

RESOURCE MANAGEMENT

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March 31, 2016

Deputy Chief Inspector – Permitting
Ministry of Energy and Mines
(via email)

SUBJECT: Annual Reclamation Report Section 5, Reclamation Liability Cost Estimate, for Mine Permit No. Q-8-94, Mine No. 1610355

This letter and attachments are submitted to satisfy Section 5 of Annual Reclamation Reporting. The remaining sections of the report have been submitted separately.

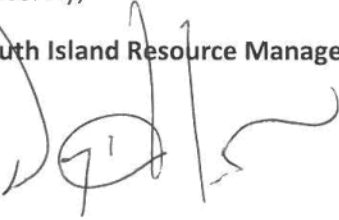
A recent ruling on an action initiated by the Cowichan Valley Regional District (BC Supreme Court Citation 2016 BCSC 489), delivered March 21, 2016, has currently shut down operations and called into question our ability to reclaim the mine as set forth in the permits under which we operate. The ruling is under appeal. The following estimated costs are based on completion of current operations under Ministry of Environment Permit #PR-105809 and does not account for extraction of all material within the Mine Boundary.

Estimated Costs to Complete Reclamation	Unit	Estimated Quantity	Unit Price	Total
Closure of Open Encapsulation Cell	s.21			
Relocation, Placement and Compaction of Remaining Contaminated Soil on-Site				\$ 30,000
Engineering Supervision				\$ 5,000
Sub-Total				\$ 35,000
Construction of Final Cover				
Supply and Installation of 30 mil LLDPE Cover System (incl. Geotextiles and Drainage Works)				\$ 36,000
Placement and Compaction of 1m low permeability soil blanket				\$ 28,000
Placement and Compaction of 1m growing medium, plus seeding				\$ 28,000
Engineering Supervision				\$ 5,000
Sub-Total				\$ 97,000
Long Term Monitoring				
Lab Analysis (surface water, groundwater, soil vapour)				\$ 8,000
Engineering, Sampling and Reporting				\$ 4,000
Required for 25 years				\$ 300,000
Sub-Total				\$ 300,000
TOTAL				\$ 432,000

At time of writing, no contaminated soil is located in the Soil Management Area, thus no relocation of soil would be required. Soils required for cover construction are already on site. Once covered, no water treatment system is required.

Sincerely,

South Island Resource Management Ltd,

A handwritten signature in black ink, appearing to read 'Doug Harlow', with a stylized flourish at the end.

per

Doug Harlow
Mine Manager

DH/tg

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PROVINCE OF BRITISH COLUMBIA
MINISTRY OF ENERGY, MINES AND PETROLEUM RESOURCES

QUARRY PERMIT

APPROVING WORK SYSTEM AND RECLAMATION PROGRAM

(Issued pursuant to Section 10 of the **Mines Act** R.S.B.C. 1996, C.293)

Permit: **Q-8-094**

Mine No.: **1610355**

Issued to: **South Island Aggregates Ltd**
497 A Garbally Road
Victoria BC V8T 2J9

For work located at the following property: **South Island Aggregates Quarry**

Lot 23, Blocks 156, 201 and 323, Malahat District, Plan VIP78459

This approval and permit is subject to the appended conditions.

Issued this 4th day October in the year 2006

Amended this 20th day of April, in the year 2009

Amended this 17th day of July in the year 2015

Amended this 28th day of October in the year 2015



Jim Dunkley, P. Geo.
Inspector of Mines

INTRODUCTION

This amendment issued October 28, 2015, replaces all previous permits and subsequent amendments. The purpose of this amendment is to clarify the end land use of the site, conform with the terminology used in the Ministry of Environment Permit "PR-105809", and to simplify jurisdictional issues by re-establishing the boundaries of the mine site to that prior to the amendment dated May 7, 2012.

PREAMBLE

Notice of intention to commence work on a quarry, including a plan of the proposed work system and a program for the protection and reclamation of the surface of the land and watercourses affected by the work dated August 23, 2006, was filed with the Inspector on August 23, 2006. Notice of such filing was published in The Pictorial on September 3, 2006, and in the BC Gazette on September 7, 2006.

This permit contains the requirements of the Ministry of Energy and Mines for reclamation. It is also compatible, to the extent possible, with the requirements of other provincial ministries for reclamation issues. The amount of security required by this permit, and the manner in which this security may be applied, will also reflect the requirements of those ministries. Nothing in this permit, however, limits the authority of other provincial ministries to set other conditions, or to act independently, under their respective permits and legislation.

