

Questions Related to Ongoing Issues

1. I have asked repeatedly for a copy of the “Water Treatment Commissioning Report” – most recently in my September 17th letter to Minister Polak. (Attachment 1 in Google Update Folder – Attachment File: <https://drive.google.com/drive/folders/0B7NnLS02oRnYV0RfbVpicTIxbVE>. I never received a reply to this letter.) According to the Permit, water is not to be discharged before a commissioning report has been submitted.

May I please see a copy of the Commissioning Report, if such a report exists? If it does not exist, why is the site allowed to operate?

2. There were many commitments made in the Technical Analysis Report (TAR) that was produced by Active Earth. These were relied on by the Ministry when deciding to grant the Permit, and also by the EAB in their decision. The EAB actually quoted them in their report. Not all commitments ended up being articulated in the Permit wording.

Can the community expect MOE and MEM to ensure that CHH/SIA/SIRM honour these commitments?

3. We have repeatedly raised the issue about the water in the “lake” or “perpetual pond” at the bottom of the pit, next to the settling pond/water treatment area. While the EAB decision deferred to the findings of Active Earth vis-à-vis the water at the bottom of Lot 23, there is mounting evidence that the reports of Dennis Lowen (Attachment 2 in Google Drive Attachment Documents File) and Alan Kohut (Attachment 3), which conclude that there is ground water at the pit bottom, are accurate. Throughout the entire summer, and months into severe drought conditions, water was always present at the pit bottom; with the recent rains the “lake” has now returned.

I expressed concern over this issue to Al Hoffman with MEM in June of this year, and through an FOI request, we have obtained the correspondence between him and Matt Pye over this issue (Attachment 4, page 4). Matt Pye dismisses concerns by arguing there is no aquifer, that water at the pit bottom is rainwater only, and that the water remains over the summer months “because it is deep enough that it is present year around.”

Nowhere is it mentioned that SIA (perhaps with advice from AE) had attempted, without success, to pump the water out of the pond, or that there is a 15-20 foot trench blasted out from this area. The small adjacent hole dug specifically for this purpose had a pump active for months yet there was no effect on water level. (See photos in Google Update Drive – perpetual pond and settling pond photos: <https://drive.google.com/drive/folders/0B7NnLS02oRnYMIJxVVRNMVhBdlk>).

The EAB testimony of Anthony Miller (Attachment 5), the blaster who oversaw the blasting of a “15-20 foot trench” at the bottom of the site, was that a channel was blasted which drained a significant volume of water from the site at the time. A forthcoming report from Thurber Engineering reiterates that water is leaving the site without going through the water containment or treatment systems, and bypassing the “settling pond” altogether.

Why is the Ministry not taking seriously the mounting evidence that there is significant underground flow of water off this site that is bypassing the water treatment system?

4. No cover has been built over the “soil management area”. Since there is no cover on the contaminant area, in the event of a significant snowfall and then quick thaw and deluge of rain there will be a huge run-off of water from the site that appears not to have been calculated.

This type of event is not unusual at least 2-3 times a year. With the elevation of the site, the snowfall amount (and rain) can be significantly higher than at the lake elevation. 12” of snow plus 2” of rain can produce a mess, even in the best of times where there is decent drainage.

Why does the Ministry not insist that the soil management area be covered? Are there any provisions for the additional water that comes from fast melting snow (ie rain that falls after there has been a snow fall)?

Questions Related to Recent Events

1. There was a significant amount of water that was documented leaving the site on Friday, November 13th, then a breach of contact water into the main quarry on Tuesday, November 17th.

Photos and videos in Google Drive Update folder:

<https://drive.google.com/folderview?id=0ByjXcSRz392ZfktSV2dFb2x0c113MGIHa3o4cEtsVTBWQlZxdTNZSzVZcUEzOWhwbXVGZEE&usp=sharing>

This was not reported by the company or the operators (who were aware of it), but by CVRD bylaw staff and myself. The operator’s “Emergency Response Plan” (Attachment manual outlines the procedures to be followed in the case of Water Treatment System Failure/Breach (section 4.7) and Bedrock Fractures/Seepage

Encountered (section 4.8). Clearly these procedures were not followed, and only instituted as a result of third parties reporting what was happening at the site.

