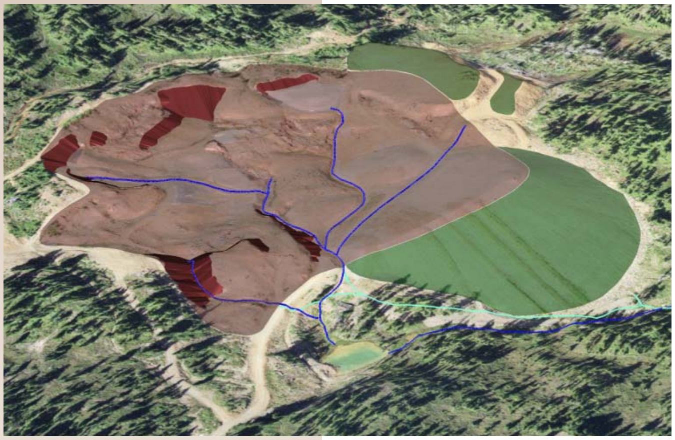
Tsolum River Partnership

Mt Washington Mine Remediation Detailed Design



Prepared for:

Tsolum River Partnership

Prepared by:

SRK Consulting
Engineers and Scientists

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Mt Washington Mine Remediation

Detailed Design

Tsolum River Partnership

C/O Pacific Salmon Foundation
Suite 300, 1682 West 7th Avenue
Vancouver, BC V6J4S6

SRK Consulting (Canada) Inc.
Suite 2200, 1066 West Hastings Street
Vancouver, B.C. V6E 3X2

Tel: 604.681.4196 Fax: 604.687.5532
E-mail: vancouver@srk.com Web site: www.srk.com

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Executive Summary

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1 Introduction

The Tsolum River Partnership has retained SRK Consulting (Canada) Inc. (SRK) to develop an Acid Rock Drainage (ARD) remediation plan for the abandoned copper mine on Mt Washington, Vancouver Island. The initial phase of the study was to:

- identify possible remediation technologies;
- reduce the list of these technologies to remedial alternatives for the site;
- evaluate and cost the short list of alternatives; and
- select a preferred alternative.

Phase II involved the development of a detailed remediation plan for the mine site based on the results of Phase I. This report presents the results of the Phase II study including the results of the field investigations, a detailed design of the preferred option, engineering analyses, design drawings, post construction monitoring and maintenance plans, and a preliminary construction schedule.

A vicinity map showing the project site is shown on Figure 1.1. A general location plan of the study area is shown on Figure 1.2.

2 Background

2.1 Geology

The Mt Washington Copper deposit is classified as a porphyry deposit subsequently superimposed by epithermal mineralization. The major rock types in the area are quartz diorite, and siltstones and argillites of the Nanaimo Group. The mineralization occurs as chalcopyrite-pyrite-quartz veins along the contact between the intrusive and sediments.

2.2 Mining History

The mine operated from 1964 until the fall of 1966. Two open pits (north and south) were created by the Mt Washington Mining Co. Ltd. from 1964 to 1967. Approximately 940,000 tonnes of overburden and 360,000 tonnes of ore were moved to produce 17,762 tonnes of copper concentrate. Ore was milled until 1967, after which time Mt. Washington Copper and Cumberland Mining Company went into receivership and the site was abandoned. Today, Better Resources owns the precious metal rights, TimberWest has surface rights, and Esquimalt and Nanaimo Railway held the subsurface rights until 2005 when they reverted back to the Crown. Base metal rights are believed to belong to Pan Canadian Energy Corporation.

The mine has two main pits - the North and the South Pits - and three waste rock dumps: the East and West Dumps adjacent to the North Pit, and the South Dump adjacent to the South Pit.

2.3 Water Quality

The North Pit is the main source of ARD which typically has pH levels below 4 and contains typical copper concentrations of 10 mg/L. The ARD originates as runoff from the shallow pit floor and waste rock on the pit floor, as well as the two waste rock dumps in the North Pit. The majority of the drainage from the North Pit flows northwards, feeding the headwaters of Pyrrhotite Creek. Part of the West Dump also contributes flow northwestward toward Piggott Creek (Figure 1.2). The South Pit in contrast has non-acidic drainage containing lower copper concentrations (1 mg/L), and flows towards McKay Lake and McKay Creek, eventually reaching the Tsolum River via Murex Creek (Figure 1.2). A detailed discussion of the water quality of the site is provided in Appendix B.

2.4 Tsolum River Fishery

Historically, the Tsolum River had large salmon runs. In the late 1940's, runs of up to 200,000 pink salmon, 15,000 coho, 11,000 chum and 3,500 steelhead were reported. Since that time several factors have affected the river and its aquatic life. These factors include development and logging along the banks of the Tsolum, which increased sedimentation in the river and its tributaries; the removal of gravel from the streambed for an airstrip at CFB Comox, which destroyed fish habitat; and water removal for irrigation for agriculture, which affected water flows and temperatures.

2.5 Remediation Objectives

In 1993, the British Columbia Ministry of Environment set water quality objectives for the Tsolum River to reduce the copper loadings (Deniseger and Pommen, 1995). The objectives set two limits on dissolved copper concentrations in the Tsolum River below Murex Creek namely: i) the 30-day average concentration should not exceed 0.007 mg/L Cu; and ii) the maximum concentration should not exceed 0.011 mg/L Cu.

The water quality objectives report further showed that in order to achieve the water quality objectives in the Tsolum River at peak loading periods, it would be necessary to reduce overall loadings from the mine area by at least 95% (see Appendix B). This translates to an upstream target of a 30-day average copper concentration at Branch 1200 of 0.257 mg/L, and a maximum of 0.5 mg/L.

2.6 Historical Remediation Efforts

2.6.1 Community Awareness

Although the community was aware of the decline of fish in the river, it was not until 1982, when, after operating for four years with very low returns, the Headquarters Creek Hatchery released 2.5 million pink fry into the Tsolum River and none returned, that the severity of the problem was discovered. Subsequent water monitoring in 1983 revealed high copper levels originating from the mine.

Several community members were concerned about watershed issues in the Comox Valley, particularly the loss of the fishery in the Tsolum River. From the time of the discovery of high copper levels in 1983, the local branch of the Steelhead Society of British Columbia (Comox Valley Chapter) began a campaign of letter writing, media outreach, and working with federal and provincial ministries to bring community attention to the mine problem, which and helped to bring about partial remediation for the mine site.

2.6.2 Remediation in the 1980s and Early 1990s

Beginning in 1987, federal and provincial agencies funded studies, monitoring and on-site works to address the ARD problem. Between 1988 and 1992, the Ministry of Energy, Mines and Petroleum Resources (MEMPR) put $1.5 million into remediation at the site. Steffen Robertson and Kirsten (Canada) Ltd. (SRK) was hired to design and install a till cover. The cover was placed over waste rock, which had been consolidated into the East Dump and lower North Pit. The purpose of this till cover was to prevent the ingress of oxygen and infiltration of water to the waste rock. Other MEMPR projects included the application and testing of an experimental asphalt emulsion/geotextile cover; and the application of calcium hydroxide to the pit walls and floor to attempt to raise the pH and reduce metal loading. Since the initial work done by SRK in 1988 and 1989, the site has been the subject of numerous government, consultant and academic reports and assessments.

Water monitoring results from 1993 to 1996 revealed little reduction in copper levels. However, since 1998, water quality monitoring has shown sustained reductions, approximately 50%, in the copper loading from the mine, which is thought to be a result of the on-site works.

2.6.3 Formation of the Tsolum River Task Force

In 1995, a focus group called the “Tsolum Team” was formed in response to ongoing concerns raised about the health of the Tsolum River. The Tsolum Team held a “Healing the Tsolum” workshop at the Comox longhouse in April 1997, which was attended by over 200 local residents. The next day, the Tsolum River Task Force (TRTF) was formed with the mission of “restoring the Tsolum River watershed to historic levels of health and productivity.” The Tsolum River Task Force was one of the first efforts to bring all levels of government (including First Nations), the industry and the local conservation community together to address the mining legacy.

The Task Force’s main funding source was DFO’s Habitat Restoration and Salmon Enhancement Program and B.C.’s Urban Salmon Habitat Enhancement Program, and most of the funding was directed towards their goals, rather than mine reclamation. A comprehensive report on work completed by the Tsolum River Task Force was published in 1999 (Campbell, 1999). However, the issue of minesite reclamation remained unresolved.

The Tsolum River Restoration Society (TRRS) was formed in the fall of 1998, to administer the TRTF funding and, when that ran out, to continue the work of restoring the river. TRRS has worked with the B.C. Ministry of Environment and Environment Canada on water quality monitoring of the Tsolum since that time, although funding for the monitoring program was an ongoing concern.

2.6.4 Formation of the Tsolum River Partnership

In June 2001, after the Task Force disbanded, Environment Canada issued a direction under Section 38(6) of the *Fisheries Act* to the owners of record of the surface and mineral rights. Esquimalt and Nanaimo Railway had owned the land since the original land grant of 1884. In 1992, the railway company severed and sold the surface rights to a forest products company, so both parties were named. The parties were directed to prevent the deposit of deleterious substances into fish habitat at the confluence of Pyrrhotite Creek and Murex Creek, upstream of the Tsolum River.

One indirect result of this direction was the formation of the first Tsolum River Partnership. The Partnership included:

- B.C. Ministry of Environment;
- Environment Canada;
- Fisheries and Oceans Canada;
- Pacific Salmon Foundation;
- TimberWest; and
- Tsolum River Restoration Society.

2.6.5 Spectacle Lake Wetland

In 2003, this Partnership developed the Spectacle Lake Wetland Project to achieve non-toxic water quality, at the compliance point downstream of the triple confluence of Pyrrhotite, McKay and Murex Creeks that drain the upper watershed. The wetland has been successful in achieving this goal to date, as copper levels in the Tsolum have been reduced by approximately 40%. The concern is that this form of passive treatment is time limited and the wetland will become less effective at reducing copper over time.

2.6.6 Mine Site Reclamation

With the improved water quality in the Tsolum River, it was expected that the health of the fishery would improve, but a longer-term solution was required. In 2005, the Tsolum River Partnership was expanded to include the Mining Association of British Columbia and the B.C. Ministry of Energy, Mines and Petroleum Resources as the focus shifted back to remediation of the major copper sources at the mine site.

2.7 Planning Final Remediation

2.7.1 Overall Process

In 2006, the Partnership initiated a process with SRK Consulting to develop a closure plan for the site, which would incorporate remedial measures to sufficiently reduce the Cu loading from the mine site, so that the water quality objectives for Pyrrhotite Creek and the Tsolum River would be achieved. The steps in this process were as follows:

- A series of site meetings and workshops involving all stakeholders to identify all possible remediation technologies, reduction of the list of technologies to remedial options for the site, and combination of the options into the preferred remediation plan;
- Initial evaluation and costing of the short list of alternatives;
- Selection and evaluation of the feasibility of the preferred alternative;
- Development of detailed designs;
- Construction; and
- Monitoring.

A workshop held in November 2006 concluded with development of a preferred method. However, in order to evaluate these methods, it was agreed that additional information would need to be obtained and further analysis would need to be carried out in order to demonstrate the practicality and effectiveness of the methods selected. The main options considered included:

- Flow equalization;
- Placement of engineered covers to the mine area;
- Clean water diversions; and
- Water treatment.

