed in the final configuration for reclamation, details of materials to be used and placement procedures:	no backfilling or slope stabilization required during this six year mining plan Reclamation cost estimate based on $5000.00 Ha. When mining completed, and site prepared for commercial/ industrial reclamation costs will likely be lower, as it will generally consist of leveling and providing access to lots. Note: scaling of faces to be undertaken if required for safety considerations.
Estimated cost of reclamation activities described above:	$30,000.00
Will progressive reclamation be carried out?	No

GROUNDWATER PROTECTION

Average depth to the high groundwater table at the proposed excavation:	25.0 m
Elevation of the groundwater table was determined from:	☐ Existing area wells ☐ Test pits ☐ Test wells drilled for this purpose ☑ Other: Inferred from ecological and SNC lavilin report to be verified
Measures proposed to protect groundwater from potential impacts of the proposed mining activity:	Verify highground water table by drilling . Adjust final elevation if required to remain 1 meter above water table. No fuel initially stored on site, Should on site fuel become necessary storage will comply with HSRC , re: containments , spill kits, and training in use of spill kits. Nitrates from Blasting operation are covered in attached blasting plan.

IMPACT MINIMIZATION

Shortest distance between proposed excavation to nearest residence:	730 m
Shortest distance between proposed excavation to nearest residential water source:	730 m
Measures proposed to prevent inadvertent access of unauthorized persons to the mine site:	Fencing, Vegetative barriers and berms as may be required. Gated access points; Also note distance to nearest residence and water source measured on google earth,
Measures proposed to minimize noise impacts of the operation:	Vegitation buffers, lay out of working faces to keep work below high points in the topography as far as practical. hours of work 7am to 5 pm Monday to Friday, If required light Maintenance on Saturday
Measures proposed to minimize the dust impacts of the operation:	Drills equipped with vacuum system or wet drilling , sprays on crushers , and screening plants, watering of roads as may be required.
Measures proposed to minimize visual impacts of the operation:	Green strips laid out in the mine plan see attached maps.

TIMBER CUTTING

Total merchantable timber volume: 0.00 m3

No TimberYou have indicated that there is no merchantable timber that will be cut. Therefore a Free Use Permit or a Licence to Cut is not required. If this is not accurate, please correct your entries.

EQUIPMENT

Click on the "Add Equipment" button to add one type of equipment at a time. All equipment must comply with the requirements of the Health, Safety and Reclamation Code.

Quantity	Type	Size / Capacity
1	Crusher	Cedar Rapids
1	Drill	Ranger Hydraulic
3	Excavator	Cat 336 E 35 ton unit
2	Loader	Cat 980 M 7Yd

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	6.50	30,000.00
Subtotal:	6.50	30,000.00
Unreclaimed disturbance from previous year:	0.00	
Disturbance planned for reclamation this year:	0.00	
Total:	**6.50**	**30,000.00**

OTHER CONTACTS

Please enter the contacts that are applicable to your application.

Contact Info		Type of Contact
Name:	Barry Chalmers	Tenure Holder
Phone:	250-887-2296	
Daytime Phone:	259-652-9211	
Fax:	250-652-9210	
Email:	bchalmers@islandpaving.com	
Mailing Address:	6702 Rajpur@Keating X Road PO Box 1324 Victoria BC V8W 2W3	

Name:	Barry Chalmers	Site operator
Phone:	250-897-2296	
Daytime Phone:	259-652-9211	
Fax:	250-652-9210	
Email:	bchalmers@islandpaving.com	
Mailing Address:	6702 Rajpur@Keating X Road PO Box 1324 Victoria BC V8W 2W3	

Name:	Barry Chalmers	Permittee
Phone:	250-897-9210	
Daytime Phone:	250-652-9211	
Fax:	250-652-9210	
Email:	bchalmers@islandpaving.com	
Mailing Address:	6702 Rajpur @Keating Road PO Box 1324 Victoria BC V8W 2W3	

Name:	Barry Chalmers	Mine manager
Phone:	250-897-2296	
Daytime Phone:	259-652-9211	
Fax:	250-652-9210	
Email:	bchalmers@islandpaving.com	
Mailing Address:	6702 Rajpur@Keating X Road PO Box 1324 Victoria BC V8W 2W3	

LOCATION INFORMATION

All applications must include the appropriate maps and applications received without maps will be returned. All maps must be in colour, computer generated, with a scale, north arrow and a detailed legend.

For Mineral, Coal and Placer applications you must provide a minimum of 3 maps:
- A Location Map which must show the location of the property in relation to the nearest community with the access route from the community to the work site clearly marked;
- A Tenure Map which must show the boundaries of the tenure(s) and tenure numbers, at a scale of 1:20,000 or less;
- A Map of Proposed Work which must show topography, water courses, existing access, existing disturbance, contour lines, known cultural heritage resources and/or protected heritage property, at a scale of 1:10,000 or 1:5,000. For site specific applications the location of all proposed exploration activities must be shown; for area-based applications the work area must be shown as a polygon, with the location of all proposed exploration activities for year 1 shown, and shape files provided of the area.

For Sand & Gravel/Quarry applications you must provide a Plan View, Cross and Longitudinal Sections and a Land Title/Crown Land Tenure Map. Details of these requirements are listed in the Sand & Gravel/Quarry Operations Activity sheet.

☑ I have one or more files (PDF, JPG, PNG etc.) with my maps

MAP FILES

Do you have a PDF or image file of a drawn map? You can upload it here.

Description	Filename
Cross Section	2845_Industrial Park_CROSS ...
Location plan	2845_Industrial Park_LOCATI...
Topo	2845_Industrial Park_TOPOGR...
Topo 2	2845_Industrial Park_TOPOGR...
Work Plan	2845_Industrial Park_PROPOS...
X section 2	2845_Industrial Park_CROSS ...

ATTACHED DOCUMENTS

Document Type	Description	Filename
Blasting Procedure	Blasting plan including protection for adjacent landfill	OK Industries LTD Blast Pla...
Other	Ecological report	ecological SKMBT_C203170228...
Other	environmental compliance report	SNC Lavalin Millstream Repo...

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.

Please enter contact information below for the person who would best answer questions about your application that may arise from anyone who received a referral or notification.

Company / Organization:	OK Industries Ltd
Contact Name:	Barry Chalmers
Contact Address:	6792 Rajpur @ Keating X Road PO Box 1324 Victoria BC V8W 2W3
Contact Phone:	250-652-9211
Contact Email:	bchalmers@islandpaving.com

☑ I hereby consent to the disclosure of the information contained in this application to other agencies, government ministries or other affected parties for referral or First Nation consultation purposes.

IMPORTANT NOTICES

- Once you click 'Next' the application will be locked down and you will NOT be able to edit it any more.

DECLARATION
☑ By submitting this application form, I, declare that the information contained on this form is complete and accurate.

APPLICATION AND ASSOCIATED FEES

Item	Amount	Taxes	Total	Outstanding Balance
Mines Notice of Work Application Fee	$16,000.00		$16,000.00	$0.00

OFFICE

Office to submit application to: Nanaimo

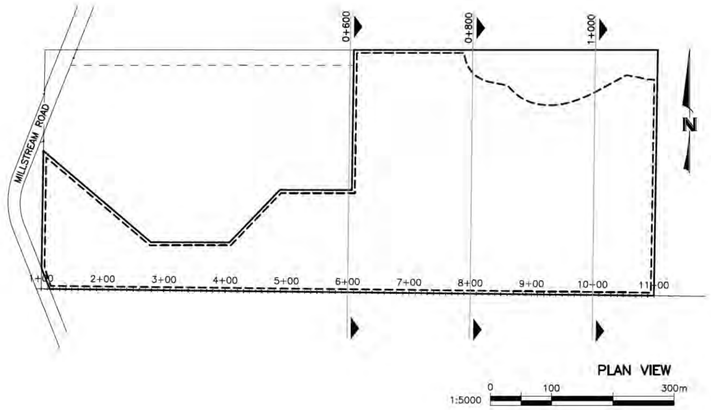
PROJECT INFORMATION

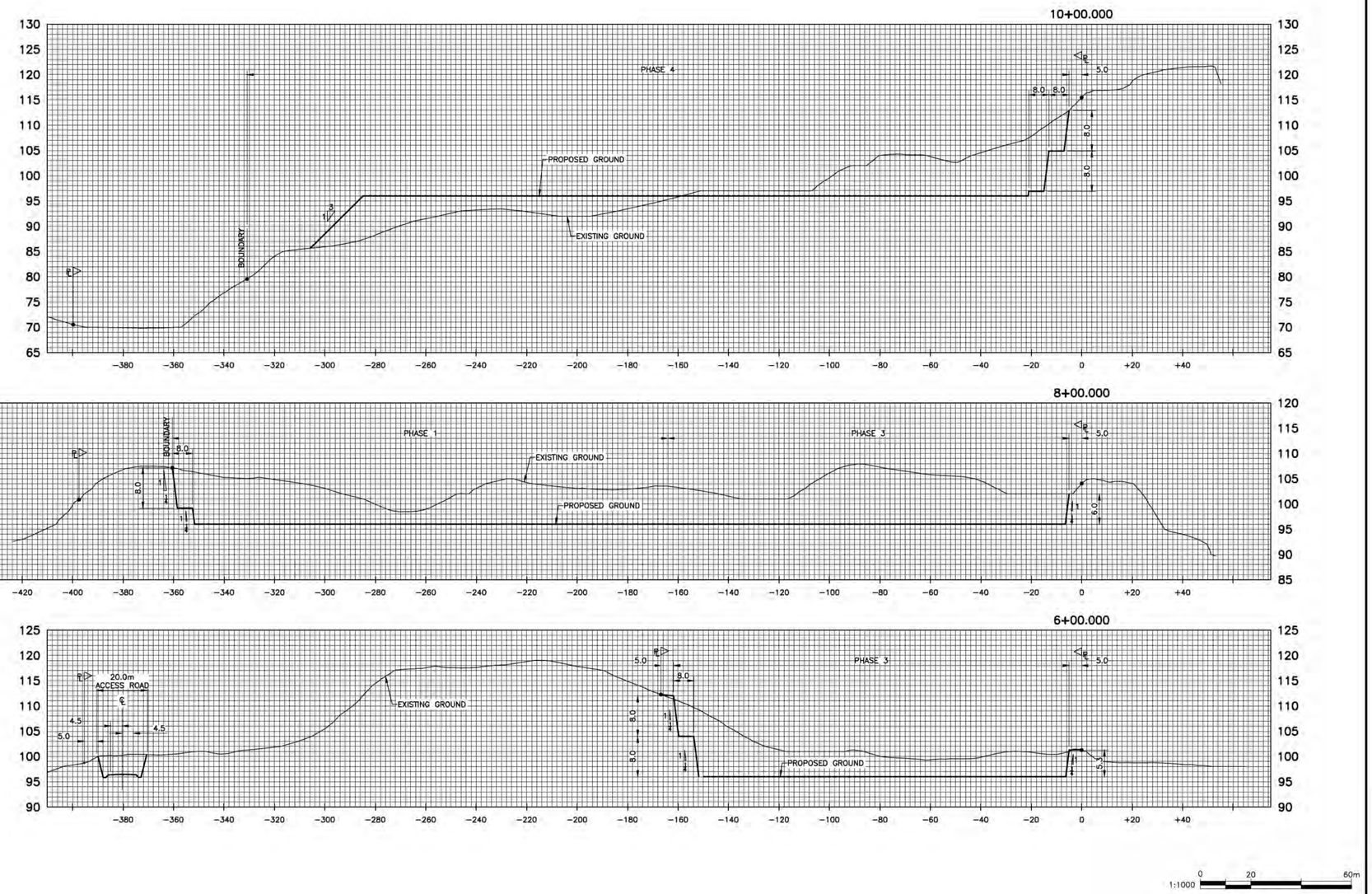
Is this application for an activity or project which requires more than one natural resource authorization from the Province of BC? No

APPLICANT SIGNATURE

Applicant Signature	Date

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





THE LOCATION AND ELEVATION OF EXISTING UNDERGROUND SERVICES ON THIS DRAWING MAY NOT BE ACCURATE OR COMPLETE. THE ACTUAL HORIZONTAL AND VERTICAL LOCATIONS MUST BE CONFIRMED BY UTILITY COMPANIES AND THE CONTRACTOR PRIOR TO THE START OF ANY EXCAVATIONS

LEGEND – Proposed services shown bold

WATER —W—	GAS —G—	EXISTING U/G UTL.	MANHOLE	HYDRANT	MONUMENT
SEWER —S—	CURB —C—	PROPOSED U/G UTL.	CLEANOUT	VALVE	LOT PIN
DRAIN —D—	SIDEWALK S/W	LIGHT STANDARD	CATCHBASIN	METER	LEAD PLUG
NATURAL GRADE	EDGE PAVE.	POWER POLE	ROAD SIGN	REDUCER	
CULVERT	BUSHLINE	ANCHOR			
HEADWALL	TREE				

SEAL

REVISIONS

No.	DESCRIPTION	DATE	SIGN

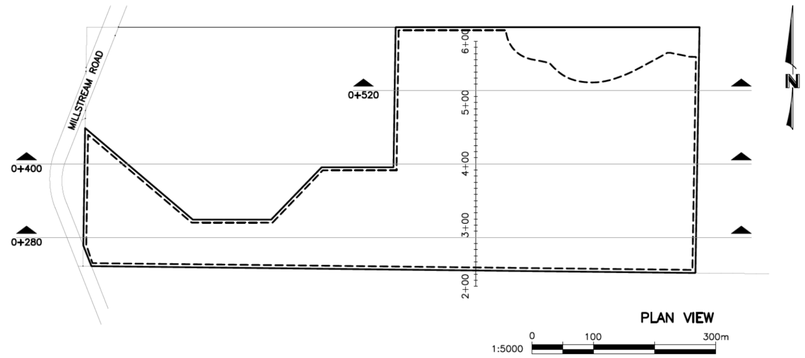
DESIGNED MW
DRAWN WR
CHECKED
DATE FEB 2017
B.M.
ELEV.
SCALE Horz. AS NOTED
Vert.

WESTBROOK Consulting Ltd.
#115 - 866 Goldstream Ave., Victoria, BC V9B 0J3
Telephone: 250-391-8592 Facsimile: 250-391-8593

PROJECT
MILLSTREAM INDUSTRIAL PARK
OK INDUSTRIES

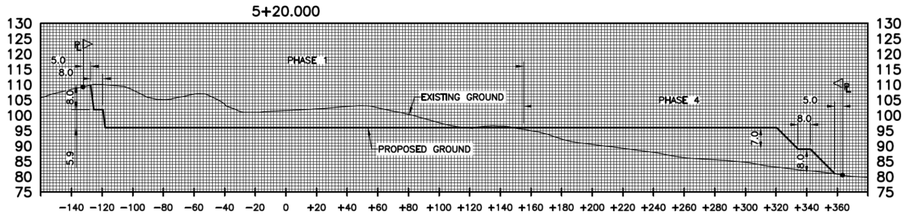
CROSS SECTIONS

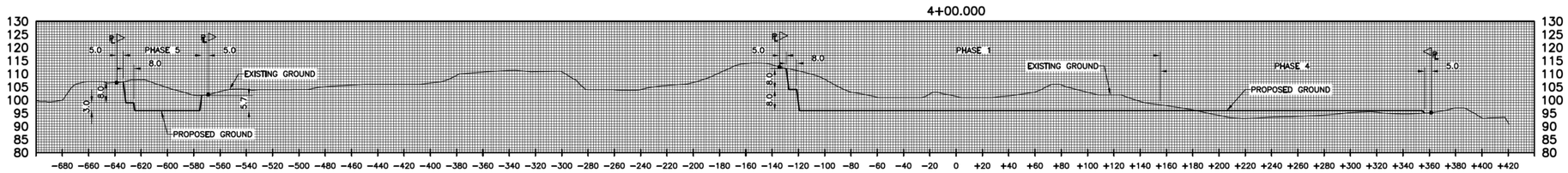
WESTBROOK PROJECT No. 2845
GOVERNING AUTHORITY FILE No.
SHEET 1 OF 2 REV.
WESTBROOK DRAWING No. FIGURE 1

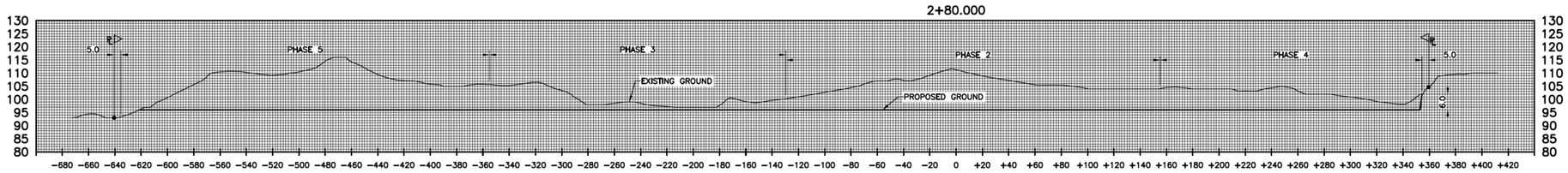


PLAN VIEW

1:5000 0 100 300m







1:2000 0 40 120m

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CULVERT	BUSHLINE	ANCHOR			
HEADWALL	TREE				

SEAL

REVISIONS

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DESIGNED MW
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CHECKED
DATE FEB 2017
B.M.
ELEV.
SCALE Horz. AS NOTED
Vert.

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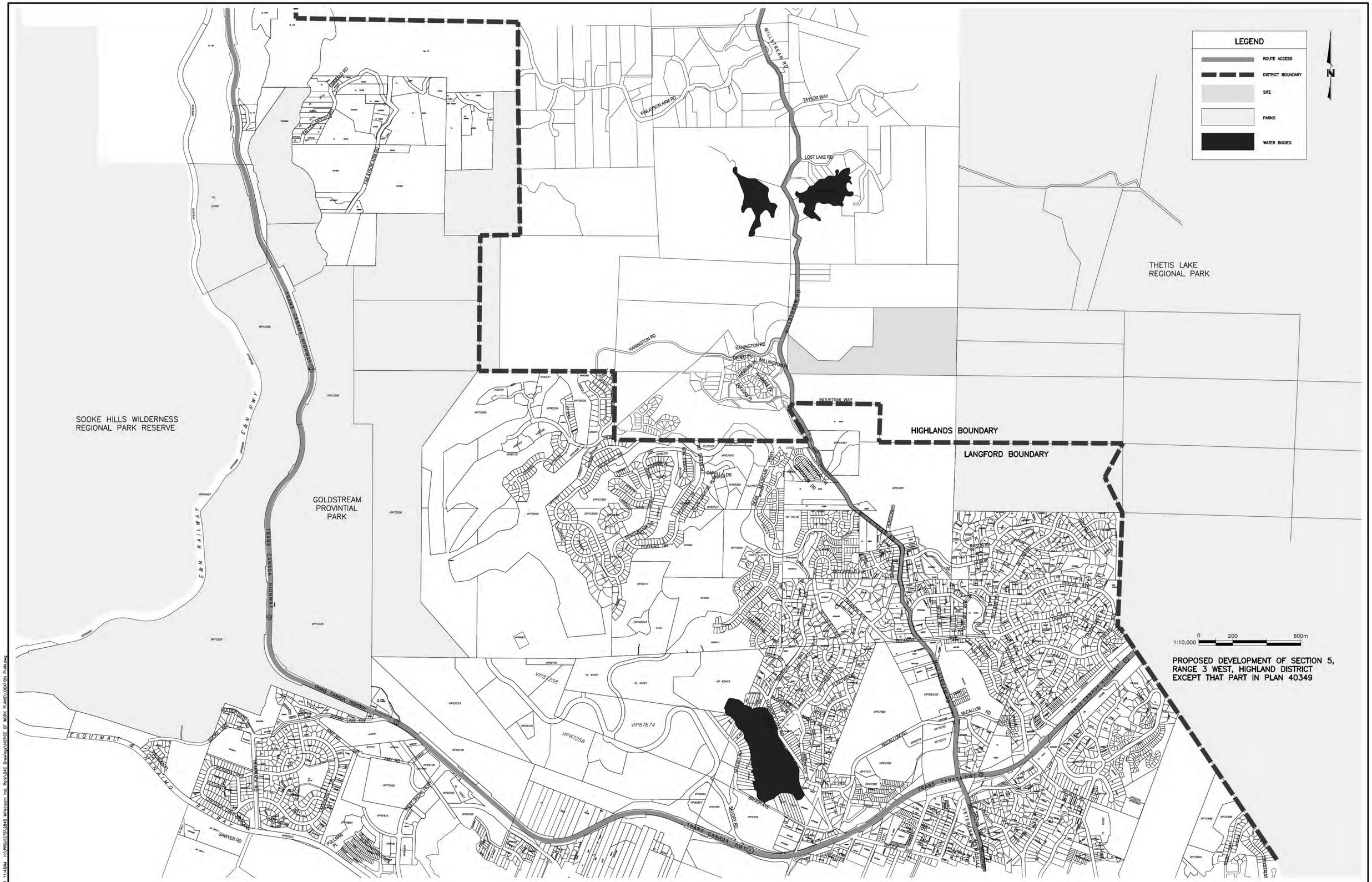
PROJECT
MILLSTREAM INDUSTRIAL PARK
OK INDUSTRIES

CROSS SECTIONS

WESTBROOK PROJECT No. 2845
GOVERNING AUTHORITY FILE No.
SHEET 2 OF 2 REV.
WESTBROOK DRAWING No. FIGURE 2



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DRAIN — D —	SIDEWALK S/W	LIGHT STANDARD	CATCHBASIN ☑	METER ○	LEAD PLUG ■
NATURAL GRADE	EDGE PAVE.	POWER POLE	ROAD SIGN	REDUCER	
CULVERT	BUSHLINE	ANCHOR			
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B.M.	
ELEV.	
SCALE Horz.	AS NOTED
Vert.	N/A

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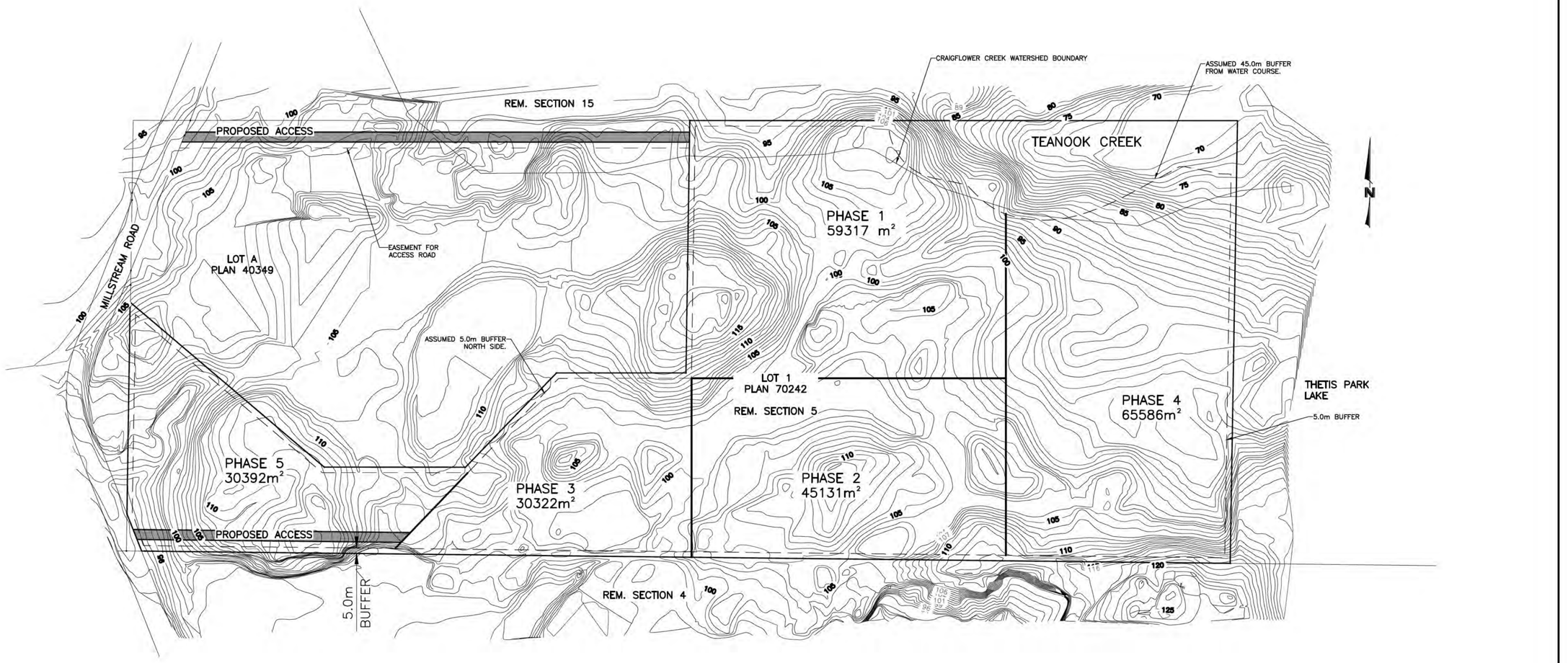
PROJECT
MILLSTREAM INDUSTRIAL PARK
OK INDUSTRIES

LOCATION PLAN

WESTBROOK PROJECT No.	2845
GOVERNING AUTHORITY FILE No.	
SHEET	1 OF 1 REV.
WESTBROOK DRAWING No.	FIGURE 1

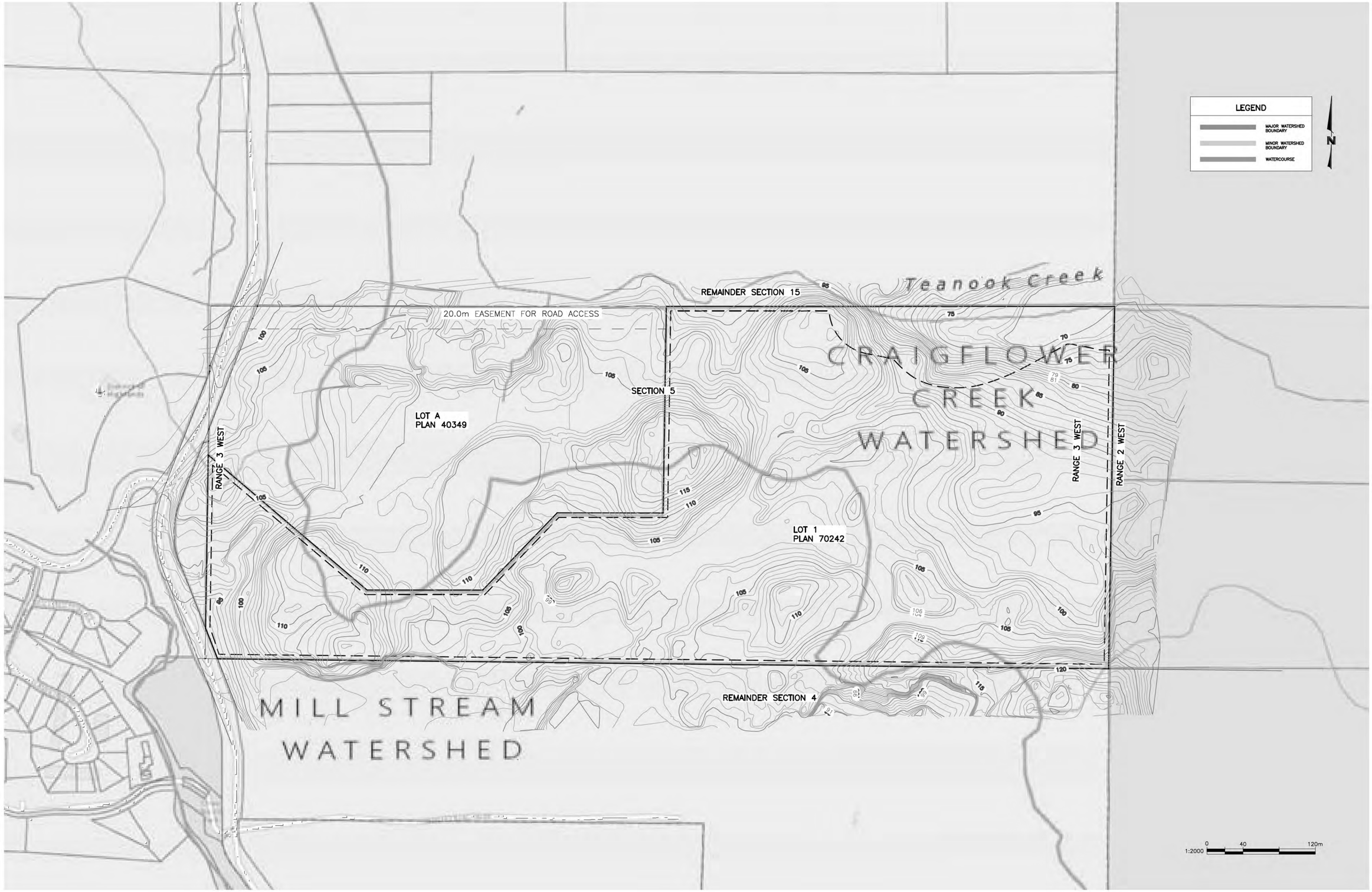
WESTBROOK CONSULTING LTD. – 2017-02-21 11:49AM H:\PROJECTS\2845 Millstream Ind. Park\04C Drawings\NOTICE OF WORK PLANS\LOCATION PLAN.dwg



1:2000 0 40 120m

NOTE:
EXISTING GROUND CONTOURS DERIVED FROM CAPITAL REGIONAL DISTRICT "CRD ATLAS" MAY 2014.

SEAL		DESIGNED MW DRAWN WR CHECKED DATE FEB 2017 B.M. ELEV. SCALE Horz. 1:2000 Vert.	**WESTBROOK Consulting Ltd.** #115 - 866 Goldstream Ave., Victoria, BC V9B 0J3 Telephone: 250-391-8592 Facsimile: 250-391-8593	PROJECT MILLSTREAM ROAD OK INDUSTRIES PROPOSED WORK	WESTBROOK PROJECT No. 2845 GOVERNING AUTHORITY FILE No. SHEET 1 OF 1 REV. WESTBROOK DRAWING No. FIGURE 1



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CULVERT	BUSHLINE	ANCHOR →			
HEADWALL	TREE				

SEAL

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PROJECT
MILLSTREAM INDUSTRIAL PARK
OK INDUSTRIES

TENURE MAP

WESTBROOK PROJECT No. 2845
GOVERNING AUTHORITY FILE No.
SHEET 1 OF 1 REV.
WESTBROOK DRAWING No. FIGURE 2

THE LOCATION AND ELEVATION OF EXISTING UNDERGROUND SERVICES ON THIS DRAWING MAY NOT BE ACCURATE OR COMPLETE. THE ACTUAL HORIZONTAL AND VERTICAL LOCATIONS MUST BE CONFIRMED BY UTILITY COMPANIES AND THE CONTRACTOR PRIOR TO THE START OF ANY EXCAVATIONS

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PROJECT
MILLSTREAM INDUSTRIAL PARK
OK INDUSTRIES

TENURE MAP

WESTBROOK PROJECT No. 2845
GOVERNING AUTHORITY FILE No.
SHEET 1 OF 1 REV.
WESTBROOK DRAWING No. FIGURE 2

From:	Dunkley, Jim R MEM:EX
To:	Southwest Regional Mines Division MEM:EX
Cc:	Bunce, Anna FLNR:EX; "Referrals Coordinator"; Harrison, Donald MEM:EX
Subject:	RE: Consultation request for a Notice of Work for Construction Aggregate on Private Land near Tervita Landfill - File 1610713
Date:	Wednesday, August 16, 2017 3:10:33 PM
Attachments:	1610713201701_2845_Industrial Park_PROPOSED WORK.pdf image001.wmz image002.png image003.wmz

Hi Heather,

Please see the attached pdf proposed work plan. Teanook Creek will have a 45m buffer where it flows through the property. On the west side of the map, there is no mining in the vicinity of Teanook Creek as that section is not part of the proposed quarry. There is a road access right of way that parallels the creek that may or may not be used depending upon Highlands allowing road access at that point. Between that section and where Teanook enters the property there is a minimum 5 m buffer between mining and the property line plus the distance from the property line to Teanook Cr.

Hopefully this is clear when looking at the map.

Jim Dunkley, P. Geo
Inspector of Mines

300-1810 Blanshard St
Victoria, BC. V8W 9M9

250.953.4640

From: Southwest Regional Mines Division MEM:EX
Sent: Wednesday, August 16, 2017 2:42 PM
To: Dunkley, Jim R MEM:EX
Cc: Bunce, Anna FLNR:EX; 'Referrals Coordinator'
Subject: FW: Consultation request for a Notice of Work for Construction Aggregate on Private Land near Tervita Landfill - File 1610713

Hi Jim,

Please provide clarification for Heather Adams. Thank you.

Sincerely,

MARYANN J. BOUFFARD
OPERATIONS COORDINATOR
SW REGION MINING OFFICE
TEL: **778-698-3648**

MINISTRY OF ENERGY, MINES AND PETROLEUM RESOURCES

www.gov.bc.ca/ener

From: Referrals Coordinator [mailto:referrals@malahatnation.com]
Sent: Wednesday, August 16, 2017 2:33 PM
To: Southwest Regional Mines Division MEM:EX; Referrals Coordinator
Cc: Bunce, Anna FLNR:EX
Subject: RE: Consultation request for a Notice of Work for Construction Aggregate on Private Land near Tervita Landfill - File 1610713

Hi Maryann,

Thank you for sending over these environmental reports.

There are a couple things I noticed and would like to seek clarification on. The initial referral letter from June 5th states that there are no waterbodies in the application area. According to the Preliminary Ecological Site Investigation report, there are four different freshwater features within the subject property, including a large wetland in the center of the area and a portion of Teanook creek. Can you confirm that the proposed mining area does not overlap with Teanook creek, as well as the planned reserve distance from the creek to the mining area?

Thank you,

Heather Adams
Fisheries and Referrals Coordinator, Malahat Nation

110 Thunder Road, Mill Bay, BC, V0R 2P4
Ph: 250.743.3231 | Cell: 778.230.1778
referrals@malahatnation.com | www.malahatnation.ca

From: Southwest Regional Mines Division MEM:EX [mailto:SouthwestMinesDivision@gov.bc.ca]
Sent: August 11, 2017 3:37 PM
To: Referrals Coordinator
Cc: Bunce, Anna FLNR:EX
Subject: RE: Consultation request for a Notice of Work for Construction Aggregate on Private Land near Tervita Landfill - File 1610713

Hello Heather,

Anna Bunce informed me that you would like a copy of the environment reports. Please find 2 reports attached.

If you have further technical questions, let me know and I'll have the inspector get in touch to

assist.

Cheers,

MARYANN J. BOUFFARD
OPERATIONS COORDINATOR
SW REGION MINING OFFICE
TEL: **778-698-3648**

MINISTRY OF ENERGY, MINES AND PETROLEUM RESOURCES
www.gov.bc.ca/ener

From: Bouffard, Maryann J MEM:EX **On Behalf Of** Southwest Regional Mines Division MEM:EX
Sent: Friday, July 14, 2017 3:23 PM
To: 'Referrals Coordinator'
Cc: Bunce, Anna FLNR:EX
Subject: RE: Consultation request for a Notice of Work for Construction Aggregate on Private Land near Tervita Landfill - File 1610713

Hello Heather,

Thank you for informing our office of your anticipated response date.

Please do not hesitate to contact me for further inquiries.

Sincerely,

MARYANN J. BOUFFARD
OPERATIONS COORDINATOR
SW REGION MINING OFFICE
TEL: **778-698-3648**

MINISTRY OF ENERGY AND MINES
www.gov.bc.ca/ener

From: Referrals Coordinator [mailto:referrals@malahatnation.com]
Sent: Friday, July 14, 2017 3:13 PM
To: Southwest Regional Mines Division MEM:EX
Subject: RE: Consultation request for a Notice of Work for Construction Aggregate on Private Land near Tervita Landfill - File 1610713

Attn: Maryann Bouffard,

Thank you for the above application (File 1610713) received June 5th, located within Malahat First Nations Traditional Territory. We are currently reviewing your application and expect to provide a response on or before July 31st.

Please note that not receiving a response to a referral from Malahat First Nation in the pre-application, current or post-application stage does not imply our support for your project.

Sincerely,

Heather Adams
Fisheries and Referrals Coordinator, Malahat Nation

110 Thunder Road, Mill Bay, BC, V0R 2P4
Ph: 250.743.3231 | Cell: 778.230.1778
referrals@malahatnation.com | www.malahatnation.ca

From: West Coast Land Referrals FLNR:EX [mailto:WestCoast.LandReferrals@gov.bc.ca]
Sent: June 5, 2017 9:23 AM
To: Referrals Coordinator
Cc: Southwest Regional Mines Division MEM:EX
Subject: Consultation request for a Notice of Work for Construction Aggregate on Private Land near Tervita Landfill - File 1610713

On behalf of the Ministry of Energy and Mines, please see the attached consultation request for a Notice of Work for a *Mines Act* permit, File 1610713.

Should you have any questions regarding this application, please contact Maryann Bouffard, Operation Coordinator, 778-698-3648 or by email:

SouthwestMinesDivision@gov.bc.ca

Regards,

FrontCounter BC | **Ministry of Forests, Lands and Natural Resource Operations**
2080 Labieux Road
Nanaimo, BC V9T 6J9
Tel: 250-751-7220 | Fax: 250-751-7224

FrontCounter BC Website | Toll-Free Contact Centre: 1-877-855-3222
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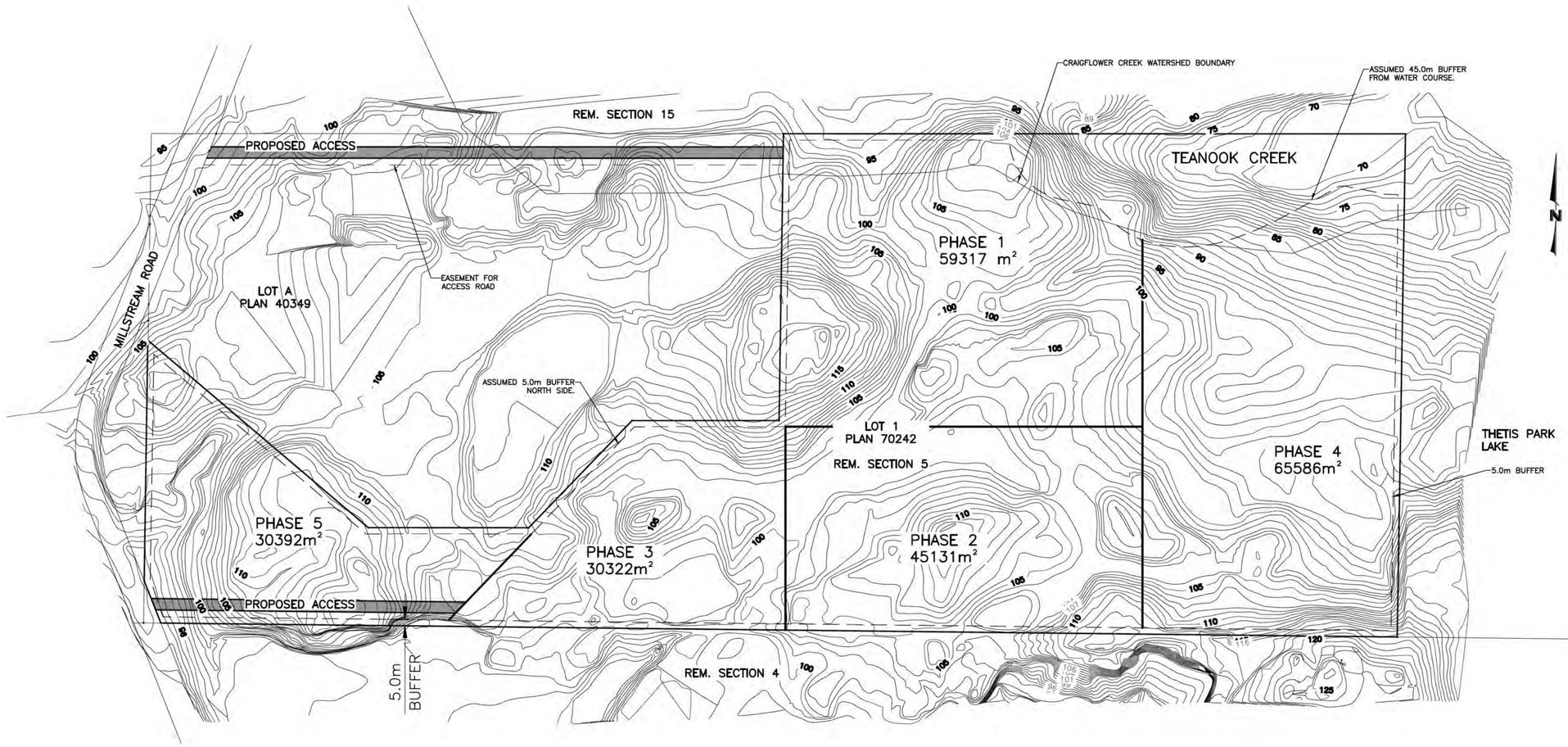
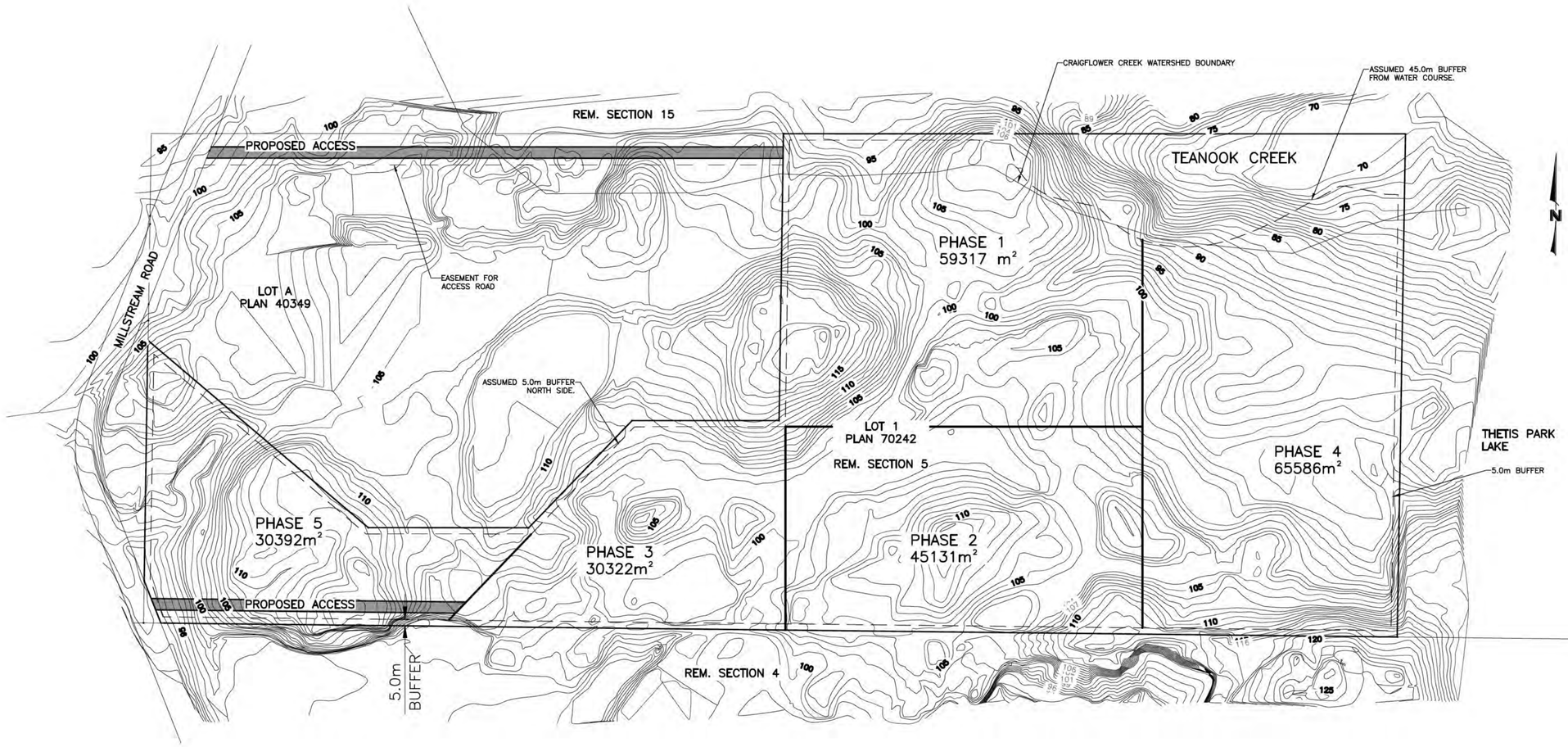


1:2000 0 40 120m

NOTE:
EXISTING GROUND CONTOURS DERIVED FROM CAPITAL REGIONAL DISTRICT "CRD ATLAS" MAY 2014.