Given the threat of contamination to an entire community's drinking water source, why were operations allowed to continue after these breaches had been reported?

2. The incoming soil is very wet – during transportation last week in heavy rain, water and sludge was dripping out of the backs of trucks. One truckload appeared to be too heavy to dump, and three staff members were standing in the back of a dump truck appearing to be loosening the soil with shovels.

Does the soil have the moisture content it is supposed to have in order to be put into the containment cell? Was this being tested by the operators before the soil was dumped directly to the containment cell? Do you have records of this?

3. From the EAB Decision:

[75] Incoming soil will be weighed at the existing weigh scale located at the eastern entrance to the Site. The soils will then be deposited and inspected in the soil management area to ensure there are no hazardous waste soils. This area will also include a holding cell designated to temporarily store suspect or rejected soils.

[76] In addition to checking soil chemical quality, incoming soils will also be screened for soil moisture content (an issue when soils are supersaturated and free water is able to drain from the soil)

[77] Soil will be stockpiled in the soil management area. Once soil quality has been confirmed by qualified personnel, the soil may be relocated on the Site to the adjacent soil treatment area or to the permanent encapsulation area, depending on the nature of the contaminants (treatable versus untreatable).

Why is incoming soil being dumped directly off the embankment into the encapsulation cell (see google drive update folder for images)? This is blatantly at odds with the above EAB description and presents many potential problems including hazard to the liner and inadvertent acceptance of soil that should be rejected.

4. It is apparent that the settling ponds are not working as designed. There is supposed to be minimum water level and references are made to baffles in the discharge pipe to limit flow. Yet any water collected by the ponds quickly leaks out through the bottom and very little water (if any) is discharged out of the pipe.

Given the increasing evidence that the settling (or “exfiltration”) pond is not working as designed, why is the site allowed to continue to operate?

5. Trucks have been documented dripping water and soil, and the barge docked at Duke Point was photographed leaching liquid into the ocean.

Why are trucks allowed to transport the soil in unlined containers, and why is the barge not required to provide better protection?

6. The morning of November 26, SIRM staff were seen trying to thaw out pipes with a propane Tiger torch on the water treatment plant. Was cold weather put in planning for the water clarification system? There is a lack of insulation or a building to protect from cold temperatures. (See photo in Google Update Drive, Nov 26.)

Last week we saw trucks come and pump water out of the cisterns that are located at the edge of the containment cell (See photos in Google Update Drive, Nov 20.)

The water treatment system appears to be rife with problems – why won’t the Ministry halt all dumping of contaminated fill until it can be proven that the system is fail-safe?

Has the water that was pumped out been tested? Where has it been relocated to?

7. In your Soil Chemistry Report recently posted on the MoE website, you state “Soil chloride levels measured range between 216-631 mg/kg which exceeded CSR industrial land use standard of 90 mg/kg. Soil zinc slightly exceeded the CSR IL of 150 mg/kg CSR IL standard for one sample.” Then the report states that the soils “appear to meet permit requirements.”

Why are there exceedences noted, then no mention that this does not comply with the Permit?

8. Sulphur levels in both the water samples and soil samples were high, although there are no DWS levels listed and BC Contaminated Sites Regulation has only one restriction on Sulphur. It must be less than 500 mg/kg for Agricultural soil. Levels in the soil were 19700, 19900, and 31500. At the discharge, the water tested had 23.2 mg/L. In Andrew Weaver’s results from the summer, the control sample out of Shawnigan Creek had undetectable levels of sulphur.