This amendment references and includes terms of the following Reports:

1. Active Earth Engineering (AEEL) "Technical Assessment for Authorization to Discharge Waste", August 2012.
2. Active Earth Engineering, "Geotechnical Assessment", October 24, 2013.
3. Levelton Consultants Ltd "South Island Aggregates Stebbings Road Quarry", October 2012.
4. BC Geological Survey "Bedrock Geology of the South Island Aggregates Stebbings Road Quarry" October 28, 2013.
5. Active Earth Engineering, "Summary of Core Drilling and Testing Results", October 2013.
6. Active Earth Engineering "Environmental Procedures Manual for Waste Discharge Permit PR-105809", October 28, 2013.
7. Levelton Consultants Ltd follow-up memo "South Island Aggregates Containment Area-640 Stebbings Road, Shawnigan Lake, BC", November 13, 2013.

Unless modified by Permit Q-8-094, or the Ministry of Environment Permit PR-105809, all terms of the referenced reports form a part of this permit. Should there be a conflict between this permit and the Ministry of Environment (MOE) permit related to requirements under the terms of the MOE permit related to environmental protection, the terms of the MOE permit shall take precedence.

Decisions made by staff of the Ministry of Energy and Mines will be made in consultation with other ministries.

CONDITIONS

The Chief Inspector of Mines (Chief Inspector) hereby approves the work plan and the program for protection and reclamation of the land surface and watercourses subject to compliance with the following conditions: Unless modified by this amended permit all conditions within the original Notice of Work, dated August 23, 2006, and the subsequent amendment form an integral part of this permit.

1. Reclamation Security

- (a) The owner, agent or manager (herein called the Permittee) shall maintain with the Minister of Finance securities in the amount of fifty five thousand dollars (\$55,000). The security will be held by the Minister of Finance for the proper performance of the approved program and all the conditions of this permit in a manner satisfactory to the Chief Inspector.
- (b) The Permittee shall conform to all forest tenure requirements of the Ministry of Forests. Should the Permittee not conform to these requirements then all or part of the security may be used to cover the costs of these requirements.
- (c) The Permittee shall conform to all Ministry of Environment approval, licence and permit conditions, as well as requirements under the **Wildlife Act**. Should the Permittee not conform to these conditions, then all or part of the security may be used to fulfill these requirements.

2. Land Use

The surface of the land and watercourses shall be reclaimed to the following land use: **Forestry/Industrial**

3. Productivity

The level of land productivity to be achieved on reclaimed areas shall not be less than existed prior to mining on an average property basis unless the Permittee can provide evidence which demonstrates, to the satisfaction of the Chief Inspector, the impracticality of doing so.

4. Revegetation

Land shall be re-vegetated to a self-sustaining state using appropriate plant species.

5. Use of Suitable Growth Medium

- (a) On all lands to be revegetated, the growth medium shall satisfy land use, productivity, and water quality objectives. Topsoil and overburden (to rooting depth) shall be removed from operational areas prior to any disturbance of the land and stockpiled separately on the property for use in reclamation programs, unless the Permittee can provide evidence which demonstrates, to the satisfaction of the Chief Inspector, that reclamation objectives can otherwise be achieved.
- (b) No topsoil shall be removed from the property without the specific written permission of the Inspector.

6. Buffer Zones and Berms

Buffer zones and/or berms shall be established between the mine and the property boundary unless exempted in writing by the Inspector.

7. Treatment of Structures and Equipment

Prior to abandonment, and unless the Chief Inspector has made a ruling otherwise, such as heritage project consideration or industrial use:

- (a) all machinery, equipment and building superstructures shall be removed;
- (b) concrete foundations shall be covered and revegetated unless, because of demonstrated impracticality, they have been exempted by the Inspector; and,

- (c) all scrap material shall be disposed of in a manner acceptable to the Inspector.

8. Watercourses

- (a) Watercourses shall be reclaimed to a condition that ensures:
 - (1) long-term water quality is maintained to a standard acceptable to the Chief Inspector;
 - (2) drainage is restored either to original watercourses or to new watercourses which will sustain themselves without maintenance: and,
 - (3) use and productivity objectives are achieved and the level of productivity shall not be less than existed prior to mining unless the Permittee can provide evidence which demonstrates to the satisfaction of the Chief Inspector the impracticality of doing so.
- (b) Water which flows from disturbed areas shall be collected and diverted into settling ponds.