SEAL		DESIGNED MW DRAWN WR CHECKED DATE FEB 2017 B.M. ELEV. SCALE Horz. 1:2000 Vert.	**WESTBROOK Consulting Ltd.** #115 - 866 Goldstream Ave., Victoria, BC V9B 0J3 Telephone: 250-391-8592 Facsimile: 250-391-8593	PROJECT MILLSTREAM ROAD OK INDUSTRIES PROPOSED WORK	WESTBROOK PROJECT No. 2845 GOVERNING AUTHORITY FILE No. SHEET 1 OF 1 REV. WESTBROOK DRAWING No. FIGURE 1

WESTBROOK CONSULTING LTD - 2017-02-21 04:22PM H:\PROJECTS\2845 Millstream Ind. Park\045 Drawings\NOTICE OF WORK PLANS\PROPOSED WORK.dwg



1:2000 0 40 120m

NOTE:
EXISTING GROUND CONTOURS DERIVED FROM CAPITAL REGIONAL DISTRICT "CRD ATLAS" MAY 2014.

SEAL		DESIGNED MW DRAWN WR CHECKED DATE FEB 2017 B.M. ELEV. SCALE Horz. 1:2000 Vert.	**WESTBROOK Consulting Ltd.** #115 - 866 Goldstream Ave., Victoria, BC V9B 0J3 Telephone: 250-391-8592 Facsimile: 250-391-8593	PROJECT MILLSTREAM ROAD OK INDUSTRIES PROPOSED WORK	WESTBROOK PROJECT No. 2845 GOVERNING AUTHORITY FILE No. SHEET 1 OF 1 REV. WESTBROOK DRAWING No. FIGURE 1

WESTBROOK CONSULTING LTD – 2017-02-21 04:22PM H:\PROJECTS\2845 Millstream Ind. Park\045 Drawings\NOTICE OF WORK PLANS\PROPOSED WORK.dwg

From:	Harrison, Donald EMPR:EX
To:	"Mela Sangha"; Barry Chalmers
Cc:	Southwest Regional Mines Division EMPR:EX; Caughill, David EMPR:EX
Subject:	RE: 1610713-Proposed Millstream Road Quarry information
Date:	Wednesday, December 27, 2017 10:24:00 AM
Attachments:	1610713-20171221_Letter-to-OK-Industries.pdf 1610713-20171221_Groundwater-Letter to OKI.pdf

Hell Mel, Barry,

My apologies; they should be attached.

Regards,

Don

From: Mela Sangha [mailto:msangha@islandpaving.com]
Sent: Friday, December 22, 2017 12:12 PM
To: Harrison, Donald EMPR:EX; Barry Chalmers
Cc: Southwest Regional Mines Division EMPR:EX; Caughill, David EMPR:EX
Subject: RE: 1610713-Proposed Millstream Road Quarry information

Hi Don

we did not get the attachment. Could you resend it please. Regards, Mel

Mel Sangha

email:msangha@islandpaving.com

O.K. Industries Ltd. www.islandpaving.com

6702 Rajpur Place at Keating X Road

PO Box 1324, Victoria, BC V9W 2W3

tel: 250-652-9211; fax: 250-652-9210

mobile: 250-889-1105

From: Harrison, Donald EMPR:EX [mailto:Donald.Harrison@gov.bc.ca]
Sent: Friday, December 22, 2017 10:39 AM
To: Barry Chalmers; Mela Sangha
Cc: Southwest Regional Mines Division EMPR:EX; Caughill, David EMPR:EX
Subject: 1610713-Proposed Millstream Road Quarry information

Hello Barry, Mel,

Please find attached additional information requirements for the proposed quarry on Millstream Road. I have received feedback from Tervita who is seeking more detail on the potential impacts to their facility. I have not heard back from the CRD but I understand Glen Harris was looking into it. While it may appear this application requires more information than expected, it is because of the unique setting and land uses within which the quarry is proposed. The Ministry needs assurance that if a quarry is to proceed, it can do so in a manner which protects the surrounding land users and minimizes adverse impacts to the environmental. I will be in the office next week if you want to discuss.

Regards,

Don J. Harrison, P.Geo.

Sr. Inspector of Mines–Permitting, SW Region

BC Ministry of Energy, Mines & Petroleum Resources

Mines & Mineral Resources Division

3rd Floor, 1810 Blanshard St,

Victoria, BC V8W 9M9

Direct Line: (778) 698-7014

Main office: (778) 698-3649

BRITISH COLUMBIA

December 21, 2017

File: 1610713

O.K. Industries Ltd.
6702 Rajpur Place,
Saanichton, BC, V8M 1Z5

ATTENTION: Barry Chalmers, Mel Sangha

RE: Proposed Millstream Road quarry; Lot 1, Section 5, Range 3 West, Highland District, Plan VIP70242, District of Highlands, BC (200 Block Millstream Road)

Dear Sirs:

The Ministry of Energy, Mines and Petroleum Resources (MEMPR) seeks assurance that OK Industries is aware of potential groundwater impacts and that it can operate the proposed quarry in a manner which minimizes adverse environmental impacts. Concerns have been raised over groundwater quality and quantity in relation to current and future land uses in the District of Highlands and particularly in the southern part under commercial/industrial use.

The area of the proposed quarry is within the fractured bedrock aquifer at the south end of the District of Highlands. Aquifer vulnerability is classified primarily as moderate at the proposed quarry site and surrounding area (landfill sites, industrial park, residential areas and Thetis Park) according to DRASTIC intrinsic aquifer vulnerability mapping. According to a study[1] by Golder Associates in 2009 for the District of Highlands, the highest priority ranking for potential hazards to groundwater resources is the area of commercial/industrial use, which includes the subject property with OK Industries' quarry application.

The proposed quarry site is bounded by properties with environmental remediation sites and or environmental monitoring sites which may be impacted by quarrying on the subject site. These sites include the CRD's Millstream Meadow landfill site under remediation, the Tervita Highwest active landfill site, and the Millstream Industrial Park.

The proposed quarry site is reported to contain at least two monitoring wells and environmental remediation site 7163 The Ministry of Environment issued a Certificate of Compliance for the site on May 31, 2010, however it is noted[2] that detectable toluene concentrations were identified monitoring well (MW00-3) in 2000 and 2001. In SNC Lavalin's

[1] Phase 2: Groundwater Protection Study, District of Highlands, December 2009
[2] Letter from SNC Lavalin Inc. to OK Industries Ltd., Nov. 10, 2014

Ministry of Energy, Mines and Petroleum Resources,
Mines and Mineral Resources Division

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Facsimile: (250) 953-3878

Location:
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1810 Blanshard Street
Victoria

BRITISH COLUMBIA

letter to OK Industries in 2014, it raised the issue that when the property faces future development there may be a requirement for a vapour investigation.

Groundwater is a primary source of drinking water for many residents in the District of Highlands and in the vicinity of the proposed quarry. A number of mixed use wells, including residential and community wells for domestic purposes, and monitoring wells, exist to the north, west and south of the site. The proposed quarry raises concerns related to potential impacts to surface water hydrology and groundwater. Having reviewed some of the groundwater and well-related information on and around the proposed quarry site, MEMPR requests additional information to address groundwater related concerns as outlined below.

The MEMPR requests OK Industries to submit a desktop hydrogeological risk assessment report prepared by a Qualified Professional with relevant experience in hydrogeology, that addresses the following concerns related to the proposed quarry and related activities :

- Assessment of potential impacts and risks to the local groundwater regime,
- Likelihood of hydraulic connectivity with, and potential impacts to nearby existing surface water bodies,
- Potential risks and impacts on nearby wells and groundwater users (within 500m radius of property) from the quarry operations and associated blasting
- Summary and Recommendations of risks, concerns or issues identified, remedial measures to minimize or mitigate potential impacts

Any wells on the property within the limits of the quarry area may have to be adequately decommissioned according to the Groundwater Protection Regulation and the Water Sustainability Act to reduce the risk of contaminating local water supply aquifers and nearby wells. Diverting water from a stream, water body or aquifer for the purpose of drilling, altering, rehabilitating or decommissioning a well and to establish a new non-domestic groundwater supply may be required to have a technical assessment completer by a professional with competency in hydrogeology. You are referred to the guidance document: Technical Requirements in Support of an Application for Groundwater Use in BC.

Sincerely,

Don Harrison, P.Geo.
Senior Inspector of Mines

Ministry of Energy, Mines and Petroleum Resources,
Mines and Mineral Resources Division

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December 21, 2017

File: 1610713

OK Industries Ltd
6792 Rajpur @ Keating Cross Road
PO Box 1324
Victoria BC V8W 2W3

Attention: Mr. Barry Chalmers
Re: Notice of Work application for a rock quarry on Millstream Rd, District of Highlands, BC

Thank you for the information provided regarding the above Notice of Work application (Mine No. 1610713). To date OK Industries has provided information including maps and sections that describes its plans and intentions to reconfigure the land by the proposed rock quarry supported by a second detailed blasting plan, a preliminary ecological site investigation report, and a reclamation plan.

After ongoing review and due to the specific location of this proposed quarry, the Ministry of Energy, Mines & Petroleum Resources (MEMPR) seeks assurance that OK Industries has considered and can address certain issues and concerns related to the proposed quarry, and that a quarry at this site can be operated in a manner that is protective of the surrounding environment and human health. MEMPR also encourages aggregate operators to maintain positive relationships, regular communication and open dialogue with their host communities.

In follow-up to the recent meeting earlier in December, MEMPR requests additional information as outlined below, supplemental to that already provided.

Mine Boundary Buffers

A sketch of a revised site plan has been submitted that indicates buffers between the proposed mine boundary and the following features: i) 60m buffer with high water mark of Teanook Creek, ii) 30m buffer on the eastern boundary along Thetis Park, and iii) 30m buffer on the west boundary along the adjoining residential property.

MEMPR would like OK Industries to consider a larger buffer on the west side to mitigate impacts from noise, dust, sight lines and drainage. Such a buffer would be a 30 m (min) riparian buffer along the creek that flows from a small wetland on the CRD property to the north into Millstream Creek, as referred to in Aqua-Tex's Preliminary Ecological Site Investigation. This could be off-set by a 20m buffer with Thetis Park and a 50m buffer with Teanook Creek.

Surface Drainage

Removal of vegetation and surficial materials, soils and rock will more expose bedrock likely increasing surface water run-off. Provide a description of the post-mine drainage directions, surface water bodies

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Victoria, BC

and drainage features, and if the proposed mine operation will impact stream flows (including peak flows) in and down-stream of the site, and what measures will be taken to prevent or minimize those impacts.

Groundwater Risk Assessment

OK Industries proposes to quarry rock to the 95 m elevation, potentially resulting in impacts to the local groundwater regime and area wells. OK Industries is requested to provide a groundwater risk assessment as outlined in a separate letter from MEMPR.

Potential impacts from blasting on nearby wells and structures

OK Industries has said verbally that there will be in the order of 5-6 blasts per year at the proposed quarry, and the life of the quarry could be approximately 25 years. The Millstream Quarry Blast Plan[1] (Blast Plan) mentions that "… most of the wells of concern are located on the west side of Millstream Road, more than 600 meters from the closest blasting in Phase 1. The anticipated blast vibration level at this distance would be 0.86mm/sec." What is the peak particle vibration (PPV) at the closest wells, residences and structures surrounding the quarry during Phases 2, 3 and 5, what are the expected cumulative impacts of multiple blasts over the course of mining, and how will the impacts be minimized or mitigated?

The Blast Plan mentions that there is no registered well on the property immediately west of Phase 5 and adjacent to the site. *(on the east side of Millstream Rd).* The residential land owner has said there is a well on the property and that it is used for domestic, non-potable uses. The well log for this well (Well Tag # 85632) indicates the well is on the proposed quarry property in Phase 5. Please confirm whether the location of the well is on the residential property or your property (Lot 1, Section 5, Range 3 West, Highland District, Plan VIP70242, District of Highlands, BC, aka 200 Block Millstream Road).

If the well is on OK Industries' property it (and all other wells on the property) will have to be adequately decommissioned according to the Groundwater Protection Regulation and the Water Sustainability Act to reduce the risk of contaminating local water supply aquifers and nearby wells. If the well is on the residential property, describe measures to be taken to minimize impacts on this well and the water supply over the operating life of the quarry.

Tervita Corporation (Tervita) notes that the Blast Plan contains inaccurate information regarding the Highwest landfill site. Tervita currently maintains 2 active cells at Highwest which have no current cap. The other cells are still in various stages of capping but no final cap is completed at site. Tervita also has the ability to construct future cells at site. OK Industries is requested to update the Blast Plan with this information.

[1] Millstream Quarry Blast Plan, prepared by Ron Elliot, International Blasting Consultants, Nov. 27, 2017

Ministry of Energy, Mines and
Petroleum Resources,
Mines and Mineral Resources Division

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The Blast Plan also states "… the predicted blast vibration intensity at the closest cell would be 8.8 mm/sec. This is well below the level of any concern for the liners, so there should be no impact on this operation …". Please provide technical documentation showing that single and cumulative blast vibrations of 8.8 mm/sec will not affect the landfill liner system and rationale that blast vibrations of 8.8 mm/sec will not affect the waste stability in the landfill, from multiple blasts over the life of the quarry.

Mine Plan

The mine plan forms the basis of the mine permit application. A detailed quarry plan with maps and sections showing final elevations has been submitted, along with a general and detailed blasting plan, a preliminary ecological investigation and a reclamation plan. MEMPR understands no permanent structures will be constructed on the site to support mining and that temporary or mobile structures will be used for First Aid and sewage facilities, and that all other supporting mine facilities or structures will be located at OK Industries' All Fun Quarry site. The mine plan should also include the following components:

Infrastructure Locations

Describe and/or show on maps the proposed or approximate locations of the following that apply:

- topsoil, subsoil and overburden storage/stockpile areas
- oversize and product stockpiles
- processing site (crusher, screening, washing)
- waste and process water management facilities (e.g., settling ponds)
- weigh scale
- fuel handling and dispensing area
- stormwater, wastewater, and erosion control, storage and treatment systems
  - permanent water-control structures will require professional design.
  - dry or intermittent water courses must be located and taken into account in the mine plan.
- noise berms (including description of design, proximity to noise source, height and materials)
- vegetated buffers
- water source(s), including wells (if or when water is not hauled to site)

Best Management Practices

The Millstream Quarry (MQ) Blast Plan states, "OK Industries Ltd. is a recognized leader in quarrying operations and follows industry best management practices at all of its operations." Provide copies of or references to the best management practices referred to above that will be employed at the quarry.

Development Sequence and Schedule

MEMPR understands that depending on future access considerations, OK Industries may revise the order of the mine Phases. Provide a generic mine development schedule estimating timing of land clearing and grubbing, operation, reclamation and closure. The Ministry of Forest, Lands and Natural

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Resource Operations (FLNRO) recommends that vegetation clearing occurs outside the nesting period from March 1 to August 31 to reduce impacts on all bird species.

Surface Water Management

The proposed quarry has potential for erosion and to generate sediment to the off-site environment. The Nov. 15/17 letter (unsigned, written by E. Taje) says existing water courses will be protected by adequate set-backs from the active mining activities, referring to an attached revised site plan, however no site plan was attached. I understand this refers to the photocopied map provided at the December meeting. Please provide a digital version of this map or its most recent version.

The Blast Plan mentions, "Quarry benches will be designed to allow for drainage and collection of run-off water through a series of ditches to direct water to a centralized sump/settling pond." The option for a settling pond was not selected in the NoW application. Please show on a map or describe the location of the sump/settling pond with approximate dimensions and where it will discharge to. Also describe how on-site precipitation from extreme rainfall and snow events will be managed and what on-site sediment and erosion control measures will be implemented.

Noise from Quarry and Mitigation Measures

The Blast Plan mentions, "Blast overpressure will be controlled to less than 120 dB at the closest residence to the blasting area. Distance to the closest home from the blasting in Phase 1 will be at least 500 meters with a treed buffer between the closest home and the blasting area." What are the distances to the closest structures (residential and industrial) and what are the expected overpressures at these structures during the other four mine phases?

Landscape

Provide a general description of how the establishment and spread of invasive species will be controlled. Describe plans to minimize impacts to the natural environment such as red and blue listed species and bird nests. According to FLNRO, a search for nests of birds protected under Section 34(b) of the Wildlife Act should be conducted before the start of vegetation clearing. Should the nest of a bird requiring protection under Section 34(b) of the Wildlife Act be located, you are referred to the buffer distances in Table 4.1 (Section 4) of Develop with Care: Environmental Guidelines for Urban and Rural Land Development in British Columbia (MOE 2014) available at:
http://www.env.gov.bc.ca/wld/documents/bmp/devwithcare/index.html

Describe how the recommendations from the "Preliminary Ecological Site Investigation" by Aqua-Tex (June 2015) will be followed and implemented? Are riparian set-backs proposed for the wetland? What are the expected impacts to the wetland near the centre of the property? How will the impacts be mitigated?

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Petroleum Resources,
Mines and Mineral Resources Division

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Location:
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Victoria, BC

Road Access

Describe the following:

- provide general descriptions of proposed mine access haul roads, their drainage and discharge points;
- describe potential impacts from quarry traffic on public roads and public safety, and how they may be minimized or mitigated.
- how much truck traffic is estimated coming onto and off of the site on a daily and weekly basis, under potential production and processing scenarios, (based on 150,000 T/yr production);

Reclamation Plan

The letter of Nov. 15, 2017 describes that as each phase of the mine is exhausted and areas are no longer actively used in the quarry operations and/or are no longer required to support the ongoing operations of subsequent phases, reclamation of these unused areas will be completed. During reclamation any disturbed land not required for mining or infrastructure will be graded and levelled to the final pit elevation, covered with previously removed and stored overburden and vegetated with appropriate native species as established by a qualified person (QP) as defined by the Province. Existing waterways will be protected. Mapping and descriptions of existing land capabilities as described in the Aqua-Tex report will be used to describe potential end land use(s) following reclamation unless local land use zoning or the local OCP dictates otherwise.

Regards,

Don Harrison, P.Geo.
Senior Inspector of Mines

Ministry of Energy, Mines and
Petroleum Resources,
Mines and Mineral Resources Division

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Location:
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Victoria, BC

From:	Barry Chalmers
To:	Harrison, Donald EMPR:EX
Cc:	Caughill, David EMPR:EX; Southwest Regional Mines Division EMPR:EX; Mela Sangha
Subject:	RE: 1 Comment on Proposed Quarry, S of Millstream Meadows site, District of Highlands (CRD).
Date:	Thursday, January 25, 2018 11:45:54 AM

Hi Don
The current easement borders the contaminated area and an access road could be constructed as shown on the plans. However we do show an alternate entrance at the southwest corner of the property and would entertain using it as our entrance to the project.
Further to your email below is there no correspondence from The District of Highlands?

Regards

M. Barry Chalmers
O.K. INDUSTRIES LTD.
ISLAND CRUSHING CO.
ALL FUN AGGREGATE CO.
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Mail:Victoria Main PO
PO Box 1324
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Phone: 250-652-9211
Fax: 250-652-9270
Cell: 250-897-2296

From: Harrison, Donald EMPR:EX [mailto:Donald.Harrison@gov.bc.ca]
Sent: Wednesday, January 24, 2018 8:21 AM
To: Barry Chalmers
Cc: Caughill, David EMPR:EX; Southwest Regional Mines Division EMPR:EX
Subject: RE: 1 Comment on Proposed Quarry, S of Millstream Meadows site, District of Highlands (CRD).

Hi Barry,

No other letters of concern I am aware of.
Regards,

Don

From: Barry Chalmers [mailto:bchalmers@islandpaving.com]
Sent: Monday, January 22, 2018 6:24 PM
To: Harrison, Donald EMPR:EX
Cc: Caughill, David EMPR:EX; Southwest Regional Mines Division EMPR:EX
Subject: Re: 1 Comment on Proposed Quarry, S of Millstream Meadows site, District of Highlands (CRD).

Thanks Don
Is there any other letters of concern received that you can share with us
Regards

Sent from my iPhone

On Jan 22, 2018, at 3:02 PM, Harrison, Donald EMPR:EX <Donald.Harrison@gov.bc.ca> wrote:

> Hello Barry,
>
> I've heard from CRD. Please see the information in the email below and the attachments. Appears the current Right of Way crosses known contaminated sites on CRD ground so it would not be a favourable option if you plan to excavate along it. Please show your alternate access route with general construction and drainage plan. Note that the proposed depth of excavation on your site is lower than the depth of the CRD contaminated site, meaning quarrying may induce contaminated groundwater flow towards your site. I recommend forwarding this information to your groundwater consultant and to work in collaboration with the CRD
>
> Thanks Barry,
>
> Don
>
> ---
>
> **From:** Korene Torney [mailto:ktorney@crd.bc.ca]
> **Sent:** Monday, January 22, 2018 2:36 PM
> **To:** Harrison, Donald EMPR:EX
> **Cc:** Caughill, David EMPR:EX; Southwest Regional Mines Division EMPR:EX; Runnells, Joanna FLNR:EX
> **Subject:** RE: 1 Comment on Proposed Quarry, S of Millstream Meadows site, District of Highlands (CRD).
>
> Mr. Harrison,
>
> It was great to touch bases with you again. As discussed, the CRD is aware of the OK Industries application. We have followed their engagement with the District of Highlands and are aware of the access right of way which crosses our property. We have discussed the access, including potential for alternate access, and expect that a mutually beneficial access arrangement will be agreed upon. That said no final decision regarding access has been made to date.
>
> As mentioned, the CRD Millstream Meadows property (Lot A Plan 40349 directly adjacent to the OK property) is a contaminated site registered on the BC SITE registry. Please find linked/attached some background information regarding the CRD Millstream Meadows site. Here is a link to our project description https://www.crd.bc.ca/project/capital-projects/millstream-meadows-remediation. Here, too, is a link to a recent CRD staff report with an update on 2017 contaminant investigations https://crd.ca.legistar.com/LegislationDetail.aspx?ID=10135&GUID=8C2B0E3E-A9E9-4FC9-9F22-07A73C934E5D .
>
> Please see attached the following site drawings that will help to illustrate site conditions:

- 636345-002 – Site Plan (shows site boundaries and monitoring network, the drawing+legend delineate the lagoon extents for all 3 lagoons (excavated and unexcavated portions)
- 636345-015C – shows potentiometric elevations as of Sept 2017. Note this is for fill and shallow bedrock.

You had asked a few other questions regarding excavation depth and potentiometric surface, here are some comments:

- The 2008 remedial excavation extending mostly to approx. 6 m (~103 m elevation) depth but the maximum depth was ~ 12 m (~96 m elevation) at its deepest point. The bedrock surface is very hummocky. Here are a few photos to illustrate bedrock/excavation conditions:
  <image005.jpg> <image006.jpg>

- The potentiometric surface varies significantly at the site, however shallow water table elevations in Sept 2017 ranged from 94 m to 103 m metres above sea level. See attached dwg 636345-015C. The potentiometric elevations measured in deep monitoring wells don't vary significantly from that.

I have a copy of the blasting plan now and will review and get back with you as soon as possible.

I look forward to discussing the project further and am happy to answer any questions you might have.

Thanks,

Korene Torney, P.Geo., PMP
CRD Geo-Environmental Programs
Phone 250.360.3148 **Email** ktorney@crd.bc.ca

From: Harrison, Donald EMPR:EX [mailto:Donald.Harrison@gov.bc.ca]
Sent: Tuesday, December 05, 2017 3:30 PM
To: Korene Torney <ktorney@crd.bc.ca>
Cc: Caughill, David EMPR:EX <David.Caughill@gov.bc.ca>; Southwest Regional Mines Division EMPR:EX <SouthwestMinesDivision@gov.bc.ca>
Subject: 1 Comment on Proposed Quarry, S of Millstream Meadows site, District of Highlands (CRD).
Importance: High

Hello Korene,

Your email was provided to me by Peggy Evans of the CRD. The Ministry of Energy, Mines & Petroleum Resources (MEMPR) would like to inform you of an application for a proposed rock quarry to the south of the CRD's Millstream Meadows reclaimed

landfill site in District of Highlands. I am attaching a copy of the quarry application and related maps. The proposal is basically to level off most of the site to the 95 m elevation to recover aggregate. MEMPR would like you to comment on concerns the CRD may have about this proposed quarry operation, and any potential impacts it may have on the Millstream Meadows site related to hydrology/hydrogeology, landfill stability and integrity, monitoring, and anything else that you may consider as a risk to the CRD's landfill facility. I'd appreciate it if you could respond to this email address within three weeks. I'll send a second email with additional information. Let me know if you have any questions. Thank you.

Regards,

Don J. Harrison, P.Geo.
Sr. Inspector of Mines–Permitting, SW Region

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Mines & Mineral Resources Division
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Direct Line: (778) 698-7014
Main office: (778) 698-3649

<636345-002.pdf>

<636345-015C.PDF>

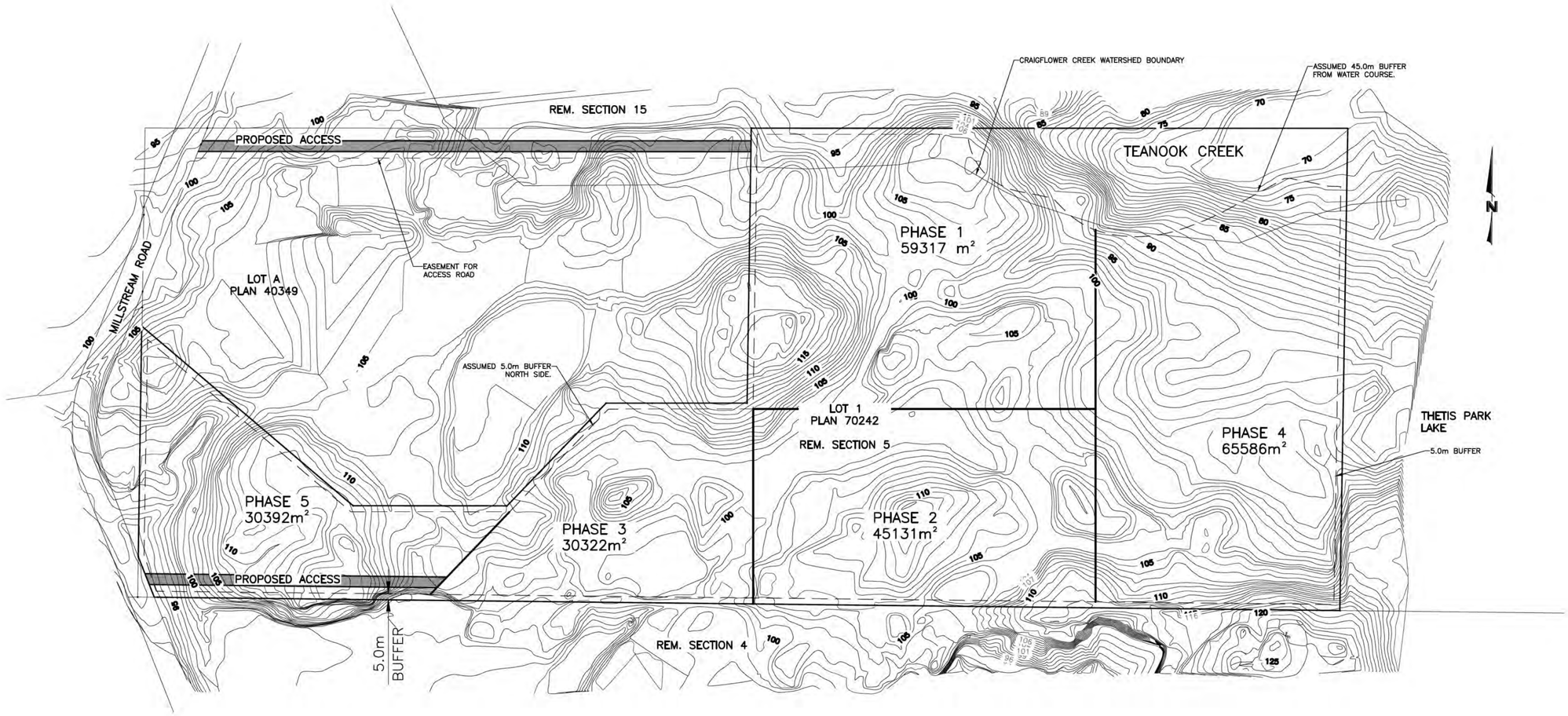
From:	Harrison, Donald EMPR:EX
To:	"ktorney@crd.bc.ca"
Cc:	Caughill, David EMPR:EX; Southwest Regional Mines Division EMPR:EX
Subject:	1 Comment on Proposed Quarry, S of Millstream Meadows site, District of Highlands (CRD).
Date:	Tuesday, December 5, 2017 3:29:00 PM
Attachments:	2017-05-18 Ref Package 1610713.pdf 1610713201701_2845_Industrial Park_PROPOSED WORK.pdf 1610713201701_2845_Industrial Park_TOPOGRAPHY PLAN 1 (1).pdf 1610713201701_2845_Industrial Park_TOPOGRAPHY PLAN 2.pdf
Importance:	High

Hello Korene,

Your email was provided to me by Peggy Evans of the CRD. The Ministry of Energy, Mines & Petroleum Resources (MEMPR) would like to inform you of an application for a proposed rock quarry to the south of the CRD's Millstream Meadows reclaimed landfill site in District of Highlands. I am attaching a copy of the quarry application and related maps. The proposal is basically to level off most of the site to the 95 m elevation to recover aggregate. MEMPR would like you to comment on concerns the CRD may have about this proposed quarry operation, and any potential impacts it may have on the Millstream Meadows site related to hydrology/hydrogeology, landfill stability and integrity, monitoring, and anything else that you may consider as a risk to the CRD's landfill facility. I'd appreciate it if you could respond to this email address within three weeks. I'll send a second email with additional information. Let me know if you have any questions. Thank you.

Regards,

Don J. Harrison, P.Geo.
Sr. Inspector of Mines–Permitting, SW Region
BC Ministry of Energy, Mines & Petroleum Resources
Mines & Mineral Resources Division
3rd Floor, 1810 Blanshard St,
Victoria, BC V8W 9M9
Direct Line: (778) 698-7014
Main office: (778) 698-3649



1:2000 0 40 120m

NOTE:
EXISTING GROUND CONTOURS DERIVED FROM CAPITAL REGIONAL DISTRICT "CRD ATLAS" MAY 2014.

SEAL		DESIGNED MW DRAWN WR CHECKED DATE FEB 2017 B.M. ELEV. SCALE Horz. 1:2000 Vert.	**WESTBROOK Consulting Ltd.** #115 - 866 Goldstream Ave., Victoria, BC V9B 0J3 Telephone: 250-391-8592 Facsimile: 250-391-8593	PROJECT MILLSTREAM ROAD OK INDUSTRIES PROPOSED WORK	WESTBROOK PROJECT No. 2845 GOVERNING AUTHORITY FILE No. SHEET 1 OF 1 REV. WESTBROOK DRAWING No. FIGURE 1

THE LOCATION AND ELEVATION OF EXISTING UNDERGROUND SERVICES ON THIS DRAWING MAY NOT BE ACCURATE OR COMPLETE. THE ACTUAL HORIZONTAL AND VERTICAL LOCATIONS MUST BE CONFIRMED BY UTILITY COMPANIES AND THE CONTRACTOR PRIOR TO THE START OF ANY EXCAVATIONS

LEGEND – Proposed services shown bold

WATER — W —	GAS — G —	EXISTING U/G UTL.	MANHOLE	HYDRANT	MONUMENT
SEWER — S —	CURB — C —	PROPOSED U/G UTL.	CLEANOUT	VALVE	LOT PIN
DRAIN — D —	SIDEWALK S/W	LIGHT STANDARD	CATCHBASIN	METER	LEAD PLUG
NATURAL GRADE	EDGE PAVE.	POWER POLE	ROAD SIGN	REDUCER	
CULVERT	BUSHLINE	ANCHOR			
HEADWALL	TREE				

SEAL

REVISIONS

No.	DESCRIPTION	DATE	SIGN

DESIGNED MW
DRAWN WR
CHECKED
DATE FEBRUARY 2017
B.M.
ELEV.
SCALE Horz. 1:2000
Vert. N/A

WESTBROOK Consulting Ltd.
#115 - 866 Goldstream Ave., Victoria, BC V9B 0J3
Telephone: 250-391-8592 Facsimile: 250-391-8593

PROJECT
MILLSTREAM INDUSTRIAL PARK
OK INDUSTRIES

TENURE MAP

WESTBROOK PROJECT No. 2845
GOVERNING AUTHORITY FILE No.
SHEET 1 OF 1 REV.
WESTBROOK DRAWING No. FIGURE 2

From:	Southwest Regional Mines Division MEM:EX
To:	Harrison, Donald MEM:EX; Caughill, David MEM:EX
Cc:	Dunkley, Jim R MEM:EX
Subject:	FW: OK Industries Ltd. Mines Act Permit Application Ref. 1610713
Date:	Friday, August 25, 2017 2:11:44 PM
Attachments:	img002.pdf

Sincerely,

MARYANN J. BOUFFARD
OPERATIONS COORDINATOR
SW REGION MINING OFFICE
TEL: **778-698-3648**

MINISTRY OF ENERGY, MINES AND PETROLEUM RESOURCES
www.gov.bc.ca/ener

From: Scott Richardson [mailto:scott@jsrichardson.com]
Sent: Friday, August 25, 2017 2:03 PM
To: Southwest Regional Mines Division MEM:EX; Minister, EMPR EMPR:EX; Horgan.MLA, John LASS:EX; Tina Neurauter
Subject: OK Industries Ltd. Mines Act Permit Application Ref. 1610713

Please accept the attached letter on behalf of the Highlands District Community Association's opposition to OK Industries application for a mine permit for a quarry operation in the Highlands.

Thank you,

Scott Richardson
Chair, HDCA

From:	Harrison, Donald MEM:EX
To:	"Barry Chalmers"
Cc:	Caughill, David MEM:EX
Subject:	Information request and Ron Elliot scope
Date:	Wednesday, September 13, 2017 11:38:00 AM
Attachments:	MAP-OK Industies-points-of-interest-1610713.pdf

Thanks Barry,

I would also like him to look at the following:

Provide overall assessment of proposed blasting plan with specific attention/detail to impacts and options to prevent impacts:
•Potential impacts from blasting on the points shown on attached map (water wells, private water utilities, points of diversion, environmental monitoring stations, etc.) on adjacent and surrounding properties (see iMap http://www2.gov.bc.ca/gov/content/data/geographic-data-services/web-based-mapping/imapbc and click on "Launch iMapBC 2 Silverlight (Public)" on right;
•Potential impacts from blasting on the residence immediately west of the subject site and east of Millstream Rd (noise, dust, water supply);
•Any other infrastructure in the area that may be impacted

Other information I'd like you to provide"
•You mentioned you were planning on drilling a well to provide water for dust suppression. Please provide coordinates of where the well is to be situated (+/-10m);
•What are the widest buffers you can provide? I am most concerned about buffers to the north (on that ~180 m boundary west of the creek set-back), west (buffer for Millstream Rd and residences), East (Thetis park) and southeast (industrial park).
•You made some rough traffic estimates at our meeting. Please provide calculations showing estimates of production and numbers or trucks to and from site per day under different scenarios.
•Any other information you have or may know of that can address potential impacts on the surrounding area from the proposed quarry

Let me know if you have any questions. Thank you.
Regards,

Don

Don J. Harrison, P.Geo.
Sr. Inspector of Mines–Permitting, SW Region

BC Ministry of Energy, Mines & Petrolem Resources
Mines & Mineral Resources Division
3rd Floor, 1810 Blanshard St,
Victoria, BC V8W 9M9
Phone: (250) 953-3881

-----Original Message-----
From: Barry Chalmers [mailto:bchalmers@islandpaving.com]
Sent: Friday, September 8, 2017 4:31 PM
To: Harrison, Donald MEM:EX
Subject: Re: Ron Elliot

I have contacted Ron Elliot he is on board to visit our site and provide us with his assessment of our property

Sent from my iPhone

> On Sep 8, 2017, at 2:38 PM, Harrison, Donald MEM:EX <Donald.Harrison@gov.bc.ca> wrote:
>
> Hello Barry,
>
> As discussed at our meeting on Wed, I'm looking for an independent assessment of your blasting plans and the potential impacts on the integrity of the Tervita Highwest landfill site/liner and the CRD's Millstream Meadows site, and to provide measures that would minimize the risks of compromising or negatively impacting either of these facilities.
> Thanks,
>
> Don
>
> -----Original Message-----
> From: Barcelonia, Gerry MEM:EX
> Sent: Friday, September 8, 2017 9:42 AM
> To: Barry Chalmers
> Cc: Harrison, Donald MEM:EX
> Subject: Ron Elliot
>
>
> Hi Barry,
>
> Below is the blasting consultant's contact information.

BRITISH COLUMBIA

OK Industries Millstream Rd (1610713)

Legend

Points of Diversion

STATUS

- Active Application
- Active Application and Licence
- Inactive
- Active Licence

Regulated Private Water Uti

Water Wells - Private Dome

Water Wells - Licensed/Unli

WELL_LICENCE_GENERAL_S

- Licensed
- Unlicensed

Water Licence Points of Div Utilities

STATUS

0 0.20 0.41 km

1: 10,000

Copyright/Disclaimer

Datum: NAD83

Projection: NAD_1983_BC_Environment_Albers

Key Map of British Columbia

From:	Referrals Coordinator
To:	Southwest Regional Mines Division MEM:EX
Cc:	Bunce, Anna FLNR:EX
Subject:	RE: Consultation request for a Notice of Work for Construction Aggregate on Private Land near Tervita Landfill - File 1610713
Date:	Thursday, August 17, 2017 11:20:01 AM
Attachments:	image004.wmz image007.wmz image008.wmz image001.png Malahat Response R17016.pdf

Hello Maryann,

Thank you for forwarding my inquiry to Jim for further clarification.

Please find the Malahat Nation's response to the consultation request attached.

Best,

Heather Adams
Fisheries and Referrals Coordinator, Malahat Nation

110 Thunder Road, Mill Bay, BC, V0R 2P4
Ph: 250.743.3231 | Cell: 778.230.1778
referrals@malahatnation.com | www.malahatnation.ca

From: Dunkley, Jim R MEM:EX [mailto:Jim.Dunkley@gov.bc.ca]
Sent: August 16, 2017 3:11 PM
To: Southwest Regional Mines Division MEM:EX
Cc: Bunce, Anna FLNR:EX; Referrals Coordinator; Harrison, Donald MEM:EX
Subject: RE: Consultation request for a Notice of Work for Construction Aggregate on Private Land near Tervita Landfill - File 1610713

Hi Heather,

Please see the attached pdf proposed work plan. Teanook Creek will have a 45m buffer where it flows through the property. On the west side of the map, there is no mining in the vicinity of Teanook Creek as that section is not part of the proposed quarry. There is a road access right of way that parallels the creek that may or may not be used depending upon Highlands allowing road access at that point. Between that section and where Teanook enters the property there is a minimum 5 m buffer between mining and the property line plus the distance from the property line to Teanook Cr.