<http://www.andrewweavermla.ca/wp-content/uploads/2015/07/ForWeb.xlsx.pdf>

Environment Alberta does have concerns about Sulphur

<http://environment.gov.ab.ca/info/posting.asp?assetid=7417&categoryid=4>

Effects of Sulphur on Soil:

Under aerobic conditions, specific micro-organisms may oxidize the S in wastes, water or soil through the reaction:

$S + 3/2O_2 + H_2O \Rightarrow H_2SO_4$ (induced by bacterial action)

Sulphuric acid increases soil acidity, solubilizes sulphates, mobilizes trace metals from soil, reduces the concentration of basic ions, decreases soil availability of nutrients, and ultimately reduces microbial activity. Acid neutralizing agents such as limestone (a mixture of calcium and magnesium carbonates), hydrated lime (calcium hydroxide), quick lime (calcium oxide) or equivalent alkaline products are suitable to buffer or mitigate these effects and should be used when remediating S-containing soils or landfilling S-wastes.

It appears that this site is introducing large quantities of Sulphur into the environment and water. Why is the Ministry not addressing this issue in its communications, and why is this acceptable to the Ministry?

Is SIRM following any of the above protocols? If they are, are they doing it in the Soil Management Area, as prescribed by the Permit, and then testing the materials before they are deposited to the containment cell? If they are, as we have seen, mixing cement into the soil that is already in the containment cell, is this a violation of the Permit? (See photos in Google Update Drive – November 19 files.)

9. From the EAB decision:

[112] The initial proposal in the TAR was that discharged water would meet BC Water Quality Guidelines for freshwater Aquatic Life. However, this was later changed as a result of the consultation process. The discharged water is now proposed to meet the most stringent of BC Water Quality Guidelines for Drinking Water use or Aquatic Life. If the water treatment system, as designed, is unable to achieve suitable effluent quality, the system design will be adjusted and, while any such adjustments are underway, effluent may be trucked to a treatment facility on an “as-needed” basis. Alternatively, additional storage tanks could be temporarily brought to the Site.

The water testing results had exceedences in a number of levels – suspended solids, turbidity, iron, manganese. Sulphur, which does not have a DW guideline amount listed, was very elevated.

Why does the Ministry downplay these exceedences and the issues generally with the water that is coming off this site and directly into drinking water sources?

Have you compared these results with any kind of control samples, taken from water before it has contact with the SIA site? Compare, for example, to Dr Andrew Weaver's control sample (Flow) in his samples collected last summer:

<http://www.andrewweavermla.ca/2015/07/16/soils-shawnigan-lake-watershed-questions/>
<http://www.andrewweavermla.ca/wp-content/uploads/2015/07/ForWeb.xlsx.pdf>

These results certainly do not meet the “most stringent BC Water Quality Guidelines”. In downplaying these issues, the Ministry creates increasing distrust and growing anxiety in the community, and contributes to an ever growing sense that the staff are working to ensure uninterrupted operations at the site, rather than to ensure that there is no risk to the environment, and no risk to the health of the people of Shawnigan Lake. The growing levels of cynicism and anxiety are themselves creating profound health effects in the people of this community, who are increasingly feeling driven to try as individuals to prevent further dumping into their watershed.

We are less than a year into the operations at this site, and there is evidence of pollution entering our drinking water systems. It is astonishing to the people of Shawnigan Lake that the Ministry allows ongoing non-compliance and contraventions of this Permit, and that the assurances and promises made to this community are proving to be increasingly hollow.

Questions related to Misrepresentation and Conflict of Interest

Pressing and serious questions arise from the relationship between CHH/SIA and the engineering company acting as the “Qualified Professionals”, Active Earth. It is clear that both MoE and MEM continue to rely on Active Earth for reports from the site, and this is disturbing for many reasons, not least of all that Active Earth engineers are potentially in a position to reap profits from the activities at the site.

Matt Pye has admitted under oath that Active Earth and CHH created a profit-sharing company, as indicated by the signed agreement from February 14, 2013. CHH and Active Earth concealed this agreement from MoE and MEM throughout the permitting process. It is clear that the Permit was granted without knowledge of

the overwhelming conflict of interest affecting the judgement of the Active Earth engineers. This also applies to the EAB decision.