9. Roads

- (a) All roads shall be reclaimed in accordance with land use objectives unless permanent access is required to be maintained.
- (b) Individual roads will be exempted from the requirement for total reclamation under condition 9(a) if either:
 - (1) the Permittee can demonstrate that an agency of the Crown has explicitly accepted responsibility for the operation, maintenance and ultimate deactivation and abandonment of the road, or
 - (2) the Permittee can demonstrate that another private party has explicitly agreed to accept responsibility for the operation, maintenance and ultimate deactivation and abandonment of the road and has, in this regard, agreed to comply with all the terms and conditions, including bonding provisions, of this reclamation

permit, and to comply with all other relevant provincial government (and federal government) regulatory requirements.

10. Disposal of Fuels and Toxic Chemicals

Fuels, chemicals or reagents which cannot be returned to the manufacturer/supplier are to be disposed of as directed by the Chief Inspector in compliance with municipal, regional, provincial and federal statutes.

11. Temporary Shutdown

If this quarry ceases operation for a period longer than one year the Permittee shall either continue to carry out the conditions of the permit or apply for an amendment setting out a revised program for approval by the Chief Inspector.

12. Safety Provisions

All safety and other provisions of the **Mines Act** shall be complied with to the satisfaction of the Chief Inspector.

13. Monitoring

The Permittee shall undertake monitoring programs, as required by the Inspector, to demonstrate that reclamation objectives are being achieved.

14. Alterations to the Program

Substantial changes to the program must be submitted to the Inspector for approval.

15. Notice of Closure

Pursuant to Part 10.6.1 of the Health, Safety and Reclamation Code for Mines in British Columbia, a Notice of Completion of Work shall be filed with the Inspector not less than seven days prior to cessation of work.

16. Annual Report

Annual reports shall be submitted in a form and containing the information as and if required by the Inspector.

17. Site Stability

- a) The inspector shall be advised in writing at the earliest opportunity of any unforeseen conditions that could adversely affect the extraction of materials, site stability, erosion control or the reclamation of the site.
- b) The stability of the slopes shall be maintained at all times and erosion shall be controlled at all times.
- c) The discovery of any significant subsurface flows of water, seeps, substantial amounts of fine textured, soils, silts and clays, as well as significant adverse geological conditions shall be reported to the inspector as soon as possible and work shall cease until the inspector advises otherwise.

SITE SPECIFIC CONDITIONS:

18. The importation of soil is permitted subject to the following conditions:

- a) Soil imported must meet Ministry of Environment Soil Guidelines for the intended end land use, as identified in the Ministry of Environment Permit PR-105809.
- b) Importation of material other than defined in 18(a) is prohibited unless approved by the Inspector.
- c) The approval as required in 18(b) shall be processed as an amendment to this permit.
- d) Documentation identifying the soil condition and suitability for the intended end land use must be maintained at the mine site office and made available to the Inspector on demand.

19. Property boundaries shall be permanently marked and maintained, and pit boundaries (mine footprint) shall be permanently marked and maintained. All persons working on the property will be instructed as to the meaning of the markings; and,

- a) The Permittee shall install a substantial fence along the property boundary.

- b) This fence can be installed in stages with completion by September 1, 2016.
 - c) The portion of the property abutting the lands owned by the Cowichan Valley Regional District (CVRD) shall be fenced by September 2015. This includes lands abutting the restrictive covenant along Shawinigan Creek.
20. An 8-metre wide vegetation buffer shall be maintained on the northeast property boundary. The existing trees shall not be removed.
21. All blasts shall be electronically monitored.
22. Blast limits are established at 50 millimeters per second peak particle velocity and 120 decibels on the L scale, at the property boundary, and:
- a) The electronic monitor unit shall be located such that the air pressure (microphone) sensor has a clear unobstructed line of sight to the centre of the blast. The Inspector may allow or require monitoring at specific locations on a case by case basis as may be required.
 - b) The Manager shall maintain at the Mine Site Office, a signed copy of the Blast Log for each blast and a copy of the Electronic Monitor Record. Such records shall be made available to the Inspector on request.
 - c) Residents within 1km of the centre of the Quarry, and the Inspector, shall be given 24 hours notice of each scheduled blast. This 24 hours notice will establish a window of 1.5 hours within which the blast can be fired.
 - i. If, due to circumstances beyond the control of the Manager, a blast has been loaded and cannot be detonated within the time frame as described above, the Manager shall secure the site, post a watchman, and fire the blast the next day following the issuing of the required 24 hours notice. The Inspector may, at his discretion, allow the blast to be fired outside of the 24 hour notice window or, outside of normal hours of work. In such cases the Inspector shall establish the conditions necessary for firing the blast.
23. For purposes of establishing the 1 km radius, the centre of the quarry is defined as: **W 48° 33.103, N 123° 36.390**