Hopefully this is clear when looking at the map.

Jim Dunkley, P. Geo
Inspector of Mines

300-1810 Blanshard St
Victoria, BC. V8W 9M9

250.953.4640

From: Southwest Regional Mines Division MEM:EX
Sent: Wednesday, August 16, 2017 2:42 PM
To: Dunkley, Jim R MEM:EX
Cc: Bunce, Anna FLNR:EX; 'Referrals Coordinator'
Subject: FW: Consultation request for a Notice of Work for Construction Aggregate on Private Land near Tervita Landfill - File 1610713

Hi Jim,

Please provide clarification for Heather Adams. Thank you.

Sincerely,

MARYANN J. BOUFFARD
OPERATIONS COORDINATOR
SW REGION MINING OFFICE
TEL: **778-698-3648**

MINISTRY OF ENERGY, MINES AND PETROLEUM RESOURCES
www.gov.bc.ca/ener

From: Referrals Coordinator [mailto:referrals@malahatnation.com]
Sent: Wednesday, August 16, 2017 2:33 PM
To: Southwest Regional Mines Division MEM:EX; Referrals Coordinator
Cc: Bunce, Anna FLNR:EX
Subject: RE: Consultation request for a Notice of Work for Construction Aggregate on Private Land near Tervita Landfill - File 1610713

Hi Maryann,

Thank you for sending over these environmental reports.

There are a couple things I noticed and would like to seek clarification on. The initial referral letter from June 5th states that there are no waterbodies in the application area. According to the Preliminary Ecological Site Investigation report, there are four different freshwater features within the subject property, including a large wetland in the center of the area and a portion of Teanook creek. Can you confirm that the proposed mining area does not overlap with Teanook creek, as well as the

planned reserve distance from the creek to the mining area?

Thank you,

Heather Adams
Fisheries and Referrals Coordinator, Malahat Nation

110 Thunder Road, Mill Bay, BC, V0R 2P4
Ph: 250.743.3231 | Cell: 778.230.1778
referrals@malahatnation.com | www.malahatnation.ca

From: Southwest Regional Mines Division MEM:EX [mailto:SouthwestMinesDivision@gov.bc.ca]
Sent: August 11, 2017 3:37 PM
To: Referrals Coordinator
Cc: Bunce, Anna FLNR:EX
Subject: RE: Consultation request for a Notice of Work for Construction Aggregate on Private Land near Tervita Landfill - File 1610713

Hello Heather,

Anna Bunce informed me that you would like a copy of the environment reports. Please find 2 reports attached.

If you have further technical questions, let me know and I'll have the inspector get in touch to assist.

Cheers,

MARYANN J. BOUFFARD
OPERATIONS COORDINATOR
SW REGION MINING OFFICE
TEL: **778-698-3648**

MINISTRY OF ENERGY, MINES AND PETROLEUM RESOURCES
www.gov.bc.ca/ener

From: Bouffard, Maryann J MEM:EX **On Behalf Of** Southwest Regional Mines Division MEM:EX
Sent: Friday, July 14, 2017 3:23 PM
To: 'Referrals Coordinator'
Cc: Bunce, Anna FLNR:EX
Subject: RE: Consultation request for a Notice of Work for Construction Aggregate on Private Land near Tervita Landfill - File 1610713

Hello Heather,

Thank you for informing our office of your anticipated response date.

Please do not hesitate to contact me for further inquiries.

Sincerely,

MARYANN J. BOUFFARD
OPERATIONS COORDINATOR
SW REGION MINING OFFICE
TEL: **778-698-3648**

MINISTRY OF ENERGY AND MINES
www.gov.bc.ca/ener

From: Referrals Coordinator [mailto:referrals@malahatnation.com]
Sent: Friday, July 14, 2017 3:13 PM
To: Southwest Regional Mines Division MEM:EX
Subject: RE: Consultation request for a Notice of Work for Construction Aggregate on Private Land near Tervita Landfill - File 1610713

Attn: Maryann Bouffard,

Thank you for the above application (File 1610713) received June 5th, located within Malahat First Nations Traditional Territory. We are currently reviewing your application and expect to provide a response on or before July 31st.

Please note that not receiving a response to a referral from Malahat First Nation in the pre-application, current or post-application stage does not imply our support for your project.

Sincerely,

Heather Adams
Fisheries and Referrals Coordinator, Malahat Nation

110 Thunder Road, Mill Bay, BC, V0R 2P4
Ph: 250.743.3231 | Cell: 778.230.1778
referrals@malahatnation.com | www.malahatnation.ca

From: West Coast Land Referrals FLNR:EX [mailto:WestCoast.LandReferrals@gov.bc.ca]
Sent: June 5, 2017 9:23 AM

Malahat Nation
110 Thunder Road, Mill Bay, BC, V0R 2P4
Tel: 250.743.3231 Fax: 250.743.3251
info@malahatnation.com www.malahatnation.ca

August 17, 2017

File No. 1610713
Referral R17016

Maryann Bouffard
Operations Coordinator
Ministry of Energy and Mines
3rd Floor, 1810 Blanshard Street
Victoria, BC V8W 9N3

Re: Notice of Work for Construction Aggregate on Private Land near Tervita Landfill - File 1610713

Dear Maryann Bouffard:

Thank you for the consultation request dated June 5, 2017 regarding the proposed quarry mine south of Tervita Landfill, located within Malahat First Nation's Traditional Territory.

Given the information we have been provided, Malahat Nation has no further comments at this time regarding the proposed activities. We acknowledge and respect the local First Nations' opportunity to act as primary correspondent. However, in the event they do not or are unable to respond, we reserve our right to further consultation and engagement. We do still require continued disclosure regarding the development of this project and others within our Traditional Territory.

Sincerely,

Heather Adams
Fisheries and Referrals Coordinator | Malahat First Nation
referrals@malahatnation.com

To: Referrals Coordinator
Cc: Southwest Regional Mines Division MEM:EX
Subject: Consultation request for a Notice of Work for Construction Aggregate on Private Land near Tervita Landfill - File 1610713

On behalf of the Ministry of Energy and Mines, please see the attached consultation request for a Notice of Work for a *Mines Act* permit, File 1610713.

Should you have any questions regarding this application, please contact Maryann Bouffard, Operation Coordinator, 778-698-3648 or by email:

SouthwestMinesDivision@gov.bc.ca

Regards,

FrontCounter BC | **Ministry of Forests, Lands and Natural Resource Operations**
2080 Labieux Road
Nanaimo, BC V9T 6J9
Tel: 250-751-7220 | Fax: 250-751-7224

FrontCounter BC Website | Toll-Free Contact Centre: 1-877-855-3222
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Page 066 to/à Page 082

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Preliminary Ecological Site Investigation

LOT 1 SECTION 5 RANGE 3 WEST HIGHLAND DISTRICT PLAN VIP70242

Prepared for: O.K. Industries Ltd.

June 10, 2015

Prepared by: Sarah Karkanis, M.Sc.
Wm. Patrick Lucey, M.Sc., R.P. Bio., CBiol, MSB
Tracy Motyer, B.Sc., R.B. Tech.

Aqua-Tex
Scientific Consulting Ltd. (1993)

Background

Ok Industries recently purchased a parcel of land within the District of Highlands from the B.C. Provincial Government with the intent of undertaking phased aggregate mining and the potential future development of an Industrial Park. The District of Highlands Official Community Plan indicates that the subject property lies within Development Permit Areas for Water & Riparian Areas and Sensitive Vegetation and is zoned Greenbelt B2 (GB2) (District of the Highlands, 2013). While this property is zoned GB2, the land use designation within the OCP is commercial/industrial.

This parcel of land – Lot 1 Section 5 Range 3 West Highland District Plan VIP70242 (PID: 024-710-270) – is 26.3 hectares and is located in the District of the Highlands on Millstream Road. The property is bordered by the Tervita Highwest Engineered Landfill Disposal Facility (hazardous wastes) to the north and the Millstream Industrial Park to the south. This parcel also abuts a Capital Regional District septage site on its northwest boundary while the eastern property boundary borders Thetis Lake Regional Park (**Figure 1**). The western portion of the property abuts a private residential property, lying adjacent to Millstream Road.

Given the presence of historical septage facilities and the existence of the landfill to the north and heavy industrial activity to the south, a report prepared by Stevens Management in 2000 states that *"the potential for contamination at this site is relatively high"* (Stevens Management, 2000); however, this property received a Certificate of Compliance in 2010 deeming the property meets "Contaminated Sites Regulation standards for urban park land soil use and aquatic life and drinking water use and, Contaminated Sites Regulation criteria for freshwater typical sediment use" (B.C. Ministry of Environment, 2010).

Aqua-Tex Scientific Consulting Ltd. was retained to provide a preliminary site assessment and review of the existing ecological site features and their implications for development, in particular with respect to freshwater regulatory requirements (e.g. RAR). This ecological review is intended to provide a baseline for development planning.

Important

Printed: Wed, Feb 25, 20 5

Regional Community Atlas

Capital Regional District
gis@crd.bc.ca
http://www.crd.bc.ca

Methods

Both a desktop review of available background information and online mapping interfaces and a field site assessment were undertaken by Aqua-Tex as part of the preliminary ecological site investigation.

Desktop Review

Previous site studies provided by O.K. Industries were reviewed along with exiting mapping databases such as Data BC viewed through Google Earth, CRD Regional Community Atlas, and the Conservation Data Centre iMap to identify ecological features that may be present on the subject property. A summary of this review is provided in the Findings section.

Field Site Assessment

Given the size of the site (26.3 hectares), the assessment was conducted by walking transects using a grid-based model to ensure all major landscape features were visually observed and documented (e.g., riparian-wetland corridors, streams, isolated wetlands, rocky knolls, forest stand structures, roads, *et cetera*); subsequent site assessments were conducted to review off-site linkages with adjacent properties, including surface channel connections with Millstream Creek, and potential stormwater management buried pipe connections. The focus of the field assessment, conducted on April 28th, 2015, was to ground-truth the presence of ecological features identified in the desktop review stage. The assessment team started with a west-to-east transect on the northern property line, then a north-to-south transect through the eastern portion of the property, then a series of shorter south-to-north and north-to-south transects from the southern property line. A Garmin hand-held GPS unit was used to track the path of assessment and identify reference points (waypoints). Photographs were taken with a digital camera to document landscape characteristics and ecological features. Finally, off-site surveys were conducted to determine whether the larger wetland on the property is connected by surface drainage to Millstream Creek. An examination of the desktop mapping revealed no connection beyond the manmade pond on the adjacent property to the south (on the Industrial landscape)(**Figure 7**).

Findings

Desktop Mapping

The CRD Regional Community Atlas was reviewed for sensitive ecosystem polygons identified through the BC Ministry of Environment's (MOE) sensitive ecosystem inventory (SEI). This search resulted in the identification of four (4) SEI polygons (**Figure 2**): two woodland polygons, one wetland polygon, and one older second growth forest polygon. The following definitions of these SEI's are provided below:

Woodlands
Woodlands are open forested areas comprised of pure stands of Garry oak and mixed stands of Douglas-fir/Garry oak and Douglas-fir/arbutus. Remnant stands of trembling aspen are also found in wetter sites. Their understorey is characterized by a rich mosaic of wildflowers, grasses, shrubs and mosses.

Woodlands are found on south facing slopes of rocky knoll and bedrock dominated areas. The disturbance or soil conditions of such areas restrict the establishment of closed conifer forest and promote Garry oak regeneration. Woodlands also occur in combination with other ecosystems such as older Douglas-fir forest (OF), Older Second Growth Forest (SG) and Terrestrial Herbaceous (HT). (MOE, n.d. c)

Wetland
Wetland ecosystems are characterized by seasonal or year-round water, either at or above the soil surface or within the root zone of plants. They are found in areas of flat, undulating terrain and colder wetter climate.

Wetlands encompass a range of plant communities that includes western redcedar/skunk cabbage swamps, cattail marshes, *Sphagnum* moss dominated bogs and coastal salt marshes. (MOE, n.d. b)

Older Forest
Older Forest is defined as conifer-dominated forest with an average tree age of 100 years or greater. The trees are generally large and tall, reaching up to 1.5m in diameter and over 50m in height.

Older Forest is often found in combination with Older Second Growth Forest (SG) and occasionally with Terrestrial Herbaceous ecosystems (HT). Based on broad areas of similar climate and vegetation, two biogeoclimatic zones are recognized in this project:

1. Coastal Douglas-fir zone (CDF). At lower elevations (<150m), Douglas-fir is the dominant canopy tree in this southern portion of the study area. Low soil moisture conditions favour open stand structure and low growth of herbs, grasses and woody shrubs in the understorey.
2. Coastal Western Hemlock zone (CWH). At higher elevations, western hemlock is the dominant tree species in this northern portion of the study area. The forest floor is composed of a dense litter of needles and small branches. Cool, damp and acidic conditions favour a moss layer build up over time. (MOE, n.d. a)

The CRD Regional Atlas also shows a potential sharp-tailed snake (*Contia tenuis*) habitat polygon that covers a large portion of the subject property (**Figure 3**). Sharp-tailed snake is a red-listed species in BC and is Federally listed as endangered (Ministry of Water, Land, and Air Protection, 2004). The specific habitat needs of sharp-tailed snakes are unconfirmed but sites where the species do occur are

Coastal Douglas-fir ecosystems where Douglas-fir and arbutus are dominant vegetation species. Furthermore, "small forest openings with rocky substrate and a southern exposure are thought to provide egg-laying and nursery sites" (Ministry of Water, Land, and Air Protection, 2004, p.4).

The BC Conservation Data Centre (CDC) iMap was also reviewed to determine if there were any identified occurrences of sensitive ecological communities or species on this property. Two polygons were identified that encompassed a portion, or more, of the subject property (**Figure 4**). The first polygon covering the majority of the site is Shape ID 55772 representing the occurrence of the Douglas-fir/dull Oregon-grape ecological community, red-listed in B.C. The subject property is a small portion of this much larger polygon covering an area from Mount Finlayson to Thetis Lake (**Figure 5**). According to the CDC occurrence report, the condition of the occurrence is considered poor to fair given the young forest stand structure and its fragmentation from residential, urban, and industrial development (B.C. Conservation Data Centre, 2014). The second polygon, Shape ID 55880, is located on the northern edge of the site and identifies the area in which northern red-legged frogs (*Rana aurora*) have been observed (a blue-listed species in BC). Red-listed species and ecological communities are Extirpated, Endangered, or Threatened in British Columbia while blue-listed species and ecological communities are of Special Concern (formerly Vulnerable) (MOE, n.d. d).

Masked (i.e. not publicly available) occurrences with the shape ID's 9204, 9468, 30137, 41842, 44849 also show up on the B.C. Conservation Data Centre map; the CDC was contacted for additional information and they determined these masked occurrences were not relevant to this property (K. Stipec, personal communication, May 7, 2015).

Lastly, GeoBC and DataBC maps were viewed through Google Earth to identify watercourses, water bodies, and other aquatic features that may exist on the subject property. These maps were compared to the CRD Regional Community Atlas watercourse layer and to existing reports including the Craigflower Watershed Assessment prepared by SHIP Environmental Consultants Ltd. in 1997. Only one watercourse was mapped traversing the subject property, Teanook Creek. Teanook Creek is located on the northern boundary of the subject property and flows from Teanook Lake into McKenzie Lake (**Figure 6**). Teanook Creek watershed is a subcatchment of the much larger Craigflower Creek watershed. A search through the Ministry of Environments FISS database revealed that there is no recorded fish presence in Teanook Lake but there are fish present in McKenzie Lake including brown catfish, cutthroat trout, and threespine stickleback (MOE, 2015). Previous site studies identified a large wetland near the centre of the site and a small drainage into Millstream Creek at the south-west corner of the site (**Figure 6**).

Figure 2. The B.C. Provincial Government Sensitive Ecosystem Inventory (SEI) mapping project identifies four SEI polygons on the subject property (thick red outline). The pink polygons represent woodlands (1 & 2), the green polygon (3) represents a wetland, and the brown polygon (4) represents older second growth forest.

Figure 3. The CRD Regional Community Atlas identifies potential sharp tail snake habitat on the subject property. The red polygon shows the property boundary while the yellow polygon identifies the potential sharp tail snake habitat.

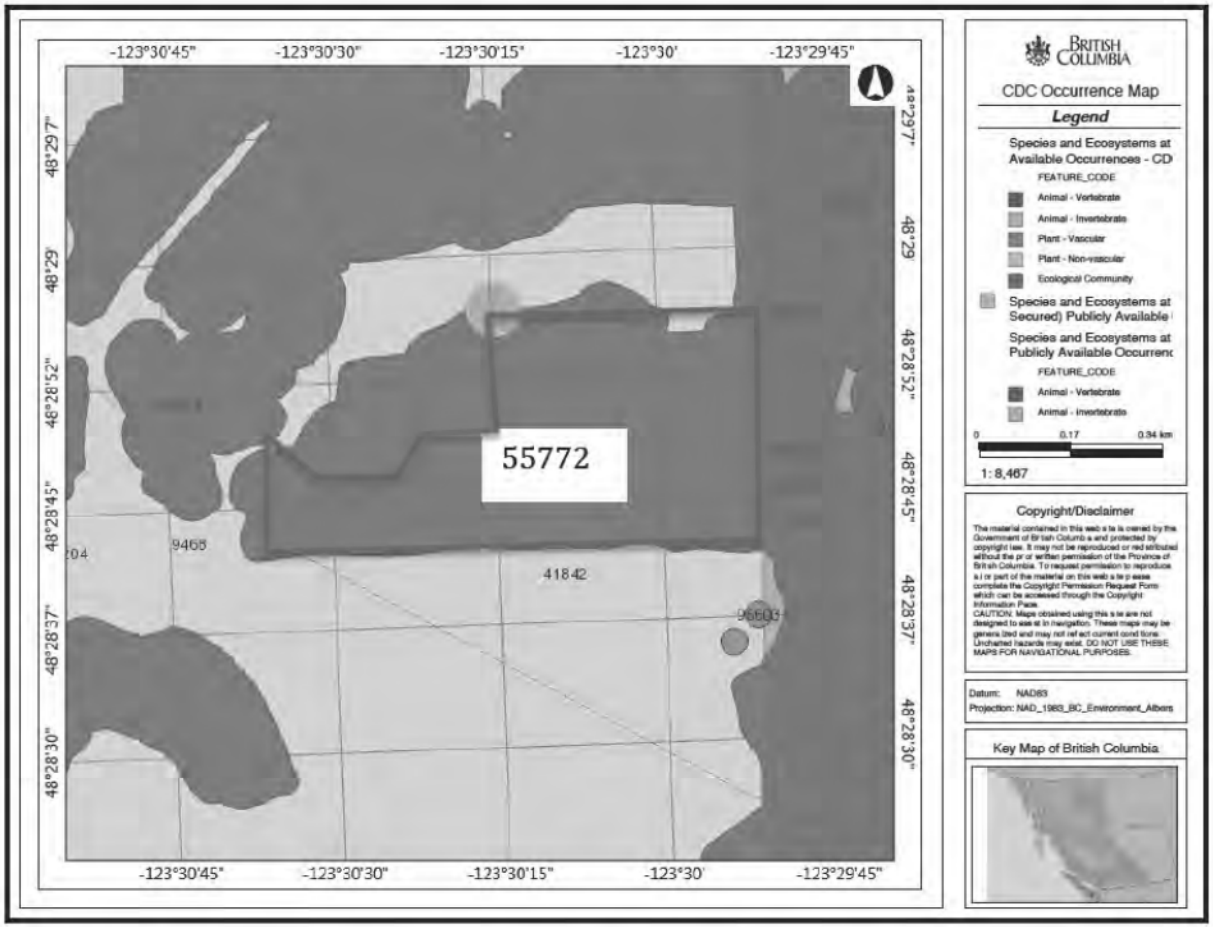

Figure 4. British Columbia Conservation Data Centre (CDC) occurrence map for sensitive species and ecosystems. The blue polygon labeled 55772 covers the subject property (red polygon approximately) and represents the Douglas-fir/dull Oregon-grape red-listed ecological community. The subject property is part of a much larger polygon that covers an area from Mount Finlayson to Thetis Lake (Figure 5). The yellow polygon sits on the northern boundary of the subject property and identifies the occurrence of red-legged frog, a blue-listed species.

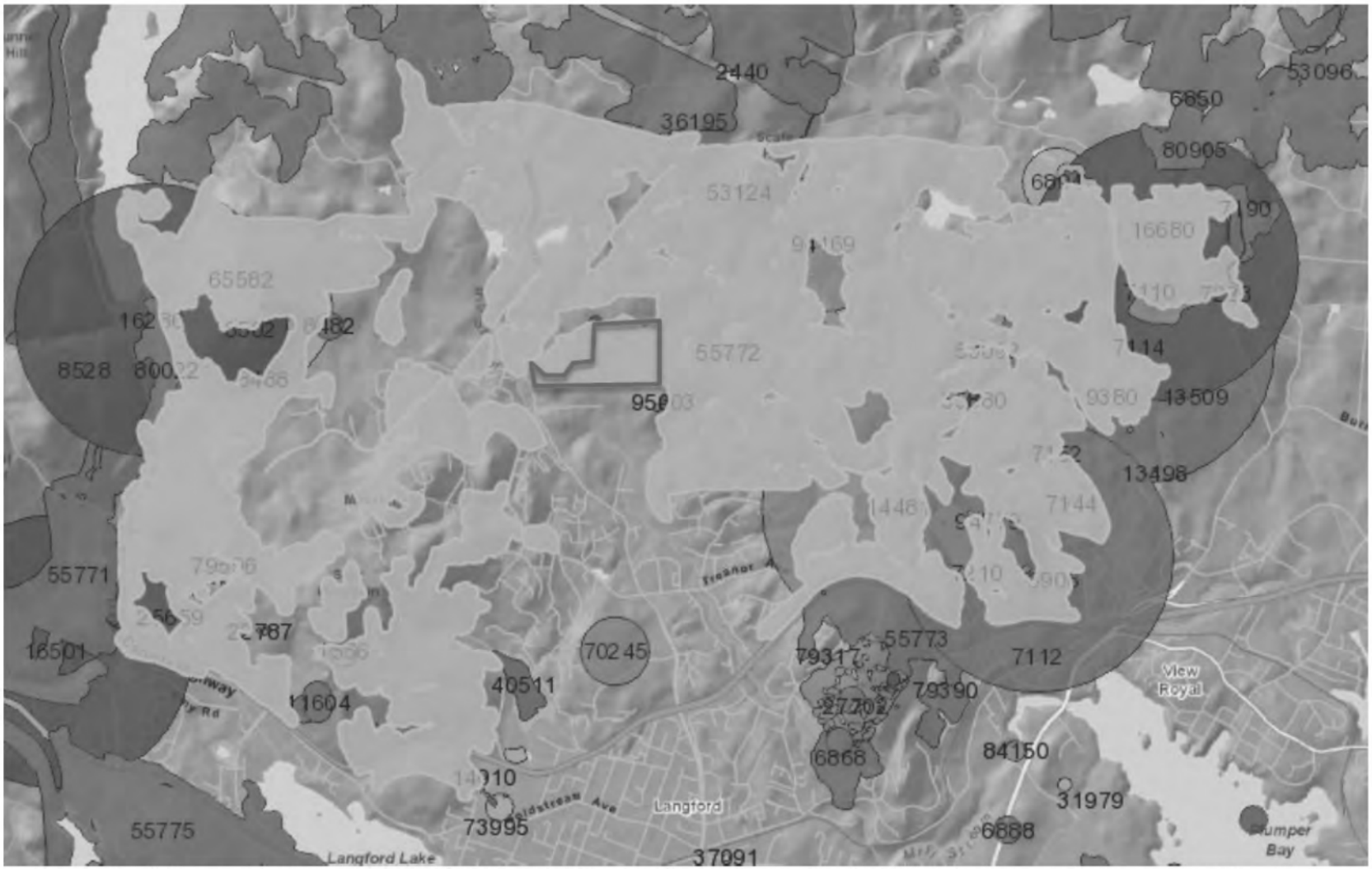

Figure 5. The light-green polygon outlined in yellow represents the large Douglas-fir/dull Oregon-grape polygon that exists in this region. The approximate boundary of the subject property is in red. Image Source: CDC iMap.

Figure 6. Google Earth map showing GeoBC (DataBC) water features in the vicinity of the subject property (red polygon). Teanook Creek is located along the north-east portion of the property. This stream is part of the Craigflower Creek Watershed and flows into McKenzie Lake. Old site maps indicate the presence of a large wetland and associated drainage near the centre of the site (yellow polygon) along with a small drainage at the south-west corner (yellow line).

Figure 7. Online mapping systems show no connection between the man-made pond on the Industrial property and Millstream Creek. Image Source: Google Earth.

Field Findings

A full day site assessment was undertaken by Aqua-Tex Scientific on Monday, April 20th, to determine the ecological characteristics of the subject property with a particular focus on freshwater ecology. During the assessment, Aqua-Tex located four different freshwater features:

- Teanook Creek,
- An isolated wetland on the southern property line,
- A large wetland complex near the centre of the site, and
- A wetland and stream channel on the southwest corner of the property (see Ecological Features Site Map).

Teanook Creek

Teanook Creek is located along the northern property boundary of the subject property. The north bank of the stream abuts the Tervita Highwest facility; in some locations, the toe of the fill slope on that property is the northern bank of the creek. For the length of the property Teanook Creek resides in the bottom of a small ravine with the land rising up as the fill slope to the north and a natural, vegetated hillside to the south. This freshwater system is a series of connected wetlands that encompass the ravine bottom; the riparian-wetland functions as a broad floodplain, with the stream moving through as a meandering channel. The stream channel is a mix of single thread and braided channels along the gradient of the wetland. The riparian-wetland within the ravine has a shallow slope (<2%), with dense riparian vegetation. Numerous cedar stumps were observed attesting to a former cedar dominated wetland within the ravine. There is one short segment, at the eastern end of the property, with no floodplain and a waterfall through bedrock and cobble; this short reach has a steeper gradient (>6%).

Channel widths were measured periodically and ranged from 1.5m to 3m with extensive active floodplain up to approximately 20m wide or more. In the areas with extensive floodplain/wetland, western redcedar, red alder, bigleaf maple, salmonberry, skunk cabbage, and Pacific water parsley dominate the riparian vegetation (**Table 1** provides a detailed list of vegetation). Two small tributaries, both dry at the time of assessment, flow into Teanook Creek from the south bank. Both tributaries are associated with a cluster of western redcedar at their upper limits. One large nest and a wildlife tree, with heavy woodpecker activity, were observed at the upper end of the second (eastern) tributary. A northern red-legged frog (blue-listed species) was seen at the top of the waterfall confirming the applicability of the CDC polygon shape ID #55880. A modified western redcedar with a hunting blind/tree fort was noted downstream of the waterfall.

Despite the industrial activity to the north, and historical land uses on the subject property, Teanook Creek has the hydrological, vegetation, and erosion/deposition characteristics that result in its being a properly functioning and healthy creek. While we did not conduct a Proper Functioning Condition assessment, our field

observations suggest the stream and its riparian-wetlands would, if such an aquatic health diagnosis was conducted, receive a high functional rating.

Table 1. Vegetation along Teanook Creek. Exotic species marked with an asterisk (*).

Common Name	**Latin Name**
bigleaf maple	*Acer macrophyllum*
vanilla-leaf	*Achlys triphylla*
red alder	*Alnus rubra*
arbutus	*Arbutus menziesii*
lady fern	*Athyrium filix-femina*
common horsetail	*Equisetum arvense*
salal	*Gaultheria shallon*
oceanspray	*Holodiscus discolor*
English holly*	*Ilex aquifolium*
skunk cabbage	*Lysichiton americanum*
dull Oregon-grape	*Mahonia nervosa*
Pacific water parsley	*Oenanthe sarmentosa*
shore pine	*Pinus contorta* var. *contorta*
sword fern	*Polystichum munitum*
Douglas-fir	*Pseudotsuga menziesii*
Nootka rose	*Rosa nutkana*
Himalayan blackberry*	*Rubus armeniacus*
salmonberry	*Rubus spectabilis*
willow species	*Salix* sp.
red elderberry	*Sambucus racemosa* ssp. *pubens*
Western redcedar	*Thuja plicata*
stinging nettle	*Urtica dioica*
red huckleberry	*Vaccinium parvifolium*

Isolated Wetland on Southern Property Boundary

A small, isolated wetland is located on the southern property line approximately 300 metres from the south-east corner of the property (see Ecological Features Site Map). This small wetland covers an approximate area of 300m^2 with its southern boundary at the toe of the Millstream Industrial Park road. The wetland appears to be receiving its water from the surrounding hillside while the road acts as a berm along its southern edge. No culvert outlet was found, with the elevated road-base acting as a physical barrier to off-site flow; this small wetland is classified as an isolated, perched wetland. The vegetation in this wetland is dominated by red-osier dogwood and hardhack (see **Table 2** for detailed list of vegetation).

Table 2. Isolated wetland vegetation. Exotic species marked with an asterisk (*).

Common Name	**Latin Name**
agromonic grasses*	
arbutus	*Arbutus menziesii*
red-osier dogwood	*Cornus stolonifera*
Scotch broom*	*Cytisus scoparius*
salal	*Gaultheria shallon*
oceanspray	*Holodiscus discolor*
shore pine	*Pinus contorta* var. *contorta*
Douglas-fir	*Pseudotsuga menziesii*
Nootka rose	*Rosa nutkana*
Himalayan blackberry*	*Rubus armeniacus*
trailing blackberry	*Rubus ursinus*
willow species	*Salix* sp.
hardhack	*Spirea douglasii* ssp. *douglasii*

Wetland Complex at the Centre of the Site

The CRD Regional Community Atlas identified a wetland SEI polygon near the centre of the subject property. The field assessment confirmed the presence of this large wetland and identified an outlet on its southern edge that flows south underneath a perimeter road. No culverts were observed at the outlet under the road; it appears water flows through the large angular rock that forms the roadbase. The flows from the wetland, having percolated through the roadbase are stored in a large, manmade pond on the adjacent property (still within the District of Highlands). Anecdotal conversation with a management staff member of the Industrial Park, indicated there is no outlet from the pond; during prolonged, heavy rainstorms the pond periodically over-flows its bank and flows across the industrial landscape. The pond is used for fire suppression at Millstream Industrial Park. The assessment team requested a review of the drainage information from the Engineering department at the City of Langford who confirmed that there is no official record of connecting drainage. Another unmapped arm of this wetland complex was located between two rocky knolls to the west of the SEI wetland. This wetland connects through a small channel to the main wetland complex just downstream of the old road.

The large wetland at the north of this complex is dominated by hardhack, red-osier dogwood, and willow sp.. Black cottonwood, oceanspray, salal, sword fern, and Douglas-fir border the wetland upslope. One large Douglas-fir is growing within the wetland itself. This is an unusual location for a Douglas-fir as they prefer drier soil conditions and suggests that the wetland may be larger than it used to be, perhaps because of the construction of the road downstream which functions as a dam. A hummingbird was observed in this area but moved on too quickly for identification.

The vegetation of the western wetland of this complex is dominated by western redcedar and skunk cabbage while the wetland at the southern end of the complex

is dominated by willow, skunk cabbage, Pacific water parsley, rushes and oceanspray. For a detailed list of vegetation for this wetland complex see **Table 3**.

Field investigations failed to find a culvert system, or any other path, connecting this wetland complex to Millstream Creek.

Table 3. Wetland Complex in the Centre of the Site. Exotic species marked with an asterisk (*).

Common Name	**Latin Name**
bigleaf maple	*Acer macrophyllum*
red alder	*Alnus rubra*
arbutus	*Arbutus menziesii*
lady fern	*Athyrium filix-femina*
deer fern	*Blechnum spicant*
red-osier dogwood	*Cornus stolonifera*
Scotch broom*	*Cytisus scoparius*
salal	*Gaultheria shallon*
oceanspray	*Holodiscus discolor*
skunk cabbage	*Lysichiton americanum*
Pacific water parsley	*Oenanthe sarmentosa*
Pacific ninebark	*Physocarpus capitatus*
shore pine	*Pinus contorta var. contorta*
sword fern	*Polystichum munitum*
black cottonwood	*Populus balsamifera* ssp. *trichocarpa*
Douglas-fir	*Pseudotsuga menziesii*
bracken fern	*Pteridium aquilinum*
Nootka rose	*Rosa nutkana*
Himalayan blackberry*	*Rubus armeniacus*
trailing blackberry	*Rubus ursinus*
willow species	*Salix* sp.
hardhack	*Spirea douglasii* ssp. *douglasii*
Western redcedar	*Thuja plicata*

Wetlands and Stream Channel at the Southwest Corner of the Site

A wetland complex is located on the CRD property along the southwest border with the subject property. These wetlands are dominated by shrubby species such as hardhack, willow, and red-osier dogwood and appear to have been created and/or modified in the past by the creation of roads.

An old stream channel was observed between the wetlands mentioned above and the pool mentioned below. There was no evidence of any flow this year but pooling water was present. If flows occur in this stream they would be routed to the southwest.

Further to the west down an old road, a pool marks the upstream end of an unnamed tributary to Millstream Creek. This stream flows adjacent to and south of the old road, then flows beside the driveway of the private residence on Millstream Road. The stream channel is routed under Millstream Road in a small culvert and down the slope to Millstream Creek; the culvert outlet was almost completely blocked with debris and soil, suggesting minimal flows pass through the culvert. The bank immediately below the culvert outlet did not provide any visual evidence of a stream channel, indicating the minimal flows from this culvert are absorbed by the forest floor and there may not be a direct, surficial connection with Millstream Creek (see the Ecological Features Site Map). Confirmation that this aquatic landscape unit is connected by surficial flow to Millstream Creek will need to be verified during winter rains.

The vegetation along this unnamed tributary is dominated by western redcedar and sword fern. A full list of vegetation for the wetland and stream channel at the western corner of the site is found in **Table 4**.

Table 4. Vegetation list for the wetlands and stream channel at the western corner of the site. Exotic species marked with an asterisk (*).

Common Name	**Latin Name**
bigleaf maple	*Acer macrophyllum*
vanilla-leaf	*Achlys triphylla*
red alder	*Alnus rubra*
red-osier dogwood	*Cornus stolonifera*
Scotch broom	*Cytisus scoparius*
daphne*	*Daphne laureola*
skunk cabbage	*Lysichiton americanum*
dull Oregon-grape	*Mahonia nervosa*
sword fern	*Polystichum munitum*
Douglas-fir	*Pseudotsuga menziesii*
willow species	*Salix* sp.
hardhack	*Spirea douglasii* ssp. *douglasii*
common snowberry	*Symphoricarpos albus*
western redcedar	*Thuja plicata*
stinging nettle	*Urtica dioica*

General Terrestrial Site Character

This site is forested with a second growth canopy of approximately 30-50 years old and lies within the Coastal Douglas-fir Biogeoclimatic zone, Moist Maritime variant (CDFmm). South of Teanook Creek the elevation rises up considerably from 70m to about 100m with a rolling landscape of bedrock knolls. Old logging roads and trails exist throughout the site.

The vegetation is dominated by Douglas-fir, arbutus, oceanspray, salal, and dull Oregon-grape. This dominant vegetation is consistent with the description of the Douglas-fir/dull Oregon-grape ecological community (CDC polygon shape ID #5772) (Wartigg, 2010). A list of all vegetation observed during the assessment is provided in **Table 5**.

The locations and existence of the SEI polygons were confirmed. The woodland polygon on the southeast corner of the property is present but it is no longer connected to rest of the polygon to the south due to a road and gravel storage area associated with Millstream Industrial Park. The large SEI woodland polygon in the middle of the site is a large rocky knoll with a thick canopy of arbutus, an understory of oceanspray, and an herb layer of few-flowered shooting star. The south side of this rocky knoll may be suitable habitat for sharp-tailed snake.

Table 5. Vegetation observed during the site assessment. Exotic species marked with an asterisk (*).

Common Name	**Latin Name**
agronomic grasses	
moss	
grand fir	*Abies grandis*
bigleaf maple	*Acer macrophyllum*
vanilla-leaf	*Achlys triphylla*
red alder	*Alnus rubra*
arbutus	*Arbutus menziesii*
lady fern	*Athyrium filix-femina*
deer fern	*Blechnum spicant*
sedges	*Carex* sp.
small-flowered blue-eyed mary	*Collinsia parviflora*
red-osier dogwood	*Cornus stolonifera*
English hawthorn*	*Crataegus mongyna*
Scotch broom*	*Cytisus scoparius*
Daphne*	*Daphne laureola*
few-flowered shooting star	*Dodecatheon pulchellum*
common horsetail*	*Equisetum arvense*
cleavers	*Galium aparine*
salal	*Gaultheria shallon*
oceanspray	*Holodiscus discolor*
English holly*	*Ilex aquifolium*
rushes	*Juncus* sp.
skunk cabbage	*Lysichiton americanum*
dull Oregon-grape	*Mahonia nervosa*
Pacific water parsley	*Oenanthe sarmentosa*
pacific ninebark	*Physocarpus capitatus*
shore pine	*Pinus contorta var. contorta*

sea blush	*Plectritis congesta*
sword fern	*Polystichum munitum*
black cottonwood	*Populus balsamifera* ssp. *trichocarpa*
Douglas-fir	*Pseudotsuga menziesii*
bracken fern	*Pteridium aquilinum*
Nootka rose	*Rosa nutkana*
Himalayan blackberry*	*Rubus armeniacus*
salmonberry	*Rubus spectabilis*
trailing blackberry	*Rubus ursinus*
willow	*Salix* sp.
red elderberry	*Sambucus racemosa* ssp. *pubens*
hardhack	*Spirea douglasii* ssp. *douglasii*
common snowberry	*Symphoricarpos albus*
western redcedar	*Thuja plicata*
stinging nettle	*Urtica dioica*
red huckleberry	*Vaccinium parvifolium*

Ecological Features Site Map

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Regulations, Policies, and Guidelines

Federal Government

The Sharp-tailed snake is federally listed as an endangered species and is, therefore, federally protected under Species at Risk Act (SARA). According to the SARA public registry, *"all known localities of the snake are on private land, which are not subject to any habitat protection requirements. The Wildlife Act of British Columbia prohibits the collection, handling and trade of all native wildlife species without a permit; but does not provide habitat protection"* (Government of Canada, 2015).

BC Provincial Government

Riparian Area Regulation

The Riparian Areas Regulation (RAR) is applicable to any watercourse(s) (streams, rivers, creeks, ditches, ponds, lakes, springs, and wetlands) that is/are connected by surface flow to a waterbody that provides fish habitat. Under the regulation, if a watercourse is present within 30 metres of a proposed development, a Qualified Environmental Professional (QEP) is required to follow a specific method to determine a setback or buffer to protect the stream and its riparian zone. With respect to the subject property, the RAR is applicable to Teanook Creek and may be applicable to the Unnamed Tributary to Millstream Creek in the southwest corner of the property.

Sensitive Ecosystem Inventory Conservation Guidelines

The Ministry of Environment has developed management recommendations for SEI's on East Vancouver Island & Gulf Islands (see MOE, n.d., d). Where land development activities cannot be excluded from these areas they recommend the proponent work with a qualified environmental professional "to incorporate designs that are sensitive to the natural ecosystem, clearly delineating sensitive areas prior to and during construction and minimizing impacts to the core ecosystem's" (MOE, n.d., d). The proponent is currently working with Aqua-Tex to address this guideline.

Guidelines for Provincially Listed Species

Provincially listed species, such as the sharp-tailed snake and northern red-legged frog, are protected under the Wildlife Act of British Columbia that prohibits the collection, handling and trade of all native wildlife species without a permit. The Act does not require habitat protection for these species on privately owned land. The Wildlife Act does protect active birds nests and nests of eagles, peregrine falcons, gyrfalcons, osprey, heron, or burrowing owl.

There are no provincial regulations that dictate the protection of listed ecological communities on private land; however, they encourage land stewardship and best management practices through guideline documents such as *Develop with Care* (MOE, 2014). The proponent has been working with Aqua-Tex to consider the

ecological values of this site while keeping in mind the desired commercial/industrial land use as described in the District of Highlands OCP.

Section 9 of the Water Act

Any changes in or about a stream, for example, the installation of a culvert, requires the submission of a Section 9 notification or application to the Ministry of Forests, Lands, and Natural Resource Operations for authorization.

District of the Highlands

Based on the preliminary site assessment there are two development permit areas that are applicable to ecological features on this property (see **Figure 11** for setbacks & protected areas as per Highland requirements): Development Permit Area No. 2 and Development Permit Area No. 3. However, the OCP also indicates that this area is intended for commercial/industrial development. To accommodate this desired land use, the DP guidelines (copied below) cannot practically be accomplished.

Development Permit Area No. 2 – Water and Riparian Areas

Two areas of the site are designated by the District of Highlands as water and riparian DP areas, the large wetland in the centre of the site and the Unnamed Tributary to Millstream Creek in the southwest corner of the property (**Figure 9**). This DP area is applied to the water feature as well as areas within 30m of the top of bank or natural boundary. Given this definition, all the freshwater features identified during the preliminary site assessment meet the criteria for this DP area even though not all of them are subject to the RAR. The guidelines for these areas as described by the District of Highlands are below:

1. No unnecessary site disturbances shall be permitted within at least 30 metres (100 feet) of the top of bank of watercourses, or the natural boundary of lakes, wetlands, and other water features. Existing vegetation shall be maintained in order to control erosion, protect banks, protect habitat, and retain the natural character of water features. Outside agencies, such as Department of Fisheries and Oceans and BC Ministry of Environment, will be consulted where necessary.
2. No habitable buildings or other structures requiring foundations will be constructed, and no septic tanks or fields will be installed within at least 30 metres (100 feet) horizontal distance from the top of a bank of a watercourse or high water mark of water features, and within 15 metres (50 feet) horizontal distance of the natural boundary of an area subject to flooding.
3. Provision will be made and works undertaken to maintain the quality of stormwater flowing toward or in the identified water features, and to ensure that the volume and peak flow of runoff from a property is not increased by any development or land altering activity.
4. Vegetation appropriate and preferably indigenous to the site may be required to be planted on the site to reduce erosion risk, restore and enhance the natural character of the site, improve water quality, or to stabilize slopes and banks. A landscaping security deposit will be required to encourage

compliance. Outside agencies, such as Department of Fisheries and Oceans and BC Ministry of Environment, will be consulted where necessary.