There is a great deal of compelling evidence that the Qualified Professionals have been co-applicants in the Permit process, and potentially co-owners of the Permit now. Why does the Ministry not suspend the Permit until this is sorted out in court?

The EAB decision repeatedly deferred to the Technical Assessment Report of Active Earth, while negating many of the concerns identified by numerous other scientists and engineers. Now those concerns - about the design of the water treatment system (Dr Liyannage's testimony – Attachment 6), issues with Active Earths Assessments (SRA's submissions – Attachment 7), groundwater issues (Lowen and Kohut) and the actual capacity for any operators at this facility to truly capture all contact and non-contact water before it leaved this site.

The implications of the Ministry's decision to not act on this issue are very serious – the message it sends out to all of BC is that this government is fine with companies misrepresenting themselves throughout permitting processes, and that Qualified Professionals can continue to operate as such, even when serious conflicts of interest have been identified.

Why has the Ministry taken this stance, in view of the overwhelming evidence that staff have been consistently given inaccurate information by the Permit holders?

Documents filed related to this case can be found at:

<http://thesra.ca/about-the-sra/water-protection-legal-action/legal-action-archive>



December 3, 2015

File No: PR-105809

VIA EMAIL: marty.sia@shaw.ca and mike.sia@shaw.ca

Attention: Marty Block

Attention: Mike Kelly

Cobble Hill Holdings Ltd. (BC0754588)
c/o Herald Street Law
101 – 536 Herald Street
Victoria BC V8W 1S6

Dear Sirs:

Thank-you for your submission of November 20, 2015, in response to my letter of November 18, 2015 regarding my consideration of a decision under Section 2.12 of permit PR-105809 to reduce or suspend the operations authorized under permit PR-105809 (“the permit”).

Further to your November 20, 2015 submission, you met with Ministry representatives on November 23, 2015 in the Ministry’s Nanaimo office to review the submission, answer questions and discuss concerns with regard to the detail and scope of information provided. It was agreed during that meeting that additional information would be forthcoming. A supplemental submission from Cobble Hill Holdings Ltd. (“CHH”) was received by the Ministry on November 25, 2015 (dated November 24, 2015) which provided some additional information as discussed during the November 23, 2015 meeting.

The following is a summary of the items discussed during the November 23, 2015 meeting with identification of follow-up questions and items that need to be addressed in order to fully resolve the issue at hand and a determination and comments regarding the adequacy of the submission:

1. Independent Site Engineering Consultant:
 - a. Please provide further information to the Ministry regarding the qualifications for this person and their specific roles and responsibilities once they have been retained.

Ministry of Environment Office of the Executive Director
Regional Operations
Environmental Protection Division

Mailing Address:
PO Box 9334 Stn Prov Govt
Victoria BC V8W 9M1

Telephone: (250) 387-9990
Facsimile: (250) 356-5496
Website: www.gov.bc.ca/env

- b. As soon as possible after this consultant has been retained, Ministry technical staff would appreciate the opportunity to meet and discuss the operational requirements for water management required under the permit.
2. Water management activities on the site for managing “contact” water – this refers to water (leachate) which is collected from the engineered lined soil management area and the engineered lined landfill facility:
 - a. Inspections conducted by Ministry staff have determined that the permittee is managing “contact” water in accordance with the permit.
3. Water management activities on site for managing “non-contact water from disturbed areas of the property” – this is water which is from the pit and active areas of the property:
 - a. Non-contact surface water from the disturbed areas covered by the permit are required to be managed in accordance with the water management plan. This type of non-contact water is not expected to contain elevated levels of contaminants because the water has not come into direct contact with contaminated soil. However, to ensure that surface storm water being discharged from the site does not contain elevated levels of suspended solids, the water must be collected and treated through a settling pond before discharging to the environment.
4. Water management activities on site for managing “non-contact water from non-disturbed areas of the property” – this is water from areas where there is existing vegetation and there is no works/activities/roads occurring in those areas:
 - a. The permit includes a site plan which is inconsistent with the As-Built diagram regarding flow of non-contact water from undisturbed areas. Water from undisturbed areas is not regulated by the permit and this is consistent with information in the SIRM Environmental Procedures Manual July 2015 (section 7.2 *Non-Contact Surface Water*). However, the *Environmental Management Act* general prohibition applies to all property owners and activities whereby causing pollution is prohibited. General mine site water management practices are to prevent and divert clean surface waters from coming in contact with active areas of the mine site. Please provide clarification regarding the plan to manage this water flow.
5. Perimeter Ecological Assessment:
 - a. This assessment is out of scope for the information request.
 - b. The permittee is required to manage water (contact and non-contact-disturbed) which leaves the site either by a permitted surface discharge or exfiltration, to ensure compliance with the permit and to ensure that pollution does not occur as a result of the permittee’s activities/actions.