These options are described below.

2.7.2 Flow Equalization

One of the key options, that the workshop group felt was worth pursuing, was the concept of a flow equalization reservoir located at Pyrrhotite Lake. This lake is already affected by ARD from the mine site and would therefore be suitable for storage of contaminated water. As described above, highest copper loads are released from the site when dilution capacity in the Tsolum River is low. The concept would involve storage of snow melt water containing high copper load in the spring. The stored water would then be released into the river the following winter when flows in the river peaked due to rainfall.

To evaluate this option, a mass loading model was developed to calculate the required storage volume and the timing of release to the Tsolum River. Initial calculations demonstrated that even if the load could be perfectly optimized to make use of dilution in the river, the water quality objectives would not be met because the site produces more copper load than can be assimilated by the river.

Further calculations showed that the water quality objectives could be met if the copper load from the mine were reduced by 60% and the storage capacity of Pyrrhotite Lake was increased to

500,000 m^3 with an embankment averaging 9 m high. Several variants were considered, including construction of surface water diversions around Pyrrhotite Lake and piping of contaminated seepage from the pit to the flow equalization reservoir at Pyrrhotite Lake.

The cost of various options evaluated ranged from $960,000 to $3.4 million. For various technical reasons and the high cost resulting from combination of this method with source control measures, the flow equalization concept is not being pursued.

2.7.3 Cover Options

A number of alternative cover options were considered to reduce contact of water with the oxidized pit floor and waste rock. This is expected to result in a proportionate reduction in the acidity and copper load. The estimated area of the North Pit that would be covered is 49,000 m^2. The following sections present an overview of each of the cover options considered. Table 1 considers benefits and disadvantages for each option.

Low Permeability Soil Cover

A low permeability soil cover would need an estimated 1.5 to 2 m thick compacted till similar to the cover placed over the East Dump in 1988. This cover appears to have been successful in reducing loads from this source. The main limitation of this option is the lack of suitable material.

Bituminous Geomembrane

The next cover option considered for the North Pit was a bituminous geomembrane a much improved version of the asphalt impregnated geotextile installed in 1992. As shown in Table 1, this type of liner is easily installed, highly durable and is less expensive than a soil cover.

Concrete Cap

A concrete cap at least 50 mm thick would require extensive engineering work for both design and quality control during construction. The subgrade will need to be compacted to minimize settlement.

Geosynthetic Clay Liner

An alternative to the bituminous geomembrane considered was a Geosynthetic Clay Liner (GCL) cover. The installation of a GCL is similar to the bituminous liner but would require more quality control and engineering.

Table 2.1: Cover Options Benefits vs. Disadvantages

Option	Pros	Cons
Till Cover	• Long Term Durability • Ease of construction, require no special technicians or equipment for installation • Minimum subgrade requirements	• Relatively High permeability with soil available on site • Long haul distance hence increase cost • Volume of suitable material maybe difficult to find
Bituminous Liner	• Long Term Durability • Ease of installation • Very low permeability • Cheaper unit cost relative to till	• Requires subgrade preparation • Relatively higher material cost than GCL • susceptible to long term traffic if left expose
Geosynthetic Clay Liner	• Ease of installation • Low permeability • Cheapest material unit cost	• Requires confining stress to perform • Susceptible to weather if exposed • Requires relatively more subgrade preparation compared to Bituminous Liner • Might require an extra layer of geogrid for poor subgrade condition • Strict construction weather conditions
Concrete Liner	• Very low permeability • Long Term Durability	• Expensive material unit cost • Require extensive subgrade preparation and installation process • Susceptible to long term cracking and settlement • Strict construction weather conditions

Uphill Diversion

Existing surface drainages up gradient of the pit would be extended to direct runoff to the surface drainage channels on the new cover.

Water Treatment

Although it is believed that source control measures (diversions and covers) would eventually reduce the copper loading from the mine area by 90% and hence achieve the water quality objective in the Tsolum River, it was felt that water treatment should be considered in the design as a contingency in the interim period until the cover achieves its optimum effectiveness. This approach was agreed to, based on experience from previous work done at the mine, where it took several years before water quality improvements were observed following placement of the cover on the North Dump in the late 1980's.

Operation of a water treatment plant near the site is expected to be challenging due to the remoteness, high snow pack, lack of nearby power and limited storage space for sludges. In concept, a small portable lime system could be operated where Branch 1200 logging road crosses Pyrrhotite Creek. A small wetland is located downstream of the bridge and could be used to settle the resulting sludge.

Preferred Remediation Plan

The preferred plan that is the basis for the current design and the enclosed cost estimate includes:

- The installation of underdrains beneath the liner to collect contaminated seepage that will continue to flow, although much reduced, after the cover is placed;
- The installation of a bituminous geomembrane over the entire area of the North Pit including parts of the East and West Dumps;
- The placement of general fill material buttressed up against the existing pit walls to facilitate the placement of the bituminous geomembrane;
- The placement of a 1m thick layer of compacted till over the geomembrane to both protect the liner and to provide growth medium for revegetation;
- Surface drainage channels would be constructed on top of the cover to direct clean runoff to Pyrrhotite Creek;

The overall cover (geomembrane and till) is considered the most cost effective option that would provide the estimated 90 percent reduction of the current Cu load from the site;

The general consensus of the Partnership is that an effort be made to revegetate the 1m thick cover placed on the surface of the pit floor. The current plan includes an amendment to the till surface with placement of a thin organic layer of growth medium to promote early vegetation. However, as discussed in Sections 8 and 9, revegetation of the till cover may be viable without amendment and a further review is required before a final decision can be made. Furthermore, the main source of this growth medium is the stripped topsoil at Borrow Area 1. Using this material as a growth medium for the till cover would create reclamation problems for the borrow area.

Short-term treatment of the underdrain flow from beneath the cover may be necessary. The underdrain flow would be collected in two sumps located at the edge of the cover and transferred to a 150mm HDPE pipeline that would transport the flow to Branch 1200 for treatment. Seepage from the toe of the East Dump would also be collected and fed to the pipeline. At Branch 1200 the flow would be treated with lime and discharged into a settling pond located within the existing wetland area. Clean water in Pyrrhotite Creek would be diverted around the ponds and over to Pyrrhotite Lake.

3 Results of Field Investigations

3.1 Water Quality Analyses and Flow Measurements

The primary purpose of the remediation plan is to address copper loadings from the site that impact water quality in the Tsolum River. This section presents the conclusions of SRK's interpretation of geochemical information collected at the Mt Washington Mine site in 2007 designed to support development of the final remediation plan. The investigations included the collection of field and water quality data from three weirs on eleven occasions during the freshet starting in April and ending in July, by representatives from the Tsolum River Partnership and B.C. Ministry of Environment (BCMoE). During each visit, the height of flow in the weir notch was measured and a water sample was collected for laboratory analysis of pH, acidity, sulphate, total and dissolved copper, iron and aluminum. Analysis was performed under supervision of BCMoE.

In addition to the above, a detailed water quality sampling was completed on July 9, 2007 by representatives from SRK, the Tsolum River Partnership and Environment Canada. SRK inspected the site and identified 23 potential surface water sampling locations and four groundwater monitoring locations.

A detailed discussion on the interpretation of the data collected is provided in Appendix B.

The following is concluded from this work:

- Copper loads originate mainly from the pit floor and more specifically in the eastern part of the pit, including the bench of highly fractured rock on the eastern edge of the pit;
- Distribution of loads, shown by weir monitoring and pit area sampling in 2007 were consistent with load distribution calculated in 2000;
- Anomalous chloride concentrations in one area of the pit and in the seepage from the East Dump suggest that copper load, emerging from the toe of the East Dump is largely a result of leaching of the dump by water originating in the pit rather than infiltration through the soil cover on the dump; and
- Reduction of water contact with the pit floor is not expected to result in a directly proportional decrease in loads because copper concentrations in water beneath a cover will increase due to a predicted decrease in pH. A 90% reduction in load will require roughly a 95% reduction in flow.

3.2 Borrow Source Investigations

A borrow source investigation was completed in August 2007 in the Mt. Washington area to identify the quality and quantity of material available for construction within a 10km radius from the site. The goal of the investigation was to identify sources for a granular material for general earthwork, a gravel material for drainage and a riprap material for channel armour. The investigation was carried out by SRK staff consultant engineer with assistances from Chatterton Geosciences Ltd. An excavator was brought to site to excavate a series of test pits for sample collection and visual inspections by the Engineer.

Details of the investigation are outlined in the memorandum attached in Appendix A, which includes location figures, laboratory results and test pit logs. The findings for the investigation was that one borrow area was identified for general earthwork material source. No ideal or high potential sites were found for granular or riprap sources. Furthermore, it is recommended that a more detailed investigation to be completed on the identified borrow area to confirm its boundary limits. A second borrow area will have to be developed for road fill and riprap. These borrow areas are currently contributing to TimberWest's productive forest land base and every effort will be made to ensure production of a second crop of commercially viable trees.

4 Site Conditions

4.1 Surface Conditions

The historic Mt. Washington mine site is located approximately 25km northwest of Courtenay on Vancouver Island near the summit of Mt. Washington at an elevation of approximately 1330m, as shown in Figure 1.2. The site is on a northerly trending ridge that is the watershed divide between three drainage systems.

The site is located at the headwaters of Pyrrhotite Creek between Piggott and Mckay Creeks. Mckay Creek and Pyrrhotite Creek are tributaries of the Tsolum River while Piggott Creek is part of the Oyster River system. Surface and groundwater flow from the site towards the three creeks. Vegetation at the site is classified as sub-alpine mountain hemlock, Pacific silver fir zone.

The south pit and associated waste rock dumps are in the Mckay Creek catchment, while the north pit and associated dumps are in the Piggott Creek and Pyrrhotite Creek catchments (see Figure 1.2 and 4.1). Figure 4.3 is an aerial photograph of the site looking south. The east dump and the north pit (as well as all material in the north pit) drain north to Pyrrhotite Creek, while the west dump drains to Piggott Creek. The north pit is approximately 4.5ha, while the surface area of the east dump and west dump are approximately 2ha and 1ha, respectively. The surface area of the catchment up-slope of the north pit is approximately 3.3ha. A diversion ditch was constructed adjacent to the extent of the north pit, as shown in Figure 4.2, in an attempt to divert surface runoff from the up-slope catchment around the north pit area to Piggot Creek. The height of the pit wall of the north pit just north of the diversion ditch is less than 10m. The surface area of the south pit was estimated to be 4ha and the surface area of the waste dump in the southeast end of the pit is approximately 1.5ha. The pit wall of the south pit exposes a rock face to a height of up to 24m.

In 1988, waste rock in the pit area was consolidated into the East Dump and recontoured to a 3:1 (H:V). Two lifts (each 0.5m thick) of compacted till were then placed on the 3:1 north facing slope of the east dump and the 10:1 south facing slope of the east dump. In 1989, the work focused on construction of shotcrete lined seepage collection channels within the pit area in an attempt to divert runoff and seepage in the pit around the East Dump located directly below the Pit. From 1990 to 1992, The BC Ministry of Mines experimented with the placement of different types of covers over small test areas in the pit. The program included stripping off the broken and oxidized rock, and the washing down of exposed bedrock. To monitor the effects of the control measures and, in an attempt to understand the surface and subsurface hydrology, the work also involved the installation of monitoring equipment such as v-notch weirs, piezometers and wells for measuring water levels, oxygen and temperature. Four v-notch weirs were installed both above and below the East Dump and 14 piezometers were installed in the North pit. Figure 4.2 shows the location of the piezometers, the seepage collection ditches, the v-notch weirs, the pit outline and East and West waste rock dumps.