5. Removal of gravel, sand, soil or peat from streambeds, lakes, or wetlands and the draining, dredging, infilling, piping or dumping of materials will be strictly limited. Outside agencies, such as Department of Fisheries and Oceans and BC Ministry of Environment, will be consulted where necessary.
6. Modification of channels, banks, or shores that could cause environmental harm or significantly alter local hydrological conditions will not be permitted.
7. Pollutants, including pesticides and fertilizers, will be prevented from entering water features or wetlands by requiring the control of surface water drainage.
8. All new developments or modifications of existing developments will be required to prove to the satisfaction of the District of Highlands that the development will cause no increase in runoff compared to existing conditions of the site.
9. Non-point source pollution will be prevented from entering water features from residential or commercial developments or agricultural activities.
10. Facilities to allow the use of gasoline powered boats and floatplanes will not be allowed.
11. The Development Permit may designate and specify where necessary, a buffer zone within which land alteration or structures will be limited to those compatible with the characteristics of the water feature.
12. Development Permits issued with regard to road and driveway construction in this area will ensure that:
    a. Watercourse crossings are so located as to minimize disturbance of water feature banks, channels, shores, and vegetation cover.
    b. Bridges are used instead of culverts for crossings of fish-bearing watercourses, wherever possible.
    c. Where culverts are used, their size will be large enough to accommodate 100-year flood conditions. Culverts should be placed to allow unrestricted movement of fish in both directions. Where desirable, culverts may be designed to retard low flows and encourage instream storage of water.

    In-stream work requires notification or approval under section 9 of the Water Act.
13. Watercourses should be left natural to protect habitat.
14. Should any application for changes to land within Highlands fall within the parameters of the BC Riparian Areas Regulation (RAR), an applicant will be required to furnish, at their expense, an Assessment Report certified by a Qualified Environmental Professional (QEP) as defined by and meeting the intent of the RAR. All applications falling under the RAR will still be subject to Council review. (District of Highlands, 2013, p. 74-75).

Development Permit Area No. 3 – Sensitive Vegetation

Four areas on the site are designated by the District of Highlands as sensitive vegetation DP areas: the large wetland in the centre of the site, the large SEI

woodland polygon in the centre of the site, the SEI woodland polygon in the southeast corner, and the SEI older second growth forest polygon in the northeast corner (**Figure 10**). The guidelines for these areas as described by the District of Highlands are below:

1. No unnecessary site disturbances shall be permitted within areas designated as sensitive vegetation.
2. In treed areas, mature vegetation will be protected, as will understorey plants and immature trees.
3. The level of the land surface will not be changed in sensitive vegetation areas if such change could affect the health of vegetation or the ecological structure of plant communities.
4. Drainage will not be altered in ways that increase or decrease the amount of surface water or groundwater available to the sensitive vegetation.
5. Where necessary, provision will be made and works undertaken to maintain the quality of water reaching the sensitive vegetation.
6. Removal of gravel, sand, soil or peat in sensitive vegetation areas will be strictly limited.
7. The Development Permit may designate and specify where necessary, a buffer zone within which land alteration or structures will be limited to those compatible with the characteristics of the sensitive vegetation.
8. Planting of invasive non-native vegetation adjacent to or in designated sensitive vegetation areas will not be permitted.
9. Older Second Growth Forests Category – Only the following guidelines apply to the older second growth forest category:
    a. Where older second growth forests are adjacent to the sensitive ecosystems in
    Development Permit Area 3 (Sensitive Vegetation) and to riparian or wetland areas, options for conservation will be considered. In such cases, buffers of older second growth forest will be maintained as determined by a registered biologist. At the very least, site disturbances into such areas will be minimized.
    b. Loss of ecosystem functions will be minimized, while maintaining the resource use value of the property.
    c. Where such areas occur in isolation from other ecosystems, efforts should be made to retain the largest patches possible.
    d. Minimize edge effects by:
        i. Retaining patches of forest rather than isolated trees.
        ii. Treed areas should have the least possible amount of edge per unit area (i.e., should be as close to round as practical).
        iii. The windward edge should be smooth and in areas of deep soils and well rooted trees.
        iv. Edge stabilization treatments including feathering, sail pruning, topping, and removal of unsound trees should be used to ensure a windfirm edge.
    e. Manage recreational and livestock access to avoid damage to vegetation, soils and wildlife.

f. Prevent disturbance of nesting and breeding areas.
g. Control the introduction and spread of invasive plant species.
h. Allow natural disturbances and successional functions and processes to occur.
i. Infrastructure (including wells and septic fields) should avoid trees and their root masses that are to be conserved. Generally, staying back the distance equal to the height of a tree from its base or 15 metres, whichever is greater, will achieve this.
j. Schedule land disturbance activities to avoid the spring nesting and breeding season forcoastal wildlife.
k. Design and implement appropriate sediment and erosion control measures. (District of Highlands, 2013, p. 77-78).

Lastly, in their 2001 Parks and Recreation Master Plan, the District of Highlands identified a portion of the subject property as a proposed connecting corridor between Millstream Road and Thetis Lake Regional Park (**Figure 8**). The proposed preliminary concept plan has been designed to accommodate a connecting corridor.

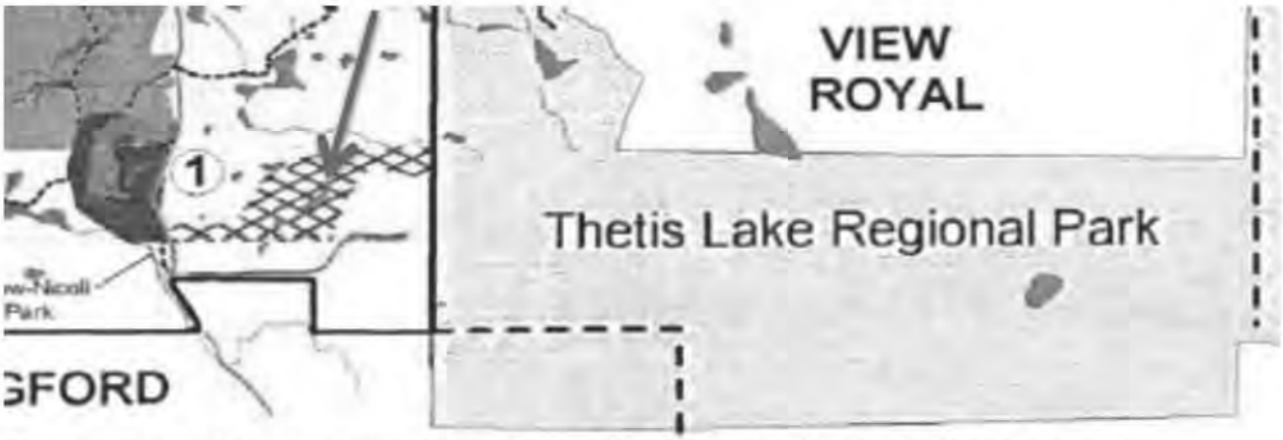

Figure 8. Zoomed-in selection of that portion of Map 4 from the Highlands 2001 Parks and Recreation Master Plan showing the proposed connecting corridor (green hatching & red arrow) through the subject property to Thetis Lake Regional Park.

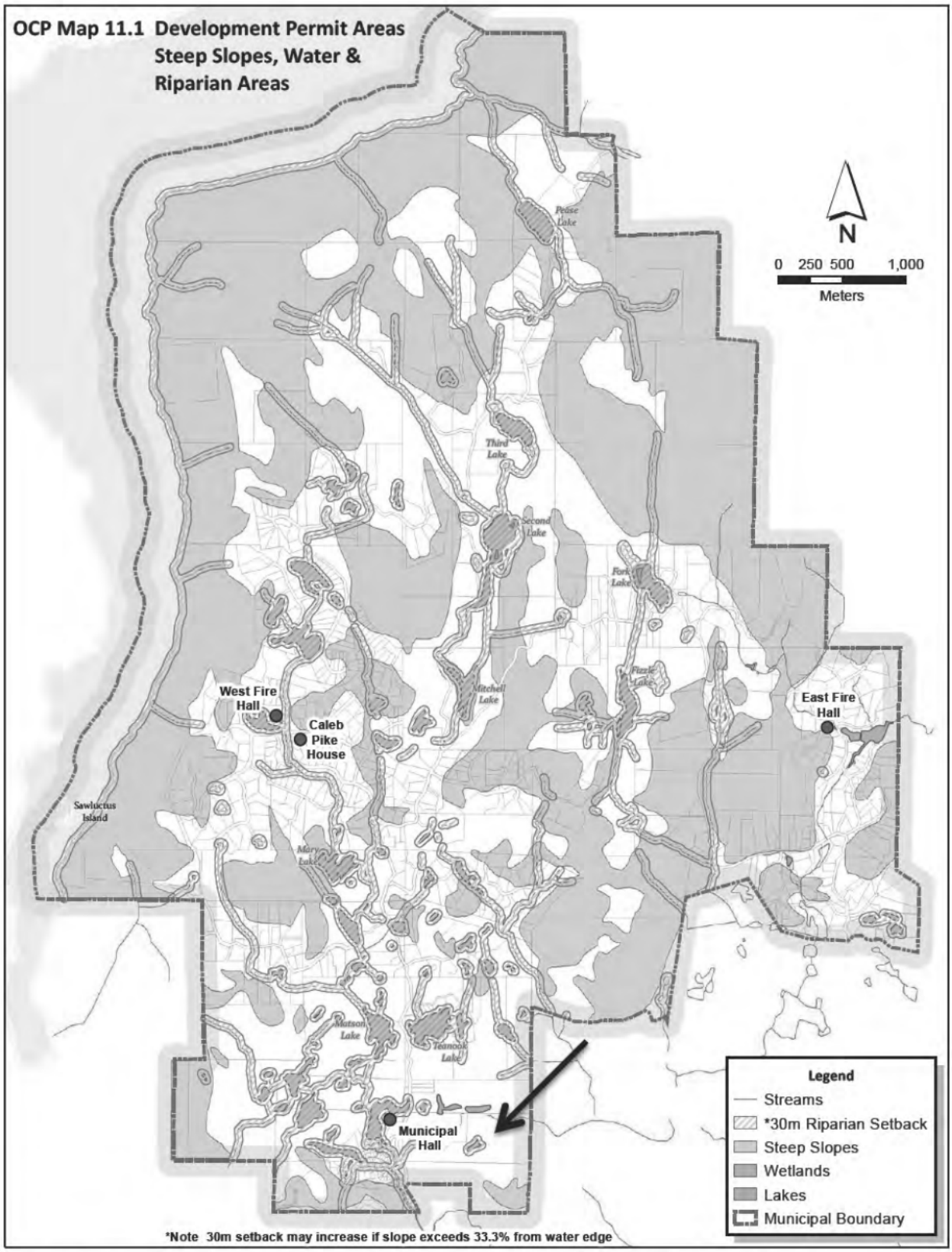

Figure 9. District of Highlands OCP maps showing the DP areas for steep slopes, water & riparian areas. The subject property is identified with the black arrow.

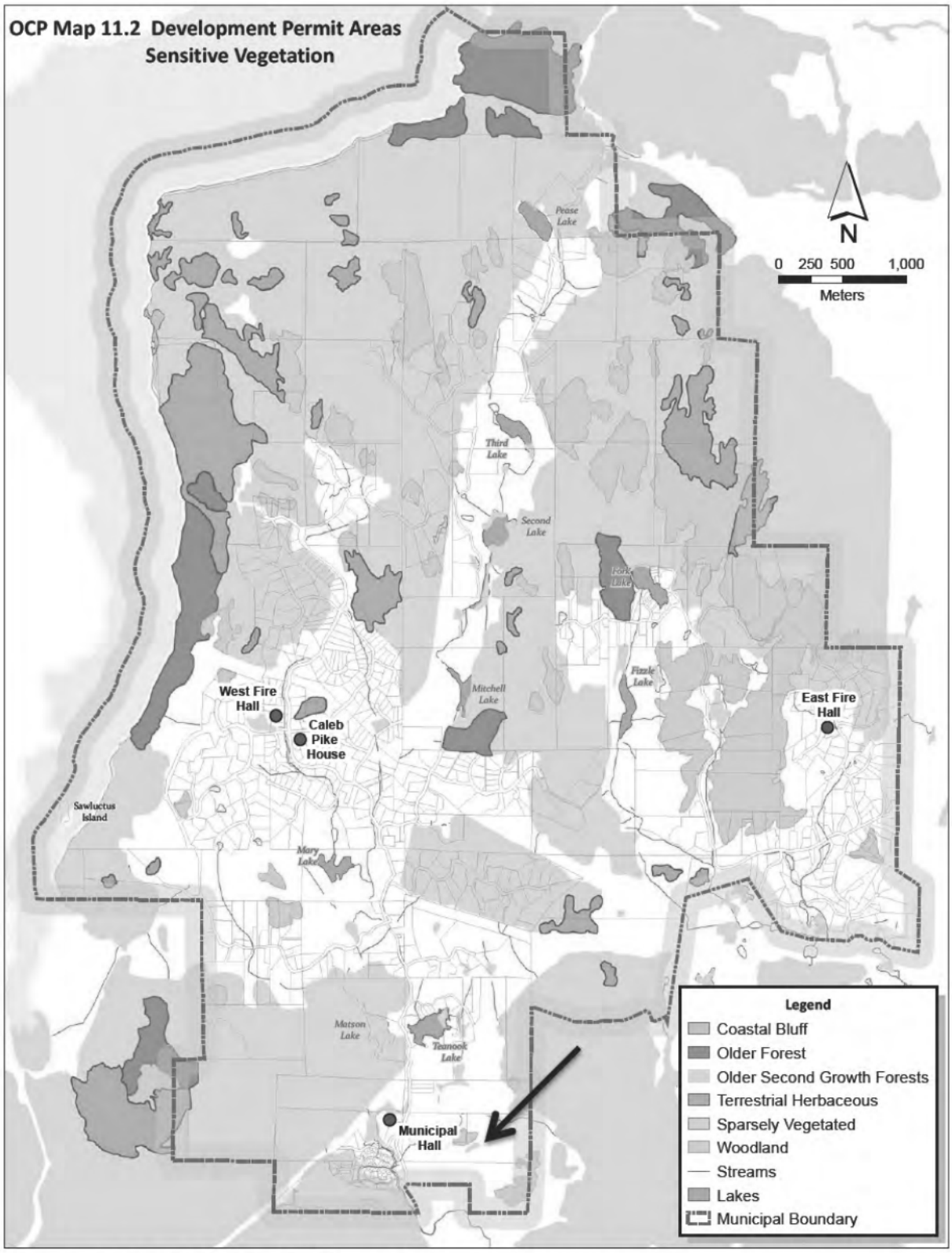

Figure 10. District of Highlands OCP map showing the DP areas for sensitive vegetation. Four DP areas exist on the subject property (black arrow) that correspond to the four SEI polygons shown in Figure 2.

Recommendations

*Please note that these recommendations apply only to the subject property, not to adjacent lands.

- Protect Teanook Creek by increasing the size of the buffer along the northern property edge. Although an RAR Assessment Report has not been conducted for this stream/wetland complex, it is likely that the RAR-based SPEA would be in the 20 – 30 metre range. If the stream channel was determined to be a riparian wetland (Lentic habitat) there would be a prescriptive 30 metre buffer established by the RAR Method.
- A buffer of 50m from the edge of the active floodplain on Teanook Creek is recommended. Given that the landscape elevations will be heavily modified by the proposed rock extraction activities, this extended buffer will protect a portion of the hillside to the south of Teanook Creek and, therefore, maintain the hydrology of this system. This extended buffer will also protect the older second growth forest SEI polygon on the northeast property corner. This extended setback may also negate the need to conduct a RAR assessment and a Water and Riparian DP on Teanook Creek as one is only required if work is proposed within 30 metres of the high water mark.
- Protect those sections of Teanook Creek and the Unnamed Tributary to Millstream Creek in the southwest corner of the site that exist on the subject property by following the Riparian DP setback as prescribed in the District of Highlands OCP or as otherwise recommended by a QEP. The Riparian DP setback cannot practically be applied on the remainder of the site if the OCP-directed commercial/industrial land use is to be accomplished.
- Given the proposed development of the site is to have it re-zoned as an Industrial Park, with extensive rock removal, it does not appear possible to maintain the water table and hydrology required to support the large wetland complex in the centre of the site. The proposed removal of much of the rock on the site, to create a landscape capable of supporting an Industrial Park, would almost certainly result in the loss of hydrological integrity within the wetland. The loss of the wetland's capability to retain water would lead to its becoming a dry depression no longer capable of functioning as a wetland.
- The client may wish to meet with the District of the Highlands and identify areas on site, or within the district that require conservation and/or rehabilitation as compensation for removing the wetland complex in the centre of the site.
- If the wetland complex in the centre of the site is to be removed, consider undertaking riparian plant salvage. In addition, fish and amphibian salvage may be required under provincial salvage permits.
- Areas to be protected such as the interface with Thetis Lake Regional Park, the Unnamed Tributary to Millstream Creek in the southwest corner of the property, and Teanook Creek may need an additional buffer to accommodate

windfall or invasive species colonization that will likely occur along the disturbed edge once the majority of the trees are removed from the site. This buffer, or a forested edge management strategy, should be established with the help of an arborist.

- In the future, prior to any site disturbance, the property should be reviewed by an appropriate Qualified Environmental Professional (QEP) to look for raptor nests, active bird nests, and sharp-tailed snakes – all of which are protected under the Wildlife Act.

Photographs

Figure 12. Representative photo of the Capital Regional District industrial property to the northwest of the subject property. Invasive species are rampant including poison hemlock.

Figure 13. Large wetland area associated with the defined channel of Teanook Creek.

Figure 14. Representative photo of the typical character of Teanook Creek along the northern property boundary. The creek has an extensive active floodplain. In this location the stream channel is a single thread structure with shallow banks and remnant channels on the adjacent terraces that also function as active floodplain.

Figure 15. A copse of western redcedar at the upper end of a small tributary to Teanook Creek. A nest is visible in the upper branches of the redcedar in the middle of the photo.

Figure 16. A view over Teanook Creek from a rocky knoll along the south bank. The photograph is oriented to the north looking across the riparian area. Note the ravine below the knoll.

Figure 17. The waterfall on Teanook Creek. This small section of creek has a steep gradient and no floodplain. The northern red-legged frog was observed here. This waterfall represents a significant change in the landscape gradient, as the land slopes east toward Thetis Lake Regional Park, in the background.

Figure 18. Teanook Creek downstream of the waterfall in the northeast corner of the property. Downstream of the waterfall the stream channel widens into a braided stream/riparian wetland on the forest floor. The stream channel has been wandering across the broad, flat forest floor. Note the mossy rocks in the stream channel, an indication the stream channel is stable and not subject to flashy eroding flood velocities.

Figure 19. A modified western redcedar and tree fort or hunting blind on the north bank of Teanook Creek.

Figure 20. The small isolated wetland on the southern property boundary. The dominant vegetation species in this wetland are hardhack and red-osier dogwood.

Figure 21. The large SEI wetland in the centre of the site (open, sunny area in the background of the photograph). The vegetation community in this wetland is dominated by hardhack, red-osier dogwood, and willow. Black cottonwood is present on the banks while thick salal and oceanspray make up the upslope shrub understorey.

Figure 22. The southern-most wetland area of the SEI wetland complex. The photographer is standing on the Millstream Industrial Park road on the southern property boundary.

Figure 23. The western-most wetland portion of the SEI wetland complex. This portion of the wetland is primarily composed of western redcedar and skunk cabbage.

Figure 24. The upstream end of the complex of wetlands on the CRD lands near the northwest subject property boundary. These wetlands have been historically disturbed with road construction.

Figure 25. The pond area at the upstream end of the Unnamed Tributary to Millstream Creek in the southwest corner of the property (this photo is facing upstream).

Figure 26. The Unnamed Tributary to Millstream Creek as it approaches Millstream Road. A small culvert carries flows under the road and into Millstream Creek.

Figure 27. A representative photograph of the terrestrial vegetation surrounding the rocky knolls. The dominant vegetation species are Douglas-fir, arbutus, and oceanspray.

Figure 28. A representative photograph the top of a rocky knoll.

Figure 29. A view of the neighbouring gravel extraction operation and industrial park to the south of the subject property. The vegetated bedrock outcrop in the background left of the photograph is a SEI woodland that the CRD map shows connecting to the SEI woodland in the southeast corner of the subject property.

Figure 30. The southern extent of the woodland SEI polygon in the southeast corner of the site. The road and associated fill provide a transportation route to the eastern side of the Millstream Industrial Park. This road defines the southern boundary of the subject property.

Figure 31. Another view of the Millstream Industrial Park. The road at the right defines the southern boundary of the subject property (treed area).

Figure 32. The SEI woodland polygon at the centre of the site is a large mossy bedrock knoll surrounded by a dominant canopy of arbutus and a thick oceanspray shrub understory.

Figure 33. The southern slope of the SEI woodland polygon at the centre of the site.

Figure 34. A representative photograph of the old roads, primarily located in the southwestern portion of the site, and the terrestrial character of this area.

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From:	Harrison, Donald EMPR:EX
To:	"Barry Chalmers"
Cc:	Mel Sangha; Cory Sangha; Caughill, David EMPR:EX
Subject:	RE: Notice of Work
Date:	Wednesday, November 22, 2017 10:36:00 AM
Attachments:	SKM_C224e17111512370.pdf 1610713_Millstream_Quarry-Blast Design Rev.1_InternationalBlasting-RonElliot.pdf

Hello Barry,

My apologies for the delay in getting back to you. Thank you for the Blasting report and reclamation update.

One noticeable gap in the Blasting report is that it does not address the potential impacts or how blasting may affect the integrity of the CRD (Meadows) landfill, nor the Tervita landfill sites. Our primary concern is that the quarry not negatively impact these facilities and the report is silent on that. If there are potential impacts on these landfills and their liners, the next question is around groundwater movement. I think Dave and I can be available mid to late next week.

Regards,

Don

Don J. Harrison, P.Geo.

Sr. Inspector of Mines–Permitting, SW Region

BC Ministry of Energy, Mines & Petroleum Resources

Mines & Mineral Resources Division

3rd Floor, 1810 Blanshard St,

Victoria, BC V8W 9M9

Direct Line: (250) 953-3881

Main office: (778) 698-3649

From: Barry Chalmers [mailto:bchalmers@islandpaving.com]
Sent: Friday, November 17, 2017 8:05 AM
To: Harrison, Donald EMPR:EX
Cc: Mel Sangha; Cory Sangha
Subject: Notice of Work

Hello Don,

Please find attached answers to your October 13, 2017 email which form part of our Reclamation Plan. We would like to set up a meeting with you and Dave to discuss any questions or concerns the Ministry may have regarding the recently submitted Blasting and Reclamation plans, setbacks, public input you have received and any other matters regarding our Mines Permit application. Would you please let us know when you could be available.

Yours truly,

Barry Chalmers

M. Barry Chalmers
O.K. INDUSTRIES LTD.
ISLAND CRUSHING CO.
ALL FUN AGGREGATE CO.
e-mail:bchalmers@islandpaving.com
Phone: 250-652-9211
Fax: 250-652-9270
Cell: 250-897-2296

November 15, 2017

OK Industries Ltd. (the "Applicant") Conceptual Reclamation Plan for Millstream Road Quarry: Notice of Work Tracking Number 100202890

Issues to be addressed as per Ministry of Energy, Mines and Petroleum Resources (MEM) email dated October 13, 2017Requirements:

1) Notice of Work Submission Re: Reclamation Program

Your NoW application states: "There is no proposed reclamation at this time ..." yet below you mention "Our reclamation plan addresses ...". I still do not see a reclamation plan for this site. It is expected that you will conform to Ministry standards as required by the Mines Act and Code, but saying so in advance does not constitute a reclamation plan. A Mines Act permit cannot be issued without an approved reclamation plan; however the plan may be updated at a minimum every 5 years.

Describe the Proposed reclamation and timing for this specific activity: Based on current market conditions it is unlikely any direct reclamation activities of phase 1 will be undertaken during the life of this submitted 5 year mine plan. However, as each phase of the mine is exhausted and areas of it are no longer actively used in the quarry operations and/or are no longer required to support the ongoing operations of subsequent phases, reclamation of these unused areas will be completed. Reclamation cost is estimated at $5000.00 per ha.

During reclamation any disturbed land not required for mining or infrastructure will be graded and levelled to the final elevation of 95 meters, covered with previously removed and stored overburden, and vegetated with the appropriate native species as established by a qualified person as defined by the Province. Existing water courses will also be protected. Rock faces and walls will be monitored for safety and any scaling required will be completed during the mine operating period and post closure of the mine up to rezoning and eventual sale of the lands to address any safety considerations. In the event the lands are not approved for rezoning, regular monitoring of rock faces and walls will be undertaken and scaling completed as required.

The qualified person shall meet the standards established by the Ministry of Forests, Lands and Natural Resources, and/or other standards as established by the Province. Please note the following link:

https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/natural-resource-use/qualified-persons/list_qualified_persons.pdf

In addition the following two documents will be referenced:

a) Qualified Person Inventory Update: "Use of qualified persons in the Provincial administration and management of natural resources in British Columbia " and

b) "Qualified Persons Working in the Natural Resources Sector in British Columbia" Below is a short description of types of Qualified Persons:

Qualified Persons			
Registered professionals		Accredited practitioners	
Registered by a legislated self-regulating association	Registered by a non-legislated association	Accredited by an organization acceptable to government	Accredited by government
Rosters established by government			
Meets criteria specified in legislation or policy.			

Not withstanding the above, it is understood the Inspector can specify the qualifications of individuals for specific purposes.

2) Mines Act S. 10(1):

" ... as part of the application for the permit, there must be filed with an inspector ... a program ... for the protection and reclamation of the land, watercourses and cultural heritage resources affected by the mine, including the information, particulars and maps established by the regulations or the code."

a) The Notice of Work proposal includes a provision that should ground water be encountered during drilling, adjustments to the mining plan will be made to remain a minimum of 1 meter above the high ground water table. Should this occur the Applicant will notify the Inspector and prepare a plan for approval by MEM. The plan will be prepared by a Registered Professional working within his field of practice;

b) The long term mine operation is subject to 5 year mining plan updates as required by the Code. The Applicant will notify the Inspector if a flow of water occurs on any of mining faces during any 5 year plan period. The Applicant will then provide a water management plan that meets the provisions of the surface water management plan requirements in place at that time;

c) Information on existing surface water and surface water management is based on reports submitted with the Applicant's original mining permit application completed by SNC Lavalin and Aqua-Tex Scientific Consulting Ltd.;

Existing water courses will be protected by adequate set-backs from active mining operations as established in the attached revised site plan and by controlling all on-site water within the mine property;

d) Prior to the purchase of the proposed quarry by the permittee, the Province of BC contacted potentially affected First Nations and resolved any cultural heritage issues. In addition, as part of this mine application process MEM requested input on any heritage issues from First Nations. To the best knowledge of the Applicant no issues were brought forward to MEM.

3) Code: Part 10.1.1 (1) and (2)

This code section is self-explanatory and the Applicant has no specific comments to add other than they understand and agree that no work can commence until MEM has issued the appropriate Mines Permit and an MEM Inspector, including the Chief Inspector, can request additional information.

4) Part 10.1.3 (g)

The conceptual long term plan for the mine is defined in the Notice of Work. Upon completion of mining at the site, the Applicant will reapply to the District of Highlands to have the lands rezoned for commercial/light industrial use in accordance with this municipality's current Official Community Plan.

In the event this rezoning reapplication is approved, areas that have been mined out will be graded and levelled and the infrastructure necessary to meet the rezoning requirements will be constructed in accordance with the specifications of the agencies having jurisdiction. No work will proceed without the approval of these agencies. In addition, the Applicant will use overburden stored on site from the mining operation to grade and level areas where mining actives were undertaken. Such areas will be vegetated with native species as determined by the appropriate qualified person. Water courses will be protected. Scaling of rock faces will be undertaken to address any safety considerations. Once the development has been completed subdivided lots will be sold to third parties. The Applicant understands that Federal, Provincial and/or Municipal by-laws and legislation may change during the life of this permit. Should this occur, the Applicant will submit to MEM an updated closure plan.

In the event this rezoning reapplication is not approved and mining of the site is completed, the mine will be closed. Areas that have been mined out will be graded and levelled. The Applicant will use overburden stored on site from the mining operation to grade and level areas where mining actives were undertaken. Such areas will be vegetated with native species as determined by the appropriate qualified person. Existing water courses will be protected. Scaling of rock faces will be undertaken to address any safety considerations. It is understood that Federal, Provincial and/or Mu-

nicipal by-laws and legislation, may change during the life of this permit. Should this occur, the Applicant will submit to MEM an updated closure plan.

5) Part 10.1.17

The Applicant believes the submissions provided in the Notice of work, and additional information in this correspondence plus revised blasting plan recently submitted meet the requirements of section 10.1.17 of the Code. However, as noted herein and in the Notice pf Work, final pit walls will be examined prior to closure, or any alternate land use. If stability issues exist they will be addressed by an appropriate Professional (Geo Tech). However, the original blasting plan submitted with the mine permit application and the additional blasting plan recently prepared by International Blasting Consultants Ltd. indicate impacts from blasting on final walls will be minimal.

Based on the provided plans submitted with the mining permit application, the final wall in the consolidated material will be 50 degrees where mining was conducted in two benches. In other areas where ground contours may fluctuate relative to the planned final floor elevation of 95 meters, the wall will likely vary. Remaining benches will be seeded with appropriate vegetation if required by a qualified professional.

6) Part 10.4.1

Surface water management will be based upon the reports submitted with the Applicant's original mining permit application completed by SNC Lavalin and Aqua-Tex Scientific Consulting Ltd. This provides for control of all on-site water within the mine. If required by the mine permit, an annual report will be prepared by a qualified professional and submitted to MEM outlining the effectiveness of this plan.

Surface water due to rain and/or snowmelt will discharge within the land much as it does at present. These waters will be collected and monitored for sediment load as established by the Mine Permit. Reports will be submitted to MEM as may be required by Mine Permit.

The Applicant understands that Water Balance normally applies to major and much larger mines than the one which this application applies to. Further, the Applicant understands that Water Balance also normally applies when water is drawn from the site and used for management of geo-chemical processes normally associated with metal and coal mining. For this mine water will be trucked onto the mine site until an on-site water source is established. Once the final blast plan is approved by MEM the Applicant will provide MEM with the location of the on-site water source and will make the necessary applications for a water license.

7) Part 10.7

We believe you are referring to section 10.7.1, and if so the information provided in Notice of Work and this submission should meet the requirements of this section. Please advise the Applicant if you require more information on this section.

8) Conclusion:

The Applicant will, with each mandated 5 year update, provide an updated closure plan in accordance with the standards in place at that time. Once Phase 1 of the mine is completed it is anticipated that any new plans submitted will include progressive reclamation.

Page 136 to/à Page 147

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Page 149 to/à Page 152

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From:	Korene Torney
To:	Harrison, Donald EMPR:EX
Subject:	RE: 1 Comment on Proposed Quarry, S of Millstream Meadows site, District of Highlands (CRD).
Date:	Thursday, March 8, 2018 4:39:15 PM
Attachments:	CRDMillstreamMeadowsSelectPotentioDwgs.pdf

Hi Don,
We spoke back in January about this proposed quarry. At the time you asked some questions about wells on the CRD Millstream Meadows contaminated site. Please find attached some site plans prepared by our consultant. I am aware that you have requested additional hydrogeologic information as, OKI's consultant Hemmera has asked us for info. I gave them the same figures I've provided here.
Unofficially, I wonder if the quarry blasting has the potential to further fracture the bedrock. We are specifically investigating chlorinated solvent type contamination in groundwater within the deep bedrock fracture system. The site lies within a drinking water aquifer with very complex fracturing and geology. When blasting at Hartland landfill (similar or same geologic formation) we require contractors to minimize ground vibrations which may damage neighboring sensitive rock formations and limit maximum Peak Particle Velocity (PPV) measured at specified locations nearest to the blast to 25 mm/second. We also require seismographic monitoring during all blasting operations. It is reasonable that seismograph monitoring be conducted during all blasts and located at the closest to property line of any individual blast to ensure conformance to vibration criteria. We would like to see these measures implemented at the OKI property.
I would be happy to talk with you regarding the quarry approval again.

Korene Torney, P. Geo., PMP
Supervisor, Geo-Environmental Programs
Parks & Environmental Services
Making a difference...together
Capital Regional District
625 Fisgard St, PO BOX 1000,
Victoria, BC V8W 2S6
Phone 250.360.3148 **:: Fax** 250.360.3076
Email ktorney@crd.bc.ca

From: Harrison, Donald EMPR:EX [mailto:Donald.Harrison@gov.bc.ca]
Sent: Tuesday, December 05, 2017 3:30 PM
To: Korene Torney
Cc: Caughill, David EMPR:EX ; Southwest Regional Mines Division EMPR:EX
Subject: 1 Comment on Proposed Quarry, S of Millstream Meadows site, District of Highlands (CRD).
Importance: High
Hello Korene,
Your email was provided to me by Peggy Evans of the CRD. The Ministry of Energy, Mines & Petroleum Resources (MEMPR) would like to inform you of an application for a proposed rock quarry to the south of the CRD's Millstream Meadows reclaimed landfill site in District of Highlands. I am attaching a copy of the quarry application and related maps. The proposal is basically to level

off most of the site to the 95 m elevation to recover aggregate. MEMPR would like you to comment on concerns the CRD may have about this proposed quarry operation, and any potential impacts it may have on the Millstream Meadows site related to hydrology/hydrogeology, landfill stability and integrity, monitoring, and anything else that you may consider as a risk to the CRD's landfill facility. I'd appreciate it if you could respond to this email address within three weeks. I'll send a second email with additional information. Let me know if you have any questions. Thank you.

Regards,

Don J. Harrison, P.Geo.

Sr. Inspector of Mines–Permitting, SW Region

BC Ministry of Energy, Mines & Petroleum Resources

Mines & Mineral Resources Division

3rd Floor, 1810 Blanshard St,

Victoria, BC V8W 9M9

Direct Line: (778) 698-7014

Main office: (778) 698-3649

LEGEND

- SUBJECT PROPERTY LIMITS
- TREE LINE
- INTERMITTENT STREAM
- APPROXIMATE EXTENT OF 2008 EXCAVATION BOUNDARY
- APPROXIMATE UNEXCAVATED EXTENT OF LAGOON 2 & 3
- EXCAVATED LAGOON BOUNDARY
- SURFACE WATER SAMPLING LOCATION (GOLDER)
- FILL/OVERBURDEN
- SHALLOW BEDROCK (<20 m bgs)
- DEEP BEDROCK (>20 m bgs)
- BOREHOLE
- 0 5 10 20 30 50 60 70 METRES
- DECOMMISSIONED MONITORING WELL – FILL/OVERBURDEN
- DECOMMISSIONED MONITORING WELL – SHALLOW BEDROCK
- DECOMMISSIONED MONITORING WELL – DEEP BEDROCK
- DECOMMISSIONED VAPOUR MONITORING STATION
- TEST PIT
- SURFACE SOIL SAMPLING LOCATION
- SOIL VAPOUR WELL
- SURFACE WATER SAMPLING LOCATION
- WETLAND
- SECTION LINE'S

NOTES

1. ORIGINAL DRAWING IN COLOUR.
2. LOCATION OF EXISTING UTILITIES SHOWN ARE APPROXIMATE ONLY AND SHOULD BE CONFIRMED PRIOR TO INTRUSIVE WORK. NOT ALL UTILITIES MAY BE SHOWN.
3. DUE TO PREVIOUS CONSTRUCTION ACTIVITIES ON THE PROPERTY NORTH OF THE SITE MONITORING WELLS BH–2 AND BH–13 ARE NO LONGER ACCESSIBLE. BASED ON A VISUAL INSPECTION, MONITORING WELLS MW02–2 AND BH–13 HAVE BEEN IDENTIFIED AS BURIED AND/OR DESTROYED.