6. Actions taken to ensure compliance with the permit such as the construction of the 'hand-dug cut-off ditch to capture this (non-contact quarry pit floor storm water) water and route it to the settling pond', as well as the use of 'heavy equipment to substantially enlarge and reinforce the cut off ditch, completely eliminating the flow':

Short term

It is recognized that 'most of the ditch has been lined with geotextile and armoured with clear crushed rock', as well as the short term plan to deepen and extend the ditch. It is unclear if these actions have been recommended/directed by an engineer with water management experience, and that a signed-off plan has been prepared to address the site water management needs. Please provide this information.

Long term

SIRM plans to deepen and extend the west pit floor cut-off ditch; the ditch will be sized, sloped and armoured to accommodate a 1 in 200 yr storm event. The design calculations and as-built drawings will be prepared and signed off by a qualified professional engineer. As this work is underway and some complete, please provide the name of the professional engineer who is qualified to oversee and design this water management remedial work.

7. The settling pond and seepage:

The primary purpose of the settling pond is to prevent the discharge of surface waters with elevated levels of TSS to the receiving environment. The settling pond was designed by a qualified professional, and Ministry staff understands it was done in accordance with the MOE's guidelines for settling ponds at mine sites which do not require the pond to be lined. However, the retention time and elevated TSS levels of the discharge to the ephemeral stream are questioned. As discussed on November 23, 2015, the permittee is requested to provide a report by the Independent Site Engineer which evaluates the design and function of the settling pond to ensure the discharge quality will meet the compliance requirements of the permit. The report should include any recommendations to address any deficiencies or areas for improvement in the function of the settling pond. This report must be submitted to the Director on or before December 31, 2015 at 12:00 PM.

Documents provided to the Ministry in 2013 were deemed satisfactory at the time for the purposes described; however given the rain events and the evident surface flow of water from non-contact sources, an updated water management approach is necessary in advance of the next annual update of your Environmental Procedures Manual. Please provide a proposed earliest possible timeline for the update to be submitted to the Ministry.

The permittee is reminded that it is a requirement of the permit to report situations of non-compliance or by-pass of works. The ministry has no record of CHH initiating contact to the Ministry to make such a report on November 13, 2015. It was after the Ministry received complaints that our Compliance Officer contacted the permittee. Regardless of the post-event

sample results, the permittee is required to manage site water in a responsible and compliant manner. Sample results have indicated a slight TSS exceedance from the settling pond for a 1 in 10 yr rainfall event. The permittee is advised that compliance with the permit is required at all times.

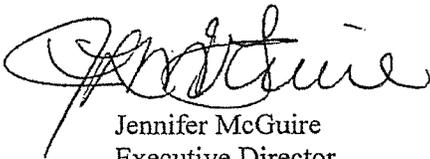
The submission dated November 24, 2015, defines a future scope of work for SIRM and Cobble Hill Holdings to fully address the issues at hand. It is unclear to the Ministry at this time which party will bear responsibility for completing the activities as set out on page 3 of 4 of your submission. Please specify which party is responsible for completing the work identified in the work activities list.

After reviewing the information provided to date, as well as a follow-up inspection by the Ministry conducted on December 2, the Ministry is satisfied that the permittee is currently taking reasonable steps to address the water management concerns which were raised in mid-November. Contact water from the contaminated soil management facility is being managed in accordance with the permit. There remain a few areas which require clarification and updating of the surface water management activities for non-contact (non-disturbed) water which the permittee is requested to address immediately.