4.2 Subsurface Conditions

The bedrock in the North pit ranges in competency from soft and broken up (highly fractured), to highly competent at depth. The thickness of the highly fractured skin has not been measured and likely varies across the pit area. The typical thickness of shattered rock “overblast” for open pit mines of this scale is in the range of 1 to 2 m.

5 Hydrology and Hydrogeology

5.1 Climatic and Hydrologic Setting

The Mt. Washington mine site is 1 km north of the summit of Mt. Washington, located on the northeast side of the Mt Washington ridge, on a moderately steep and hilly slope. The climate is mild, average temperatures vary from –2ºC in the winter to 14ºC in the summer. Average total precipitation for the mine site has been estimated to vary from 2000 mm to 4200 mm (SRK, 1987). Drainage from the mine site enters the steeply sloped Pyrrhotite Creek, and then flows into Murex Creek and ultimately the Tsolum River (Figure 1.2).

The hydrology of Pyrrhotite Creek and the Tsolum River present a significant challenge to remediation of the site due to the difference in timing of peak flows and copper loadings in the creek and river.

Pyrrhotite Creek experiences two peak flows (See Figure 5.1). The first peak occurs in May in response to melting snow on Mt Washington. This event causes copper concentrations to increase in the drainage due to flushing of oxidation products. As a result, copper loads increase. Flows and copper concentrations are lower in the summer months. In the fall, a second flow and copper loading peak occurs in response to rainfall prior to accumulation of snow at the mine site elevation.

In contrast, the Tsolum River receives most of its flow from low-elevation streams fed mainly by fall and winter rainfall. Flows increase slightly in the spring due to melting of snow on Mt Washington, but flows are not sufficient to dilute copper load from the mine site. Copper concentrations currently peak at over 20 µg/L in the Tsolum during the spring (70 to 90 µg/L historically). A second concentration peak at the same levels occurs in the fall. Peak discharges in the Tsolum are observed in the winter due to rainfall events. Figure 5.2 shows the flow and Cu concentration over time.

In summary, peak flows in Pyrrhotite Creek occur in the spring when Tsolum River flows are decreasing and relatively low, which thereby maximizes impact on the river water quality at the times when salmonids are most sensitive. Remediation efforts at the site must achieve a high level of effectiveness because dilution cannot be used to a significant degree.

5.2 Surface Flow Data

5.2.1 Regional

The daily surface flow data from Water Survey of Canada (WSC) gauging stations at Pyrrhotite Creek near Branch 1200 (08HBB09), Murex Creek (08HBB10), Tsolum River below Murex Creek (08HBO89 and Tsolum River near Courtenay (08HBO11) were used to develop the flow distributions shown in Figures 5.1 and 5.2. The locations of these stations are shown on Figure 1.2.

5.2.2 Mine site

Flow data for the mine area has been recorded at Weirs 1, 2, 3 and 4. Weirs 2, 3 and 4 record surface runoff and shallow groundwater that flows through the diversion ditch system on the site. Weir 1 records flow that emerges from a sump located at the base of the East Dump (Figure 4.1). The sump actually collects seepage that is captured by an internal drain within the dump. It does not record flow or runoff from the cover.

The weir flow data provides the best indication of surface and shallow surface water flow, however, the discontinuities in the data make their use in calculating monthly flows across the site difficult. In SRK's 2000 hydrological and hydrogeological study, SRK estimated average monthly flows in the weirs by extrapolating long-term runoff (2130mm/yr) to the site. At the time, the weir data was used as a partial validation of these estimates. Because flow to Weir 1 consists of precipitation that infiltrates through the current cover as well groundwater underflow below the dump, average monthly flow estimates were made for the combined flows of Weir 1 and Weir 2, and Weir 3. Figure 5.3 shows observed data collected in 2007 compared to the calculated monthly flows for selected months, when weir data was available. Although, isolated monthly flow data for the weirs would not necessarily be expected to be close to the calculated long-term average values, the calculated values are comparable to the observed flows (i.e. well within an order of magnitude).

5.3 Flood Analysis

The design peak flows for the surface drainage channels on the North Pit till cover and the diversion of Pyrrhotite Creek at Branch 1200 and the Uphill Diversions were calculated using an equation determined empirically from analysis of flood data for Vancouver Island, the western South Coast Mountains of B.C. and Region 2 of Washington State (northwestern corner of Washington State).

The equation used for determining the flood discharge is:

$$Q_{200} = 3.4 * A^{0.83}$$

where Q_{200} = 200-year instantaneous flood (m^3/sec) and A is drainage area (km^2).

For the purposes of this design report, the design flow for each of the surface drainage channels is assumed to be the same and is based on the catchment area shown in Figure 5.4. The catchment area for the Uphill Diversions is also shown on Figure 5.4. The catchment area for the Pyrrhotite Creek diversion is shown on Figure 5.5. Table 5.1 lists the catchment areas and the 200-year discharges for the surface channels, Pyrrhotite Creek Diversion and the Uphill Diversions.

Table 5.1: Watershed calculations

Catchment	Area (km^2)	200 Year Discharge (m^3/s)
Surface Drainage Channels	0.092	0.46
Pyrrhotite Ck Diversion	0.292	1.22
Uphill Diversions	0.033	0.2

Flow from the surface diversion channels will discharge into the Dry Pond. This pond will function as a stilling basin to dissipate energy during periods of high flow. As the channels will be riprapped to slow the velocity and reduce erosion potential, it is not anticipated that an erosion protection will be required for the Dry Pond. However, the storage capacity of the Dry Pond and its capacity to dissipate high flow will be evaluated in the event construction of the till cover and the surface drainage channels are delayed until the Year 2. Runoff from the relatively smooth geomembrane liner without the protection of the till cover and drainage channels, could generate runoff volumes that may exceed the capacity of Dry Pond.

5.4 Groundwater Flow

Water enters the site via direct interception of precipitation (rainfall and snowmelt) and upgradient recharge in the form of subsurface groundwater flow.

As shown in Figure 5.6, water flow through the pit area can be divided into two distinct flow systems. A shallow flow system comprises all water flow above competent bedrock, and incorporates true surface flow, as well as flow through shattered bedrock and residual waste rock present over most of the area. The steep topography, thin saturated thickness and high permeability of these units result in this system being driven by short duration and, high intensity climatological events (i.e. “event driven”) with a small baseflow component. This flow is equivalent to the flow intercepted by the diversion ditch system as measured by the weirs.

These diversion ditches are not able to collect all of the water from the pit area during intense precipitation events, such as the one that occurred on October 23, 1989. At these times, some water from the pit area bypasses the diversion ditches and flows through waste rock at the base of the East Dump, resulting in temporarily high discharges to Weir 1 (Golder, 1990).

Much less water enters the deeper flow system in the competent and fractured bedrock. The three nested piezometer installations at the site have downward, vertical groundwater gradients, suggesting that the pit area is a source of groundwater recharge to the deeper groundwater system. However, given that the hydraulic conductivity of the bedrock is approximately two to three orders of magnitude lower than the shallow permeable units (SRK 2000), it is unlikely that this flux is significant in comparison to the shallow flow.

The best indication of the magnitude of deeper groundwater flow is provided by the Weir 1 data. The topography of the original bedrock surface below the base of the East Dump indicates a potential discharge area for groundwater from the deeper groundwater system. The lower variability in flow rates at Weir 1 suggests that this seepage is controlled, at least in part, by low permeability bedrock. Since the weir also records shallow flow that bypasses the diversion ditches, the deeper groundwater flow is likely small.

Although cover infiltration is a component of flow at Weir 1, the existing flow data does not allow a definitive evaluation of this flow. Given the observed flows at Weir 1 and the low permeability nature of the cover materials, the component of infiltration is likely smaller than groundwater underflow from the pit area.

Most of the water leaving the mine site originates as direct interception of precipitation and snowmelt on the mine site area. Above the pit, beyond Uphill Creek, an uncertain amount of groundwater may run on to the mine site in the form of shallow groundwater flow. SRK concluded in the 2000 study that the majority of the water leaves the site as runoff or shallow groundwater flow. In addition it was believed that the deeper groundwater flow system through the competent bedrock is relatively small compared to the shallow groundwater/runoff flows.

The SRK 2000 study concluded that a cover would reduce directly intercepted precipitation and snow melt from contacting mineralized rocks in the pit area, however; a small component of the water may still flow under a cover from above as leakage from the Uphill Creek diversion. As any attempt to improve the efficiency of the ditch or to intercept the groundwater would not be cost effective, the current plan includes diverting the two main contributing drainages either into the surface drainage channels on the proposed cover or into the existing drainage between the two pits.

6 Final Design

6.1 Overview

The reclamation work planned is designed in three phases. The first phase will include all the major earthworks involving installation of underdrains, placement of the till buttresses against the pit high walls, installation of the bituminous geomembrane, placement of the 1m thick till cover over the geomembrane, construction of surface drainage channels in the till cover and the work associated with the uphill diversion. The second phase would involve placement of the 0.5m deep weathered till cover on the flat areas of the west dump, site revegetation and reclamation of the borrow areas and instrumentation installation. The need for amendment of the till cover to encourage the vegetative growth is currently under review. The third phase of the project is subject to the need for a water treatment system. The current design includes a provision for treatment but a decision on whether it is required will be made at the end of Year 2. If water treatment is required, the work would involve final design and procurement of the lime addition water treatment system, the installation of the pipeline to Branch 1200, construction of the settling ponds and the Pyrrhotite diversion at Branch 1200.

The overall project remediation measures are shown in Figure 6.1. Detail schematics for specific measures are shown in Figure 6.2, 6.3 and 6.4. The pipeline and water treatment system is described in Section 7.

All work will be carried out in compliance with the *Mines Act* and the *Health Safety and Reclamation Code for Mines in BC*.

6.2 Pre-construction

6.2.1 Upgrade Site Access from Ski Hill Road

In order to allow passage of haul trucks, transportation lowbeds and other vehicles, the existing access road to the mine site will need to be upgraded. This will typically involve regrading the road surface with a grader, making repairs where required and trimming any vegetation along each side of the road. There are two levels of upgrade needed for the roads: the section from the Ski Hill Road to Borrow Area 1, and Borrow Area 1 to site.

The section connecting the Ski Hill Road to Borrow Area 1 will be considered to be an access road for equipment. It will only be upgraded to fit the widest vehicle and for lowest clearance. It is designated to be a one lane access, using existing turnouts along the road. General fill will be required to fill low spots to even out the grade for equipment clearance. The current plan of mobilization of equipment and supplies is mostly done by flat bed and lowbeds. It is anticipated that there might be sections of the road that is not cost effective to upgrade for wide turning, compared to walking the equipment onto Site. The minimum clearance required on the road is 0.15m from the lowbed and minimum turning radius for a 13.7m long trailer is 6m.