Standard Quarry Blasting Conditions:

24. To the extent practical, all blasts initiated on the quarry shall be videoed, and:
- a) A copy of the video shall be kept at the mine office, and made available to the Inspector on request.
 - b) The video file shall include the following identification information as a word document;
 - 1. the pit name, and mine number
 - 2. the bench/location identification, including a map showing the location on the mine footprint.
 - 3. the name of the blaster
 - 4. the date of the blast
 - 5. the time of the blast
 - c) Other information and records as may be required as conditions of the permit, or directives of the Inspector.
 - d) The video shall clearly show the conduct of the blast in sequence of events including.
 - e) The free faces prior to the blast, with emphasis placed on the face profile and the rock structure.
 - f) The layout of the blast pattern including the tie ins.
 - g) The overall site layout of the area within the "danger zone."
25. Hours of work shall be between 7am and 5pm Monday to Friday. No work, except as defined below, shall occur on weekends or Statutory Holidays:
- a) Light maintenance is permitted on Saturdays between 9am and 4pm. *Light Maintenance is defined as:* work requiring the only the use of hand tools. It does not include air impact tools, air arcing, or any heavy equipment to perform a task.
 - b) Drilling operations shall be limited to the hours of 8am to 4pm Monday to Friday.

- c) Notwithstanding the above, nothing in this condition prevents the Manager from working outside the permitted hours of work should:
 - i) a safety concern on site is such that a failure to complete necessary work can result in harm or risk to workers, members of the public, or the environment or,
 - ii) an agency having jurisdiction declares an emergency and product from this operation is required to mitigate or assist in the mitigation of the emergency.
 - d) Should the provisions of condition 25(c) be implemented the Manager shall advise the Inspector without delay.
 - e) A sign shall be posted at the entrance to the Quarry clearly indicating the permitted hours of work.
26. The Manager shall schedule truck traffic entering or leaving the Quarry such that the trucks do not conflict with elementary school bus pick-up or drop off times.

Permit Conditions related to the Construction, Operation, and Maintenance of the Contaminated Soil Cells as referenced in this Permit.

27. Blasting:
- a) No blasts shall be initiated during the installation of the liner, (geo- tech liner) including the upper liner as required by the approved plan.
 - b) Installation includes the completion of any soil cover to a compactness of 0.66 meters thick.
28. Blasting of final walls in the quarry and for the contaminated soil cells:
- a) All final walls within the quarry shall be blasted using controlled blasting techniques, commonly referred to as "smooth blasting".
 - b) Following the blast all walls shall be scaled as may be required.
 - c) Any row of holes to be blasted within 10 meters of the common boundary between the Quarry and property owned by the CVRD shall be surveyed

in by a Licensed Land Surveyor. A copy of the survey shall be forwarded to the Inspector within one week of the blast.

29. Clay placed above the bedrock shall be placed in 250mm lifts, and compacted to 90% standard proctor until the Clay is 1 meter compacted thickness.
30. At the completion of each 1 meter (compacted) lift, the Manager shall provide the Inspector an As Built of the lift signed by a suitable registered professional, registered in the Province of British Columbia.
 - a) For soil imported into the cell, not including clay or sand, the Engineer of Record shall identify soils where 95 Proctor could not be obtained, and shall identify the type of soil, the maximum compactness the soil can sustain, and the maximum moisture content to attain the compaction.
 - b) For purpose of clarity, the Engineer of Record is not required to provide the above information on soil for every square foot of surface area but can provide the report in accordance with good engineering practice and standards.
31. All surface water shall be drained and controlled such that surface water does not have free access to the contaminated soil cell.
 - a) Following rainfall, snow melt, or inadvertent flow of water into the contaminated soil cell, the Permittee shall take such measures as may be necessary to drain any accumulations of surface water from the cell.
 - b) This may require suitable time frames to allow the drying of the soil to the point that the engineer of record is satisfied the moisture content does not compromise the achievement and maintenance of the required compaction as defined in this permit.
32. **Geotechnical**
 1. **Design and Construction**
 - a) The construction of the contaminated soil storage facility, as described in the application, is approved.
 - b) The sediment control pond shall be designed with a minimum 1 metre freeboard during the 200-year flood event.