The Ministry will continue to monitor the activities at the site, and expects a response to all of the items in this letter along with a general update of related activities on or before December 15th, 2015. Further updates should be provided twice a month (on the 15th and final day of each month) until such time as all the items in this letter are resolved to the satisfaction of the Director. Submissions must be provided to AJ Downie.

Should you have any questions concerning the content of this letter, please contact either AJ Downie at: AJ.Downie@gov.bc.ca, or the undersigned.

Sincerely,



Jennifer McGuire
Executive Director
Regional Operations Branch



December 3, 2015

File: 105809

Brian Farquhar
Manager, Parks & Trails Division
Planning & Development Department
CVRD
175 Ingram Street
Duncan BC V9L 1N8

Dear Mr. Farquhar:

Thank you very much for your letter dated December 2, 2015 regarding Storm Water Assessment and Water Quality Testing. As you are aware the Ministry of Environment (MoE) has been very actively involved in overseeing the activities occurring at the South Island Aggregates (SIA) Lot 23 property and we take matters of environmental protection very seriously.

On November 13, 2015 it was reported to the Ministry that there was surface water runoff flowing off the site from the vicinity of the MoE-permitted areas on Lot 23. MoE staff have attended the site on four occasions in November to conduct inspections and collect samples of soil, the surface water flowing off the site and the permitted discharge. Results from the Ministry's sampling as well as from sampling conducted by the permittee confirmed that the water leaving the site was non-contact stormwater runoff, which had not come into contact with contaminated soil. Based on the compliance assessments and spill reports related to the site, the Ministry issued a letter to the permittee on November 18, 2015 advising them of their legal obligations and requiring the submission of additional information to determine if further action was needed on the part of the Ministry.

In immediate response to the November 13, 2015 incident, the permittee installed surface water ditching and swales to prevent further uncontrolled flow of non-contact surface water off the western property boundary. They are also taking other actions including retaining an independent qualified professional to fully review the water management works, systems and procedures in place on the site to ensure they are all functioning according to plans, specifications and permit conditions. At this time the Ministry has no reason to believe that there are any issues with the contact water management systems; however, their performance will be also be fully reviewed by the independent qualified professional as part of the full review of site water management. This includes the settling pond. If the review reveals any inadequacies in the system, the Ministry will take swift action to ensure protection of the environment.

Attached to your December 2, 2015 letter you provided a copy of a report by Thurber Engineering. Ministry staff have received and reviewed the Thurber report and a brief summary of our review is attached as Appendix A. The report recommends additional review of water management infrastructure and procedures and your letter has requested a more detailed assessment. As mentioned above, this will be done and the Ministry will forward the Thurber report to the permittee and their qualified professional(s) for consideration in that review.

Also attached to your letter is a copy of a report by Madrone Environmental Services Ltd. Ministry staff have received and reviewed the Madrone report as well and a brief summary of our review is attached as Appendix B. The report summarizes some limited sampling conducted on behalf of the CVRD. The report confirms that all water quality guidelines were met at the ephemeral creek sampling site which receives all runoff and water from the portion of Lot 23 which is of interest. These results are generally consistent with significant additional datasets collected by the Ministry as well as by the permittee.

Ministry of Environment staff have been working extremely hard to address ongoing concerns raised at this site. Ministry staff have received in excess of 50 individual complaints and queries, and staff have conducted four inspections of the SIA site since November 12, 2015. At this time we are satisfied with the permittee's response to date and their planned activities. No further action is contemplated by the Ministry at this time.