The section connecting the Borrow Area 1 to the site will be considered a haul road for construction. It will be upgraded to two lane traffic where possible and turnouts will be constructed at specified locations. Overgrowth vegetation will be trimmed and low areas will be filled. Articulated trucks (CAT 730 or equivalent) will be used on the haul road and their width is 3.3m. Turnouts should be made at least 3.3m wide and 15m long to accommodate these trucks. Upgrading the access road will be done in accordance with BC MEMPR requirements.

As shown on Figure 1.2, the access road from the Ski Hill road to the mine site is about 8.2 km.

Prior to initiating any work on the site, the project team will liaise with TimberWest to address issues such as road access, safety and liability.

6.2.2 Borrow Area 1

Borrow Area 1 is the source of the Type 1 material (till) that will be used as cover material over the liner and as general fill material for the pit wall buttresses. The borrow area is about 3km from the mine site as shown on Figure 1.2.

The material found in the borrow area is classified as silty sand with clay in two identifiable zones: weathered and unweathered. It is recommended that these soil types be blended together prior to placement to produce capping material which will have higher erosion resistance, soil moisture retention, drainage, and resistance to compaction. The details of this site investigation are outlined in Appendix A along with test pit logs and laboratory results. The depth of usable material is estimated to average 3m.

Development of the borrow area is estimated to be about 2.2 ha to provide required construction quantity. The development will include clearing the trees and grubbing the remaining scrub and low profile vegetation. The material will be placed in windrows along the outer perimeter of the borrow area. Where required, diversion ditches will be constructed to control runoff. Development of the borrow area will be done in stages and in a controlled fashions as to not affect slope stability and surficial water drainage.

The upper layer of organic soil will be stripped and stockpiled at the borrow area for latter used as the topsoil layer for re-vegetation. The development of the borrow area will be staged to minimize double handling when accessing the deeper unweathered till material for buttresses and bedding material.

The borrow area will is expected to be resloped to free drain and re-vegetated.

6.2.3 Borrow Area 2

Borrow Area 2 will be a rock quarry used to source riprap for lining surface diversion ditches and road building material. The quarry will be located within a 1 km radius of Branch 1200 which is approximately 2 km away from the Site. However the location of this Borrow has not been confirmed by field investigation. Development of this quarry will require drilling and blasting. The construction material from this borrow will be produce directly from blasting as crushing is not planned for the construction operation.

The borrow area will be resloped to free drain and re-vegetated.

6.3 Underdrains

Underdrains will be constructed beneath the liner to collect contaminated seepage that will continue to flow, although much reduced, after the cover is placed. The location of these drains is shown on Figures 6.2 and Figure 6.5. The underdrains will follow existing drainage patterns within the pit, where applicable and will be built using either imported drain rock or synthetic prefabricated drains made from high density polyethylene (Geocomposite) and geotextile.

Drain rock (19mm minus) will be used in underdrains U5, U6 and U8 over the existing shotcrete lined seepage collection channels. The current plan is to source drain rock from Cumberland, BC. Geotextile filter fabric will be placed around the drain rock to reduce clogging from migration of the finer fraction in the overlying till material. The maximum flow through the drains is estimated to be no more than 10 L/s. The plan and typical section of the underdrains are shown in Figure 6.5 and 6.6.

Geocomposite synthetic drains will be used to build the remaining underdrains as they are expected to carry smaller seepage flows. The Geocomposite is a Layfield Geo-Comp 5 or equivalent product with LP8 geotextile component. The Geocomposite drains are expected to be lay directly onto the exposed rock surface. A two layered system of 150mm thick till material sandwiched between two layers of 542g/m2 (LP16) geotextile is to act as a filter layer above the Geocomposite. The plan and typical section of the Geocomposite are shown in Figures 6.5 and 6.6.

The underdrain flow would be collected in two sumps located at the edge of the cover and transferred to a 150mm HDPE pipeline that would transport the flow to Branch 1200 for treatment. The sumps will be lined and tied in with the liner cover. The pipes will be sealed into the liner with bitumen. Typical plan and section for the sumps are shown in Figure 6.10. The two pipes will junction at a manhole downstream of the cover to allow for flow monitoring and water quality sampling. Figure 6.11 shows a typical plan view and sections of the manhole.

The flow through the underdrains will be dominantly from groundwater flow through the fractures in the bedrock. There will be minimal to no sediment infiltration from the groundwater flow into the underdrain, as the drains are laid directly on bedrock. Precipitation will not infiltrate the underdrains due directly to the bituminous liner cover; hence the overall sediment migration into the drains will be minimal. The only source of sediment infiltration will be from horizontal flow through the bedding and buttress material, which will be minimal as underdrains are deployed on identified seepage areas to collect all groundwater flows. All the underdrains are protected by a filter zone with the combination of geotextile and drain materials. This will control the amount of fine material infiltrating the underdrain while making the geotextile wrapped material surrounding the drain a filter zone over time. SRK does not expect the whole cross-sectional area and the entire length of the underdrains to block from sediment migration and cease to function. Furthermore, SRK is of the opinion that the likelihood of chemical blinding of the underdrains is very small.

In an extreme case, where all the underdrains are blocked, the groundwater will still be able to flow to the lowest point of the site as the bedding and buttress material are not impermeable. The groundwater will travel along the natural drainage paths toward the lowest point, where the sump is located. The groundwater will have a higher retention time inside the liner cover if all the underdrains are blocked. Groundwater will be drained from underneath the liner as long as the sump drainage pipe is clear. Maintenance work can be done from the manhole to ensure the pipe is clear of sediment or debris.

An air trap will be installed at the end of the drain pipe inside the manhole to ensure minimal oxygen exchange between the insides of the liner cover and manhole. It is recommended that the air trap to be installed at the end of the pipe inside the manhole for easy access for maintenance.

6.4 Pit Wall Buttresses

To facilitate the placement of the bituminous geomembrane liner and till cover over the steep pit wall areas, buttresses constructed from compacted till will be placed against the pit wall areas at a slope of 2H to 1V (Horizontal to Vertical). The location of the buttresses is shown on Figure 6.3 and Figure 6.7.

The buttress slopes are designed at 2H to 1V to ensure a stable configuration when combined with the till cover that will be placed over the liner. A discussion of the slope stability analyses is provided in Appendix D.

The pit wall buttresses will be constructed from the till material in lifts of 0.3m. Compaction will be completed using a sheepsfoot roller to achieve 95 percent of the Modified Proctor maximum dry density. A smooth drum roller should use on finished slope surface for liner deployment. Typical buttress sections are shown in Figure 6.8.

A number of vibrating wire piezometers will be installed during construction at the bottom of selected buttress that are higher than 3m. The purpose of the piezometers is to monitor the pore water pressure inside the buttress post construction prior to the fill achieving long-term equilibrium. These piezometers can provide information on any unexpected pressure build up and local underdrain performance. If the underdrains are working as intended, then there should be no pressure build up inside the buttress and the piezometers will register normalized pressures. If the data indicates a build up of excess pore pressure over long periods of time, remedial measures such as wick or horizontal drains can be installed before slope stability is compromised. Surges of high pore water pressure are predicted during freshet and high precipitation seasons.

The installation of the vibrating wire piezometers will involve wrapping the instrument with geotextile for protection and placing them directly on the original ground. Survey and calibration will be done for initial readings. The cables will be routed through the liner and sealed according to manufacturer's recommendations. The cables will be protected during the construction and mounted to a post on the soil liner cover construction is completed. The installation details and locations of these piezometers will be determined by the Engineer during construction to suit site conditions.

6.5 West Dump Resloping

As the eastern half of the West Dump will be covered as shown in Figure 6.7, the dump slope in this area will be resloped to 2H to 1V to allow placement of the BGM liner and till cover and to ensure a stable configuration when the till cover is placed on the liner . A typical section of the resloped dump is shown on Figure 6.8.

The resloping will be a cut and fill operation. The resloped material will be compacted to 95 percent of the Modified Proctor maximum dry density using a a vibratory compactor. A minimum amount of sorting might be required to eject oversize, over 0.5m, during construction. The Engineer will determine, on site, the location to stockpile the oversized material.

6.6 Washed Areas in Pit Floor

The two washed areas of the pit floor as shown on Figure 6.1 will require backfilling with till to provide a suitable bedding surface for the bituminous geomembrane liner. The bedding layer will be constructed from the till material in lifts of 0.3m. Compaction will be done via a sheepsfoot roller where practicable. In some areas, the depth of the bedding layer will be shallow and compaction will not be practicable with a sheepsfoot roller. In these areas, a smooth drum compactor should be used. The Engineer shall approval the degree of compaction during construction via compaction trial and field testing.

6.7 Bituminous Geomembrane (BGM) Liner

This section discusses the foundation preparation for, supply and placement of the bituminous geomembrane liner. The liner will be a 4mm thick Coletanche NP4 membrane or equivalent and will be placed from 5m wide rolls with a hydraulic beam. Each section of the liner will be manually welded with a gas burner. The liner will be anchored around the edges and along the top of the steeper slope area. The liner cover limits are shown in Figure 6.4.

The BGM liner shall be delivered and stored on site according to manufacturer's recommendations. The prime contractor shall have the manufacturer's recommended equipment and supplies needed for the liner installation. The BGM liner will be installed according to the manufacturer's specifications including but not limited to: anchoring, overlap, panel layout, deployment procedures and all quality control requirements. Typical anchoring systems for the liner are anchor trench in areas where excavation is possible and rock bolt with bonding otherwise. Anchorage will be required on all upper limits of the liner. Typical liner anchor systems are shown in Figure 6.9. The overlap for panels shall be done in direction of covering the down slope. Each seam will be heat sealed according to the manufacturer's specifications. Panel layout will be design so that panels will be deployed parallel to the grade of the slope.

The subgrade below the liner will be approved by the Engineer prior to liner developed and quality control will be done by the installer. The Engineer will perform independent quality assurance on liner construction. All repairs will be done by the installer to according to the specifications.

The liner installation shall be approved by the Engineer prior to liner cover deployment.

6.8 Liner Cover

This item involves the placement of a 1m thick layer of compacted till over the BGM liner to both protect the liner and to provide suitable growth medium for revegetation. In the steeper areas where the geomembrane has been placed over the pit wall buttress, the cover will be placed to a slope of 3:1(H:V) to ensure long term stable conditions as discussed in Appendix D. The till will be hauled from borrow area 1.

It is recommended that both till types (the weathered and unweathered) be blended together prior to placement to produce capping material, which will provide a higher erosion resistance, soil moisture retention, drainage, and resistance to compaction. If the capping material becomes compacted during spreading operations, the material will be decompacted prior to seeding in order to facilitate seed germination, root penetration and water percolation.

Sorting shall be done at the borrow area to ensure oversize boulders (>0.5m) will be ejected to prevent damage to the liner. The liner cover will be compacted by traffic as the equipment will not be able to travel directly on the liner. Machine compaction will be required on the buttresses areas to increase slope stability. The 1.0m thick cover will provide sufficient protection to prevent the liner being damage from equipment operations. The liner cover should be sloped to provide free drain to the surface drain channel.

Metal analyses of the till will be carried out before cover placement.

6.9 Surface Channels

Runoff from the cover will be collected in riprap lined channels constructed on the surface of the cover as shown in Figure 6.2. The surface channels will have a trapezoidal configuration with a 1.5m wide base, 1.5H to 1V side slopes, and be built within the 1m till cover over the liner. A 0.15m thick layer of compacted till will be retained beneath the channel to protect the bituminous geomembrane liner. A 0.3m thick layer of riprap will be placed over the till as erosion protection.