- c) The Permittee shall ensure the facility is constructed under the supervision of a qualified professional engineer.
- d) Rock cuts and slope design shall be reviewed by a professional geotechnical engineer following blasting and excavation. The requirement for scaling and/or stabilization measures shall be evaluated to ensure the safety of workers working below these slopes.
- e) The facility shall be constructed in accordance with the design and construction specifications outlined in the application and approved by the Engineer of Record. The Engineer of Record shall review the construction drawings and specifications to verify that recommendations are properly incorporated as per design. Any changes to the proposed method of development will require previous approval of the Inspector.
- f) During construction, appropriate Quality Assurance/Quality Control (QAQC) shall be carried out. Within 30 days of completing construction, a construction QAQC report shall be submitted to the Inspector. This report shall include a summary of the liner installation, materials testing and compaction information and the QAQC measures employed during construction.
- g) The Permittee shall submit an As-Built report with drawings to the Inspector prior to operation of the facility. As-Built reports shall be sealed by a professional engineer and shall include a statement indicating that the facility was constructed in general conformance with the design and specifications. A complete set of As-Built drawings shall be kept at the mine site at all times and be provided to any Mines Inspector upon request.

2. Operation and Monitoring

- a) Prior to operation of the facility, the Permittee shall submit an updated Operation, Maintenance, and Surveillance (OMS) manual and a Mine Emergency Response Plan (MERP) to the Inspector that outlines procedures for the successful operation, maintenance, and surveillance of the facility and emergency preparedness and response procedures. These documents shall be kept current and updated over time as procedures are modified.

- b) All contaminated soil materials entering the facility shall meet the specifications as specified by the geotechnical engineer in the stability analyses and design of the facility. No contaminated soil materials that are subject to liquefaction (regardless of triggering mechanism) shall be disposed in the facility. Materials not meeting design specifications or operational requirements must be spoiled off-site at an alternate approved location.
- c) Instrumentation shall be installed as recommended by the professional geotechnical engineer to monitor conditions related to the stability of the facility. Monitoring frequency, thresholds, and response procedures shall be determined by the geotechnical engineer and be clearly described in the OMS manual.
- d) During operations, appropriate Quality Assurance/Quality Control (QA/QC) shall be carried out on the contaminated soil materials to ensure material properties meet geotechnical design and compaction requirements. Results of this testing shall be provided to the Inspector upon request. An up-to-date copy of QA/QC procedures, testing results, and inspection logs shall be maintained at site and made available for any Inspector upon request.

3. Reporting

- a) Annual inspections of the contaminated soil storage facility shall be undertaken by a qualified Professional Geotechnical Engineer with a report submitted to the Inspector by March 31 of the year following the inspection. The report shall include a summary of observations, review of monitoring data including instrumentation, QA/QC procedures, testing results, and recommendations with respect to any necessary changes to operating procedures. Any recommendations relating to health and safety or geotechnical stability shall be followed unless a suitable alternative course of action is approved in writing by the professional undertaking the review, or by a third party qualified Professional Engineer, as may be determined by the Inspector.

33. **Completion of the cell:**

- a) The final cover of each cell shall consist of two meters of till or residential classification soil, compacted to the degree necessary to prevent/limit erosion and sustain growth of appropriate vegetation.

- b) The permittee shall, prior to applying any vegetation cover to the completed cell, provide the inspector a plan designed by an appropriate qualified person which demonstrates the vegetation cover is suitable for the area, and as cover for the cell.
 - c) Filling of the cells shall be conducted on a one cell at a time basis. Filling of the next cell can only commence upon completion of the previous cell.
 - d) The previous condition does not prevent the Permittee from doing cell preparation, up to the point of being ready to receive fill material.
 - e) Prior to receiving fill in any cell, the Permittee must provide a signed As-built of the construction of the cell to date. This As-built, signed by the Engineer of Record, shall state that this construction meets the standards required by this permit and the Ministry of Environment Permit PR-105809.
 - f) Each completed cell shall remain in, and be subject to, ongoing monitoring under the terms of this permit, for the life of the mine.
 - g) Once completed, a cell shall not be disturbed without the written approval of the Inspector.
 - h) The Manager shall, by March 31 of each year, provide the Inspector a report identifying the volume of water treated through the treatment plant, and shall include all operating costs associated with the operation and maintenance of the treatment plant.
34. The Manager shall forward to the Inspector a copy of the report submitted to the Minister of Finance in relation to the annual Health and Safety Assessment. This report provides the annual production.
35. Surface water not subject to treatment in the water treatment plant shall be monitored at the discharge point to the receiving environment and suspended solids shall not exceed 25mg/litre. In addition, this monitoring shall include analysis for nitrates and nitrate content shall not exceed the limits specified for drinking water.
36. The mine foot-print shall revert back to that prior to the May 7, 2012 amendment.
37. Production from this quarry is limited to 240,000 tonnes annually.