REFERENCE DRAWINGS

No.	DATE	DESCRIPTION
–	–	–

REVISIONS

REV.	DATE	DESCRIPTION	BY	CHK
4	2017–11–22	ISSUED AS DRAFT	PRT	CM
3	2016–10–14	ISSUED TO CLIENT	PRT	LS
2	2016–09–27	ISSUED TO CLIENT	PRT	LS
1	2016–08–19	ISSUED TO CLIENT	PES	AAZ
0	2016–05–20	ISSUED AS DRAFT	PRT	AAZ

SNC·LAVALIN

CLIENT NAME: CAPITAL REGIONAL DISTRICT

PROJECT LOCATION: 1965 MILLSTREAM ROAD VICTORIA, BC

TITLE: SITE □L□□

DWN BY: PB/PRT | SCALE: 1:750 | DATE: 2016–04–12 | DWG No: | REV.: □

CHK'D: AAZ | PLOT: 20180116,1349 | CADFILE: 636345R16 | □□□□□□□□□□

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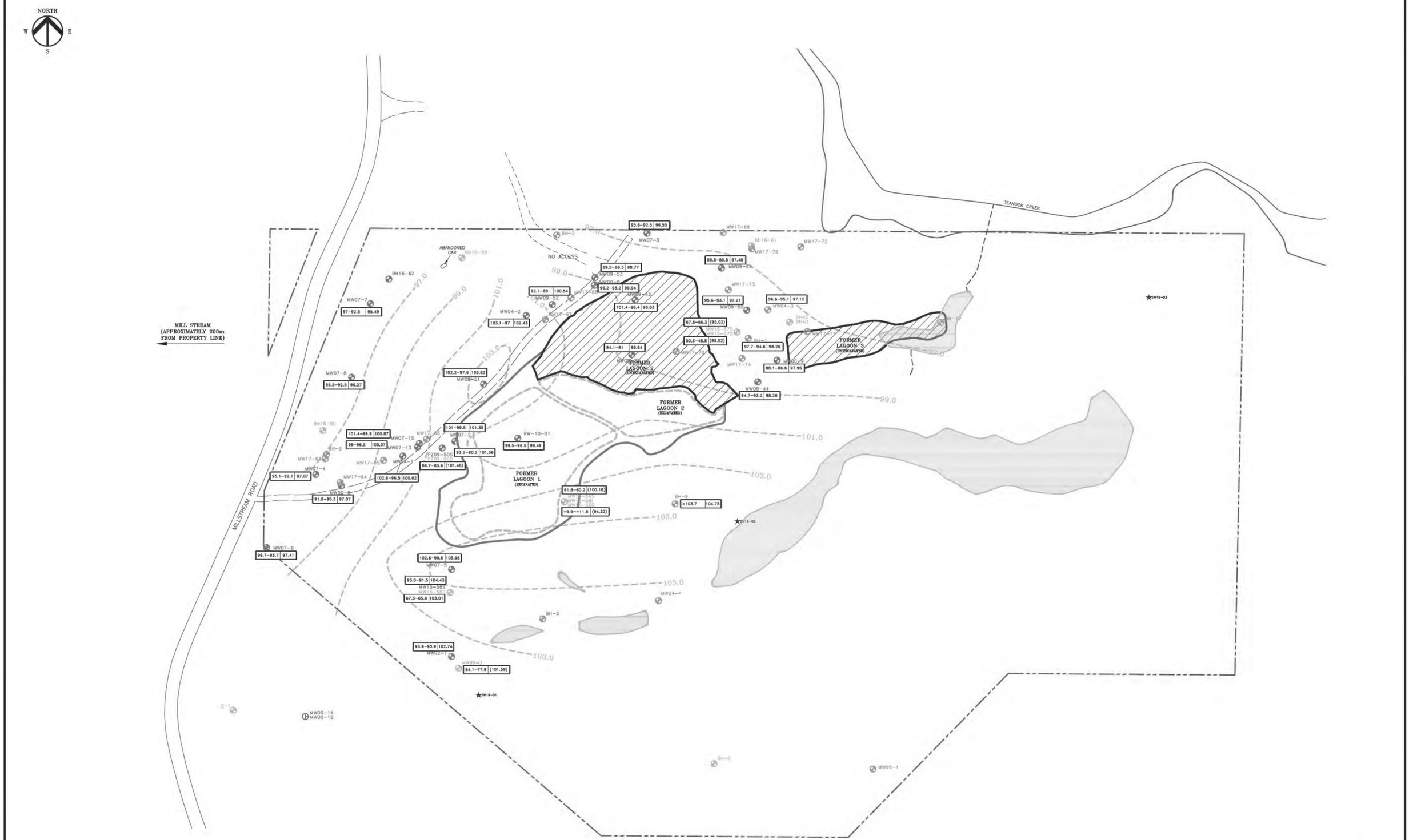

LEGEND

- SUBJECT PROPERTY LIMITS
- INTERMITTENT STREAM
- APPROXIMATE EXTENT OF 2008 EXCAVATION BOUNDARY
- DECEMBER 2015 POTENTIOMETRIC SURFACE
- APPROXIMATE UNEXCAVATED EXTENT OF LAGOON 2 & 3
- EXCAVATED LAGOON BOUNDARY

0 10 50 METRES

- FILL/OVERBURDEN
- SHALLOW BEDROCK (SCREENED ENTIRELY ABOVE 85masl)
- DEEP BEDROCK (BASE OF SCREEN IS BELOW 85masl)
- WETLAND

93.9–90.9 | 102.72
SCREEN (masl)
POTENTIOMETRIC ELEVATION (masl)

(101.59) NOT USED IN CONTOUR

NOTES

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REFERENCE DRAWINGS

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DWG. NO.	DATE	DESCRIPTION

REVISIONS

REV.	DATE	DESCRIPTION	BY	CHK
4	2017–11–22	ISSUED AS DRAFT	PRT	CM
3	2016–10–14	ISSUED TO CLIENT	PRT	LS
2	2016–09–27	ISSUED TO CLIENT	PRT	LS
1	2016–08–19	ISSUED TO CLIENT	PES	AAZ
0	2016–05–20	ISSUED AS DRAFT	PRT	AAZ

DRAFT

SNC·LAVALIN

CLIENT NAME: CAPITAL REGIONAL DISTRICT

PROJECT LOCATION: 1965 MILLSTREAM ROAD VICTORIA, BC

TITLE: DECEMBER 2015 GROUNDWATER ELEVATIONS AND INFERRED CONTOURS SHALLOW BEDROCK GROUNDWATER ELEVATIONS

DWN BY: PRT | SCALE: 1:1,250 | DATE: 2016–04–12 | DWG No: | REV.:

CHK'D: LS | PLOT: 20171122,11:39 | CADFILE: 636345R16

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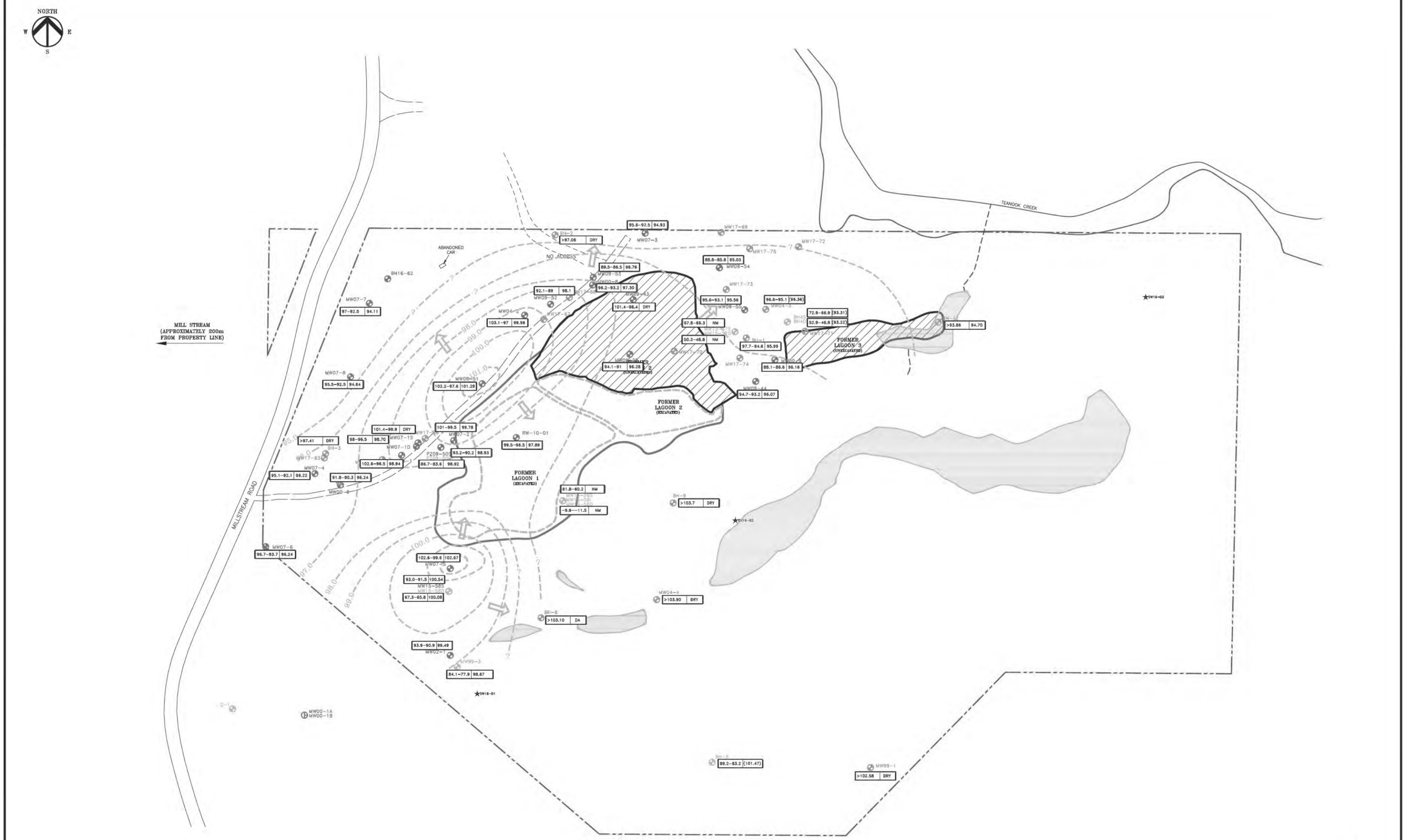

DRAFT

LEGEND

- SUBJECT PROPERTY LIMITS
- INTERMITTENT STREAM
- APPROXIMATE EXTENT OF 2008 EXCAVATION BOUNDARY
- SEPTEMBER 2016 POTENTIOMETRIC SURFACE
- APPROXIMATE UNEXCAVATED EXTENT OF LAGOON 2 & 3
- EXCAVATED LAGOON BOUNDARY

0 10 50 METRES

- FILL/OVERBURDEN
- SHALLOW BEDROCK (SCREENED ENTIRELY ABOVE 85masl)
- DEEP BEDROCK (BASE OF SCREEN IS BELOW 85masl)
- WETLAND

93.9-90.9 | 102.72
SCREEN (masl)
POTENTIOMETRIC ELEVATION (masl)

(101.59) NOT USED IN CONTOUR

NOTES

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REFERENCE DRAWINGS

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DWG. NO.	DATE	DESCRIPTION

REVISIONS

REV.	DATE	DESCRIPTION	BY	CHK
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0	2016-11-03	ISSUED TO CLIENT	PRT	LS

SNC·LAVALIN

CLIENT NAME: CAPITAL REGIONAL DISTRICT

PROJECT LOCATION: 1965 MILLSTREAM ROAD VICTORIA, BC

TITLE: SEPTEMBER 2016 POTENTIOMETRIC ELEVATIONS - SHALLOW BEDROCK

DWN BY: PRT | SCALE: 1:1,250 | DATE: 2016-11-03 | DWG No: | REV.: 1

CHK'D: LS | PLOT: 20171122.1305 | CADFILE: 636345R16

PATH: P:\CURRENT PROJECTS\CRD\636345 - MILLSTREAM MEADOWS\4.0 EXECUTION\4.5 GIS AND DRAWINGS\CAD\636345R16.DWG

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REFERENCE DRAWINGS

DWG. NO.	DATE	DESCRIPTION
–	–	–

REVISIONS

REV.	DATE	DESCRIPTION	BY	CHK
0	2017–11–22	ISSUED AS DRAFT	PRT	CM

DRAFT

SNC·LAVALIN

CLIENT NAME: CAPITAL REGIONAL DISTRICT

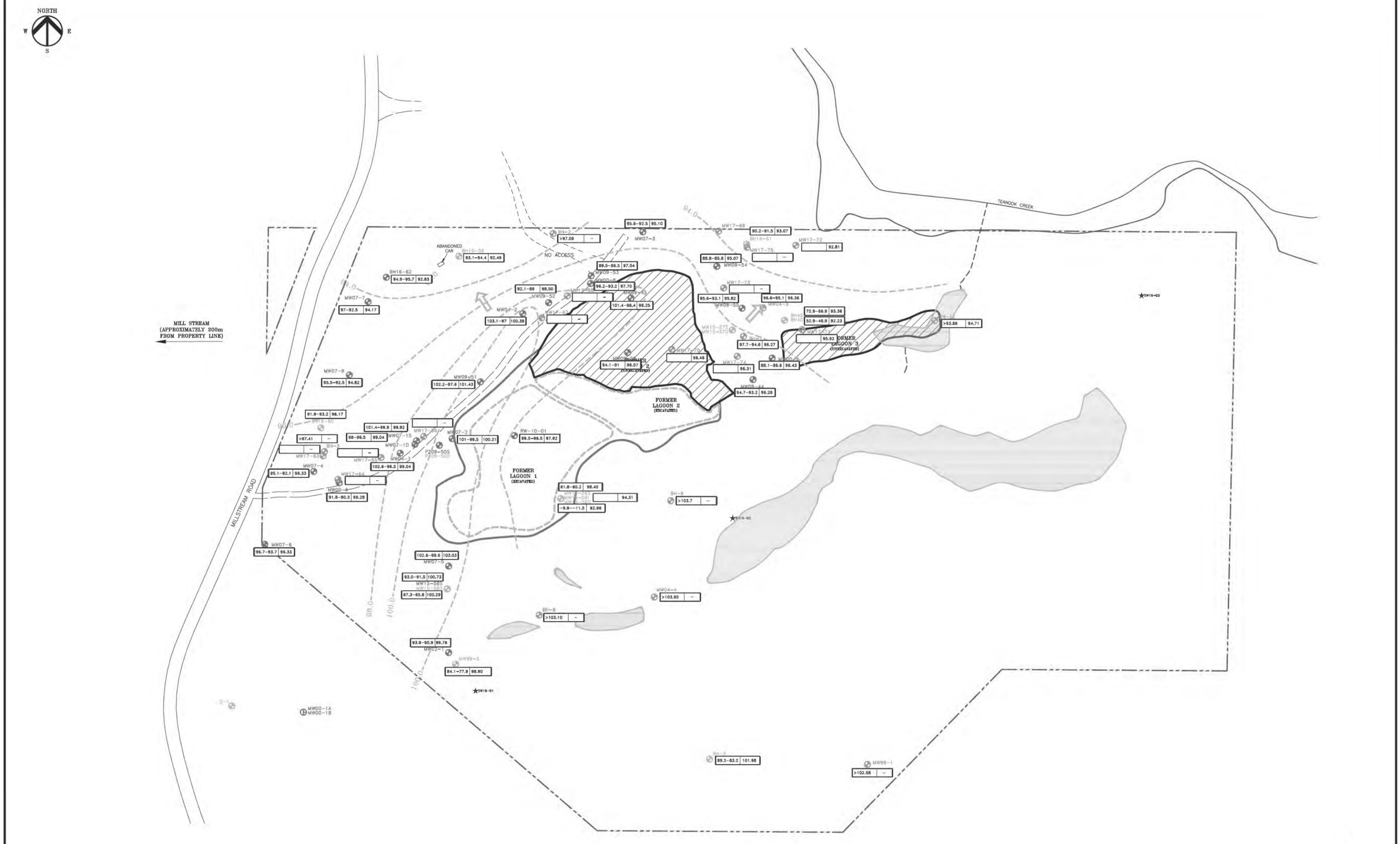
PROJECT LOCATION: 1965 MILLSTREAM ROAD VICTORIA, BC

TITLE: MARCH 2017 GROUNDWATER ELEVATIONS – SHALLOW BEDROCK

DWN BY: PRT | SCALE: 1:1,250 | DATE: 2017–11–07 | DWG No: | REV.: 0

CHK'D: AR | PLOT: 20171208,1714 | CADFILE: 636345R16 | B

PATH: P:\CURRENT PROJECTS\CRD\636345 – MILLSTREAM MEADOWS\4.0 EXECUTION\4.5 GIS AND DRAWINGS\CAD\636345R16.DWG



LEGEND

0 10 METRES 50

- SUBJECT PROPERTY LIMITS
- INTERMITTENT STREAM
- APPROXIMATE EXTENT OF 2008 EXCAVATION BOUNDARY
- SEPTEMBER 2016 POTENTIOMETRIC SURFACE
- APPROXIMATE UNEXCAVATED EXTENT OF LAGOON 2 & 3
- EXCAVATED LAGOON BOUNDARY
- FILL/OVERBURDEN
- SHALLOW BEDROCK (SCREENED ENTIRELY ABOVE 85masl)
- DEEP BEDROCK (BASE OF SCREEN IS BELOW 85masl)
- WETLAND

93.9–90.9 | 102.72
SCREEN (masl)
POTENTIOMETRIC ELEVATION (masl)

(101.59) NOT USED IN CONTOUR

NOTES

1. ORIGINAL DRAWING IN COLOUR.
2. LOCATION OF EXISTING UTILITIES SHOWN ARE APPROXIMATE ONLY AND SHOULD BE CONFIRMED PRIOR TO INTRUSIVE WORK. NOT ALL UTILITIES MAY BE SHOWN.
3. DUE TO PREVIOUS CONSTRUCTION ACTIVITIES ON THE PROPERTY NORTH OF THE SITE MONITORING WELLS BH–2 AND BH–13 ARE NO LONGER ACCESSIBLE. BASED ON A VISUAL INSPECTION, MONITORING WELLS MW02–2 AND BH–13 HAVE BEEN IDENTIFIED AS BURIED AND/OR DESTROYED.

REFERENCE DRAWINGS

DWG. NO.	DATE	DESCRIPTION
–	–	–

REVISIONS

REV.	DATE	DESCRIPTION	BY	CHK
0	2017–11–22	ISSUED AS DRAFT	PRT	CM

DRAFT

SNC·LAVALIN

CLIENT NAME: CAPITAL REGIONAL DISTRICT

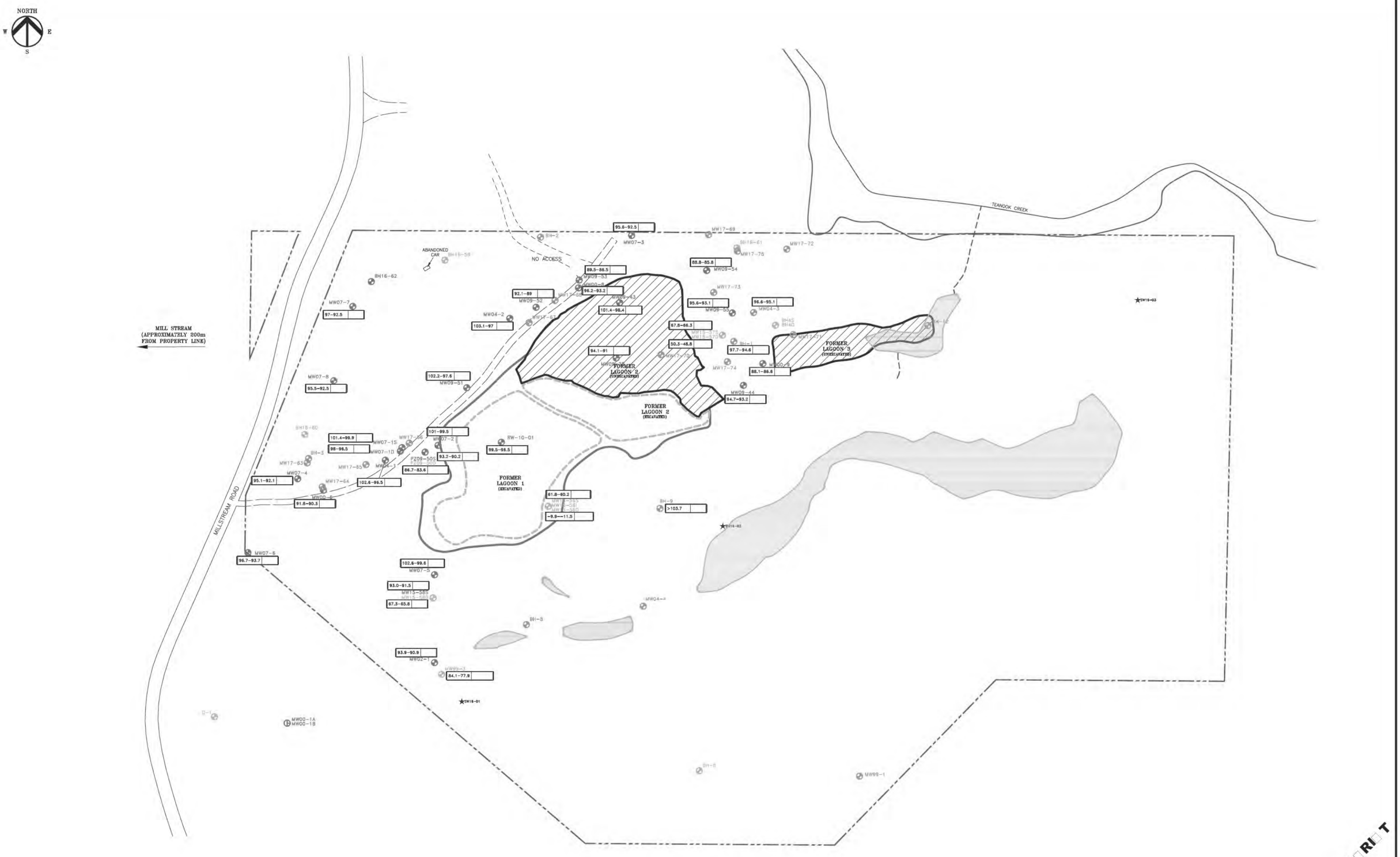
PROJECT LOCATION: 1965 MILLSTREAM ROAD VICTORIA, BC

TITLE: SEPTEMBER 2016 POTENTIOMETRIC ELEVATIONS SHALLOW BEDROCK

DWN BY: PRT | SCALE: 1:1,250 | DATE: 2017–11–07 | DWG No: | REV.: C

CHK'D: AR | PLOT: 20171208,1713 | CADFILE: 636345R16

PATH: P:\CURRENT PROJECTS\CRD\636345 – MILLSTREAM MEADOWS\4.0 EXECUTION\4.5 GIS AND DRAWINGS\CAD\636345R16.DWG



LEGEND

- SUBJECT PROPERTY LIMITS
- INTERMITTENT STREAM
- APPROXIMATE EXTENT OF 2008 EXCAVATION BOUNDARY
- DECEMBER 2015 POTENTIOMETRIC SURFACE
- APPROXIMATE UNEXCAVATED EXTENT OF LAGOON 2 & 3
- EXCAVATED LAGOON BOUNDARY

0 10 METRES 50

- FILL/OVERBURDEN
- SHALLOW BEDROCK (SCREENED ENTIRELY ABOVE 85masl)
- DEEP BEDROCK (BASE OF SCREEN IS BELOW 85masl)
- WETLAND

93.9–90.9 | 102.72
SCREEN (masl)
POTENTIOMETRIC ELEVATION (masl)

(101.59) NOT USED IN CONTOUR

NOTES

1. ORIGINAL DRAWING IN COLOUR.
2. LOCATION OF EXISTING UTILITIES SHOWN ARE APPROXIMATE ONLY AND SHOULD BE CONFIRMED PRIOR TO INTRUSIVE WORK. NOT ALL UTILITIES MAY BE SHOWN.
3. DUE TO PREVIOUS CONSTRUCTION ACTIVITIES ON THE PROPERTY NORTH OF THE SITE MONITORING WELLS BH–2 AND BH–13 ARE NO LONGER ACCESSIBLE. BASED ON A VISUAL INSPECTION, MONITORING WELLS MW02–2 AND BH–13 HAVE BEEN IDENTIFIED AS BURIED AND/OR DESTROYED.

REFERENCE DRAWINGS

DWG. NO.	DATE	DESCRIPTION
–	–	–

REVISIONS

REV.	DATE	DESCRIPTION	BY	CHK
0				

SNC·LAVALIN

CLIENT NAME: CAPITAL REGIONAL DISTRICT

PROJECT LOCATION: 1965 MILLSTREAM ROAD VICTORIA, BC

TITLE: □□□□ □d□t□□OTE□TIOMETRIC ELE□□TIO□S□□D I□□ERRED CO□TO□RS□ S□□LLOW BEDROCK□□D□ILL

DWN BY: PRT | SCALE: 1:1,250 | DATE: 2017–08–16 | DWG No: | REV.: □

CHK'D: CH | PLOT: 20171122,1310 | CADFILE: 636345R16

C□ECK□RI□T

PATH: P:\CURRENT PROJECTS\CRD\636345 – MILLSTREAM MEADOWS\4.0 EXECUTION\4.5 GIS AND DRAWINGS\CAD\636345R16.DWG

From:	Harrison, Donald EMPR:EX
To:	Barry Chalmers (bchalmers@islandpaving.com)
Cc:	Caughill, David EMPR:EX; Southwest Regional Mines Division EMPR:EX
Subject:	FW: 1 Comment on Proposed Quarry, S of Millstream Meadows site, District of Highlands (CRD).
Date:	Monday, January 22, 2018 3:02:19 PM
Attachments:	636345-002.pdf 636345-015C.PDF

Hello Barry,

I've heard from CRD. Please see the information in the email below and the attachments. Appears the current Right of Way crosses known contaminated sites on CRD ground so it would not be a favourable option if you plan to excavate along it. Please show your alternate access route with general construction and drainage plan. Note that the proposed depth of excavation on your site is lower than the depth of the CRD contaminated site, meaning quarrying may induce contaminated groundwater flow towards your site. I recommend forwarding this information to your groundwater consultant and to work in collaboration with the CRD

Thanks Barry,

Don

From: Korene Torney [mailto:ktorney@crd.bc.ca]
Sent: Monday, January 22, 2018 2:36 PM
To: Harrison, Donald EMPR:EX
Cc: Caughill, David EMPR:EX; Southwest Regional Mines Division EMPR:EX; Runnells, Joanna FLNR:EX
Subject: RE: 1 Comment on Proposed Quarry, S of Millstream Meadows site, District of Highlands (CRD).

Mr. Harrison,

It was great to touch bases with you again. As discussed, the CRD is aware of the OK Industries application. We have followed their engagement with the District of Highlands and are aware of the access right of way which crosses our property. We have discussed the access, including potential for alternate access, and expect that a mutually beneficial access arrangement will be agreed upon. That said no final decision regarding access has been made to date.

As mentioned, the CRD Millstream Meadows property (Lot A Plan 40349 directly adjacent to the OK property) is a contaminated site registered on the BC SITE registry. Please find linked/attached some background information regarding the CRD Millstream Meadows site. Here is a link to our project description https://www.crd.bc.ca/project/capital-projects/millstream-meadows-remediation. Here, too, is a link to a recent CRD staff report with an update on 2017 contaminant investigations https://crd.ca.legistar.com/LegislationDetail.aspx?ID=10135&GUID=8C2B0E3E-A9E9-4FC9-9F22-07A73C934E5D .

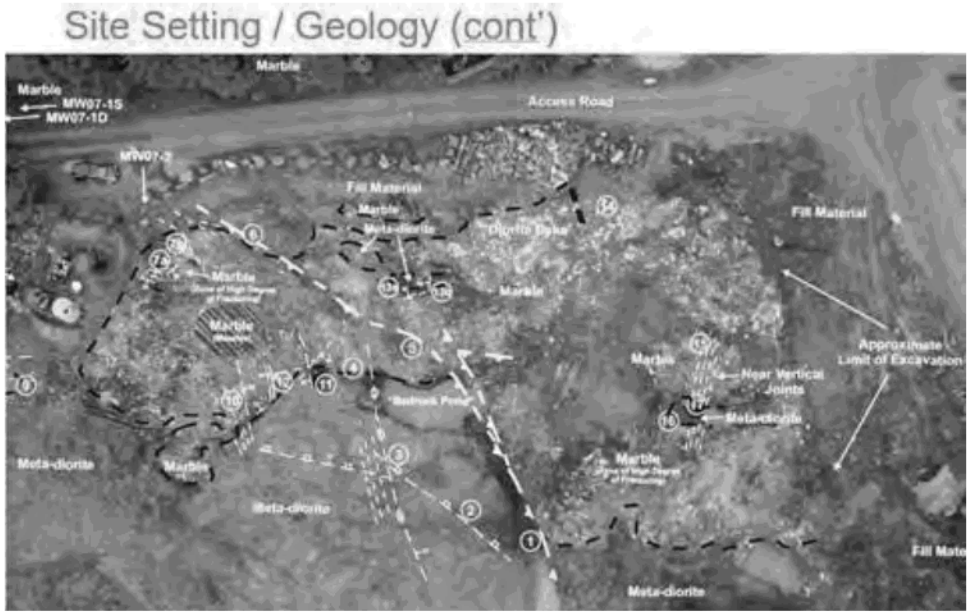
Please see attached the following site drawings that will help to illustrate site conditions:

- 636345-002 – Site Plan (shows site boundaries and monitoring network, the drawing+legend delineate the lagoon extents for all 3 lagoons (excavated and unexcavated portions)

- 636345-015C – shows potentiometric elevations as of Sept 2017. Note this is for fill and shallow bedrock.

You had asked a few other questions regarding excavation depth and potentiometric surface, here are some comments:

- The 2008 remedial excavation extending mostly to approx. 6 m (~103 m elevation) depth but the maximum depth was ~ 12 m (~96 m elevation) at its deepest point. The bedrock surface is very hummocky. Here are a few photos to illustrate bedrock/excavation conditions:



Photograph 7: Lagoon 1(near) and Lagoon 2 (far), looking east (November 14, 2008)

- The potentiometric surface varies significantly at the site, however shallow water table elevations in Sept 2017 ranged from 94 m to 103 m metres above sea level. See attached dwg 636345-015C. The potentiometric elevations measured in deep monitoring wells don't vary significantly from that.

I have a copy of the blasting plan now and will review and get back with you as soon as possible.

I look forward to discussing the project further and am happy to answer any questions you might have.

Thanks,

Korene Torney, P.Geo., PMP
CRD Geo-Environmental Programs
Phone 250.360.3148 **Email** ktorney@crd.bc.ca

From: Harrison, Donald EMPR:EX [mailto:Donald.Harrison@gov.bc.ca]
Sent: Tuesday, December 05, 2017 3:30 PM
To: Korene Torney <ktorney@crd.bc.ca>
Cc: Caughill, David EMPR:EX <David.Caughill@gov.bc.ca>; Southwest Regional Mines Division EMPR:EX <SouthwestMinesDivision@gov.bc.ca>
Subject: 1 Comment on Proposed Quarry, S of Millstream Meadows site, District of Highlands (CRD).
Importance: High

Hello Korene,

Your email was provided to me by Peggy Evans of the CRD. The Ministry of Energy, Mines & Petroleum Resources (MEMPR) would like to inform you of an application for a proposed rock quarry to the south of the CRD's Millstream Meadows reclaimed landfill site in District of Highlands. I am attaching a copy of the quarry application and related maps. The proposal is basically to level off most of the site to the 95 m elevation to recover aggregate. MEMPR would like you to comment on concerns the CRD may have about this proposed quarry operation, and any potential impacts it may have on the Millstream Meadows site related to hydrology/hydrogeology, landfill stability and integrity, monitoring, and anything else that you may consider as a risk to the CRD's landfill facility. I'd appreciate it if you could respond to this email address within three weeks. I'll send a second email with additional information. Let me know if you have any questions. Thank you.

Regards,

Don J. Harrison, P.Geo.
Sr. Inspector of Mines–Permitting, SW Region

BC Ministry of Energy, Mines & Petroleum Resources
Mines & Mineral Resources Division
3rd Floor, 1810 Blanshard St,
Victoria, BC V8W 9M9
Direct Line: (778) 698-7014
Main office: (778) 698-3649

From:	Bracher, Grant FLNR:EX
To:	Harrison, Donald EMPR:EX
Subject:	RE: Notice of Work 1610713 (quarry Millstream Rd)
Date:	Wednesday, November 29, 2017 12:21:27 PM
Attachments:	image001.png

Hello Don,

A Riparian Area assessment is **not** required.

Cheers,

Grant Bracher, Ph.D., P.Ag., R.P.Bio.
Ecosystem Biologist
Ministry of Forests, Lands and Natural Resource Operations
and Rural Development
2080 Labieux Road
Nanaimo BC V9T 6J9
Tel. 250 751-3221
Fax. 250 751-3103
Grant.Bracher@gov.bc.ca

From: Harrison, Donald EMPR:EX
Sent: Wednesday, November 29, 2017 12:08 PM
To: Bracher, Grant FLNR:EX
Subject: Notice of Work 1610713 (quarry Millstream Rd)

Hi Grant,

Thank you for your response to the referral of the proposed quarry in District of Highlands off Millstream road. You wrote "The wetland complex in the center of the property should be left intact with a minimum 30 m vegetated buffer surrounding it and the site hydrology remain as is so that the wetland is not adversely impacted."

Is the proponent required to conduct a Riparian Area assessment by a Qualified Environmental Professional (QEP) when the wetland is not reported to contain fish and is not connected on surface to a natural watercourse?

Thank you.

Don

Don J. Harrison, P.Geo.
Sr. Inspector of Mines–Permitting, SW Region
BC Ministry of Energy, Mines & Petroleum Resources
Mines & Mineral Resources Division
3rd Floor, 1810 Blanshard St,
Victoria, BC V8W 9M9
Direct Line: (778) 698-7014
Main office: (778) 698-3649

From:	Harrison, Donald EMPR:EX
To:	"Barry Chalmers"
Cc:	Southwest Regional Mines Division EMPR:EX; Caughill, David EMPR:EX
Subject:	RE: 1610713-Proposed Millstream Road Quarry information
Date:	Wednesday, January 3, 2018 4:39:00 PM
Attachments:	1610713-20171219_Tervita Highwest-Letter of Concern-2017DEC19.pdf

Hello Barry,

I was in touch with Peter Nelson (pnelson@tervita.com , Tervita Corporation Environmental and Regulatory Advisor: office 403-234-4875, 1600-140 10th Avenue S.E., Calgary). He sent the attached letter and said he could discuss Tervita's concerns with O.K. Industries at any time if you require clarification regarding their letter. He raised 3 points in his letter.

The first two points relate to surface water quality in Teanook Creek, which Tervita is monitoring and working to protect. While these are good points, they are ultimately the government's responsibility with respect to impacts from the quarry. I believe the riparian buffer along the creek, as proposed by OK is sufficient, and I believe the surface water concerns are captured in my earlier request for measures to control surface run-off and erosion and sediment control (quality and quantity). With respect to water quality, the Ministry would require regular water monitoring prior to discharge from site for total suspended solids (TSS to be less than 25 mg/L) and possibly in-stream nitrate (NO_3) monitoring. Tervita's third point is regarding impacts to their facility and liner, which are partially addressed in International Blasting's plan, and it is this that directly affects Tervita. I'm seeking information on the cumulative impacts on the liner from blasting over the life of mine.

Hope that helps. I still have not heard from the CRD re technical concerns at Millstream Meadows. I'll check in with them and get back to you.

All the best in the New Year Barry,

Regards,

Don

Don J. Harrison, P.Geo.

Sr. Inspector of Mines–Permitting, SW Region

BC Ministry of Energy, Mines & Petroleum Resources

Mines & Mineral Resources Division

3rd Floor, 1810 Blanshard St,

Victoria, BC V8W 9M9

Direct Line: (778) 698-7014

Main office: (778) 698-3649

From: Barry Chalmers [mailto:bchalmers@islandpaving.com]
Sent: Wednesday, January 3, 2018 2:33 PM
To: Harrison, Donald EMPR:EX; Mela Sangha
Cc: Southwest Regional Mines Division EMPR:EX; Caughill, David EMPR:EX
Subject: RE: 1610713-Proposed Millstream Road Quarry information

Happy New Year to all.

Don

We have started the process to work through your attached list of requests for the Millstream Quarry NOW.

Please ensure that our NOW remains active as we feel some of the items may take some time, we will forward information to you as we have it available.

Could you please forward to me the contact person you have for Tervita as we seem to have been

given incorrect information from the on-site employee.

We will clarify and correct as required.

Regards

M. Barry Chalmers
O.K. INDUSTRIES LTD.
ISLAND CRUSHING CO.
ALL FUN AGGREGATE CO.
e-mail:bchalmers@islandpaving.com
Phone: 250-652-9211
Fax: 250-652-9270
Cell: 250-897-2296

From: Harrison, Donald EMPR:EX [mailto:Donald.Harrison@gov.bc.ca]
Sent: Wednesday, December 27, 2017 10:24 AM
To: Mela Sangha; Barry Chalmers
Cc: Southwest Regional Mines Division EMPR:EX; Caughill, David EMPR:EX
Subject: RE: 1610713-Proposed Millstream Road Quarry information

Hell Mel, Barry,

My apologies; they should be attached.

Regards,

Don

From: Mela Sangha [mailto:msangha@islandpaving.com]
Sent: Friday, December 22, 2017 12:12 PM
To: Harrison, Donald EMPR:EX; Barry Chalmers
Cc: Southwest Regional Mines Division EMPR:EX; Caughill, David EMPR:EX
Subject: RE: 1610713-Proposed Millstream Road Quarry information

Hi Don

we did not get the attachment. Could you resend it please. Regards, Mel

Mel Sangha
email:msangha@islandpaving.com
O.K. Industries Ltd. www.islandpaving.com
6702 Rajpur Place at Keating X Road
PO Box 1324, Victoria, BC V9W 2W3
tel: 250-652-9211; fax: 250-652-9210
mobile: 250-889-1105

From: Harrison, Donald EMPR:EX [mailto:Donald.Harrison@gov.bc.ca]
Sent: Friday, December 22, 2017 10:39 AM
To: Barry Chalmers; Mela Sangha
Cc: Southwest Regional Mines Division EMPR:EX; Caughill, David EMPR:EX
Subject: 1610713-Proposed Millstream Road Quarry information

Hello Barry, Mel,

Please find attached additional information requirements for the proposed quarry on Millstream Road. I have received feedback from Tervita who is seeking more detail on the potential impacts to their facility. I have not heard back from the CRD but I understand Glen Harris was looking into it. While it may appear this application requires more information than expected, it is because of the unique setting and land uses within which the quarry is proposed. The Ministry needs assurance that if a quarry is to proceed, it can do so in a manner which protects the surrounding land users and minimizes adverse impacts to the environmental. I will be in the office next week if you want to discuss.

Regards,

Don J. Harrison, P.Geo.

Sr. Inspector of Mines–Permitting, SW Region
BC Ministry of Energy, Mines & Petroleum Resources
Mines & Mineral Resources Division
3rd Floor, 1810 Blanshard St,
Victoria, BC V8W 9M9
Direct Line: (778) 698-7014
Main office: (778) 698-3649

Dec 19th, 2017

BC Ministry of Energy, Mines & Petroleum Resources

Mines & Mineral Resources Division
3rd Floor, 1810 Blanshard Street
Victoria, BC, V8W 9M9

Attention: Don Harrison

Tervita Corporation - Highwest Landfill Operational Certificate 100193 Letter of Concern Regarding O.K. Industries Proposed Quarry

Dear Don Harrison,

As a leader in environmental and energy services, Tervita Corporation (Tervita) has a strong track record of safety and environmental compliance. We have built our track record on the safe, secure management of industrial and oil and gas wastes through our network of Treatment and Recovery facilities and industrial landfills.

Tervita is providing a letter of concern to the BC Ministry of Energy, Mines and Petroleum Resources (MEMPR) regarding the proposed blasting and development of a quarry just south of our current active landfill. Tervita has reviewed the material provided by O.K. Industries regarding the proposed quarry and have noted the following concerns:

1) Tervita currently carries out an active surface water monitoring program (Figure 1) as part of our environmental monitoring program. The proposed access along Tervita's property boundary and the quarry development may affect surface water quality.

   Tervita asks that O.K Industries provides more detail how surface water quality will be maintained and monitored throughout all stages of the project including development of the proposed access road.

2) Section 6.0 of the Millstream Quarry Blast Plan (the Plan), November 27, 2017 makes note that run-off water will be directed to a sump settling pond.

   Tervita asks O.K Industries to clarify where collected water will be discharged as not to affect surrounding surface water quality and what parameters the collected water will be tested for prior to release.

3) Tervita reviewed Section 7.0 and 7.1 of the Plan, and information provided about our Highwest Facility is incorrect. Tervita is unsure where our Facility knowledge was obtained.

   The Plan states "a liner has been finalized to cap the last completed cell. There are no new cells to be developed. All existing cells have been capped with liners and covered with materials."

   Tervita still maintains 2 active cells at Highwest which have no current cap. The other cells are currently in various stages of capping but no final cap is completed at site. Tervita still has the ability to construct future cells at site.

Tervita Corporation
500, 140 - 10 Avenue SE
Calgary, AB, Canada T2G 0R1

Tel: 1.403.233.7565
Fax: 1.403.261.5612

Section 7.1 of the Plan also states "... the predicted blast vibration intensity at the closest cell would be 8.8 mm/sec. This is well below the level of any concern for the liners, so there should be no impact on this operation..."

Tervita asks for O.K Industries to:

- Revise Section 7.1 of the Plan with the correct information regarding our facility.
- Provide the technical report supporting that a blast vibration of 8.8 mm/sec won't affect the landfill liner system.
- Provide rational in a technical report how a blast vibration of 8 mm/sec won't affect the waste stability in our landfill.

Prior to construction and development at the quarry by O.K. Industries, Tervita expects our concerns noted above to be answered. Tervita is able to share technical details regarding our design and monitoring programs so O.K Industries is able to properly assess potential affects.

Should you require further information, please feel free to contact me directly at (403) 234-4875.

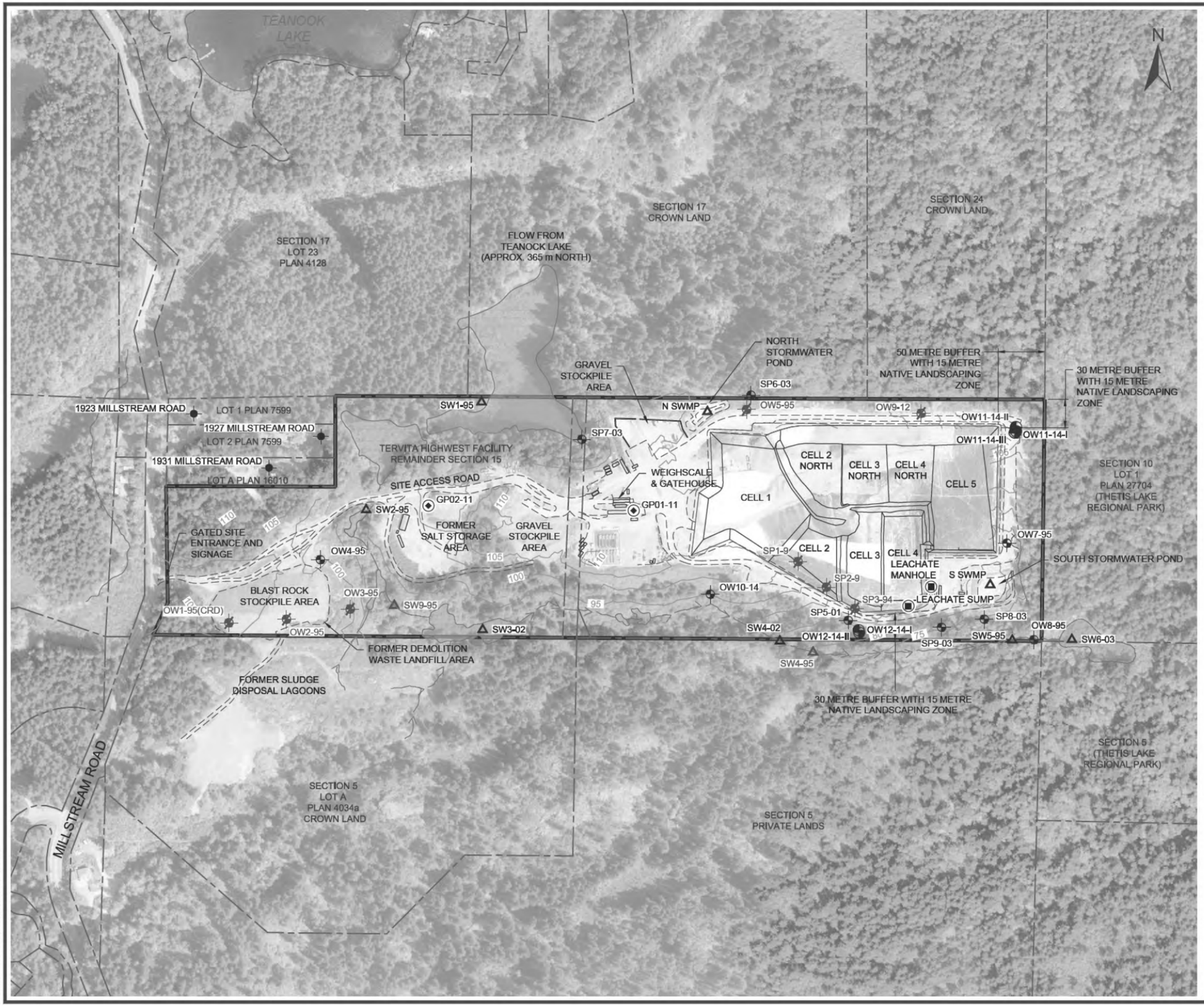
Sincerely,

Tervita Corporation

Peter Nelson
Advisor, Environment and Regulatory

cc: Shad Watts, Director, HSE, Tervita Corporation
Al Leuschen, Environmental Protection Officer, Ministry of Environment

Figure 1
Environmental Monitoring Program Sampling Points



NOTES:
REFERENCED FROM TERVITA DRAWING: *HIGHWEST LANDFILL FACILITY SITE PLAN* (DECEMBER, 2012), SITE RECONNAISSANCE.
IMAGERY: © 2017 CAPITAL REGIONAL DISTRICT (MAGE DATE: 2015).

LEGEND:

- PROPERTY BOUNDARY
- SITE LOCATION
- WATERCOURSE / FLOW DIRECTION
- SWAMP
- BOREHOLE COMPLETED AS A MONITOR NG WELL (SLR)
- BOREHOLE COMPLETED AS A MONITOR NG WELL (OTHER)
- BOREHOLE COMPLETED AS A MONITOR NG WELL (OTHER) (DECOMMISSIONED)
- SURFACE WATER SAMPLE (OTHER)
- SURFACE WATER SAMPLE (OTHER) (HISTORICAL)
- RESIDENTIAL WELL SAMPLE (OTHER)
- LEACHATE MONITORING LOCATION (OTHER)
- GAS PROBE (OTHER)

0 25 50 100 150 200 250 m

SCALE 1:4,000
WHEN PLOTTED CORRECTLY ON A 11 x 17 PAGE LAYOUT
NAD 1983 UTM Zone 10 U

THIS DRAWING IS FOR CONCEPTUAL PURPOSES ONLY. ACTUAL LOCATIONS MAY VARY AND NOT ALL STRUCTURES ARE SHOWN.