The minimum depth of the surface channel will be 0.55m. The design peak flow for the surface channel was calculated to be 0.46m3/s as discussed in Section 5. A plan view of the channels is provided in Figure 6.12. A typical section through the channel is shown in 6.13.

6.10 Uphill Diversion

Currently the diversion above the pit is founded in bedrock and was originally constructed to divert runoff from the catchment above the pit into the Piggott Creek catchment. However, the bedrock foundation is quite fractured causing leakage, which contributes to baseflow in the shallow bedrock in the pit. To mitigate this, two options are currently under consideration. The first option would direct two of the main drainages above the ditch into the pit over to the newly constructed surface drainage channels in the cover as shown on Figure 6.14. This would be achieved by constructing a lined extension of the existing ditches to one of the surface channels on top of the new cover. BGM with a till cover would be used to line the ditch and riprap would placed over the liner to provide erosion protection.

The ditches will have a trapezoid shape with bottom width of 2.0m, 1.5m depth and 2.5H to 1V side slopes. The diversion ditches will have an overall gradient of 1percent increasing to 40 percent down the slope of the pit wall buttress. The BGM liner in the ditch will be tied into the BGM liner in the pit. A 0.3m thick layer will cover the liner in the ditch to protect the liner and 0.3m thick riprap layer will be placed on top of the till. A plan view of the uphill diversion is provided in Figure 6.14. Details of the tie-in from diversion ditches to the pit cover are provided in Figure 6.15.

A second option would require diverting the two drainages away from the covered pit area over to the existing drainage between the pits as shown on Figure 6.14. Further investigation of this option is required before a final decision can be made.

7 Water Treatment

The current plan is to include a provision in the design for short-term treatment of the underdrain flow from beneath the cover. A schematic of the treatment concept is shown on Figure 7.1. The underdrain flow would be collected in two sumps located at the edge of the cover and transferred to a 150 mm diameter HDPE pipeline that would transport the flow to Branch 1200 for treatment. An alignment of the proposed pipeline is shown on Figures 7.2 and 7.3. Seepage from Seep 3 at the toe of the East Dump and the resultant flow at Weir 1 would be directed in manholes and fed into the pipeline. At Branch 1200, the flow would be treated with lime and discharged into an initial settling pond located within the existing wetland area as shown on Figure 7.4 and 7.5. Clean water in Pyrrhotite Creek would be diverted around the ponds and over to Pyrrhotite Lake. A typical section through the dam at pond 1 is shown in Figure 7.6. The proposed alignment of the diverted Pyrrhotite Creek is shown in Figure 7.7. A typical section through the diversion is provided in Figure 7.8.

The treatment system is assumed to be based on hydrated lime addition operating 90 days per year. Assuming a flow rate of about 5L/s and a copper concentration of 10mg/L, it is estimated that about

4 to 5 tonnes of hydrated lime would be required per year. Based on a flow rate of 5L/s, with a residence time of 5 days, the required capacity and surface area of the settling pond are 2,150 m^3 and 1,500 m^2 respectively. Under these assumptions, it is expected that about 5 tonnes of lime would be consumed each year and would produce about 60 tonnes of sludge.

The current treatment concept and estimated quantities are based on assumptions about the performance of the cover system. It is important that these assumptions be verified prior to final selection of a treatment method and further design.

The proposed design and construction schedule is shown on Figures 10.1, 10.2 and 10.3. A water quality monitoring program would be initiated following the construction of the cover in Year 1 (2008). This program would include the minesite, Pyrrhotite Creek and the Tsolum River. In the spring of Year 2 and Year 3 (2009 and 2010), water quality samples would be collected from the underdrain discharge and from the seeps at the toe of the East dump. Monthly sampling and analysis would continue through the summer and fall of 2009. The data will be reviewed and discussed with the Tsolum River partnership to determine the need for pipeline construction and lime treatment. This decision will be based on the establishment of copper loadings and concentration "triggers" developed with the Tsolum River Partnership. This decision would be made by end of June 2010 so that the final design and procurement of the lime addition treatment system, the installation of the pipeline to Branch 126, the construction of the settling ponds and Pyrrhotite diversion and the establishment of the water treatment system could be completed by the end of the 2010 field season.

The project team will liaise with TimberWest during the final design phase of the water treatment system. This would also include the construction of two settling ponds, access roads and diversion channels.

8 Borrow Area Reclamation

The borrow areas will be reclaimed once materials are no longer required for the project. The upper layer of organic soil that will be windrowed and stockpiled at the borrow areas will be spread back over the borrow areas as the topsoil layer for revegetation. At this time it is not known what material type will be remaining or the condition of these sites; they may require site preparation activities such as levelling and ripping compacted surfaces prior to capping and revegetation activities being carried out. The borrow areas will be replanted with commercial conifer tree species appropriate for the site. The borrow areas will also be seeded with a light cover of grasses/legumes for erosion control and invasive plant species control.

These borrow areas are currently contributing to TimberWest's productive forest land base and every effort will be made to ensure production of a second crop of commercially viable trees.

9 Site Revegetation

The reclamation of the mine site areas will include the entire area of the covered pit and the capped areas of the East and West Dumps. The capping material will be sourced from Borrow Area 1. Based on grain size analyses there are two soil material types present at Borrow Area 1 that would be suitable for reclamation capping; a silt loam soil type and loam soil type. Either of these soil types would be suitable as a growth medium; the loam has less coarse fragment content and more fines so it has a higher erosion potential. It is recommended that these soil types be blended together prior to placement to produce capping material which will have higher erosion resistance, soil moisture retention, drainage, and resistance to compaction. If the capping material becomes compacted during spreading operations, the material will be decompacted prior to seeding in order to facilitate seed germination, root penetration and water percolation.

Once the sites are capped, they will be seeded with a grass/legume seed mix to establish a fast growing ground cover that will provide erosion control. Alder seed will be incorporated into the seed mix in order establish a long term vegetation cover for the sites. The sites will be fertilized at the time of seeding.

Consideration will be given to commercially available non-palatable (for ungulates) legume species with an assortment of bunchgrass and creeping grasses (erosion control) and possibly "pockets" of organic soil for site diversification and aesthetics. A shrub based cover will also be considered for the medium term.

10 Staging

The construction season for Mt Washington is normally late June to late October. Figures 10.1 to 10.3 provide a preliminary project construction schedule. It is expected that the earthworks, and final cover including the bituminous geomembrane liner would be completed in Year 1. The work would include development of the borrow areas, construction of the underdrains, placement of the till buttresses against the pit wall areas, installation of the bituminous geomembrane, placement of the 1m thick till cover, construction of the surface drainage channels and the work associated with the uphill diversion. The work in Year 2 would involve placement of the 0.5m cover on the flat areas of the west dump, placement of the 150mm topsoil layer over the entire area including the East dump, site revegetation and reclamation of the borrow areas and instrumentation installation. A provision for possible repairs to the cover has also been included in Year 2. If required, final design and procurement of the lime addition water treatment system, the installation of the pipeline to Branch 1200, construction of the settling ponds and the Pyrrhotite diversion at Branch 1200 would be carried out in Year 3.

11 Long Term Monitoring

Groundwater monitoring would be initiated following the construction of the cover in Year 1 (2008) and will include recording of water levels and collection of samples for water quality analysis. During the first five years after cover installation, groundwater samples and water level measurements will be collected twice yearly, once in the winter and once in the summer. After five years, sampling will be reduced to once yearly, during the summer. Sampling analyses will include the same parameters as have been historically collected.

In addition to the groundwater monitoring, water quality will be monitored of the flow in the underdrains, in Pyrrhotite Creek and the Tsolum River. As discussed in Section 7.0, in the spring of Year 2 and Year 3 (2009 and 2010), water quality samples would be collected from the underdrain discharge and from the seeps at the toe of the East dump. Monthly sampling and analysis would continue through the summer and fall of 2009. The data will be reviewed and discussed with the Tsolum River partnership to determine the need for pipeline construction and lime treatment. This decision will be based on the establishment of copper loadings and concentration "triggers" developed with the Tsolum River Partnership.

12 Annual Inspections and Maintenance

The post-construction activities would include provision for the following items:

- Inspection and maintenance of earthworks including the underdrains, the surface channels and revegetation;
- Operation and maintenance of the water treatment system including and the piping system; and
- Environmental management including surface and ground water monitoring, inspections, and preparation and filing of annual reports.

13 Cost Estimate

13.1 General

This section of the report presents an engineering cost estimate in 2007 dollars for the implementation of ARD remediation measures at the abandoned copper mine on Mt Washington, Vancouver Island. Table 13.1 provides an estimate of the direct and indirect costs for the proposed works as well as an estimate of associated maintenance and operating costs. Table 13.2 provides a cashflow estimate over the proposed three year project schedule.

13.2 Format of Estimate

The estimate of closure costs is compiled in a spreadsheet provided in Table 13.1. The spreadsheet shows estimates of direct costs for the following components and the associated indirects costs:

1. Pre Construction
2. North pit Drains and Cover
3. Uphill Diversion Upgrade
4. Water Treatment System
5. Borrow Area Revegetation
6. Site Revegetation
7. Instrumentation
8. Provision for Cover Repair
9. Maintenance and Operating cost

13.3 Direct Costs

13.3.1 Pre-Construction

Direct costs for the pre-construction component include the upgrading of the site access roads and development of the two main borrow areas.

Direct cost estimates were based on:

- Road alignments and lengths measured from recent ortho-rectified images of the site and topographic maps provided by Aero Geometrics Ltd;
- Areas measured from the same maps;
- Clearing, grubbing and topsoil stripping;
- A productivity spreadsheet prepared by SRK ; and
- 2007-2008 Blue book for equipment rental rates.

13.3.2 North Pit Drains, Cover and Uphill Diversion

Direct costs for installing the underdrains, placement of the pit wall till buttresses, placement of bedding material for the liner, the liner placement, protective till cover placement, construction of the surface drains and the uphill diversion were estimated by SRK from:

- Volumes, surface areas and lengths from recent topographic plans referenced above ;
- Equipment fleets and productivities estimated from excavate-load-haul-dump-spread-compact calculations; and

- All-in equipment unit rates from the 2007-2008 Blue book for equipment rental rates.

The excavate-load-haul-dump-spread-compact calculations follow standard methods, as used by earthworks contractors. The calculations make use of equipment specifications obtained from manufacturer's data, in this case the Caterpillar Handbook.

Equipment all-in unit rates include equipment, operator, maintenance, parts, and insurance. Home office overhead and contractor profit has been included in the indirect costs.

13.3.3 Water Treatment System

Direct costs for the Water Treatment system at Branch 1200 including the pipeline from the mine site, Pyrrhotite creek diversion and construction of the settling ponds were estimated by SRK from:

- Alignments and lengths measured from topographic plans;
- Typical sections designed to convey 200-year floods from the respective catchment areas;
- Clearing, grubbing and topsoil stripping from alignments and sections, with experience unit costs;
- Excavation equipment and productivities estimated from excavate-load-haul-dump-spread calculations, assuming hauling of spoil material to a nearby location;
- Unit costs for material supply and placement of dam fill and riprap;
- All-in equipment unit rates from BC Blue book; and
- Supply and installation of the pipeline to Branch 1200.