Yours truly,



A.J. Downie
Director, Authorizations South
Ministry of Environment

cc: P. Hasselback, Medical Health Officer, Island Health Authority paul.hasselbackj@viha.ca

Appendix A: Ministry Review of Thurber Report

Thurber conducted a visual site assessment of the stormwater management works and indicated:

- Surface water ditching and swales were recently installed by the permittee to prevent a previous uncontrolled flow of non-contact surface water off the western property boundary. No surface water was observed to be crossing the property boundary at this location.
- The sediment pond basin is relatively porous. The presence of the large volume of water emerging from under the rock armour at the head of the ephemeral stream indicates that runoff storm water sourced from the SIA site is bypassing the sediment pond (i.e. by flowing under it) and is being discharged directly onto the land owned by the CVRD.
- The majority of the discharge volume contained within the stream is storm water that infiltrated into the shallow-subsurface on the SIA site, as well as storm and post-treatment water that infiltrated through the bottom of the sediment pond basin.
- It is not clear from SIA's WMP how rainfall falling within this portion of the site (i.e. the Cell 1 landfill area) is contained and managed, particularly during intermittent filling stages prior to the final placement of the landfill cap.

Recommendations include:

- A more detailed assessment of water management practices at the SIA site, particularly in the area of Cell #1 (including during its construction) would be required to assess the environmental risk to CVRD property.
- The CVRD bring the observations and concerns regarding the water management system to the attention of SIA and the BC Ministry of Environment.

Ministry response:

- The assessment was conducted by reviewing some published materials and by making visual observations from off-site. It is possible that some of the comments and conclusions may be based on incomplete information or without full understanding of permit requirements and engineered details (eg. As-built drawings for the Cell 1 landfill).
- The Environmental Appeal Board (EAB) carefully reviewed the permit, including all its requirements, considered all the evidence including with regard to surface water management and the movement of groundwater, and confirmed the permit subject to directions. The ministry amended the permit in accordance with the EAB directions. The ministry expects the permittee to comply with the permit including all its requirements.
- The required Environmental Procedures Manual (EPM) includes a Water Management Plan (section 7) that describes the management of contact water (leachate) and non-contact surface runoff from non-disturbed and disturbed areas.
- The permit requires that contact water (leachate) from the engineered lined soil management area and the engineered lined landfill facility be collected and, as necessary, treated, to achieve stringent water quality guidelines, prior to discharge to the settling/sediment pond. The Thurber report does not indicate that this is not occurring.

- The permittee has recently installed surface water ditching and swales to prevent a previous uncontrolled flow of non-contact surface water off the western property boundary some of the concerns raised have now been addressed.
- It is recognized that groundwater seepage will migrate through the subsurface to the ephemeral tributary to the west of the Site, i.e., to the area of the settling pond discharge.
- The EAB decision included consideration of groundwater seepage at the base of the quarry, and the EAB was aware that the groundwater seepage will be conveyed through the subsurface towards the west slope and may report to the ephemeral tributary, or may remain below grade as shallow groundwater flow; and that any groundwater that enters the seepage blanket from below the pit will be considered non-contact water, and this water will remain subsurface as groundwater flow while it is on the site (paragraph 489).
- The permit does not refer to a lined settling pond, nor does it prohibit exfiltration of water into the ground. The As-Built drawing for the settling/sediment pond does not show a liner and shows rip-rap on the bottom and interior sides of the settling pond around the pond outlet. To ensure the setting pond is functioning as designed by the permittee's qualified professional, a review is being undertaken (see below).
- Beginning on November 18, 2015 the Ministry initiated actions that will result in a full review of the water management works, systems and procedures in place on the site to ensure they are all functioning according to plans, specifications and permit conditions.
- A copy of the Thurber report will be provided to the permittee and their qualified professional(s) for review, response and consideration in the review.