TERVITA CORPORATION
TERVITA HIGHWEST FACILITY
1943 MILLSTREAM ROAD
DISTRICT OF HIGHLANDS, BC

2016 ANNUAL MONITORING REPORT

SITE AND SURROUNDING LAND USE PLAN

Date: March 29, 2017
Project No. 201.88650.00000
Drawing No. 2

SLR global environmental solutions

Cadfile name: S_201-88650-00000-A5.dwg

From:	Bouffard, Maryann J MEM:EX
To:	"Referrals Coordinator"
Cc:	Bunce, Anna FLNR:EX
Subject:	RE: Consultation request for a Notice of Work for Construction Aggregate on Private Land near Tervita Landfill - File 1610713
Date:	Friday, August 11, 2017 3:37:00 PM
Attachments:	1610713201701_SNC Lavalin Millstream Report.pdf 1610713_Ecological Site Investigation_June 10 2015.pdf image002.wmz image003.png

Hello Heather,

Anna Bunce informed me that you would like a copy of the environment reports. Please find 2 reports attached.

If you have further technical questions, let me know and I'll have the inspector get in touch to assist.

Cheers,

MARYANN J. BOUFFARD

OPERATIONS COORDINATOR

SW REGION MINING OFFICE

TEL: **778-698-3648**

MINISTRY OF ENERGY, MINES AND PETROLEUM RESOURCES

www.gov.bc.ca/ener

From: Bouffard, Maryann J MEM:EX **On Behalf Of** Southwest Regional Mines Division MEM:EX
Sent: Friday, July 14, 2017 3:23 PM
To: 'Referrals Coordinator'
Cc: Bunce, Anna FLNR:EX
Subject: RE: Consultation request for a Notice of Work for Construction Aggregate on Private Land near Tervita Landfill - File 1610713

Hello Heather,

Thank you for informing our office of your anticipated response date.

Please do not hesitate to contact me for further inquiries.

Sincerely,

MARYANN J. BOUFFARD

OPERATIONS COORDINATOR

SW REGION MINING OFFICE

TEL: **778-698-3648**

MINISTRY OF ENERGY AND MINES

www.gov.bc.ca/ener

From: Referrals Coordinator [mailto:referrals@malahatnation.com]
Sent: Friday, July 14, 2017 3:13 PM
To: Southwest Regional Mines Division MEM:EX
Subject: RE: Consultation request for a Notice of Work for Construction Aggregate on Private Land near Tervita Landfill - File 1610713

Attn: Maryann Bouffard,

Thank you for the above application (File 1610713) received June 5th, located within Malahat First Nations Traditional Territory. We are currently reviewing your application and expect to provide a response on or before July 31st.

Please note that not receiving a response to a referral from Malahat First Nation in the pre-application, current or post-application stage does not imply our support for your project.

Sincerely,

Heather Adams

Fisheries and Referrals Coordinator, Malahat Nation
110 Thunder Road, Mill Bay, BC, V0R 2P4
Ph: 250.743.3231 | Cell: 778.230.1778
referrals@malahatnation.com | www.malahatnation.ca

From: West Coast Land Referrals FLNR:EX [mailto:WestCoast.LandReferrals@gov.bc.ca]
Sent: June 5, 2017 9:23 AM
To: Referrals Coordinator
Cc: Southwest Regional Mines Division MEM:EX
Subject: Consultation request for a Notice of Work for Construction Aggregate on Private Land near Tervita Landfill - File 1610713

On behalf of the Ministry of Energy and Mines, please see the attached consultation request for a Notice of Work for a *Mines Act* permit, File 1610713.

Should you have any questions regarding this application, please contact Maryann Bouffard, Operation Coordinator, 778-698-3648 or by email:

SouthwestMinesDivision@gov.bc.ca

Regards,

FrontCounter BC | **Ministry of Forests, Lands and Natural Resource Operations**
2080 Labieux Road
Nanaimo, BC V9T 6J9
Tel: 250-751-7220 | Fax: 250-751-7224

FrontCounter BC Website | Toll-Free Contact Centre: 1-877-855-3222
Tell us about your experience with FrontCounter BC: Complete an Online Comment Card

Preliminary Incidental Site Investigation

LOT 1 SECTION 5 RANGE 3 WEST HIGHLAND DISTRICT
PLAN VIP70242

Prepared for: O.K. Industries Ltd.
Prepared by: Sarah Karkanis, M.Sc.
Wm. Patrick Lucey, M.Sc., R.P. Bio., CBiol, MSB
Tracy Motyer, B.Sc., R.B. Tech.

June 10, 2015

Aqua-Tex
Scientific Consulting Ltd. (1993)

Background

Ok Industries recently purchased a parcel of land within the District of Highlands from the B.C. Provincial Government with the intent of undertaking phased aggregate mining and the potential future development of an Industrial Park. The District of Highlands Official Community Plan indicates that the subject property lies within Development Permit Areas for Water & Riparian Areas and Sensitive Vegetation and is zoned Greenbelt-B2 (GB2) (District of the Highlands, 2013). While this property is zoned GB2, the land use designation within the OCP is commercial/industrial.

This parcel of land – Lot 1 Section 5 Range 3 West Highland District Plan VIP70242 (PID: 024-710-270) – is 26.3 hectares and is located in the District of the Highlands on Millstream Road. The property is bordered by the Tervita Highwest Engineered Landfill Disposal Facility (hazardous wastes) to the north and the Millstream Industrial Park to the south. This parcel also abuts a Capital Regional District septage site on its northwest boundary while the eastern property boundary borders Thetis Lake Regional Park (**Figure 1**). The western portion of the property abuts a private residential property, lying adjacent to Millstream Road.

Given the presence of historical septage facilities and the existence of the landfill to the north and heavy industrial activity to the south, a report prepared by Stevens Management in 2000 states that *"the potential for contamination at this site is relatively high"* (Stevens Management, 2000); however, this property received a Certificate of Compliance in 2010 deeming the property meets "Contaminated Sites Regulation standards for urban park land soil use and aquatic life and drinking water use and, Contaminated Sites Regulation criteria for freshwater typical sediment use" (B.C. Ministry of Environment, 2010).

Aqua-Tex Scientific Consulting Ltd. was retained to provide a preliminary site assessment and review of the existing ecological site features and their implications for development, in particular with respect to freshwater regulatory requirements (e.g. RAR). This ecological review is intended to provide a baseline for development planning.

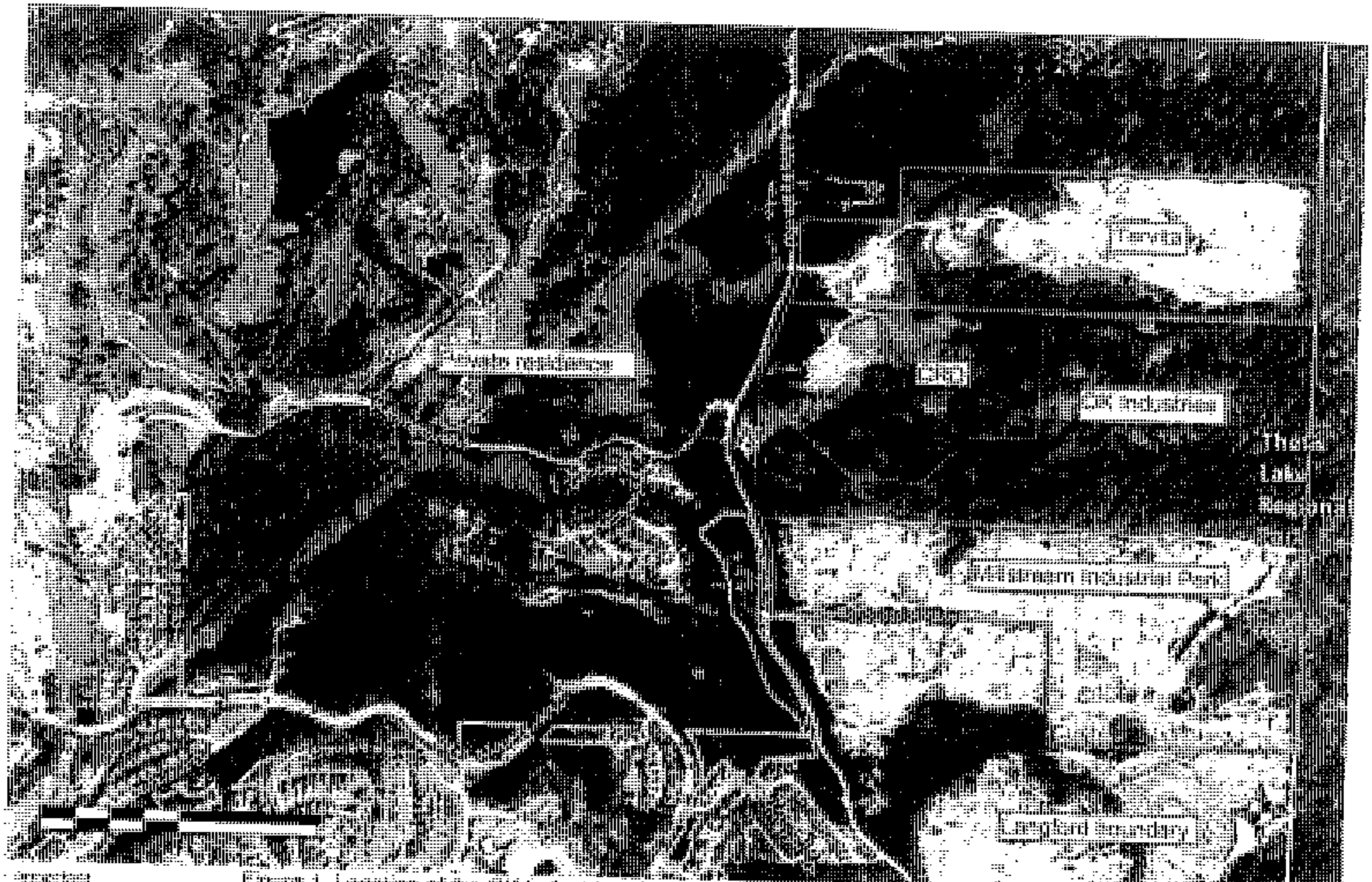


Figure 1. Location of the OK Industries site off Millstream Road. It is sandwiched between the Tervita Highwest facility to the north, the old CRD landfill/septage site to the northwest, the Millstream Industrial Park to the south, Thetis Lake Regional Park to the east, and a private residence and Millstream Road to the west

Methods

Both a desktop review of available background information and online mapping interfaces and a field site assessment were undertaken by Aqua-Tex as part of the preliminary ecological site investigation.

Desktop Review

Previous site studies provided by O.K. Industries were reviewed along with exiting mapping databases such as Data BC viewed through Google Earth, CRD Regional Community Atlas, and the Conservation Data Centre iMap to identify ecological features that may be present on the subject property. A summary of this review is provided in the Findings section.

Field Site Assessment

Given the size of the site (26.3 hectares), the assessment was conducted by walking transects using a grid-based model to ensure all major landscape features were visually observed and documented (e.g., riparian-wetland corridors, streams, isolated wetlands, rocky knolls, forest stand structures, roads, *et cetera*); subsequent site assessments were conducted to review off-site linkages with adjacent properties, including surface channel connections with Millstream Creek, and potential stormwater management buried pipe connections. The focus of the field assessment, conducted on April 28th, 2015, was to ground-truth the presence of ecological features identified in the desktop review stage. The assessment team started with a west-to-east transect on the northern property line, then a north-to-south transect through the eastern portion of the property, then a series of shorter south-to-north and north-to-south transects from the southern property line. A Garmin hand-held GPS unit was used to track the path of assessment and identify reference points (waypoints). Photographs were taken with a digital camera to document landscape characteristics and ecological features. Finally, off-site surveys were conducted to determine whether the larger wetland on the property is connected by surface drainage to Millstream Creek. An examination of the desktop mapping revealed no connection beyond the manmade pond on the adjacent property to the south (on the Industrial landscape)(**Figure 7**).

Findings

Desktop Mapping

The CRD Regional Community Atlas was reviewed for sensitive ecosystem polygons identified through the BC Ministry of Environment's (MOE) sensitive ecosystem inventory (SEI). This search resulted in the identification of four (4) SEI polygons (**Figure 2**): two woodland polygons, one wetland polygon, and one older second growth forest polygon. The following definitions of these SEI's are provided below:

Woodlands
Woodlands are open forested areas comprised of pure stands of Garry oak and mixed stands of Douglas-fir/Garry oak and Douglas-fir/arbutus. Remnant stands of trembling aspen are also found in wetter sites. Their understorey is characterized by a rich mosaic of wildflowers, grasses, shrubs and mosses.

Woodlands are found on south facing slopes of rocky knoll and bedrock dominated areas. The disturbance or soil conditions of such areas restrict the establishment of closed conifer forest and promote Garry oak regeneration. Woodlands also occur in combination with other ecosystems such as older Douglas-fir forest (OF), Older Second Growth Forest (SG) and Terrestrial Herbaceous (HT). (MOE, n.d. c)

Wetland
Wetland ecosystems are characterized by seasonal or year-round water, either at or above the soil surface or within the root zone of plants. They are found in areas of flat, undulating terrain and colder wetter climate.

Wetlands encompass a range of plant communities that includes western redcedar/skunk cabbage swamps, cattail marshes, *Sphagnum* moss dominated bogs and coastal salt marshes. (MOE, n.d. b)

Older Forest
Older Forest is defined as conifer-dominated forest with an average tree age of 100 years or greater. The trees are generally large and tall, reaching up to 1.5m in diameter and over 50m in height.

Older Forest is often found in combination with Older Second Growth Forest (SG) and occasionally with Terrestrial Herbaceous ecosystems (HT). Based on broad areas of similar climate and vegetation, two biogeoclimatic zones are recognized in this project:

1. Coastal Douglas-fir zone (CDF). At lower elevations (<150m), Douglas-fir is the dominant canopy tree in this southern portion of the study area. Low soil moisture conditions favour open stand structure and low growth of herbs, grasses and woody shrubs in the understorey.
2. Coastal Western Hemlock zone (CWH). At higher elevations, western hemlock is the dominant tree species in this northern portion of the study area. The forest floor is composed of a dense litter of needles and small branches. Cool, damp and acidic conditions favour a moss layer build up over time. (MOE, n.d. a)

The CRD Regional Atlas also shows a potential sharp-tailed snake (*Contia tenuis*) habitat polygon that covers a large portion of the subject property (**Figure 3**). Sharp-tailed snake is a red-listed species in BC and is Federally listed as endangered (Ministry of Water, Land, and Air Protection, 2004). The specific habitat needs of sharp-tailed snakes are unconfirmed but sites where the species do occur are

Coastal Douglas-fir ecosystems where Douglas-fir and arbutus are dominant vegetation species. Furthermore, "small forest openings with rocky substrate and a southern exposure are thought to provide egg-laying and nursery sites" (Ministry of Water, Land, and Air Protection, 2004, p.4).

The BC Conservation Data Centre (CDC) iMap was also reviewed to determine if there were any identified occurrences of sensitive ecological communities or species on this property. Two polygons were identified that encompassed a portion, or more, of the subject property (**Figure 4**). The first polygon covering the majority of the site is Shape ID 55772 representing the occurrence of the Douglas-fir/dull Oregon-grape ecological community, red-listed in B.C. The subject property is a small portion of this much larger polygon covering an area from Mount Finlayson to Thetis Lake (**Figure 5**). According to the CDC occurrence report, the condition of the occurrence is considered poor to fair given the young forest stand structure and its fragmentation from residential, urban, and industrial development (B.C. Conservation Data Centre, 2014). The second polygon, Shape ID 55880, is located on the northern edge of the site and identifies the area in which northern red-legged frogs (*Rana aurora*) have been observed (a blue-listed species in BC). Red-listed species and ecological communities are Extirpated, Endangered, or Threatened in British Columbia while blue-listed species and ecological communities are of Special Concern (formerly Vulnerable) (MOE, n.d. d).

Masked (i.e. not publicly available) occurrences with the shape ID's 9204, 9468, 30137, 41842, 44849 also show up on the B.C. Conservation Data Centre map; the CDC was contacted for additional information and they determined these masked occurrences were not relevant to this property (K. Stipec, personal communication, May 7, 2015).

Lastly, GeoBC and DataBC maps were viewed through Google Earth to identify watercourses, water bodies, and other aquatic features that may exist on the subject property. These maps were compared to the CRD Regional Community Atlas watercourse layer and to existing reports including the Craigflower Watershed Assessment prepared by SHIP Environmental Consultants Ltd. in 1997. Only one watercourse was mapped traversing the subject property, Teanook Creek. Teanook Creek is located on the northern boundary of the subject property and flows from Teanook Lake into McKenzie Lake (**Figure 6**). Teanook Creek watershed is a subcatchment of the much larger Craigflower Creek watershed. A search through the Ministry of Environments FISS database revealed that there is no recorded fish presence in Teanook Lake but there are fish present in McKenzie Lake including brown catfish, cutthroat trout, and threespine stickleback (MOE, 2015). Previous site studies identified a large wetland near the centre of the site and a small drainage into Millstream Creek at the south-west corner of the site (**Figure 6**).

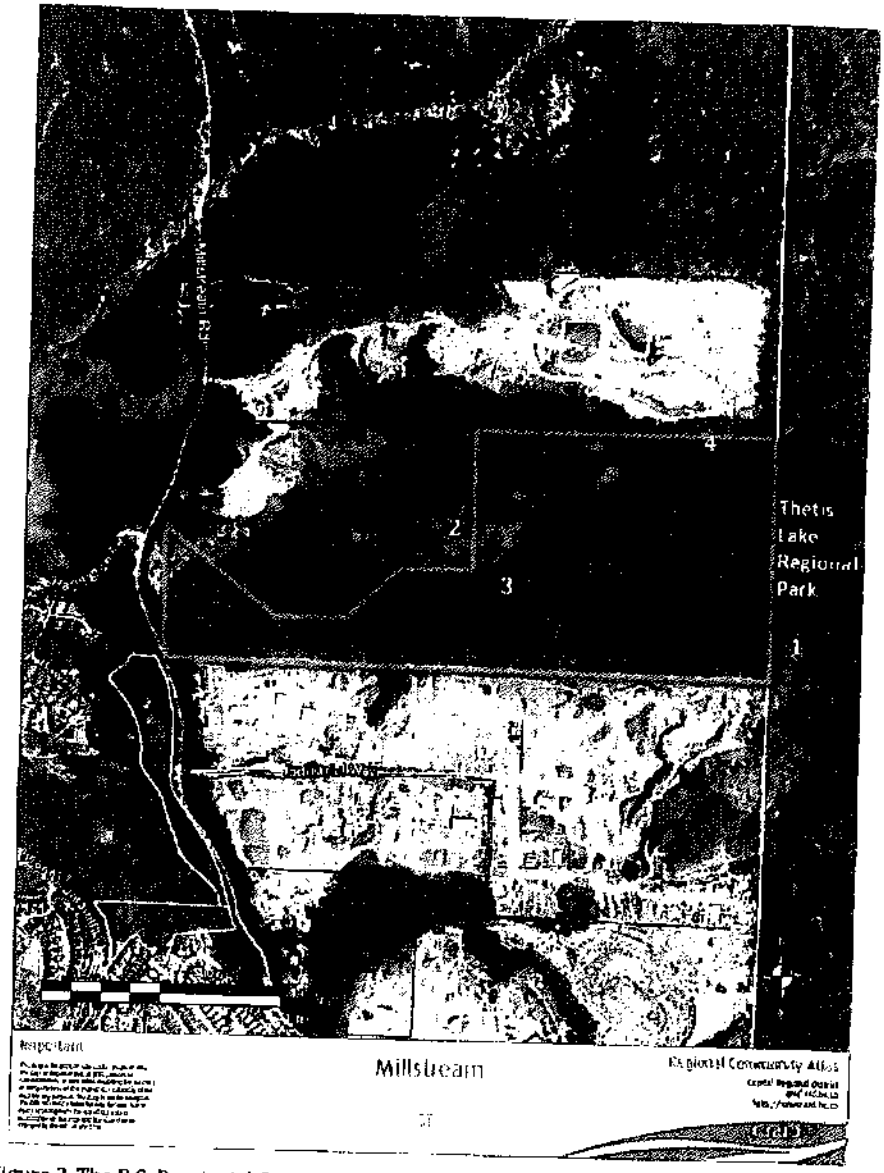


Figure 2. The B.C. Provincial Government Sensitive Ecosystem Inventory (SEI) mapping project identifies four SEI polygons on the subject property (thick red outline). The pink polygons represent woodlands (1 & 2), the green polygon (3) represents a wetland, and the brown polygon (4) represents older second growth forest.

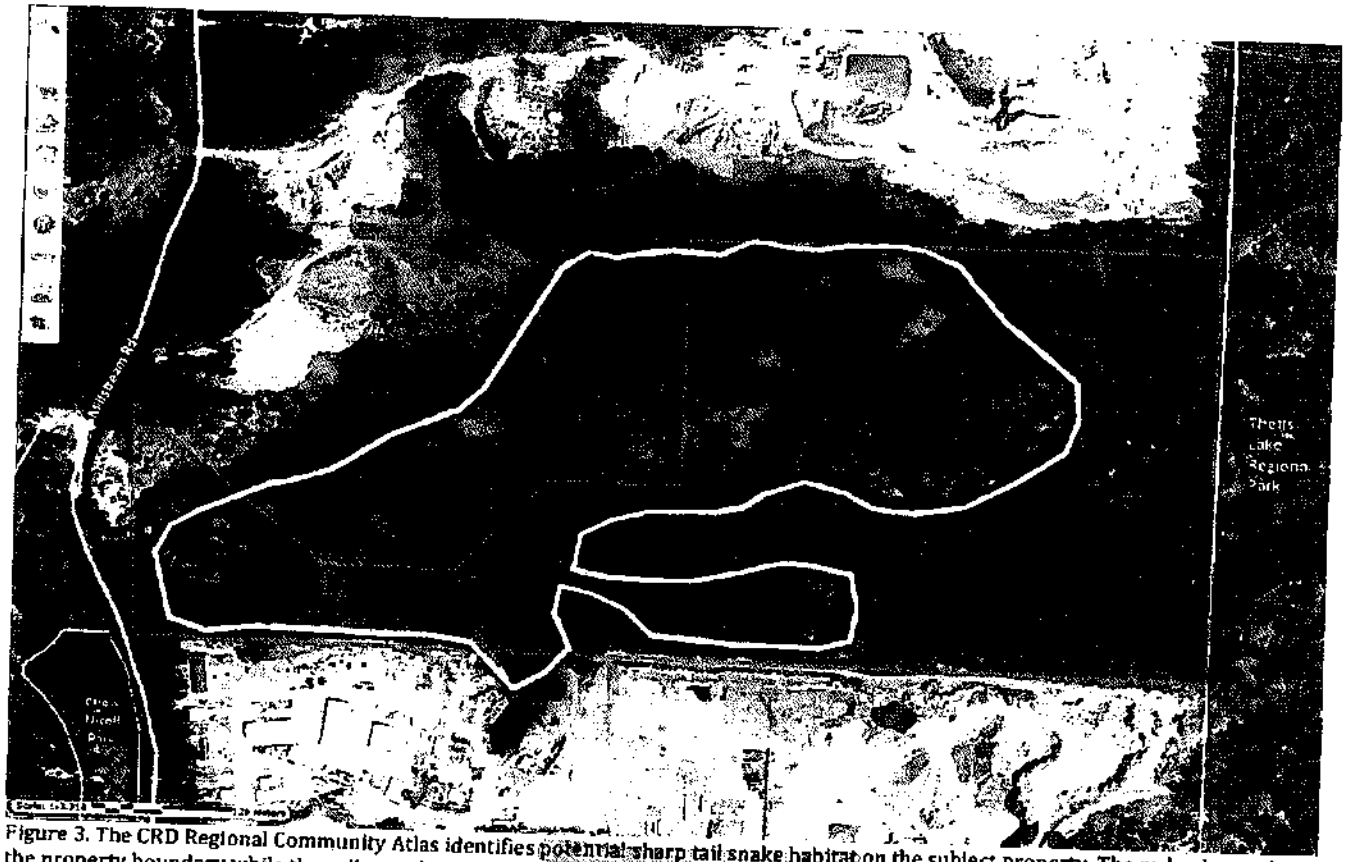


Figure 3. The CRD Regional Community Atlas identifies potential sharp tail snake habitat on the subject property. The red polygon shows the property boundary while the yellow polygon identifies the potential sharp tail snake habitat.

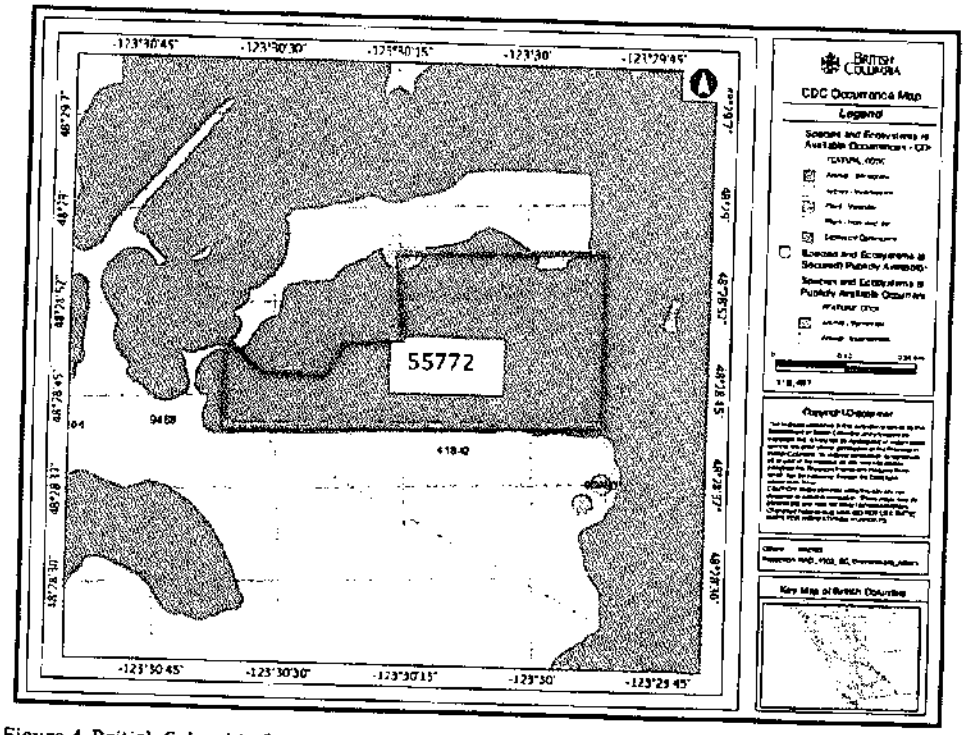


Figure 4. British Columbia Conservation Data Centre (CDC) occurrence map for sensitive species and ecosystems. The blue polygon labeled 55772 covers the subject property (red polygon approximately) and represents the Douglas-fir/dull Oregon-grape red-listed ecological community. The subject property is part of a much larger polygon that covers an area from Mount Finlayson to Thetis Lake (Figure 5). The yellow polygon sits on the northern boundary of the subject property and identifies the occurrence of red-legged frog, a blue-listed species.

Figure 5. The light green polygon outlined in yellow represents the large Douglas-fir/salal-Oregon-grape polygon that exists in this region. The approximate boundary of the subject property is in red. Image Source: CDC iMap.

Figure 6. Google Earth map showing GeoBC (DataBC) water features in the vicinity of the subject property (red polygon). Teanook Creek is located along the north-east portion of the property. This stream is part of the Craigflower Creek Watershed and flows into McKenzie Lake. Old site maps indicate the presence of a large wetland and associated drainage near the centre of the site (yellow polygon) along with a small drainage at the south-west corner (yellow line).

Image Source: Google Earth.

Field Findings

A full day site assessment was undertaken by Aqua-Tex Scientific on Monday, April 20th, to determine the ecological characteristics of the subject property with a particular focus on freshwater ecology. During the assessment, Aqua-Tex located four different freshwater features:

- Teanook Creek,
- An isolated wetland on the southern property line,
- A large wetland complex near the centre of the site, and
- A wetland and stream channel on the southwest corner of the property (see Ecological Features Site Map).

Teanook Creek

Teanook Creek is located along the northern property boundary of the subject property. The north bank of the stream abuts the Tervita Highwest facility; in some locations, the toe of the fill slope on that property is the northern bank of the creek. For the length of the property Teanook Creek resides in the bottom of a small ravine with the land rising up as the fill slope to the north and a natural, vegetated hillside to the south. This freshwater system is a series of connected wetlands that encompass the ravine bottom; the riparian-wetland functions as a broad floodplain, with the stream moving through as a meandering channel. The stream channel is a mix of single thread and braided channels along the gradient of the wetland. The riparian-wetland within the ravine has a shallow slope (<2%), with dense riparian vegetation. Numerous cedar stumps were observed attesting to a former cedar dominated wetland within the ravine. There is one short segment, at the eastern end of the property, with no floodplain and a waterfall through bedrock and cobble; this short reach has a steeper gradient (>6%).

Channel widths were measured periodically and ranged from 1.5m to 3m with extensive active floodplain up to approximately 20m wide or more. In the areas with extensive floodplain/wetland, western redcedar, red alder, bigleaf maple, salmonberry, skunk cabbage, and Pacific water parsley dominate the riparian vegetation (**Table 1** provides a detailed list of vegetation). Two small tributaries, both dry at the time of assessment, flow into Teanook Creek from the south bank. Both tributaries are associated with a cluster of western redcedar at their upper limits. One large nest and a wildlife tree, with heavy woodpecker activity, were observed at the upper end of the second (eastern) tributary. A northern red-legged frog (blue-listed species) was seen at the top of the waterfall confirming the applicability of the CDC polygon shape ID #55880. A modified western redcedar with a hunting blind/tree fort was noted downstream of the waterfall.

Despite the industrial activity to the north, and historical land uses on the subject property, Teanook Creek has the hydrological, vegetation, and erosion/deposition characteristics that result in its being a properly functioning and healthy creek. While we did not conduct a Proper Functioning Condition assessment, our field

observations suggest the stream and its riparian-wetlands would, if such an aquatic health diagnosis was conducted, receive a high functional rating.

Table 1. Vegetation along Teanook Creek. Exotic species marked with an asterisk (*).

Common Name	Latin Name
bigleaf maple	*Acer macrophyllum*
vanilla-leaf	*Achlys triphylla*
red alder	*Alnus rubra*
arbutus	*Arbutus menziesii*
lady fern	*Athyrium filix-femina*
common horsetail	*Equisetum arvense*
salal	*Gaultheria shallon*
oceanspray	*Holodiscus discolor*
English holly*	*Ilex aquifolium*
skunk cabbage	*Lysichiton americanum*
dull Oregon-grape	*Mahonia nervosa*
Pacific water parsley	*Oenanthe sarmentosa*
shore pine	*Pinus contorta* var. *contorta*
sword fern	*Polystichum munitum*
Douglas-fir	*Pseudotsuga menziesii*
Nootka rose	*Rosa nutkana*
Himalayan blackberry*	*Rubus armeniacus*
salmonberry	*Rubus spectabilis*
willow species	*Salix* sp.
red elderberry	*Sambucus racemosa* ssp. *pubens*
Western redcedar	*Thuja plicata*
stinging nettle	*Urtica dioica*
red huckleberry	*Vaccinium parvifolium*

Isolated Wetland on Southern Property Boundary

A small, isolated wetland is located on the southern property line approximately 300 metres from the south-east corner of the property (see Ecological Features Site Map). This small wetland covers an approximate area of 300m² with its southern boundary at the toe of the Millstream Industrial Park road. The wetland appears to be receiving its water from the surrounding hillside while the road acts as a berm along its southern edge. No culvert outlet was found, with the elevated road-base acting as a physical barrier to off-site flow; this small wetland is classified as an isolated, perched wetland. The vegetation in this wetland is dominated by red-osier dogwood and hardhack (see **Table 2** for detailed list of vegetation).

Table 2. Isolated wetland vegetation. Exotic species marked with an asterisk (*).

Common Name	Latin Name
agromonic grasses*	
arbutus	*Arbutus menziesii*
red-osier dogwood	*Cornus stolonifera*
Scotch broom*	*Cytisus scoparius*
salal	*Gaultheria shallon*
oceanspray	*Holodiscus discolor*
shore pine	*Pinus contorta* var. *contorta*
Douglas-fir	*Pseudotsuga menziesii*
Nootka rose	*Rosa nutkana*
Himalayan blackberry*	*Rubus armeniacus*
trailing blackberry	*Rubus ursinus*
willow species	*Salix* sp.
hardhack	*Spirea douglasii* ssp. *douglasii*

Wetland Complex at the Centre of the Site

The CRD Regional Community Atlas identified a wetland SEI polygon near the centre of the subject property. The field assessment confirmed the presence of this large wetland and identified an outlet on its southern edge that flows south underneath a perimeter road. No culverts were observed at the outlet under the road; it appears water flows through the large angular rock that forms the roadbase. The flows from the wetland, having percolated through the roadbase are stored in a large, manmade pond on the adjacent property (still within the District of Highlands). Anecdotal conversation with a management staff member of the Industrial Park, indicated there is no outlet from the pond; during prolonged, heavy rainstorms the pond periodically over-flows its bank and flows across the industrial landscape. The pond is used for fire suppression at Millstream Industrial Park. The assessment team requested a review of the drainage information from the Engineering department at the City of Langford who confirmed that there is no official record of connecting drainage. Another unmapped arm of this wetland complex was located between two rocky knolls to the west of the SEI wetland. This wetland connects through a small channel to the main wetland complex just downstream of the old road.

The large wetland at the north of this complex is dominated by hardhack, red-osier dogwood, and willow sp.. Black cottonwood, oceanspray, salal, sword fern, and Douglas-fir border the wetland upslope. One large Douglas-fir is growing within the wetland itself. This is an unusual location for a Douglas-fir as they prefer drier soil conditions and suggests that the wetland may be larger than it used to be, perhaps because of the construction of the road downstream which functions as a dam. A hummingbird was observed in this area but moved on too quickly for identification.

The vegetation of the western wetland of this complex is dominated by western redcedar and skunk cabbage while the wetland at the southern end of the complex

is dominated by willow, skunk cabbage, Pacific water parsley, rushes and oceanspray. For a detailed list of vegetation for this wetland complex see **Table 3.**

Field investigations failed to find a culvert system, or any other path, connecting this wetland complex to Millstream Creek.

Table 3. Wetland Complex in the Centre of the Site. Exotic species marked with an asterisk (*).

Common Name	Latin Name
bigleaf maple	*Acer macrophyllum*
red alder	*Alnus rubra*
arbutus	*Arbutus menziesii*
lady fern	*Athyrium filix-femina*
deer fern	*Blechnum spicant*
red-osier dogwood	*Cornus stolonifera*
Scotch broom*	*Cytisus scoparius*
salal	*Gaultheria shallon*
oceanspray	*Holodiscus discolor*
skunk cabbage	*Lysichiton americanum*
Pacific water parsley	*Oenanthe sarmentosa*
Pacific ninebark	*Physocarpus capitatus*
shore pine	*Pinus contorta var. contorta*
sword fern	*Polystichum munitum*
black cottonwood	*Populus balsamifera* ssp. *trichocarpa*
Douglas-fir	*Pseudotsuga menziesii*
bracken fern	*Pteridium aquilinum*
Nootka rose	*Rosa nutkana*
Himalayan blackberry*	*Rubus armeniacus*
trailing blackberry	*Rubus ursinus*
willow species	*Salix* sp.
hardhack	*Spirea douglasii* ssp. *douglasii*
Western redcedar	*Thuja plicata*

Wetlands and Stream Channel at the Southwest Corner of the Site

A wetland complex is located on the CRD property along the southwest border with the subject property. These wetlands are dominated by shrubby species such as hardhack, willow, and red-osier dogwood and appear to have been created and/or modified in the past by the creation of roads.

An old stream channel was observed between the wetlands mentioned above and the pool mentioned below. There was no evidence of any flow this year but pooling water was present. If flows occur in this stream they would be routed to the southwest.

Further to the west down an old road, a pool marks the upstream end of an unnamed tributary to Millstream Creek. This stream flows adjacent to and south of the old road, then flows beside the driveway of the private residence on Millstream Road. The stream channel is routed under Millstream Road in a small culvert and down the slope to Millstream Creek; the culvert outlet was almost completely blocked with debris and soil, suggesting minimal flows pass through the culvert. The bank immediately below the culvert outlet did not provide any visual evidence of a stream channel, indicating the minimal flows from this culvert are absorbed by the forest floor and there may not be a direct, surficial connection with Millstream Creek (see the Ecological Features Site Map). Confirmation that this aquatic landscape unit is connected by surficial flow to Millstream Creek will need to be verified during winter rains.

The vegetation along this unnamed tributary is dominated by western redcedar and sword fern. A full list of vegetation for the wetland and stream channel at the western corner of the site is found in **Table 4.**

Table 4. Vegetation list for the wetlands and stream channel at the western corner of the site. Exotic species marked with an asterisk (*).

Common Name	Latin Name
bigleaf maple	*Acer macrophyllum*
vanilla-leaf	*Achlys triphylla*
red alder	*Alnus rubra*
red-osier dogwood	*Cornus stolonifera*
Scotch broom	*Cytisus scoparius*
daphne*	*Daphne laureola*
skunk cabbage	*Lysichiton americanum*
dull Oregon-grape	*Mahonia nervosa*
sword fern	*Polystichum munitum*
Douglas-fir	*Pseudotsuga menziesii*
willow species	*Salix* sp.
hardhack	*Spirea douglasii* ssp. *douglasii*
common snowberry	*Symphoricarpos albus*
western redcedar	*Thuja plicata*
stinging nettle	*Urtica dioica*

General Terrestrial Site Character

This site is forested with a second growth canopy of approximately 30-50 years old and lies within the Coastal Douglas-fir Biogeoclimatic zone, Moist Maritime variant (CDFmm). South of Teanook Creek the elevation rises up considerably from 70m to about 100m with a rolling landscape of bedrock knolls. Old logging roads and trails exist throughout the site.

The vegetation is dominated by Douglas-fir, arbutus, oceanspray, salal, and dull Oregon-grape. This dominant vegetation is consistent with the description of the Douglas-fir/dull Oregon-grape ecological community (CDC polygon shape ID #5772) (Wartigg. 2010). A list of all vegetation observed during the assessment is provided in **Table 5.**

The locations and existence of the SEI polygons were confirmed. The woodland polygon on the southeast corner of the property is present but it is no longer connected to rest of the polygon to the south due to a road and gravel storage area associated with Millstream Industrial Park. The large SEI woodland polygon in the middle of the site is a large rocky knoll with a thick canopy of arbutus, an understory of oceanspray, and an herb layer of few-flowered shooting star. The south side of this rocky knoll may be suitable habitat for sharp-tailed snake.

Table 5. Vegetation observed during the site assessment. Exotic species marked with an asterisk (*).

Common Name	Latin Name
agronomic grasses	
moss	
grand fir	*Abies grandis*
bigleaf maple	*Acer macrophyllum*
vanilla-leaf	*Achlys triphylla*
red alder	*Alnus rubra*
arbutus	*Arbutus menziesii*
lady fern	*Athyrium filix-femina*
deer fern	*Blechnum spicant*
sedges	*Carex* sp.
small-flowered blue-eyed mary	*Collinsia parviflora*
red-osier dogwood	*Cornus stolonifera*
English hawthorn*	*Crataegus monogyna*
Scotch broom*	*Cytisus scoparius*
Daphne*	*Daphne laureola*
few-flowered shooting star	*Dodecatheon pulchellum*
common horsetail*	*Equisetum arvense*
cleavers	*Galium aparine*
salal	*Gaultheria shallon*
oceanspray	*Holodiscus discolor*
English holly*	*Ilex aquifolium*
rushes	*Juncus* sp.
skunk cabbage	*Lysichiton americanum*
dull Oregon-grape	*Mahonia nervosa*
Pacific water parsley	*Oenanthe sarmentosa*
pacific ninebark	*Physocarpus capitatus*
shore pine	*Pinus contorta var. contorta*

sea blush	*Plectritis congesta*
sword fern	*Polystichum munitum*
black cottonwood	*Populus balsamifera ssp. trichocarpa*
Douglas-fir	*Pseudotsuga menziesii*
bracken fern	*Pteridium aquilinum*
Nootka rose	*Rosa nutkana*
Himalayan blackberry*	*Rubus armeniacus*
salmonberry	*Rubus spectabilis*
trailing blackberry	*Rubus ursinus*
willow	*Salix* sp.
red elderberry	*Sambucus racemosa ssp. pubens*
hardhack	*Spirea douglasii ssp. douglasii*
common snowberry	*Symphoricarpos albus*
western redcedar	*Thuja plicata*
stinging nettle	*Urtica dioica*
red huckleberry	*Vaccinium parvifolium*

Ecological Features Site Map

Page 195

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Regulations, Policies, and Guidelines

Federal Government

The Sharp-tailed snake is federally listed as an endangered species and is, therefore, federally protected under Species at Risk Act (SARA). According to the SARA public registry, *"all known localities of the snake are on private land, which are not subject to any habitat protection requirements. The Wildlife Act of British Columbia prohibits the collection, handling and trade of all native wildlife species without a permit; but does not provide habitat protection"* (Government of Canada, 2015).