Preliminary estimates for installation of the lime addition system at Branch 1200 are provided in the Table 13.1. Construction costs for the water treatment system were estimated by SRK from experience on other projects. The method takes influent flowrates and water quality, and estimates equipment and operating requirements for the treatment system. Equipment costs are estimated by pro-rating supplier quotes.

The cost for this component may range from $50,000 to $200,000. For budgeting purposes the upper range has been used.

13.3.4 Borrow Area Reclamation and Site Revegetation

The direct cost for the reclamation of the borrow areas and revegetation of the mine site assumes that the stripped topsoil layer from the borrow area will be hauled to the mine site and placed as growth medium on the till cover. However, as discussed in Sections 8 and 9, the need for the placement of an organic layer as growth medium on top of the till cover is still under review. The trade off is the restoration of the borrow area versus enhancing the revegetation at the mine site. For the purposes of this report, the cost estimate in Table 13.1 assumes that the stripped topsoil will be hauled to the site for placement as growth medium.

13.3.5 Instrumentation

To monitor groundwater quality after cover placement, a monitoring network utilizing existing groundwater monitoring wells is proposed. Use of existing monitoring wells, from which historical data is available, would allow comparison of water quality from pre- to post-cover installation periods. Appendix G presents details of the proposed groundwater monitoring installation. The direct cost for installation of the wells is provided in Table 13.1.

13.3.6 Cover Repair

This cost item was included to cover possible repairs to the till cover in the year following construction and before the revegetation program.

13.4 Indirect Costs

13.4.1 Site Office

This item covers accommodations for contractor office space and work staff at site.

13.4.2 Final Design Engineering, Technical Specifications and Contract Documents

Final Design Engineering, preparation of the technical specifications and contract documents were estimated, as shown in Table 13.1. The percentage was based on levels that were consistent with SRK's experience in engineering and QA of similar projects.

13.4.3 Field Engineering and QA

Field Engineering QA costs were estimated as a percentage of total direct costs, as shown in Table 13.1. The percentage was based on SRK's experience in engineering and QA of similar projects. The estimate covers professional time, field testing and sample analyses.

13.4.4 Insurance

General insurance is covered in the all-in equipment unit rates. Additional insurance of 0.5% of total direct cost was added to cover the additional requirements associated contaminated soils remediation.

13.4.5 Bonding

The Contractor will require financing of a bond for the work.

13.4.6 Mobilization and Demobilization

Contractors will be sourced from Vancouver or Vancouver Island. It is expected that equipment will require significant mobilization cost. A lump sum mob-demob cost of $150,000 was allowed for in the cost estimate.

13.4.7 Freight

Materials will be delivered to and stored at the site. All materials were estimated FOB the mine site.

13.4.8 Contractor Profit

As contractor profit is not included in the all-in unit equipment rates, therefore a provision for this item is shown in the indirect costs.

13.4.9 Taxes

PST is estimated at 7% of the taxable direct costs. GST is charged but will be 100% reimbursable and therefore is excluded from the estimate.

13.4.10 Contingency

A contingency would normally be factored into the indirect costs to offset the risk of unforeseen or under-predicted circumstances or conditions which experience shows will likely result in additional costs. For the purposes of this estimate, a contingency of 20% of the direct costs has been included in the unit rates provided in Table 13.1.

13.5 Post Construction

13.5.1 Earthworks Inspection and Maintenance

Average annual costs for inspection and maintenance of covers, ditches, ponds and dams were estimated for the first five years after construction. Actual maintenance expenditures are expected to occur only periodically, on an as-required basis.

13.5.2 Water Treatment Operating Cost

Water treatment operating and maintenance costs include, lime supply, annual commissioning and decommissioning, bi weekly monitoring and effluent analysis and sludge removal.

This report, **1CT001.001 – Mt. Washington Remediation, Detailed Design**, was prepared by SRK Consulting (Canada) Inc.

Prepared by

Peter Healey, P.Eng
Principal Consultant

Alvin Tong, E.I.T.
Geotechnical Engineer

Reviewed by

Daryl Hockley, P.Eng
Corporate Consultant

Tables

Table 13.1: Cost Estimate

Item	Activity	Task	Quantity	Unit	Unit Cost	Activity Total	Subtotals	Source / Comments
REMEDIATION COSTS - DIRECT CAPITAL								
1.0 Pre Construction							$190,427	
1.1	Upgrade Site Access Road from Ski Hill road	Clear Vegetation along side of roadway	5,100	Lm	$2.53	$12,923		Using the excavator, faller and dozer
		Widen where required and grade road surface	2,500	Lm	$3.84	$9,609		Uses the excavator for excavation and fill placement
1.2	Borrow Area #1 (Type 1 Material (Till))	Clearing and Grubbing	23,101	m^2	$1.45	$33,482		Excavator and faller to clear the wood and dense shurb
		Strip and stockpile topsoil	23,101	m^2	$0.18	$4,136		dozer work
		Upgrade haul road to site	3,640	Lm	$5.42	$19,717		Excavator, faller, grader work
		Water Management	23,101	m^2	$1.34	$31,039		reslope and ditching in and around the borrow
1.3	Borrow Area #2 (Type 2 and 3 material (Road fill and Riprap)	Clearing and Grubbing	1,000	m^2	$1.63	$1,628		Excavator and faller to clear the wood and dense shurb, and dozer work
		Drill, Blast and Stockpile Riprap	1,248	Bm^3	$48.00	$59,893		Quarry for Pyrrhoitte Creek Diversion Riprap and Settling Pond Dyke access road Fill
		Screen and Stockpile road fill	1,000	Bm^3	$18.00	$18,000		Excavator, loader sorting work
2.0 North Pit Drains and Cover							$1,903,375	
2.1	Underdrains(Type 4 Material, Geocomposite)	Prepare surface for Geocomposite	805	Lm	$1.80	$1,449		excavator clean up work
		Supply and Place Geocomposite	3,220	m^2	$9.85	$31,711		Geocomposite underdrain
2.2	Underdrains (Type 5 Material, Drain rock)	Prepare existing shotcrete lined diversion channels for Drainrock	364	Lm	$3.60	$1,310		excavator clear up work
		Load, Haul, Dump and Place drainrock	219	Bm^3	$57.46	$12,583		drain rock truck from cumberland, unload at access entrance and reload onto rock truck to site
		Supply and Place Geotextile filter Fabric over drainrock	3,137	m^2	$3.43	$10,766		Use 385g/m2 geotextile
		Construct sump and seepage discharge system to water Treatment pipeline	2	L.S.	$10,000.00	$20,000		
2.3	Buttress for Highwall Areas (Type 1 Material, Till)	Load, Haul, Dump, place and compact Backfill on highwalls to 2:1 (H:V)	5,267	Bm^3	$14.96	$78,773		compact using sheepfoot roller
2.4	West Dump Resloping	Cut and Fill West Dump south slope to 2:1 (H:V)	796	m^2	$2.24	$1,781		dozer work
2.5	Place bedding for Liner in Washed Areas (Type 1Material, Till)	Load, Haul, Dump, place and compact Type 1 material	2,209	Bm^3	$14.96	$33,042		compact using sheepfoot
2.6	Bituminous Geomembrane (BGM)	Subgrade preparation	49,227	m^2	$0.18	$8,814		dozer work
		Supply and Place NP4 BGM or equivalent	49,227	m^2	$18.12	$892,082		using excavator and 3 labours
2.7	Liner Cover (Type 1material, Till)	Load, Haul, dump, and place geomembrane cover material	53,641	Bm^3	$14.75	$790,942		no compaction
2.8	Surface Drains (Type 3 Material, riprap)	Load, Haul, Dump and place erosion protective riprap in surface drains	1,248	Bm^3	$16.12	$20,120		haulage from 1km away and 9% load grade
3.0 Uphill Diversion Upgrade							$65,701	
3.1	Upgrade existing Surface Diversion above North Pit	Clean out debris in existing channel to bedrock	140	Lm	$7.20	$1,008		excavator clean up work
		Build berm in lower reach to control high flow ditch	50	Bm^3	$24.00	$1,200		with till material
3.2	Redirect surface flow above upper reach of diversion on to cover	Excavate new diversion channel onto the cover	1,143	Bm^3	$31.19	$35,655		excavation in rock
		Supply and place NP4 BGM or equivalent	1,106	m^2	$18.12	$20,042		
		Load, haul, dump and place geomembrance cover material	166	Bm^3	$14.75	$2,446		
		Load, haul, dump and place erosion protective riprap in diversion	332	Bm^3	$16.12	$5,350		
4.0 Water Treatment System							$443,847	
4.1	Pipeline to Treatment System at Branch 1200	Clearing and Grubbing of pipeline route	1,884	m^2	$2.53	$4,774		Using the excavator, faller and dozer
		Upgrade access road along pipeline route	840	Lm	$5.42	$4,550		Excavator, faller, grader work
		Supply and Install 150mm HDPE pipe (DR13)	983	Lm	$34.91	$34,324		
		Supply and Install 150mm HDPE pipe (DR9)	328	Lm	$44.48	$14,580		
		Install Manhole at Pipe Junctions	3	L.S.	$10,000.00	$30,000		
4.2	Settlement Ponds	Remove Organic material in sludge Pond		Bm^3	$0.00	$0		
		Clearing and Grubbing of access road to dykes	780	m^2	$60.76	$47,393		excavation in rock and develop road way using excavated material.
		Load, haul dump, place and compact road fill (Type 2 Material)	0	Bm^3	$29.57	$0		expected in cut/fill operation so no need for haulage
		Foundation preparation for Dam	701	m^3	$5.40	$3,783		common excavation
		Load, haul dump, place and compact Dam fill (Type 1 Material)	1,004	Bm^3	$14.96	$15,019		
		Supply and place NP4 BGM or equivalent on Dam	217	m^2	$18.12	$3,932		
		Construct Spillway in Dam	6	Bm^3	$180.00	$1,080		excavation in dam, including liner deployment and riprap placement
		Foundation preparation for Dyke	148	m^3	$24.00	$3,552		possible wet excavation in peaty ground
		Load, haul, dump, place and compact Type 2 material	90	Bm^3	$60.00	$5,400		slower cycle compare to site work due to limited space and more complex construction methods.
4.3	Pyrrhotite Creek Diversion	Clearing and Grubbing diversion alignment	1,214	m^2	$5.42	$6,573		using the excavator, faller and dozer
		Ditch Excavation	1,875	Bm^3	$29.57	$55,437		excavation in rock
		Supply and Place Geotextile filter Fabric over subgrade	1,214	m^2	$3.43	$4,165		
		Load, Haul, Dump and place erosion protective riprap in diversion	607	Bm^3	$16.12	$9,784		
4.4	Construct lime addition system	Final design and procurement	1	L.S.	$40,000.00	$40,000		
		Supply Aquafix system with 15-tonne hopper	1	L.S.	$90,000.00	$90,000		
		Prepare foundation and piping	1	L.S.	$5,000.00	$5,000		
		Install and connect to piping	1	L.S.	$5,000.00	$5,000		
		Supply lime	15	tonne	$300.00	$4,500		
		Commission system	1	L.S.	$15,000.00	$15,000		
		Backup power supply - 10 kW diesel	1	L.S.	$20,000.00	$20,000		
		Supply and install fuel tank and berm	1	L.S.	$20,000.00	$20,000		