Appendix B: Ministry Review of Madrone Report

Ministry Review of the CVRD-commissioned Madrone Report Findings:

- The CVRD water quality results overall were quite similar to the MoE results. Some parameters were higher in the MoE samples while others were lower. For example, the MoE discharge quality results had higher concentrations for copper, iron and aluminum than the CVRD results while the CVRD perimeter surface flows off-site had higher aluminum and copper than MoE sample results. Without additional information such as total suspended solids and turbidity for the CVRD samples, it is difficult to determine the reasons for the differences.
- The report states that sampling at MSW-2 (samples 2 & 4) was conducted while ditch digging and diversion was ongoing. This could affect the representativeness of the sample results by introducing excessive solids which can contribute to higher parameter results. Interestingly the CVRD off-site flow quality results upslope (MSW-2 #3) of the diversion works, showed consistently higher total metals concentrations than the downslope sample (MSW-2 #4).
- All PAHs and PCB water quality results for all samples were found to be below laboratory detection limits.
- At the ephemeral stream site (MSW-1) metals results were below BC Approved Water Quality Guidelines for the protection of aquatic life.
- The report found that some of the overland flow samples (MSW-2 #3 and #4) had elevated levels of copper, zinc, selenium and aluminum:
 - Levels of copper and zinc are reported to be over WQG for the protection of aquatic life but met the Health Canada drinking water guideline. The copper WQG used in the report needs to be hardness corrected. However, the overland flow samples both still exceed the hardness corrected copper guideline.
 - Sample #3 had a slight selenium exceedance above guidelines.
 - The total aluminum results were also significantly elevated (114mg/L and 29.5 mg/L) and were reported to be above guidelines; however, the BC Approved WQGs for Aluminum listed were incorrectly stated as 5000ug/L and should be *100 ug/L as dissolved aluminum*. No dissolved metals results were reported. While the exact reason for the elevated aluminum is difficult to determine, it may be due to elevated concentrations of solids entering the water quality sample containers due to disturbance near the sampling site.
 - For all contaminants, because these elevated levels were found in intermittent overland flow of disturbed soil and not in the ephemeral creek itself, the risk associated with these exceedances is likely very minimal, if any.
- It appears that the qualified professional who prepared the report is a hydro-geologist; a biologist with water quality impact assessment expertise is in the best position to assess and interpret water quality data.

General comments pertaining to report as well as other materials submitted by Sonia Furstenau on behalf of the CVRD (received via email on Monday November 30, 2015 @2:20pm):

- Comments made by Ms. Furstenau about pollution are incorrect and her comparison of stormwater runoff to the Shawnigan Creek mainstem upstream are inappropriate:

- Under the BC *Environmental Management Act* (EMA), we do not expect effluent discharges or even nearfield receiving environment concentrations to match those of background. EMA is structured to recognize that there is an assimilative capacity in the environment and constituents can be discharged in a certain quantities that still allow for the environment to be protected.
- In most places, it is not reasonable to expect or assume that tributary conditions are the same as mainstem conditions. Generally, each tributary does not make an equivalent contribution to the larger watershed and it would be necessary to consider both parameter concentrations and flows to give a true weight to each tributary. Monitoring episodic surface flows from a small focus area, can lead to inappropriate conclusions about risks to aquatic resources or humans.
- In the absence of extensive spatial coverage for flows and parameter concentrations, the MoE relies on water quality meeting Provincial Approved and Working Water Quality Guidelines and Site Specific Water Quality Objectives. Of particular relevance are those that are set to protect human health and aquatic life.
- Pollution has a very specific definition in the legislation and this definition talks about “substantial impairment of the usefulness of the environment”. The data does not appear to support that there is pollution occurring.
- Concerns about surface water quality are best addressed by a whole watershed planning and monitoring approach. Baseline information for the Shawnigan Lake watershed should be used to inform land use decisions. While managing individual stormwater contributions are important, they need to be considered within the context of a cumulative effects assessment of all surface flows and how they contribute to overall watershed planning and decisions for land uses.
- The Ministry has extensive experience with monitoring programs around the Province and the runoff water quality results at SIA are within the range or better than stormwater quality measured from other jurisdictions experiencing mixed rural and urban land uses.
- Aside from the issues above related to sampling of stormwater runoff and interpretation of this information, the Madrone report is consistent with MoE data and other data collected by the permittee which shows that **water quality guidelines were met for all parameters in the ephemeral stream** (which is downstream from the stormwater sampling sites), and this is what is most important in terms of characterizing risks to aquatic resources or human health.