BC Provincial Government

Riparian Area Regulation

The Riparian Areas Regulation (RAR) is applicable to any watercourse(s) (streams, rivers, creeks, ditches, ponds, lakes, springs, and wetlands) that is/are connected by surface flow to a waterbody that provides fish habitat. Under the regulation, if a watercourse is present within 30 metres of a proposed development, a Qualified Environmental Professional (QEP) is required to follow a specific method to determine a setback or buffer to protect the stream and its riparian zone. With respect to the subject property, the RAR is applicable to Teanook Creek and may be applicable to the Unnamed Tributary to Millstream Creek in the southwest corner of the property.

Sensitive Ecosystem Inventory Conservation Guidelines

The Ministry of Environment has developed management recommendations for SEI's on East Vancouver Island & Gulf Islands (see MOE, n.d., d). Where land development activities cannot be excluded from these areas they recommend the proponent work with a qualified environmental professional "to incorporate designs that are sensitive to the natural ecosystem, clearly delineating sensitive areas prior to and during construction and minimizing impacts to the core ecosystem's" (MOE, n.d., d). The proponent is currently working with Aqua-Tex to address this guideline.

Guidelines for Provincially Listed Species

Provincially listed species, such as the sharp-tailed snake and northern red-legged frog, are protected under the Wildlife Act of British Columbia that prohibits the collection, handling and trade of all native wildlife species without a permit. The Act does not require habitat protection for these species on privately owned land. The Wildlife Act does protect active birds nests and nests of eagles, peregrine falcons, gyrfalcons, osprey, heron, or burrowing owl.

There are no provincial regulations that dictate the protection of listed ecological communities on private land; however, they encourage land stewardship and best management practices through guideline documents such as *Develop with Care* (MOE, 2014). The proponent has been working with Aqua-Tex to consider the

ecological values of this site while keeping in mind the desired commercial/industrial land use as described in the District of Highlands OCP.

Section 9 of the Water Act

Any changes in or about a stream, for example, the installation of a culvert, requires the submission of a Section 9 notification or application to the Ministry of Forests, Lands, and Natural Resource Operations for authorization.

District of the Highlands

Based on the preliminary site assessment there are two development permit areas that are applicable to ecological features on this property (see **Figure 11** for setbacks & protected areas as per Highland requirements): Development Permit Area No. 2 and Development Permit Area No. 3. However, the OCP also indicates that this area is intended for commercial/industrial development. To accommodate this desired land use, the DP guidelines (copied below) cannot practically be accomplished.

Development Permit Area No. 2 – Water and Riparian Areas

Two areas of the site are designated by the District of Highlands as water and riparian DP areas, the large wetland in the centre of the site and the Unnamed Tributary to Millstream Creek in the southwest corner of the property (**Figure 9**). This DP area is applied to the water feature as well as areas within 30m of the top of bank or natural boundary. Given this definition, all the freshwater features identified during the preliminary site assessment meet the criteria for this DP area even though not all of them are subject to the RAR. The guidelines for these areas as described by the District of Highlands are below:

1. No unnecessary site disturbances shall be permitted within at least 30 metres (100 feet) of the top of bank of watercourses, or the natural boundary of lakes, wetlands, and other water features. Existing vegetation shall be maintained in order to control erosion, protect banks, protect habitat, and retain the natural character of water features. Outside agencies, such as Department of Fisheries and Oceans and BC Ministry of Environment, will be consulted where necessary.
2. No habitable buildings or other structures requiring foundations will be constructed, and no septic tanks or fields will be installed within at least 30 metres (100 feet) horizontal distance from the top of a bank of a watercourse or high water mark of water features, and within 15 metres (50 feet) horizontal distance of the natural boundary of an area subject to flooding.
3. Provision will be made and works undertaken to maintain the quality of stormwater flowing toward or in the identified water features, and to ensure that the volume and peak flow of runoff from a property is not increased by any development or land altering activity.
4. Vegetation appropriate and preferably indigenous to the site may be required to be planted on the site to reduce erosion risk, restore and enhance the natural character of the site, improve water quality, or to stabilize slopes and banks. A landscaping security deposit will be required to encourage

compliance. Outside agencies, such as Department of Fisheries and Oceans and BC Ministry of Environment, will be consulted where necessary.

5. Removal of gravel, sand, soil or peat from streambeds, lakes, or wetlands and the draining, dredging, infilling, piping or dumping of materials will be strictly limited. Outside agencies, such as Department of Fisheries and Oceans and BC Ministry of Environment, will be consulted where necessary.
6. Modification of channels, banks, or shores that could cause environmental harm or significantly alter local hydrological conditions will not be permitted.
7. Pollutants, including pesticides and fertilizers, will be prevented from entering water features or wetlands by requiring the control of surface water drainage.
8. All new developments or modifications of existing developments will be required to prove to the satisfaction of the District of Highlands that the development will cause no increase in runoff compared to existing conditions of the site.
9. Non-point source pollution will be prevented from entering water features from residential or commercial developments or agricultural activities.
10. Facilities to allow the use of gasoline powered boats and floatplanes will not be allowed.
11. The Development Permit may designate and specify where necessary, a buffer zone within which land alteration or structures will be limited to those compatible with the characteristics of the water feature.
12. Development Permits issued with regard to road and driveway construction in this area will ensure that:
    a. Watercourse crossings are so located as to minimize disturbance of water feature banks, channels, shores, and vegetation cover.
    b. Bridges are used instead of culverts for crossings of fish-bearing watercourses, wherever possible.
    c. Where culverts are used, their size will be large enough to accommodate 100-year flood conditions. Culverts should be placed to allow unrestricted movement of fish in both directions. Where desirable, culverts may be designed to retard low flows and encourage instream storage of water.

    In-stream work requires notification or approval under section 9 of the Water Act.
13. Watercourses should be left natural to protect habitat.
14. Should any application for changes to land within Highlands fall within the parameters of the BC Riparian Areas Regulation (RAR), an applicant will be required to furnish, at their expense, an Assessment Report certified by a Qualified Environmental Professional (QEP) as defined by and meeting the intent of the RAR. All applications falling under the RAR will still be subject to Council review. (District of Highlands, 2013, p. 74-75).

Development Permit Area No. 3 – Sensitive Vegetation

Four areas on the site are designated by the District of Highlands as sensitive vegetation DP areas: the large wetland in the centre of the site, the large SEI

woodland polygon in the centre of the site, the SEI woodland polygon in the southeast corner, and the SEI older second growth forest polygon in the northeast corner (**Figure 10**). The guidelines for these areas as described by the District of Highlands are below:

1. No unnecessary site disturbances shall be permitted within areas designated as sensitive vegetation.
2. In treed areas, mature vegetation will be protected, as will understorey plants and immature trees.
3. The level of the land surface will not be changed in sensitive vegetation areas if such change could affect the health of vegetation or the ecological structure of plant communities.
4. Drainage will not be altered in ways that increase or decrease the amount of surface water or groundwater available to the sensitive vegetation.
5. Where necessary, provision will be made and works undertaken to maintain the quality of water reaching the sensitive vegetation.
6. Removal of gravel, sand, soil or peat in sensitive vegetation areas will be strictly limited.
7. The Development Permit may designate and specify where necessary, a buffer zone within which land alteration or structures will be limited to those compatible with the characteristics of the sensitive vegetation.
8. Planting of invasive non-native vegetation adjacent to or in designated sensitive vegetation areas will not be permitted.
9. Older Second Growth Forests Category – Only the following guidelines apply to the older second growth forest category:
    a. Where older second growth forests are adjacent to the sensitive ecosystems in
    Development Permit Area 3 (Sensitive Vegetation) and to riparian or wetland areas, options for conservation will be considered. In such cases, buffers of older second growth forest will be maintained as determined by a registered biologist. At the very least, site disturbances into such areas will be minimized.
    b. Loss of ecosystem functions will be minimized, while maintaining the resource use value of the property.
    c. Where such areas occur in isolation from other ecosystems, efforts should be made to retain the largest patches possible.
    d. Minimize edge effects by:
        i. Retaining patches of forest rather than isolated trees.
        ii. Treed areas should have the least possible amount of edge per unit area (i.e., should be as close to round as practical).
        iii. The windward edge should be smooth and in areas of deep soils and well rooted trees.
        iv. Edge stabilization treatments including feathering, sail pruning, topping, and removal of unsound trees should be used to ensure a windfirm edge.
    e. Manage recreational and livestock access to avoid damage to vegetation, soils and wildlife.

f. Prevent disturbance of nesting and breeding areas.
g. Control the introduction and spread of invasive plant species.
h. Allow natural disturbances and successional functions and processes to occur.
i. Infrastructure (including wells and septic fields) should avoid trees and their root masses that are to be conserved. Generally, staying back the distance equal to the height of a tree from its base or 15 metres, whichever is greater, will achieve this.
j. Schedule land disturbance activities to avoid the spring nesting and breeding season forcoastal wildlife.
k. Design and implement appropriate sediment and erosion control measures. (District of Highlands, 2013, p. 77-78).

Lastly, in their 2001 Parks and Recreation Master Plan, the District of Highlands identified a portion of the subject property as a proposed connecting corridor between Millstream Road and Thetis Lake Regional Park (**Figure 8**). The proposed preliminary concept plan has been designed to accommodate a connecting corridor.

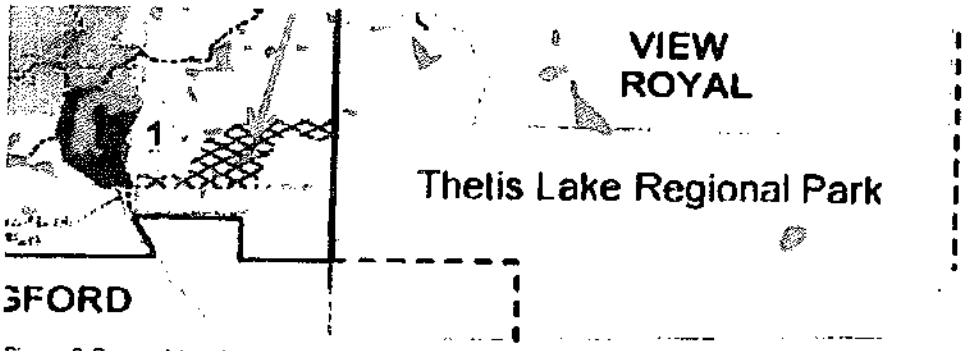

Figure 8. Zoomed-in selection of that portion of Map 4 from the Highlands 2001 Parks and Recreation Master Plan showing the proposed connecting corridor (green hatching & red arrow) through the subject property to Thetis Lake Regional Park.

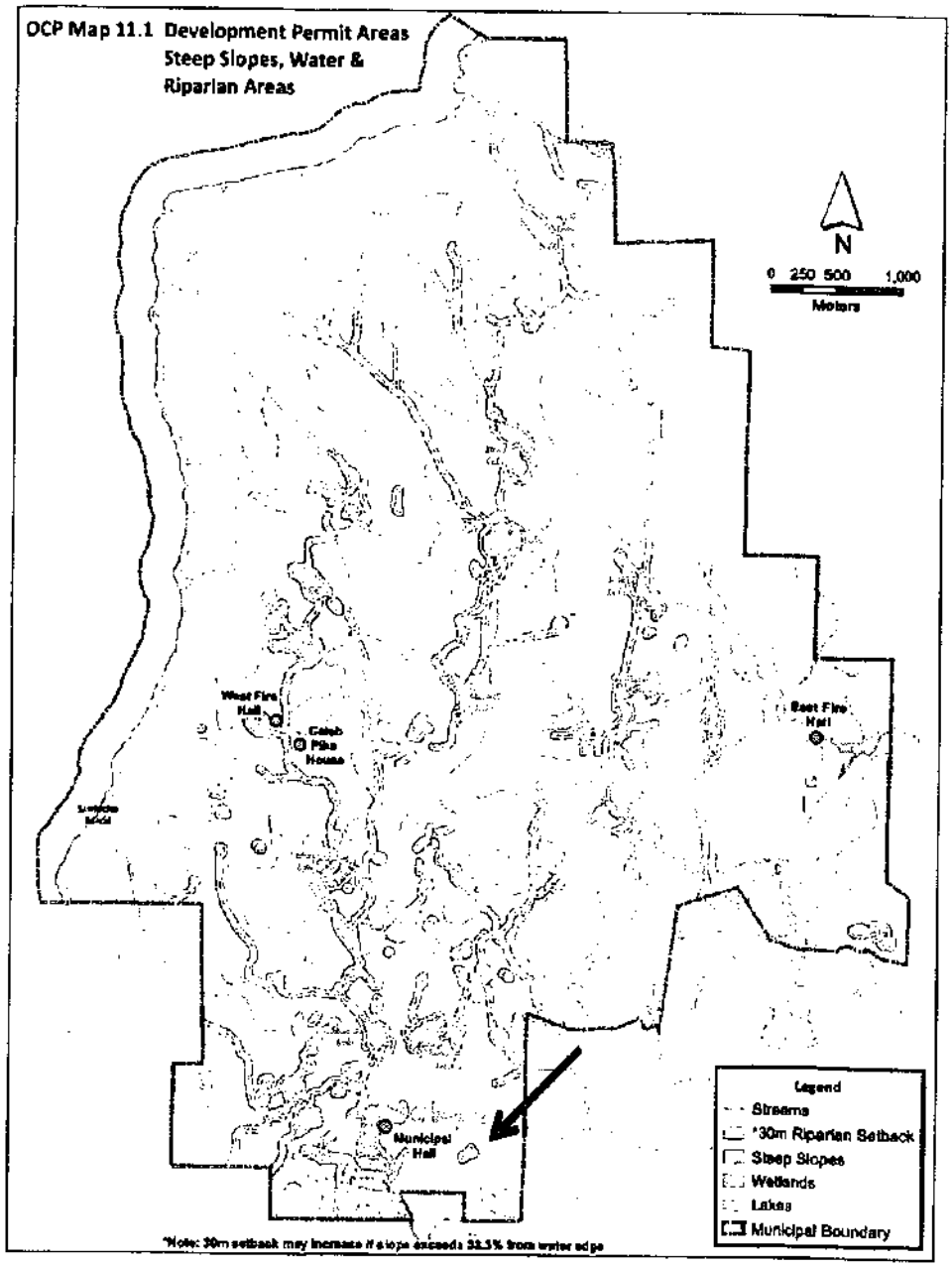

Figure 9. District of Highlands OCP maps showing the DP areas for steep slopes, water & riparian areas. The subject property is identified with the black arrow.

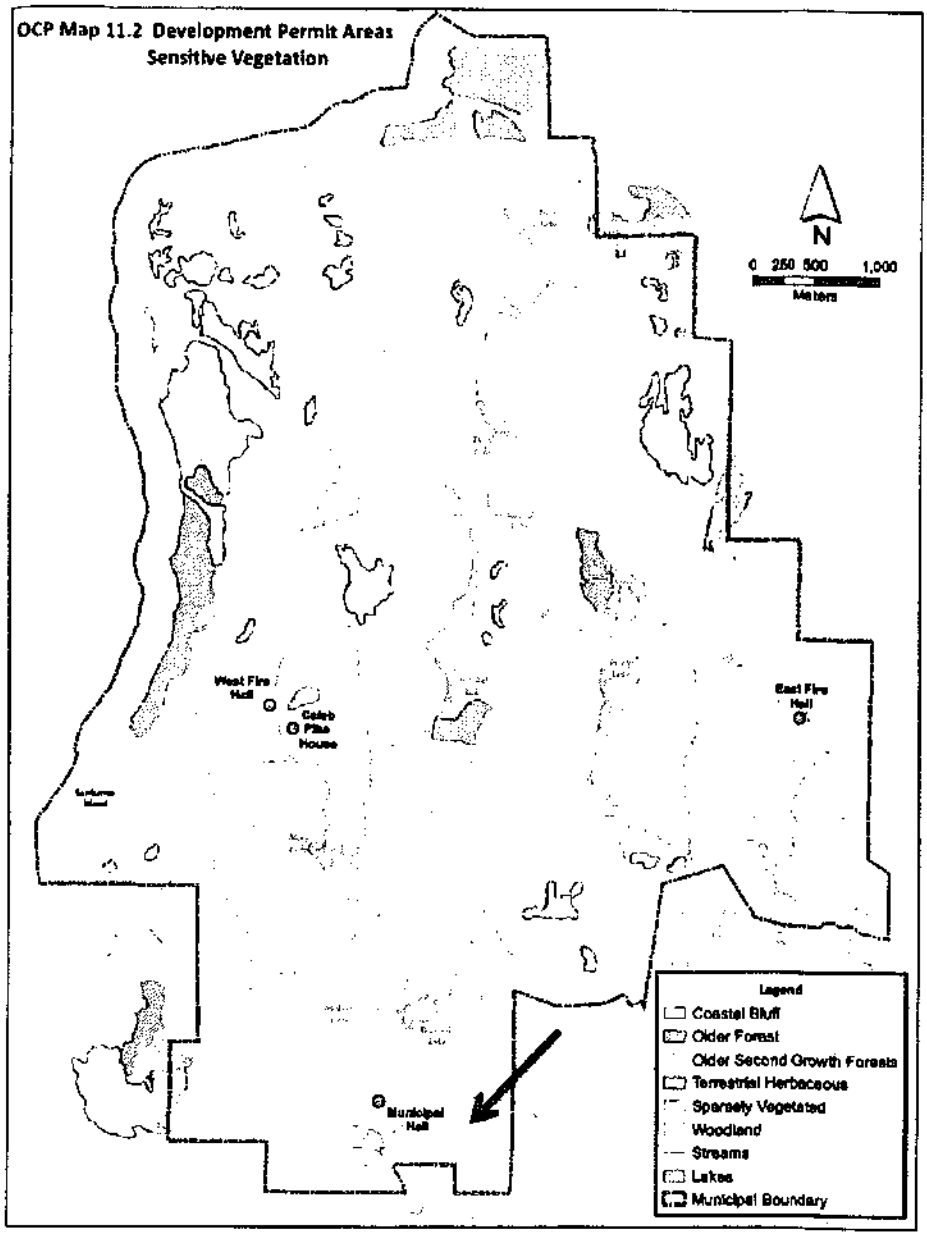

Figure 10. District of Highlands OCP map showing the DP areas for sensitive vegetation. Four DP areas exist on the subject property (black arrow) that correspond to the four SEI polygons shown in Figure 2.

Page 203

Withheld pursuant to/removed as

Copyright

Recommendations

*Please note that these recommendations apply only to the subject property, not to adjacent lands.

- Protect Teanook Creek by increasing the size of the buffer along the northern property edge. Although an RAR Assessment Report has not been conducted for this stream/wetland complex, it is likely that the RAR-based SPEA would be in the 20 – 30 metre range. If the stream channel was determined to be a riparian wetland (Lentic habitat) there would be a prescriptive 30 metre buffer established by the RAR Method.
- A buffer of 50m from the edge of the active floodplain on Teanook Creek is recommended. Given that the landscape elevations will be heavily modified by the proposed rock extraction activities, this extended buffer will protect a portion of the hillside to the south of Teanook Creek and, therefore, maintain the hydrology of this system. This extended buffer will also protect the older second growth forest SEI polygon on the northeast property corner. This extended setback may also negate the need to conduct a RAR assessment and a Water and Riparian DP on Teanook Creek as one is only required if work is proposed within 30 metres of the high water mark.
- Protect those sections of Teanook Creek and the Unnamed Tributary to Millstream Creek in the southwest corner of the site that exist on the subject property by following the Riparian DP setback as prescribed in the District of Highlands OCP or as otherwise recommended by a QEP. The Riparian DP setback cannot practically be applied on the remainder of the site if the OCP-directed commercial/industrial land use is to be accomplished.
- Given the proposed development of the site is to have it re-zoned as an Industrial Park, with extensive rock removal, it does not appear possible to maintain the water table and hydrology required to support the large wetland complex in the centre of the site. The proposed removal of much of the rock on the site, to create a landscape capable of supporting an Industrial Park, would almost certainly result in the loss of hydrological integrity within the wetland. The loss of the wetland's capability to retain water would lead to its becoming a dry depression no longer capable of functioning as a wetland.
- The client may wish to meet with the District of the Highlands and identify areas on site, or within the district that require conservation and/or rehabilitation as compensation for removing the wetland complex in the centre of the site.
- If the wetland complex in the centre of the site is to be removed, consider undertaking riparian plant salvage. In addition, fish and amphibian salvage may be required under provincial salvage permits.
- Areas to be protected such as the interface with Thetis Lake Regional Park, the Unnamed Tributary to Millstream Creek in the southwest corner of the property, and Teanook Creek may need an additional buffer to accommodate

windfall or invasive species colonization that will likely occur along the disturbed edge once the majority of the trees are removed from the site. This buffer, or a forested edge management strategy, should be established with the help of an arborist.

- In the future, prior to any site disturbance, the property should be reviewed by an appropriate Qualified Environmental Professional (QEP) to look for raptor nests, active bird nests, and sharp-tailed snakes – all of which are protected under the Wildlife Act.

Photographs

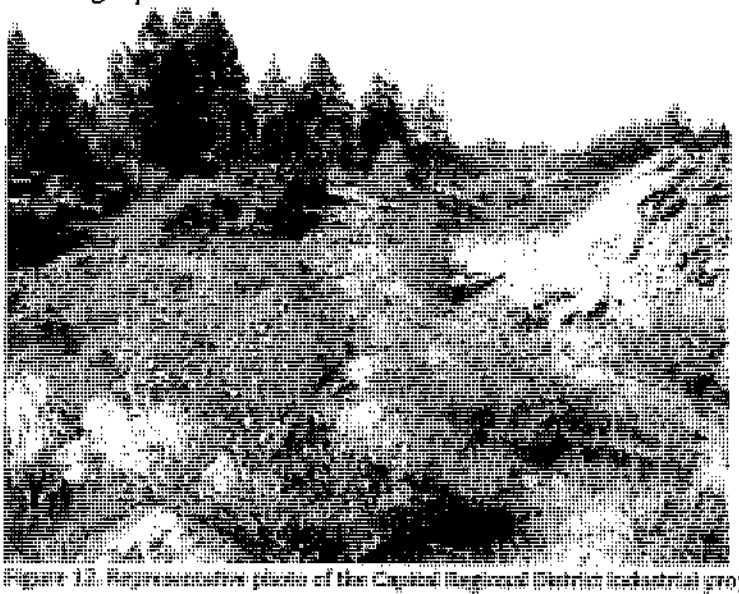

Figure 12. Representative photo of the Capital Regional District industrial property to the northwest of the subject property. Invasive species are rampant including poison hemlock.

Figure 13. Large wetland area associated with the defined channel of Tsaouak Creek.

Figure 14. Representative photo of the typical character of Teanook Creek along the northern property boundary. The creek has an extensive active floodplain. In this location the stream channel is a single thread structure with shallow banks and remnant channels on the adjacent terraces that also function as active floodplain.

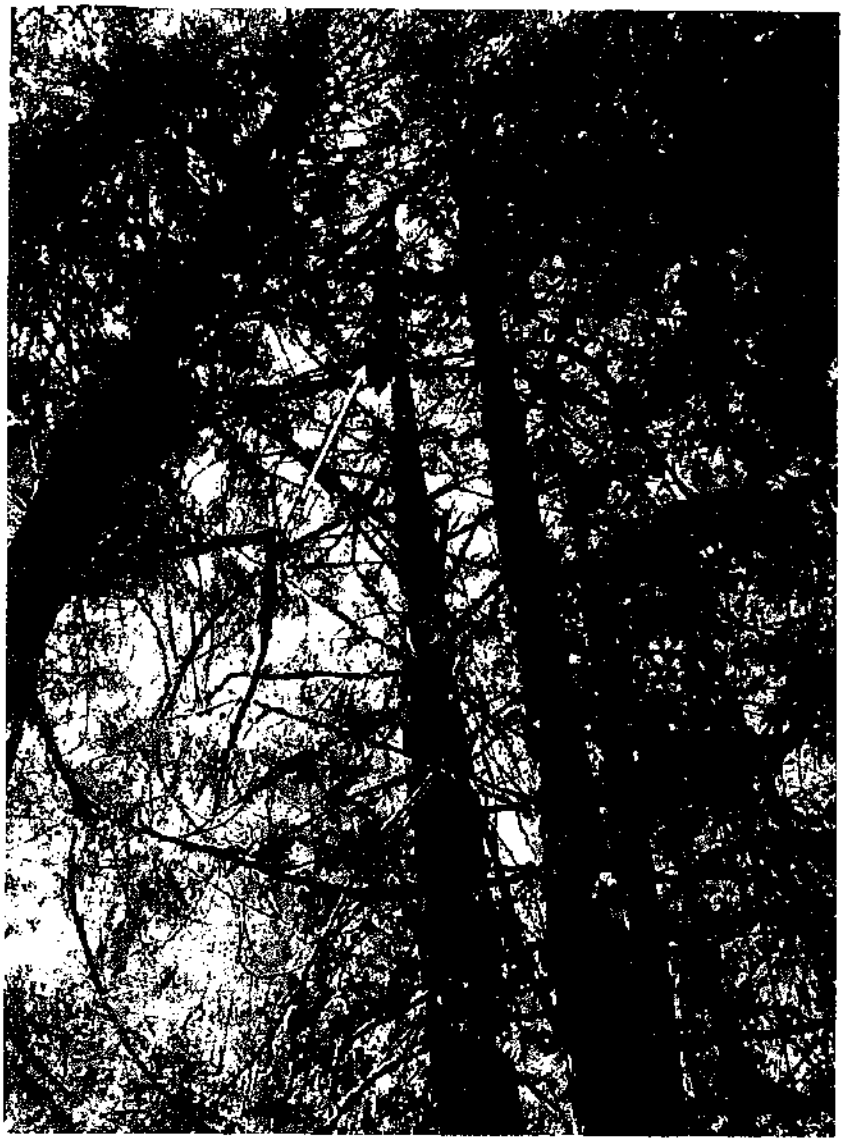

Figure 15. A copse of western redcedar at the upper end of a small tributary to Teanook Creek. A nest is visible in the upper branches of the redcedar in the middle of the photo.

Figure 16. A view over Timanous Creek from a rocky knoll along the south bank. The photograph is oriented to the north looking across the riparian area. Note the ravine below the knoll.

Figure 17. The waterfall on Timanous Creek. This small section of creek has a steep gradient and no floodplain. The northern red-legged frog was observed here. This waterfall represents a significant change in the landscape gradient, as the land slopes east toward Thetis Lake Regional Park, in the background.

Figure 16. Tamaki Creek downstream of the waterfall in the northeast corner of the property. Downstream of the waterfall the stream channel widens into a braided stream/riparian wetland on the forest floor. The stream channel has been wandering across the broad, flat forest floor. Note the mossy rocks in the stream channel, an indication the stream channel is stable and not subject to flashy eroding flood velocities.

Figure 19. A modified western redcedar and tree fort or hunting blind on the north bank of Teanook Creek.

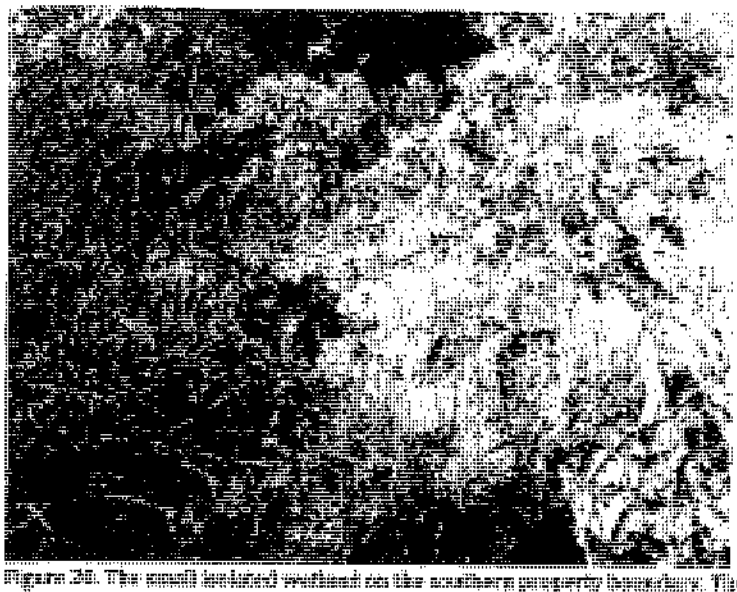

Figure 20. The small isolated wetland on the southern property boundary. The dominant vegetation species in this wetland are hardhack and red-osier dogwood.

Figure 21. The large SEI wetland in the centre of the site (open, sunny area in the background of the photograph). The vegetation community in this wetland is dominated by hardhack, red-osier dogwood, and willow. Black cottonwood is present on the banks while thick salal and oceanspray make up the upslope shrub understorey.

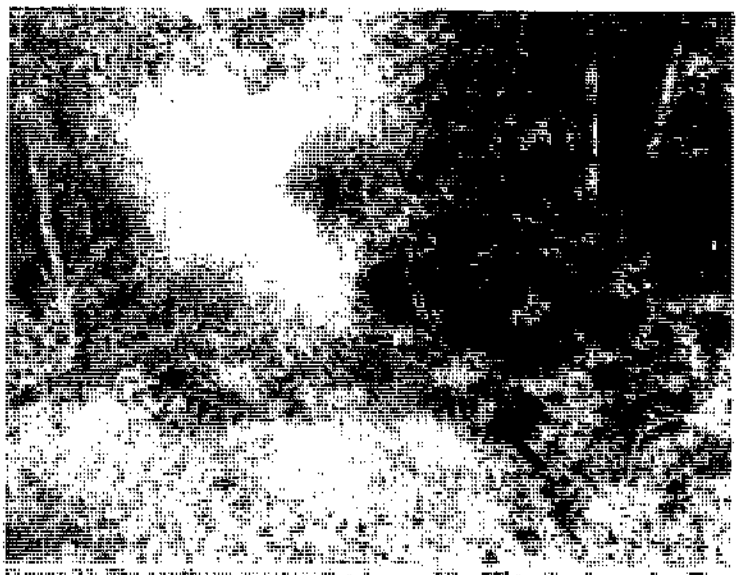

Figure 22. The southernmost wetland area of the EEI wetland complex. The photographer is standing on the Millstream Industrial Park road on the southern property boundary.

Figure 23. The western most wetland portion of the EEI wetland complex. This portion of the wetland is primarily composed of western redcedar and skunk cabbage.

Figure 24. The upstream end of the complex of wetlands on the CEP lands near the northwest subject property boundary. These wetlands have been historically disturbed with road construction.

Figure 25. The point where the upstream end of the unnamed tributary to Millstream Creek in the southwest corner of the property (this photo is facing upstream).

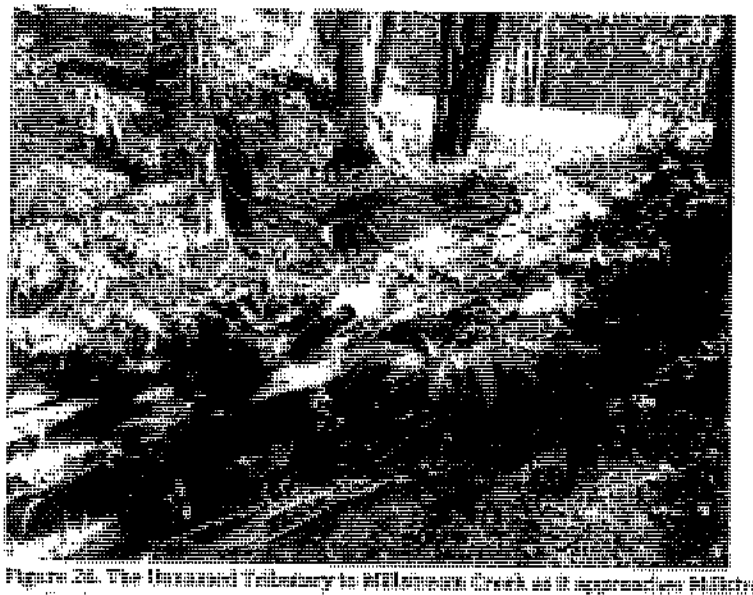

Figure 26. The Unnamed Tributary to Millstream Creek as it approaches Millstream Road. A small culvert carries flows under the road and into Millstream Creek.

Figure 27. A representative photograph of the terrestrial vegetation surrounding the rocky knolls. The dominant vegetation species are Douglas-fir, arbutus, and oceanspray

Figure 28. A representative photograph the top of a rocky knoll.

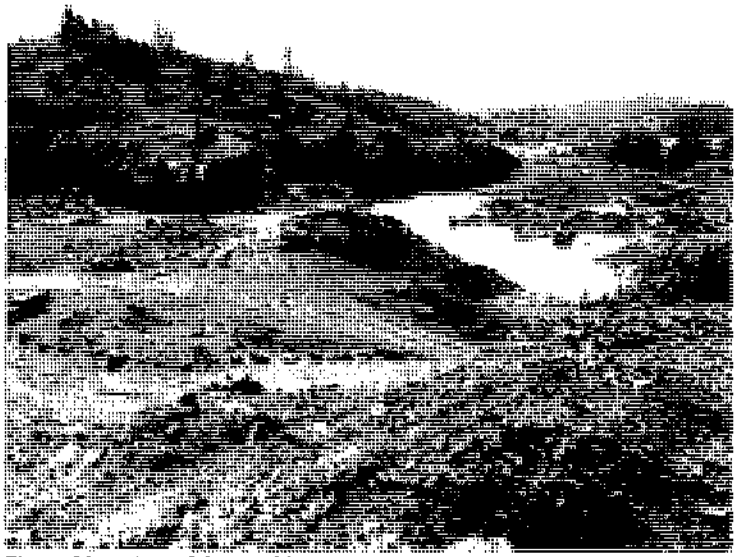

Figure 29. A view of the neighbouring gravel extraction operation and industrial park to the south of the subject property. The vegetated bedrock outcrop in the background left of the photograph is a SEI woodland that the CRD map shows connecting to the SEI woodland in the southeast corner of the subject property.

Figure 10. The southern extent of the woodland fill polygon in the southeast corner of the site. The road and associated fill provide a transportation route to the eastern side of the Millstream Industrial Park. This road defines the southern boundary of the subject property.

Figure 11. Another view of the Millstream Industrial Park. The road at the right defines the southern boundary of the subject property (treed area).

Figure 32. The SE1 woodland polygon at the centre of the site is a large mossy bedrock knoll surrounded by a dominant canopy of arbutus and a thick oceanspray shrub understory.

Figure 33. The southern slope of the SE1 woodland polygon at the centre of the site.

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Response Roll-up Report

FrontCounter BC

Referral Type:	Notice of Work	**Referral Number:**	94049930
Reference Number:	Forests, Lands and Natural Resource Operations / 1610713	**Referral Status:**	In Summary
Legislated Only:	No		

Recommendations

Request	Other	
0	0	Approval of project is supported.
0	0	Interests unaffected.
0	0	No objection to approval of project.
1	0	No objection to approval of project subject to the conditions outlined below.
1	0	Recommend refusal of project due to reasons outlined below.
0	0	N/A

Requests

Organization:	Ministry of Forests Lands and Natural Resource Operations - ESD/WASTE/WATER - Nanaimo Service Cnt	**Request Number:**	001
Respondent:	Dr. Grant Bracher P.Ag., R.P.Bio.	**Legislated:**	No
Closed By:	Grant Bracher	**Referral Level:**	Optional
Recommendation:	No objection to approval of project subject to the conditions outlined below.		

Yes	No	N/A	Question
☑	☐	☐	Does this application impact your agency's legislated responsibilities? If yes, how will the proposal impact your legislated responsibility and please identify the relevant legislation (section) and what mitigative measures will be required to address these impacts in the response text box at the bottom of the page.
☐	☑	☐	If the proposal proceeds, will the proponent require approval or a permit from your agency? If yes, please explain in response text box at the bottom of the page.
☐	☑	☐	Will on-going compliance monitoring be required by your agency as a result of your legislated responsibilities? If yes, please explain what will be required in the response text box at the bottom of the page.
☐	☐	☑	Will this application affect public use of this area? If yes, please explain in the response text box at the bottom of the page.
☐	☐	☑	For Municipal/Regional Government Use Only: Is the application area zoned for the proposed purpose? If no, please provide the current zoning. In the event the applicant wishes to apply for re-zoning, please also provide the estimated time required for this decision. Your comments can be entered in the response text box at the bottom of the page.

Explanation of Response **Attachments Exist**

Applicable Legislation - Wildlife Act, Fisheries Act

Note:

We recommend that the project proceed only if the watercourses on the property are protected. The wetland complex in the center of the property should be left intact with a minimum 30 m vegetated buffer surrounding it and the site hydrology remain as is so that the wetland is not adversely impacted. Teanook Creek and the unnamed tributary to Millstream Creek should be protected with a 30 m vegetated buffer.

Should the project proceed:

We recommend that vegetation clearing be minimized and occur outside the nesting period from March 1 to August 31 to reduce impacts on all bird species. A search for the nests of birds (eagles, peregrine falcons, gyrfalcon, ospreys and herons) protected under Section 34(b) of the Wildlife Act should be conducted before the start of vegetation clearing. Should the nest of a bird requiring protection under Section 34(b) of the Wildlife Act be located, please refer to the recommended buffer distances in Table 4.1 (Section 4) of Develop with Care: Environmental Guidelines for Urban and Rural Land Development in British Columbia (MOE 2014) available at http://www.env.gov.bc.ca/wld/documents/bmp/devwithcare/index.html.

Excavation of the pit should remain a minimum of 1 metre above groundwater resources to prevent the breakout of groundwater.

To help prevent the release of sediment to local waters, we recommend that an effective sediment and erosion control plan be implemented. All extraction activities should be isolated from surface drainage through construction of perimeter ditches to settling ponds and ground infiltration or discharge to less than 25 mg/l standards. Diversion, collection and treatment works should be in place and operational prior to any other development of the pit site.

Explosives handling and utilization should be conducted in a manner which minimizes the opportunity for nitrate and blasting residue contamination of groundwater, site runoff and adjacent watercourses.

Top soil and overburden should be stockpiled and protected from erosion.

Organization:	District of Highlands - Planning Department	**Request Number:**	003
Respondent:	Loranne Hilton, District of Highlands	**Legislated:**	No
Closed By:		**Referral Level:**	Optional
Recommendation:	Recommend refusal of project due to reasons outlined below.		

Yes	No	N/A	Question
☑	☐	☐	Does this application impact your agency's legislated responsibilities? If yes, how will the proposal impact your legislated responsibility and please identify

			the relevant legislation (section) and what mitigative measures will be required to address these impacts in the response text box at the bottom of the page.
☑	☐	☐	If the proposal proceeds, will the proponent require approval or a permit from your agency? If yes, please explain in response text box at the bottom of the page.
☑	☐	☐	Will on-going compliance monitoring be required by your agency as a result of your legislated responsibilities? If yes, please explain what will be required in the response text box at the bottom of the page.
☐	☐	☑	Will this application affect public use of this area? If yes, please explain in the response text box at the bottom of the page.
☐	☑	☐	For Municipal/Regional Government Use Only: Is the application area zoned for the proposed purpose? If no, please provide the current zoning. In the event the applicant wishes to apply for re-zoning, please also provide the estimated time required for this decision. Your comments can be entered in the response text box at the bottom of the page.

Explanation of Response	Attachments Exist
Documents attached. In response to question two above regarding permits, notwithstanding the District's opposition, if a quarry permit is to be issued for the Property, based on the proposed activities stated in the permit application, the operator will likely require various approvals and permits from the District including OCP and zoning amendments, development permits as well as a soil deposit and removal permit under the District's Soil Deposit and Removal Regulation and Fees Bylaw	

Contact

FrontCounter BC

,

Contact: Maryann Bouffard
E-mail: SouthwestMinesDivision@gov.bc.ca

From:	Southwest Regional Mines Division EMPR:EX
To:	Harrison, Donald EMPR:EX
Cc:	Caughill, David EMPR:EX
Subject:	FW: Millstream Creek - Proposed Rock Mine Ref: 1610713
Date:	Monday, March 19, 2018 4:14:56 PM
Attachments:	Min of Mines Letter - Highlands.docx

FYI...

MARYANN J. BOUFFARD
OPERATIONS COORDINATOR
SW REGION MINING OFFICE
TEL: **778-698-3648**
MINISTRY OF ENERGY, MINES AND PETROLEUM RESOURCES
www.gov.bc.ca/ener

From: Ian Bruce s.22
Sent: Monday, March 19, 2018 3:08 PM
To: Minister, EMPR EMPR:EX
Cc: Southwest Regional Mines Division EMPR:EX; OfficeofthePremier, Office PREM:EX; kwilliams@highlands.ca; leslie.corvidconsulting@gmail.com; Ann Baird; Gord Baird; burnska@shaw.ca; marciemclean@shaw.ca; karel@roessong.com
Subject: Millstream Creek - Proposed Rock Mine Ref: 1610713

Dear Minister....please find a letter attached outlining our concerns and objections to the proposed mine in the District of the Highlands.
Yours truly,
Ian

--
Ian Douglas Bruce, B.Sc. (Mar.Bio), R.P.Bio, QEP
Dip. Restoration of Natural Systems
Executive Coordinator, Peninsula Streams Society
www.PeninsulaStreams.ca

work: 250-363-6596
s.22

--
Ian Douglas Bruce, B.Sc. (Mar.Bio), R.P.Bio, QEP
Dip. Restoration of Natural Systems
President, Watershed Ecological Services Ltd.

s.22

From:	Harrison, Donald MEM:EX
To:	"Barry Chalmers"
Cc:	Mel Sangha; Southwest Regional Mines Division MEM:EX
Subject:	RE: 1610713_Millstr5eam Rd Reclamation Plan
Date:	Friday, October 13, 2017 3:14:00 PM

Hi Barry,

Your NoW application states: "There is no proposed reclamation at this time …" yet below you mention "Our reclamation plan addresses …". I still do not see a reclamation plan for this site. It is expected that you will conform to Ministry standards as required by the Mines Act and Code, but saying so in advance does not constitute a reclamation plan. A Mines Act permit cannot be issued without an approved reclamation plan, however the plan may be updated at a minimum every 5 years.