Table 13.1: Cost Estimate

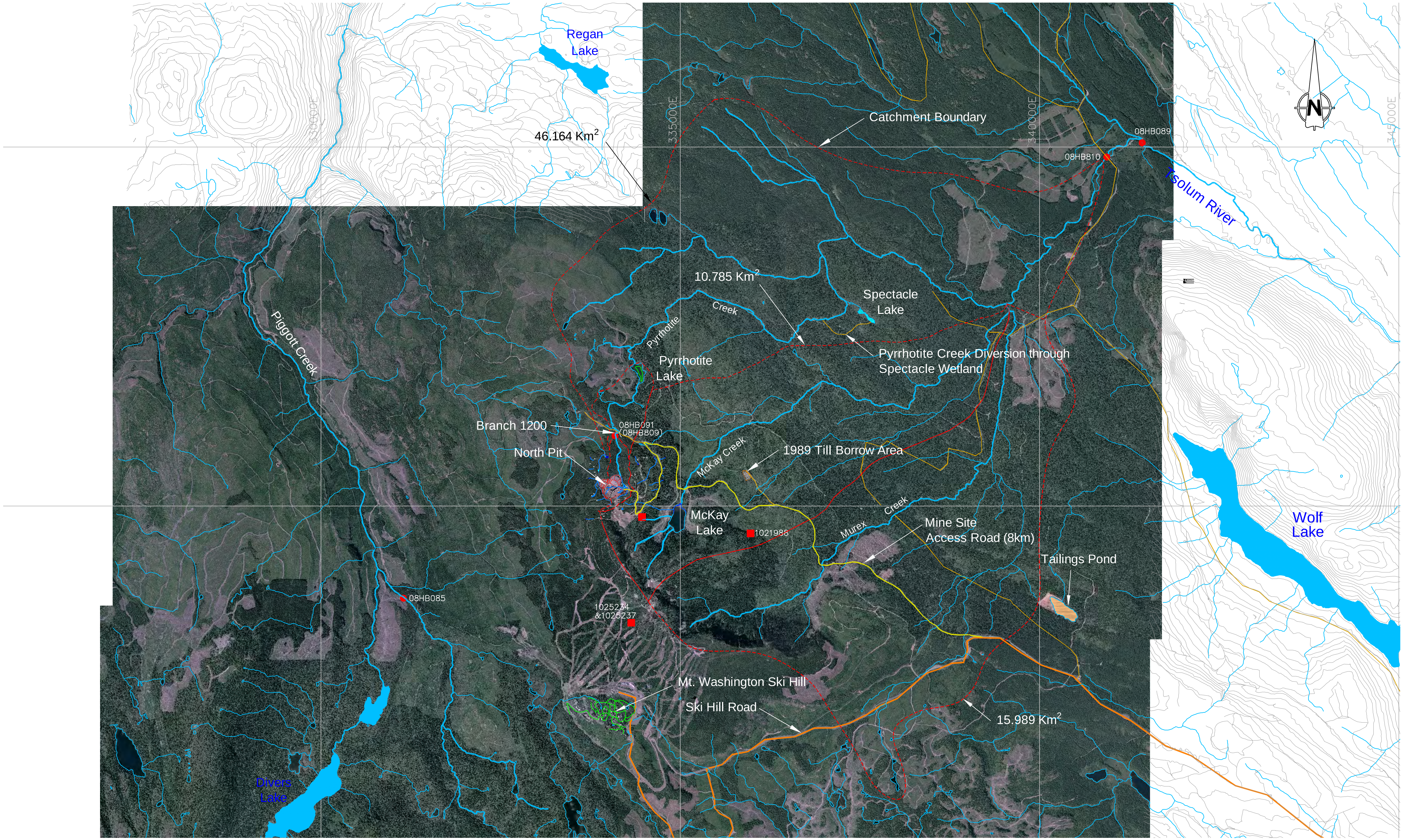
Item	Activity	Task	Quantity	Unit	Unit Cost	Activity Total	Subtotals	Source / Comments
5.0 Borrow Area Reclamation							$12,475	
		Seed and fertilize	23,101	m^2	$0.54	$12,475		
6.0 Site Revegetation							$205,195	
	Growth Medium and Vegetation	Load, haul and place stripped topsoil from borrow area on new pit cover	7,384	Bm^3	$14.75	$108,879		
		Load, haul and place stripped topsoil from borrow area on East Dump	1,980	Bm^3	$14.75	$29,195		
		Load, haul and place till (underlay) on West Dump	1,650	Bm^3	$14.75	$24,329		
		Load, haul and place stripped topsoil from borrow area on West Dump	495	Bm^3	$14.75	$7,299		
		Seed and fertilize	65,727	m^2	$0.54	$35,493		
7.0 Instrumentation							$41,600	
	Monitoring Wells (2" PVC nested wells)	Drill and install monitoring wells (upgrade existing and install 3 at toe of east Dump	120	Lm	$180.00	$21,600		
	Vibrating Wire Piezometer	FOB and install VWP	1	pc	$20,000.00	$20,000		
8.0 Cover Repair				lump		$100,000	$100,000	
Subtotal Direct Costs							**$2,962,619**	
REMEDIATION COSTS - INDIRECT								
	Site Office	Lump Sum	1.00	lump	40,000.00	$40,000		
	Survey	Survey control and asbuilt	200	man hr	$ 200.00	$40,000		
	Field Supervision	Contractor's superviser	150	day	$ 300.00	$45,000		
	Contractor profit and home office overhead	10% of direct costs	$ 2,962,619	x	10.0%	$296,262		
	Insurance	0.5% of direct costs	$ 2,962,619	x	0.5%	$14,813		
	Bonding	0.5% of direct costs	$ 2,962,619	x	0.5%	$14,813		
	Final Design Engineering, Technical Specs and Contract Doc	Design, reporting and office support during construction	$ 2,962,619	x	6.0%	$177,757		
	Field Engineering and QA	Resident Engineer and quality assurance testings	$ 2,962,619	x	5.0%	$148,131		
	Mob - Demob		1	lump	$150,000.00	$150,000		
	Living out allowances	Out of town allowance for resident engineer	150	day	$160.00	$24,000		
	Taxes	7% of taxable direct and indirect costs	$ 3,320,871	x	7.0%	$232,461		
Subtotal Indirect Costs							**$1,183,237**	
REMEDIATION COSTS - TOTAL								
	Total direct and indirect costs						**$4,145,856**	
Maintenance and Operating Cost for Five Year (After Project Completion)								
	Annual reporting	Complete annual geotechnical inspections	5	L.S.		$50,000		
		Prepare annual report on treatment system and monitoring	5	L.S.		$75,000		
	Operate lime addition system	Supply lime	60	tonne		$18,000		
		Annual commissioning and decommissioning	5	years		$12,500		
		Bi-weekly monitoring (90 day per year)	65	trips		$32,500		
		Bi-weekly effluent analysis (90 day per year)	65	samples		$19,630		
		Remove sludge from ponds and dispose in pit	5	L.S.		$15,000		
	Maintenance	Maintain cover and ditches in Years 3 and 5	2	L.S.		$100,000		
					Total	**$322,630**		

Table 13.2: Cash Flow

Activity	Year 1	Year 2	Year 3	Total
Direct Costs				
Preconstruction	$190,427			$190,427
North Pit Drains and Cover	$1,903,375			$1,903,375
Uphill Diversion	$65,701			$65,701
Water Treatment				
Pipeline to Treatment System at Branch 1200			$88,228	$88,228
Settlement Ponds			$80,160	$80,160
Pyrrhotite Creek Diversion			$75,959	$75,959
Construct lime addition system			$199,500	$199,500
Borrow Area Reclamation		$12,475		$12,475
Site Revegetation		$205,195		$205,195
Instrumentation		$41,600		$41,600
Cover Repairs		$100,000		$100,000
Subtotal Directs	**$2,159,503**	**$359,269**	**$443,847**	**$2,962,619**
Indirect Costs				
Site Office	$40,000			$40,000
Survey	$20,000	$20,000		$40,000
Field Supervision	$18,000	$18,000	$9,000	$45,000
Contractor profit and home office overhead	$215,950	$35,927	$44,385	$296,262
Insurance	$10,798	$1,796	$2,219	$14,813
Bonding	$10,798	$1,796	$2,219	$14,813
Final Design Engineering, Technical Specs and Contract Doc	$129,570	$21,556	$26,631	$177,757
Field Engineering and QA	$107,975	$17,963	$22,192	$148,131
Mob - Demob	$60,000	$60,000	$30,000	$150,000
Living out allowances	$9,600	$9,600	$4,800	$24,000
Taxes	$164,521	$33,184	$34,757	$232,461
Subtotal Indirects	**$787,211**	**$219,823**	**$176,203**	**$1,183,237**
Total	**$2,946,714**	**$579,092**	**$620,050**	**$4,145,856**

Figures

SRK Consulting Engineers and Scientists VANCOUVER	**Tsolum River Partnership**	Detailed Design **Vicinity Map**
Job No: 1CT001.001 Filename: Figure 1.1_Vicinity_20071121.ppt	Mt. Washington Remediation	Date: November 2007 | Approved: | Figure: **1.1**



LEGEND

- Climate station
- WSC Flow monitoring site.

SRK Consulting Engineers and Scientists Vancouver B.C.	Tsolum River Partnership	Detailed Design
SRK JOB NO.: 1CT001.001–700		Catchment Areas and General Location Map
FILE NAME: 1CT001001–700–1.dwg	Mt. Washington Remediation	DATE: Nov. 07 / APPROVED: PMH / FIGURE: 1.2