I refer you to the Mines Act and Health, Safety & Reclamation Code (Code), including but not limited to:

Mines Act S. 10(1)

" … as part of the application for the permit, there must be filed with an inspector … a program … for the protection and reclamation of the land, watercourses and cultural heritage resources affected by the mine, including the information, particulars and maps established by the regulations or the code."

Code:

- Part 10.1.1 (1) and (2)
- Part 10.1.3 (g)
- Part 10.1.17
- Pert 10.4.1
- Part 10.7

Regards,

Don

Don J. Harrison, P.Geo.
Sr. Inspector of Mines–Permitting, SW Region

BC Ministry of Energy, Mines & Petroleum Resources
Mines & Mineral Resources Division
3rd Floor, 1810 Blanshard St,
Victoria, BC V8W 9M9
Direct Line: (250) 953-3881
Main office: (778) 698-3649

From: Barry Chalmers [mailto:bchalmers@islandpaving.com]
Sent: Tuesday, October 10, 2017 9:21 AM

To: Harrison, Donald MEM:EX
Cc: Mel Sangha
Subject: RE: 1610713_Millstr5eam Rd Reclamation Plan

Don
Our reclamation plan addresses using all on-site overburden during this 6 year mining plan to construct berms and landscaping as required.
We will ensure all rock faces are to Ministry standards as required by the act.
We still do not know which stage will be extracted until we have a permit and can confirm our exact point of access.
It is still our intent to carry on and complete work as per the local OCP.
Ron Elliot should have the new blasting plan to us this week and I would like to set up a meeting with you again to present it and review the permit.

Regards

M. Barry Chalmers
O.K. INDUSTRIES LTD.
ISLAND CRUSHING CO.
ALL FUN AGGREGATE CO.
e-mail:bchalmers@islandpaving.com
Phone: 250-652-9211
Fax: 250-652-9270
Cell: 250-897-2296

From: Harrison, Donald MEM:EX [mailto:Donald.Harrison@gov.bc.ca]
Sent: Friday, October 6, 2017 2:29 PM
To: Barry Chalmers
Cc: Mel Sangha
Subject: 1610713_Millstr5eam Rd Reclamation Plan

HI Barry,

I was looking at the reclamation section in the NoW and it includes:

Proposed end land use is: Commercial/ Industrial Subdivisions
There is no proposed reclamation at this time as the area will be required for infrastructure during the period of this 6 year mining plan.
no backfilling or slope stabilization required during this six year mining plan
Reclamation cost estimate based on $5000.00 Ha. When mining completed, and site prepared for commercial/ industrial reclamation
costs will likely be lower, as it will generally consist of leveling and providing access to lots. Note: scaling of faces to be undertaken if required for safety considerations.

I would like to see a reclamation plan for the site that can be implemented in the event mining or development activities do not follow as planned or expected. The plan should include, but not limited to, reclamation works to keep the site safe and geotechnically stable to prevent rock-fall, control erosion from wind and water and control sedimentation and other potential off-site impacts.

Thank you,

Don

Don J. Harrison, P.Geo.
Sr. Inspector of Mines–Permitting, SW Region

BC Ministry of Energy, Mines & Petroleum Resources
Mines & Mineral Resources Division
3rd Floor, 1810 Blanshard St,
Victoria, BC V8W 9M9
Phone: (250) 953-3881

From:	Barry Chalmers
To:	Harrison, Donald MEM:EX
Cc:	Mel Sangha
Subject:	RE: 1610713_Millstr5eam Rd Reclamation Plan
Date:	Tuesday, October 10, 2017 9:21:14 AM

Don
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Thank you,

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Don J. Harrison, P.Geo.
Sr. Inspector of Mines–Permitting, SW Region

BC Ministry of Energy, Mines & Petroleum Resources
Mines & Mineral Resources Division
3rd Floor, 1810 Blanshard St,
Victoria, BC V8W 9M9
Phone: (250) 953-3881

From: Barry Chalmers
To: Harrison, Donald EMPR:EX
Cc: Mel Sangha
Subject: RE: Millstream Road Mine Application
Date: Monday, October 30, 2017 10:20:06 AM

Don
The Mine Plan and Blasting Plan will speak to local wells and the first phase and 5 year plan is 730 meters away

M. Barry Chalmers
O.K. INDUSTRIES LTD.
ISLAND CRUSHING CO.
ALL FUN AGGREGATE CO.
e-mail bchalmers@islandpaving.com
Phone: 250-652-9211
Fax: 250-652-9270
Cell: 250-897-2296

From: Harrison, Donald EMPR:EX [mailto:Donald.Harrison@gov.bc.ca]
Sent: Friday, October 27, 2017 2:58 PM
To: Barry Chalmers
Cc: Southwest Regional Mines Division EMPR:EX
Subject: FW: Millstream Road Mine Application

Hello Barry,

We received the email below this afternoon. I know you are looking at area wells but are you aware of a so-called water utility within 50-60m from the proposed site? Could you look into this please if it is not captured already in your assessment.

Thanks,

Don

From: s.22
Sent: Friday, October 27, 2017 1:36 PM
To: Southwest Regional Mines Division EMPR:EX
Cc: Harrison, Donald EMPR:EX
Subject: RE: Millstream Road Mine Application

Thank you for this information, I will be sharing it with the residents s.22 one glaring statement within the application is the statement the nearest residence is 730m away, and nearest water source is 730m away, those should be verified, by the applicants own maps it shows residents within a 100m from the site, and we have a well for our water utility within 50-60m from the site,

s.22

From: Pope, Rue EMPR:EX [mailto:Ru.Pope@gov.bc.ca] **On Behalf Of** Southwest Regional Mines Division EMPR:EX
Sent: Friday, October 27, 2017 12:08 PM
To: s.22
Cc: Harrison, Donald EMPR:EX
Subject: RE: Millstream Road Mine Application

Good afternoon s.22

Attached please find the Notice of Work package for the Millstream Road Mine application. The hard copy package is available for viewing at the District of Highlands Municipal offices as stated in the advertisement placed in the Goldstream News Gazette on June 21, 2017.

If I can be of any further assistance please contact me.

Thank you,

Rue Pope

Authorization Administrator
Ministry of Energy, Mines and Petroleum Resources
3rd floor – 1810 Blanshard St.
Victoria, BC V8W – 9M9
778-698-3649

From: s.22
Sent: Friday, October 27, 2017 11:18 AM
To: Southwest Regional Mines Division EMPR:EX
Subject: Millstream Road Mine Application

Hell, I am s.22 from a proposed mine application by OK Industries, in the 1900 block of Millstream Road in The District of Highlands. See image for reference.

We have had no information supplied to us regarding this application, as we will be adversely effected by many factors of this proposal we would like the Ministry provide the information of what is happening and what we can do to protect our quality of life in the sensitive ecosystem we live in.

The sign that is posted on the property is in a very dangerous location on the road, the road is small, with no sidewalks and on a double blind corner section of Millstream Road that has a high truck traffic count. Not many people would take their life in their hands to pull over and stand in such an area, as I have witnessed many tragic wildlife accidents in that exact spot.

Please provide all public information so that I can relay this to s.22

Thank you

s.22

From: Harrison, Donald EMPR:EX
To: "Barry Chalmers (bchalmers@islandpaving.com)"
Cc: "Ron Elliot - International Blasting Consultants Ltd."
Subject: FW: Millstream Road Mine Application
Date: Friday, November 3, 2017 1:06:00 PM
Importance: High

Also for your consideration ... See email below

Don

From: Harrison, Donald EMPR:EX
Sent: Wednesday, November 1, 2017 10:58 AM
To: Caughill, David EMPR:EX
Subject: FW: Millstream Road Mine Application
Importance: High

FYI ...

From: s.22
Sent: Tuesday, October 31, 2017 1:05 PM
To: Southwest Regional Mines Division EMPR:EX; OfficeofthePremier, Office PREM:EX; Minister, EMPR EMPR:EX; Mungall.MLA, Michelle LASS:EX; Horgan MLA, John LASS:EX
Cc: Harrison, Donald EMPR:EX; 'Laura Beckett'; info@dfo-mpo gc ca
Subject: FW: Millstream Road Mine Application
Importance: High

This email is in response to the OK Industries Proposed Mine at the 1900 Block of Millstream Road in the Highlands BC. s.22 s.22 below is some information that should be considered when processing the application. Furthermore I would like to add that no residents s.22 have been notified by Government or applicant regarding this application, other than a sign in a very poor location at best on the property on a very unsafe portion of Millstream Road that you would risk your life if you were to have people stopping to read.

Please find attached the images showing the location of the s.22 and OK Industries proposed mine, On it you will see the following,

- Houses are +/- 50 meters from the proposed mining site on Millstream Road, OK Industries application says residences are 750 meter away, which is either a mistake or a lie.

s.22 this well is at a high risk for contamination from OK Industries proposed mining use, considering previous damage to the aquifer by Millstream Meadows Landfill and Millstream Industrial Park.

- 1985 Millstream Road, adjoining the site, a single family residence right beside proposed mine.

- Millstream Industrial Park adjoining the site – This site has already destroyed the aquifer under it through unscrupulous practices including excessive blasting, causing contamination, similar activity that OK Industries would be conducting.

- Millstream Creek a Salmon bearing creek flows within feet of the proposed mine site and into Esquimalt Harbour.

There is already excessive noise and dust in our neighborhood from existing rock blasting and crushing at 2207 Millstream Road, which is substantially further away than the proposed OK Industry mine, plants are dying in our neighborhood and residents are having health issues with breathing, for me personally I have had more dust allergy attacks this year than my entire life combined. I see thick dust on my vehicles every day, the OK Industry mine will compound this problem, there is no way to prevent more dust from entering the air and increased truck traffic will stir it up even more, reducing our local air quality and making more health concerns for residents.

Millstream Road is a small meandering road designed for rural residential traffic, not for large tandem dump trucks, we are already seeing heavy increases of volume without this mine, no sidewalks or bike lanes are in place, a mine and its truck traffic are an unsafe use of these overtaxed roads. Take 5 minutes and Google 2000 block of Millstream Road and travel down towards the proposed Mine, look at the trucks in the images, and the size of the road, or better yet spend an afternoon at the site and see for yourself how much existing dust and commercial traffic we have in this rural neighborhood on these small winding roads.

Millstream Creek: This stream supported limited salmon runs in the past, restoration work has been done to create "fishways" and Coho salmon have returned. The spawning population is approximately 150 and is not currently restocked. This is a highly sensitive stream, that will be adversely affected by any mining across the road from it. As a resident I have witnessed Beaver, Otter, Bear, Heron's, Cougar , Deer all using the stream and the proposed mine site as a wildlife corridor.

The proposed mine was rejected by the Local Government, which does not want it, it is in conflict with the OCP and does not fit within the vision of the community. It is an environmental threat to local residents, wildlife and marine life, why would Provincial government overstep local government on such an important issue?

We are living on a rock, there are more suitable locations for mines in the West Shore and lower Island, this proposal is unacceptable with what we have already learned from past history of failed site management in the area at Millstream Meadows and Millstream Industrial Park, very compelling that on either side of this proposed mine we have had gross contamination of the environment and water aquifer that cost government millions to restore and yet today we are looking at approving a mine.

s.22 will not sit still while their quality of life, air and water are threatened. It is unfathomable to conceive that this

application even exists,

Sincerely

s.22

From: Pope, Rue EMPR:EX [mailto:Ru.Pope@gov.bc.ca] **On Behalf Of** Southwest Regional Mines Division EMPR:EX
Sent: Friday, October 27, 2017 12:08 PM
To: s.22
Cc: Harrison, Donald EMPR:EX
Subject: RE: Millstream Road Mine Application

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Attached please find the Notice of Work package for the Millstream Road Mine application. The hard copy package is available for viewing at the District of Highlands Municipal offices as stated in the advertisement placed in the Goldstream News Gazette on June 21, 2017.

If I can be of any further assistance please contact me.

Thank you,

Rue Pope

Authorization Administrator
Ministry of Energy, Mines and Petroleum Resources
3rd floor – 1810 Blanshard St.
Victoria, BC V8W – 9M9
778-698-3649

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We have had no information supplied to us regarding this application, as we will be adversely effected by many factors of this proposal we would like the Ministry provide the information of what is happening and what we can do to protect our quality of life in the sensitive ecosystem we live in.

The sign that is posted on the property is in a very dangerous location on the road, the road is small, with no sidewalks and on a double blind corner section of Millstream Road that has a high truck traffic count. Not many people would take their life in their hands to pull over and stand in such an area, as I have witnessed many tragic wildlife accidents in that exact spot.

Please provide all public information so that I can relay this to the Hanington residents.

Thank you

s.22

s.22

From:	Barry Chalmers
To:	Harrison, Donald EMPR:EX
Cc:	Mel Sangha; Cory Sangha
Subject:	Notice of Work
Date:	Friday, November 17, 2017 8:05:47 AM
Attachments:	SKM_C224e17111512370.pdf

Hello Don,

Please find attached answers to your October 13, 2017 email which form part of our Reclamation Plan. We would like to set up a meeting with you and Dave to discuss any questions or concerns the Ministry may have regarding the recently submitted Blasting and Reclamation plans, setbacks, public input you have received and any other matters regarding our Mines Permit application. Would you please let us know when you could be available.

Yours truly,

Barry Chalmers

M. Barry Chalmers
O.K. INDUSTRIES LTD.
ISLAND CRUSHING CO.
ALL FUN AGGREGATE CO.
e-mail:bchalmers@islandpaving.com
Phone: 250-652-9211
Fax: 250-652-9270
Cell: 250-897-2296

November 15, 2017

OK Industries Ltd. (the "Applicant") Conceptual Reclamation Plan for Millstream Road Quarry: Notice of Work Tracking Number 100202890

Issues to be addressed as per Ministry of Energy, Mines and Petroleum Resources (MEM) email dated October 13, 2017Requirements:

1) Notice of Work Submission Re: Reclamation Program

Your NoW application states: "There is no proposed reclamation at this time ..." yet below you mention "Our reclamation plan addresses ...". I still do not see a reclamation plan for this site. It is expected that you will conform to Ministry standards as required by the Mines Act and Code, but saying so in advance does not constitute a reclamation plan. A Mines Act permit cannot be issued without an approved reclamation plan; however the plan may be updated at a minimum every 5 years.

Describe the Proposed reclamation and timing for this specific activity: Based on current market conditions it is unlikely any direct reclamation activities of phase 1 will be undertaken during the life of this submitted 5 year mine plan. However, as each phase of the mine is exhausted and areas of it are no longer actively used in the quarry operations and/or are no longer required to support the ongoing operations of subsequent phases, reclamation of these unused areas will be completed. Reclamation cost is estimated at $5000.00 per ha.

During reclamation any disturbed land not required for mining or infrastructure will be graded and levelled to the final elevation of 95 meters, covered with previously removed and stored overburden, and vegetated with the appropriate native species as established by a qualified person as defined by the Province. Existing water courses will also be protected. Rock faces and walls will be monitored for safety and any scaling required will be completed during the mine operating period and post closure of the mine up to rezoning and eventual sale of the lands to address any safety considerations. In the event the lands are not approved for rezoning, regular monitoring of rock faces and walls will be undertaken and scaling completed as required.

The qualified person shall meet the standards established by the Ministry of Forests, Lands and Natural Resources, and/or other standards as established by the Province. Please note the following link:

https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/natural-resource-use/qualified-persons/list_qualified_persons.pdf

In addition the following two documents will be referenced:

a) Qualified Person Inventory Update: "Use of qualified persons in the Provincial administration and management of natural resources in British Columbia " and

b) "Qualified Persons Working in the Natural Resources Sector in British Columbia" Below is a short description of types of Qualified Persons:

Qualified Persons			
Registered professionals		Accredited practitioners	
Registered by a legislated self-regulating association	Registered by a non-legislated association	Accredited by an organization acceptable to government	Accredited by government
Rosters established by government			
Meets criteria specified in legislation or policy.			

Not withstanding the above, it is understood the Inspector can specify the qualifications of individuals for specific purposes.

2) Mines Act S. 10(1):

" ... as part of the application for the permit, there must be filed with an inspector ... a program ... for the protection and reclamation of the land, watercourses and cultural heritage resources affected by the mine, including the information, particulars and maps established by the regulations or the code."

a) The Notice of Work proposal includes a provision that should ground water be encountered during drilling, adjustments to the mining plan will be made to remain a minimum of 1 meter above the high ground water table. Should this occur the Applicant will notify the Inspector and prepare a plan for approval by MEM. The plan will be prepared by a Registered Professional working within his field of practice;

b) The long term mine operation is subject to 5 year mining plan updates as required by the Code. The Applicant will notify the Inspector if a flow of water occurs on any of mining faces during any 5 year plan period. The Applicant will then provide a water management plan that meets the provisions of the surface water management plan requirements in place at that time;

c) Information on existing surface water and surface water management is based on reports submitted with the Applicant's original mining permit application completed by SNC Lavalin and Aqua-Tex Scientific Consulting Ltd.;

Existing water courses will be protected by adequate set-backs from active mining operations as established in the attached revised site plan and by controlling all on-site water within the mine property;

d) Prior to the purchase of the proposed quarry by the permittee, the Province of BC contacted potentially affected First Nations and resolved any cultural heritage issues. In addition, as part of this mine application process MEM requested input on any heritage issues from First Nations. To the best knowledge of the Applicant no issues were brought forward to MEM.

3) Code: Part 10.1.1 (1) and (2)

This code section is self-explanatory and the Applicant has no specific comments to add other than they understand and agree that no work can commence until MEM has issued the appropriate Mines Permit and an MEM Inspector, including the Chief Inspector, can request additional information.

4) Part 10.1.3 (g)

The conceptual long term plan for the mine is defined in the Notice of Work. Upon completion of mining at the site, the Applicant will reapply to the District of Highlands to have the lands rezoned for commercial/light industrial use in accordance with this municipality's current Official Community Plan.

In the event this rezoning reapplication is approved, areas that have been mined out will be graded and levelled and the infrastructure necessary to meet the rezoning requirements will be constructed in accordance with the specifications of the agencies having jurisdiction. No work will proceed without the approval of these agencies. In addition, the Applicant will use overburden stored on site from the mining operation to grade and level areas where mining actives were undertaken. Such areas will be vegetated with native species as determined by the appropriate qualified person. Water courses will be protected. Scaling of rock faces will be undertaken to address any safety considerations. Once the development has been completed subdivided lots will be sold to third parties. The Applicant understands that Federal, Provincial and/or Municipal by-laws and legislation may change during the life of this permit. Should this occur, the Applicant will submit to MEM an updated closure plan.

In the event this rezoning reapplication is not approved and mining of the site is completed, the mine will be closed. Areas that have been mined out will be graded and levelled. The Applicant will use overburden stored on site from the mining operation to grade and level areas where mining actives were undertaken. Such areas will be vegetated with native species as determined by the appropriate qualified person. Existing water courses will be protected. Scaling of rock faces will be undertaken to address any safety considerations. It is understood that Federal, Provincial and/or Mu-

nicipal by-laws and legislation, may change during the life of this permit. Should this occur, the Applicant will submit to MEM an updated closure plan.

5) Part 10.1.17

The Applicant believes the submissions provided in the Notice of work, and additional information in this correspondence plus revised blasting plan recently submitted meet the requirements of section 10.1.17 of the Code. However, as noted herein and in the Notice pf Work, final pit walls will be examined prior to closure, or any alternate land use. If stability issues exist they will be addressed by an appropriate Professional (Geo Tech). However, the original blasting plan submitted with the mine permit application and the additional blasting plan recently prepared by International Blasting Consultants Ltd. indicate impacts from blasting on final walls will be minimal.

Based on the provided plans submitted with the mining permit application, the final wall in the consolidated material will be 50 degrees where mining was conducted in two benches. In other areas where ground contours may fluctuate relative to the planned final floor elevation of 95 meters, the wall will likely vary. Remaining benches will be seeded with appropriate vegetation if required by a qualified professional.

6) Part 10.4.1

Surface water management will be based upon the reports submitted with the Applicant's original mining permit application completed by SNC Lavalin and Aqua-Tex Scientific Consulting Ltd. This provides for control of all on-site water within the mine. If required by the mine permit, an annual report will be prepared by a qualified professional and submitted to MEM outlining the effectiveness of this plan.

Surface water due to rain and/or snowmelt will discharge within the land much as it does at present. These waters will be collected and monitored for sediment load as established by the Mine Permit. Reports will be submitted to MEM as may be required by Mine Permit.

The Applicant understands that Water Balance normally applies to major and much larger mines than the one which this application applies to. Further, the Applicant understands that Water Balance also normally applies when water is drawn from the site and used for management of geo-chemical processes normally associated with metal and coal mining. For this mine water will be trucked onto the mine site until an on-site water source is established. Once the final blast plan is approved by MEM the Applicant will provide MEM with the location of the on-site water source and will make the necessary applications for a water license.

7) Part 10.7

We believe you are referring to section 10.7.1, and if so the information provided in Notice of Work and this submission should meet the requirements of this section. Please advise the Applicant if you require more information on this section.

8) Conclusion:

The Applicant will, with each mandated 5 year update, provide an updated closure plan in accordance with the standards in place at that time. Once Phase 1 of the mine is completed it is anticipated that any new plans submitted will include progressive reclamation.

Dec 19th, 2017

BC Ministry of Energy, Mines & Petroleum Resources

Mines & Mineral Resources Division
3rd Floor, 1810 Blanshard Street
Victoria, BC, V8W 9M9

Attention: Don Harrison

Tervita Corporation - Highwest Landfill Operational Certificate 100193 Letter of Concern Regarding O.K. Industries Proposed Quarry

Dear Don Harrison,

As a leader in environmental and energy services, Tervita Corporation (Tervita) has a strong track record of safety and environmental compliance. We have built our track record on the safe, secure management of industrial and oil and gas wastes through our network of Treatment and Recovery facilities and industrial landfills.

Tervita is providing a letter of concern to the BC Ministry of Energy, Mines and Petroleum Resources (MEMPR) regarding the proposed blasting and development of a quarry just south of our current active landfill. Tervita has reviewed the material provided by O.K. Industries regarding the proposed quarry and have noted the following concerns:

1) Tervita currently carries out an active surface water monitoring program (Figure 1) as part of our environmental monitoring program. The proposed access along Tervita's property boundary and the quarry development may affect surface water quality.

   Tervita asks that O.K Industries provides more detail how surface water quality will be maintained and monitored throughout all stages of the project including development of the proposed access road.

2) Section 6.0 of the Millstream Quarry Blast Plan (the Plan), November 27, 2017 makes note that run-off water will be directed to a sump settling pond.

   Tervita asks O.K Industries to clarify where collected water will be discharged as not to affect surrounding surface water quality and what parameters the collected water will be tested for prior to release.

3) Tervita reviewed Section 7.0 and 7.1 of the Plan, and information provided about our Highwest Facility is incorrect. Tervita is unsure where our Facility knowledge was obtained.

   The Plan states "a liner has been finalized to cap the last completed cell. There are no new cells to be developed. All existing cells have been capped with liners and covered with materials."

   Tervita still maintains 2 active cells at Highwest which have no current cap. The other cells are currently in various stages of capping but no final cap is completed at site. Tervita still has the ability to construct future cells at site.

Tervita Corporation
500, 140 - 10 Avenue SE
Calgary, AB, Canada T2G 0R1

Tel: 1.403.233.7565
Fax: 1.403.261.5612

Section 7.1 of the Plan also states "... the predicted blast vibration intensity at the closest cell would be 8.8 mm/sec. This is well below the level of any concern for the liners, so there should be no impact on this operation..."

Tervita asks for O.K Industries to:

- Revise Section 7.1 of the Plan with the correct information regarding our facility.
- Provide the technical report supporting that a blast vibration of 8.8 mm/sec won't affect the landfill liner system.
- Provide rational in a technical report how a blast vibration of 8 mm/sec won't affect the waste stability in our landfill.

Prior to construction and development at the quarry by O.K. Industries, Tervita expects our concerns noted above to be answered. Tervita is able to share technical details regarding our design and monitoring programs so O.K Industries is able to properly assess potential affects.

Should you require further information, please feel free to contact me directly at (403) 234-4875.

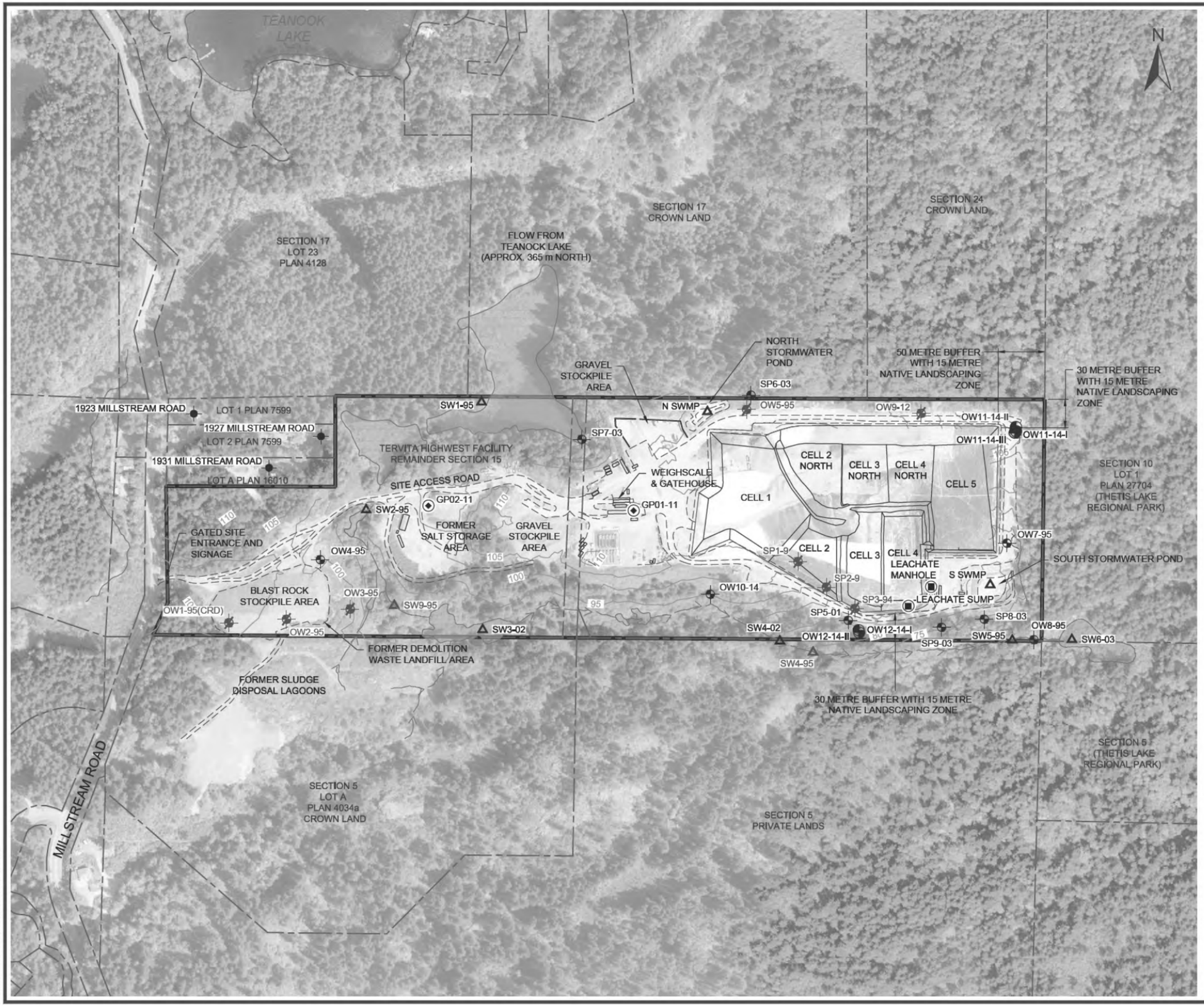
Sincerely,

Tervita Corporation

Peter Nelson
Advisor, Environment and Regulatory

cc: Shad Watts, Director, HSE, Tervita Corporation
Al Leuschen, Environmental Protection Officer, Ministry of Environment

Figure 1
Environmental Monitoring Program Sampling Points



NOTES:
REFERENCED FROM TERVITA DRAWING: *HIGHWEST LANDFILL FACILITY SITE PLAN* (DECEMBER, 2012), SITE RECONNAISSANCE.
IMAGERY: © 2017 CAPITAL REGIONAL DISTRICT (MAGE DATE: 2015).

LEGEND:

- PROPERTY BOUNDARY
- SITE LOCATION
- WATERCOURSE / FLOW DIRECTION
- SWAMP
- BOREHOLE COMPLETED AS A MONITOR NG WELL (SLR)
- BOREHOLE COMPLETED AS A MONITOR NG WELL (OTHER)
- BOREHOLE COMPLETED AS A MONITOR NG WELL (OTHER) (DECOMMISSIONED)
- SURFACE WATER SAMPLE (OTHER)
- SURFACE WATER SAMPLE (OTHER) (HISTORICAL)
- RESIDENTIAL WELL SAMPLE (OTHER)
- LEACHATE MONITORING LOCATION (OTHER)
- GAS PROBE (OTHER)

0 25 50 100 150 200 250 m

SCALE 1:4,000
WHEN PLOTTED CORRECTLY ON A 11 x 17 PAGE LAYOUT
NAD 1983 UTM Zone 10 U

THIS DRAWING IS FOR CONCEPTUAL PURPOSES ONLY. ACTUAL LOCATIONS MAY VARY AND NOT ALL STRUCTURES ARE SHOWN.

TERVITA CORPORATION
TERVITA HIGHWEST FACILITY
1943 MILLSTREAM ROAD
DISTRICT OF HIGHLANDS, BC

2016 ANNUAL MONITORING REPORT

SITE AND SURROUNDING LAND USE PLAN

Date: March 29, 2017
Project No. 201.88650.00000
Drawing No. 2

SLR global environmental solutions

Cadfile name: S_201-88650-00000-A5.dwg

Page 245 to/à Page 274

Withheld pursuant to/removed as

s.16

Record of telephone call – MEM Permitting, SW Region

Date: Dec. 13/17, Time: 3:10-3:20 pm

Project Name: OK-Millstream Rd Mine No. 1610713, Permit No. N/A

Call to (name): D. HARRISON, (company): MEM, (tel number): Office

Call from (name): Stephen Henderson (company): CRD, (tel number): 250-360-3136

Notes:

D. - concerns from CRD on applicat^n for quarry to S and EAST - sent to Kelly Trudeau

SH - OK has ROW across CRD prop. on N.; if OK gets MA permit, CRD will consider relocat^n of access for enviro + topographic reasons

- CRD looking to rezone to light industrial
- applied but applicat^n stalled, will reapply
- would bring in water service lines (CRD serv.)
- want to complete remediat^n in next couple years - cost-based remediat^n
- prop. owned by province - when it's sold - proceeds split betw BC + CRD (48-52?)

D. - area once used as limestone pit?

SH - possibly - way existing hole in ground
- then used to dispose septic tank sludge
- remediat^n involved removal of material
- BC + CRD spent ~ 10-13 $M in remediat^n (total?)
- CRD now doing GW testing + drilling new monitoring wells
- why calling again?

D - to hear if any concerns from CRD on quarry proposal to S/E

SH - CRD doesn't have concerns
- to may want to talk to Glenn Harris @ 250-360-3090

From:	Referrals Coordinator
To:	Southwest Regional Mines Division MEM:EX
Cc:	Bunce, Anna FLNR:EX
Subject:	RE: Consultation request for a Notice of Work for Construction Aggregate on Private Land near Tervita Landfill - File 1610713
Date:	Thursday, August 17, 2017 11:20:00 AM
Attachments:	image004.wmz image007.wmz image008.wmz image009.jpg image001.png Malahat Response R17016.pdf

Hello Maryann,
Thank you for forwarding my inquiry to Jim for further clarification.
Please find the Malahat Nation's response to the consultation request attached.
Best,

Heather Adams
Fisheries and Referrals Coordinator, Malahat Nation
110 Thunder Road, Mill Bay, BC, V0R 2P4
Ph: 250.743.3231 | Cell: 778.230.1778
referrals@malahatnation.com | www.malahatnation.ca

From: Dunkley, Jim R MEM:EX [mailto:Jim.Dunkley@gov.bc.ca]
Sent: August 16, 2017 3:11 PM
To: Southwest Regional Mines Division MEM:EX
Cc: Bunce, Anna FLNR:EX; Referrals Coordinator; Harrison, Donald MEM:EX
Subject: RE: Consultation request for a Notice of Work for Construction Aggregate on Private Land near Tervita Landfill - File 1610713

Hi Heather,
Please see the attached pdf proposed work plan. Teanook Creek will have a 45m buffer where it flows through the property. On the west side of the map, there is no mining in the vicinity of Teanook Creek as that section is not part of the proposed quarry. There is a road access right of way that parallels the creek that may or may not be used depending upon Highlands allowing road access at that point. Between that section and where Teanook enters the property there is a minimum 5 m buffer between mining and the property line plus the distance from the property line to Teanook Cr.
Hopefully this is clear when looking at the map.

Jim Dunkley, P. Geo
Inspector of Mines
300-1810 Blanshard St
Victoria, BC. V8W 9M9
250.953.4640

From: Southwest Regional Mines Division MEM:EX
Sent: Wednesday, August 16, 2017 2:42 PM
To: Dunkley, Jim R MEM:EX
Cc: Bunce, Anna FLNR:EX; 'Referrals Coordinator'
Subject: FW: Consultation request for a Notice of Work for Construction Aggregate on Private Land near Tervita Landfill - File 1610713

Hi Jim,

Please provide clarification for Heather Adams. Thank you.

Sincerely,

MARYANN J. BOUFFARD

OPERATIONS COORDINATOR

SW REGION MINING OFFICE

TEL: **778-698-3648**

MINISTRY OF ENERGY, MINES AND PETROLEUM RESOURCES

www.gov.bc.ca/ener

From: Referrals Coordinator [mailto:referrals@malahatnation.com]
Sent: Wednesday, August 16, 2017 2:33 PM
To: Southwest Regional Mines Division MEM:EX; Referrals Coordinator
Cc: Bunce, Anna FLNR:EX
Subject: RE: Consultation request for a Notice of Work for Construction Aggregate on Private Land near Tervita Landfill - File 1610713

Hi Maryann,

Thank you for sending over these environmental reports.

There are a couple things I noticed and would like to seek clarification on. The initial referral letter from June 5th states that there are no waterbodies in the application area. According to the Preliminary Ecological Site Investigation report, there are four different freshwater features within the subject property, including a large wetland in the center of the area and a portion of Teanook creek. Can you confirm that the proposed mining area does not overlap with Teanook creek, as well as the planned reserve distance from the creek to the mining area?

Thank you,

Heather Adams

Fisheries and Referrals Coordinator, Malahat Nation

110 Thunder Road, Mill Bay, BC, V0R 2P4

Ph: 250.743.3231 | Cell: 778.230.1778

referrals@malahatnation.com | www.malahatnation.ca

From: Southwest Regional Mines Division MEM:EX [mailto:SouthwestMinesDivision@gov.bc.ca]
Sent: August 11, 2017 3:37 PM
To: Referrals Coordinator
Cc: Bunce, Anna FLNR:EX
Subject: RE: Consultation request for a Notice of Work for Construction Aggregate on Private Land near Tervita Landfill - File 1610713

Hello Heather,

Anna Bunce informed me that you would like a copy of the environment reports. Please find 2 reports attached.

If you have further technical questions, let me know and I'll have the inspector get in touch to assist.

Cheers,

MARYANN J. BOUFFARD

OPERATIONS COORDINATOR

SW REGION MINING OFFICE

TEL: **778-698-3648**

MINISTRY OF ENERGY, MINES AND PETROLEUM RESOURCES

www.gov.bc.ca/ener

From: Bouffard, Maryann J MEM:EX **On Behalf Of** Southwest Regional Mines Division MEM:EX
Sent: Friday, July 14, 2017 3:23 PM
To: 'Referrals Coordinator'
Cc: Bunce, Anna FLNR:EX
Subject: RE: Consultation request for a Notice of Work for Construction Aggregate on Private Land near Tervita Landfill - File 1610713

Hello Heather,

Thank you for informing our office of your anticipated response date.

Please do not hesitate to contact me for further inquiries.

Sincerely,

MARYANN J. BOUFFARD
OPERATIONS COORDINATOR
SW REGION MINING OFFICE
TEL: **778-698-3648**
MINISTRY OF ENERGY AND MINES
www.gov.bc.ca/ener

From: Referrals Coordinator [mailto:referrals@malahatnation.com]
Sent: Friday, July 14, 2017 3:13 PM
To: Southwest Regional Mines Division MEM:EX
Subject: RE: Consultation request for a Notice of Work for Construction Aggregate on Private Land near Tervita Landfill - File 1610713

Attn: Maryann Bouffard,

Thank you for the above application (File 1610713) received June 5th, located within Malahat First Nations Traditional Territory. We are currently reviewing your application and expect to provide a response on or before July 31st.

Please note that not receiving a response to a referral from Malahat First Nation in the pre-application, current or post-application stage does not imply our support for your project.

Sincerely,

Heather Adams
Fisheries and Referrals Coordinator, Malahat Nation
110 Thunder Road, Mill Bay, BC, V0R 2P4
Ph: 250.743.3231 | Cell: 778.230.1778
referrals@malahatnation.com | www.malahatnation.ca

From: West Coast Land Referrals FLNR:EX [mailto:WestCoast.LandReferrals@gov.bc.ca]
Sent: June 5, 2017 9:23 AM
To: Referrals Coordinator
Cc: Southwest Regional Mines Division MEM:EX
Subject: Consultation request for a Notice of Work for Construction Aggregate on Private Land near Tervita Landfill - File 1610713

On behalf of the Ministry of Energy and Mines, please see the attached consultation request for a Notice of Work for a *Mines Act* permit, File 1610713.

Should you have any questions regarding this application, please contact Maryann Bouffard, Operation Coordinator, 778-698-3648 or by email:
SouthwestMinesDivision@gov.bc.ca

Regards,

FrontCounter BC | **Ministry of Forests, Lands and Natural Resource Operations**
2080 Labieux Road
Nanaimo, BC V9T 6J9
Tel: 250-751-7220 | Fax: 250-751-7224

FrontCounter BC Website | Toll-Free Contact Centre: 1-877-855-3222
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BRITISH COLUMBIA

Ministry of
Energy, Mines and
Petroleum Resources

Ref: 102955

January 15, 2018

s.22

FILE COPY

Email: s.22

Dear s.22

Thank you for writing on October 31, 2017 and sharing your concerns regarding the OK Industries proposed rock quarry at the 1900 Block of Millstream Road, Highlands, British Columbia.

Rock quarries in British Columbia are permitted by the Ministry of Energy, Mines and Petroleum Resources under the requirements outlined in the *Mines Act* and administered under various regulations, central to which is the Health, Safety and Reclamation Code for Mines in BC, and may be subject to other provincial, federal or local/municipal legislation and regulation.

The Ministry is currently in the process of reviewing this application, and we will undertake to consider and weigh all relevant information and perspectives. We take this application very seriously and are committed to conducting a thorough and comprehensive review based on input from affected stakeholders and agencies.

The Ministry understands the community's concerns regarding the protection of its groundwater resources and the impacts that may be associated from quarry blasting. We further appreciate and understand the identified ecological values this site has and how they are relevant to the surrounding lands.

The Ministry's review of the application will take into consideration the potential impacts on these resources and will also include assessments of other factors, including potential noise and dust to surrounding properties.

The Ministry appreciates your input and comments on this proposal and will undertake to make an informed and balanced decision.

Ministry of Energy, Mines and Petroleum Resources
Mining Division
Mailing Address:
PO Box 9395 Stn Prov Govt
Victoria, BC V8W 9M9
Telephone: 778-698-7258
Facsimile: 250-953-3878
Location:
3rd Floor
1810 Blanshard Street
Victoria

BRITISH COLUMBIA

Ministry of
Energy, Mines and
Petroleum Resources

Should you have any further questions or concerns regarding this application, please feel free to contact me at David.Caughill@gov.bc.ca.

Thank you, again, for bringing your concerns to our attention.

Sincerely,

FILE COPY

David Caughill
Regional Director, SW Region
Ministry of Energy, Mines and Petroleum Resources

Ministry of Energy, Mines and Petroleum Resources

Mining Division

Mailing Address:
PO Box 9395 Stn Prov Govt
Victoria, BC V8W 9M9
Telephone: 778-698-7258
Facsimile: 250-953-3878

Location:
3rd Floor
1810 Blanshard Street
Victoria

From:	Barcelonia, Gerry EMPR:EX
To:	Harrison, Donald EMPR:EX
Subject:	RE: Review of Blasting and Mine Plan for Proposed quarry o Millstream (1610713)
Date:	Friday, December 8, 2017 2:22:54 PM

Hi Don,

I think it is a very good baseline design for blasting which I recommend to be a part of the permit condition specifically the recommended blast design parameters under "5. Blasting Operations" and the requirement for an urban ticketed blaster.

Thanks

Gerry Barcelonia
Ministry of Energy, Mines and Petroleum Resources
3rd Flr. 1810 Blanshard Street, Victoria BC
Phone: 778- 698 7241
Cell: 250 480-9275

From: Harrison, Donald EMPR:EX
Sent: Friday, December 8, 2017 12:35 PM
To: Barcelonia, Gerry EMPR:EX
Subject: Review of Blasting and Mine Plan for Proposed quarry o Millstream (1610713)

Hi Gerry,

Can you please review and comment on the attached blasting plan from Ron Elliot. This takes precedent over the email I just sent you about the underground information. Much appreciated,

Don

Don J. Harrison, P.Geo.
Sr. Inspector of Mines–Permitting, SW Region
BC Ministry of Energy, Mines & Petroleum Resources
Mines & Mineral Resources Division
3rd Floor, 1810 Blanshard St,
Victoria, BC V8W 9M9
Direct Line: (778) 698-7014
Main office: (778) 698-3649