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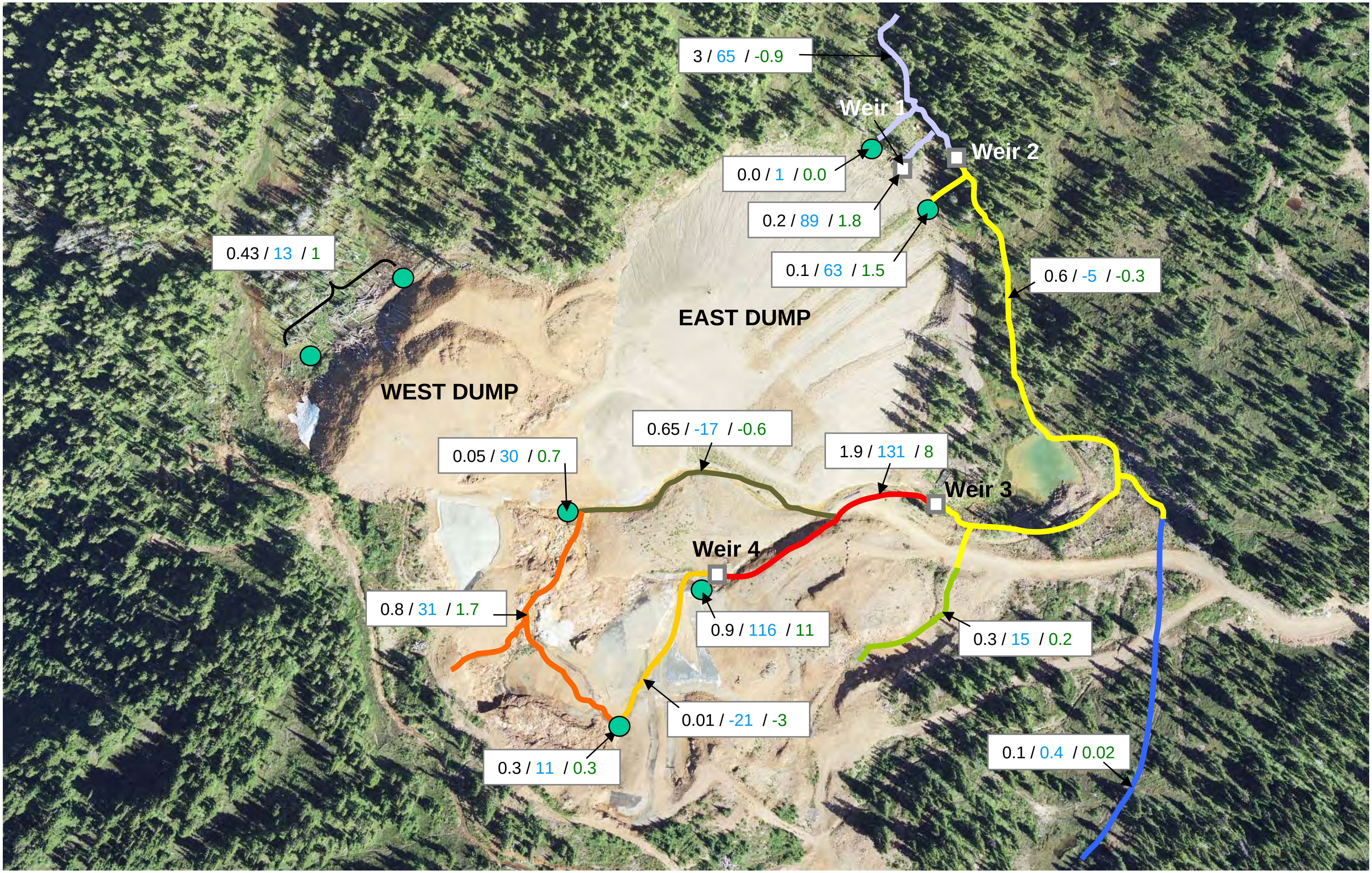

KEY

Seep Sample Location

Flow (L/s)/ SO_4 (mg/s) / Cu (mg/s)

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Job No: 1CT001.001

Filename: Figure 3.1_Loading_20071126.ppt

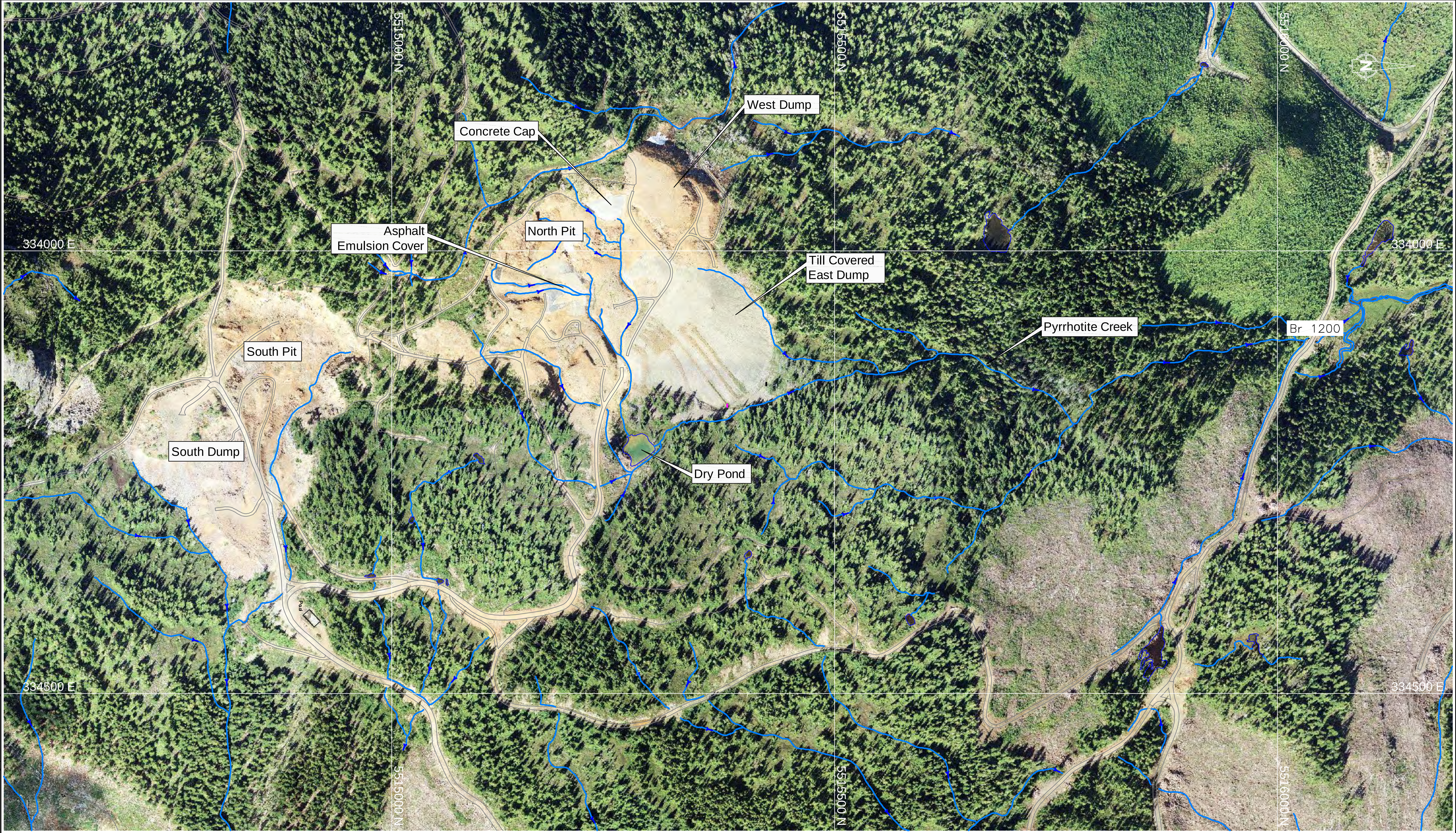
Tsolum River Partnership

Mt. Washington Remediation

Detailed Design

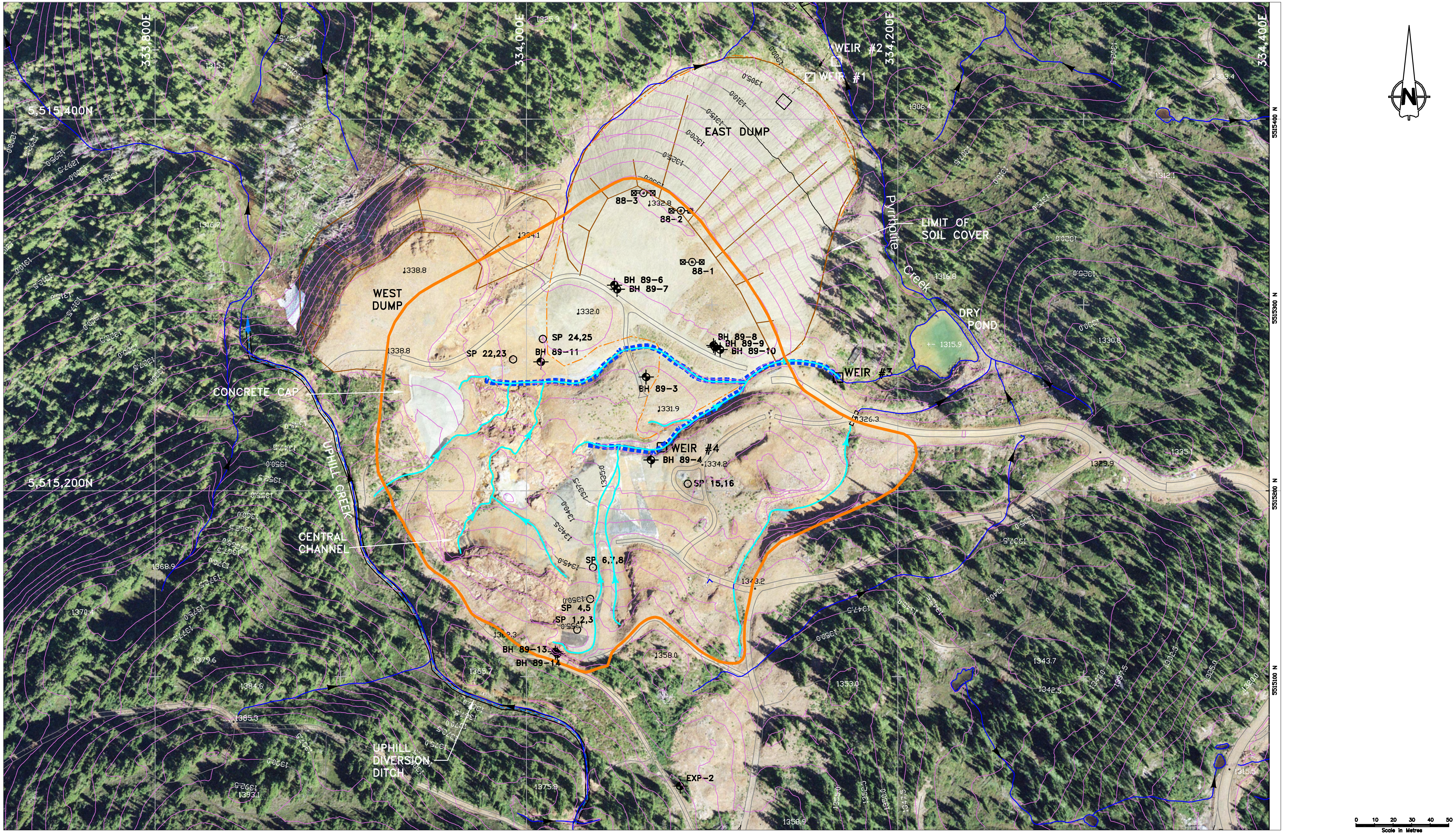
Loading Interpretation based on July 9, 2007, Seep Survey

Date:	Approved:	Figure:
November 2007		**3.1**



0 20 40 60 80 100
Scale in Metres

SRK Consulting Engineers and Scientists	Tsolum River Partnership	Detailed Design
SRK JOB NO.: 1CT001.001		Overall Current Site Conditions Plan View
FILE NAME: 1CT001001-700-16.dwg	Mt. Washington Remediation	DATE: Nov. 07 / APPROVED: PMH / FIGURE: 4.1



LEGEND

WEIR #2	V-NOTCH WEIRS		PROPOSED COVER OUTLINE
	SURFACE DIVERSIONS		EXISTING SHOTCRETE LINED SEEPAGE COLLECTION CHANNEL
BH 89-11	MONITORING WELLS		EXISTING SEEPAGE DRAINAGE
SP 24,25	STANDPIPE PIEZOMETERS		

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SRK JOB NO.: 1CT001.001-700
FILE NAME: 1CT001001-700-12.dwg

Tsolum River Partnership

Mt. Washington Remediation

Detailed Design

Current Site Conditions
South Pit

DATE:	APPROVED:	FIGURE:
Nov. 07	PMH	4.2

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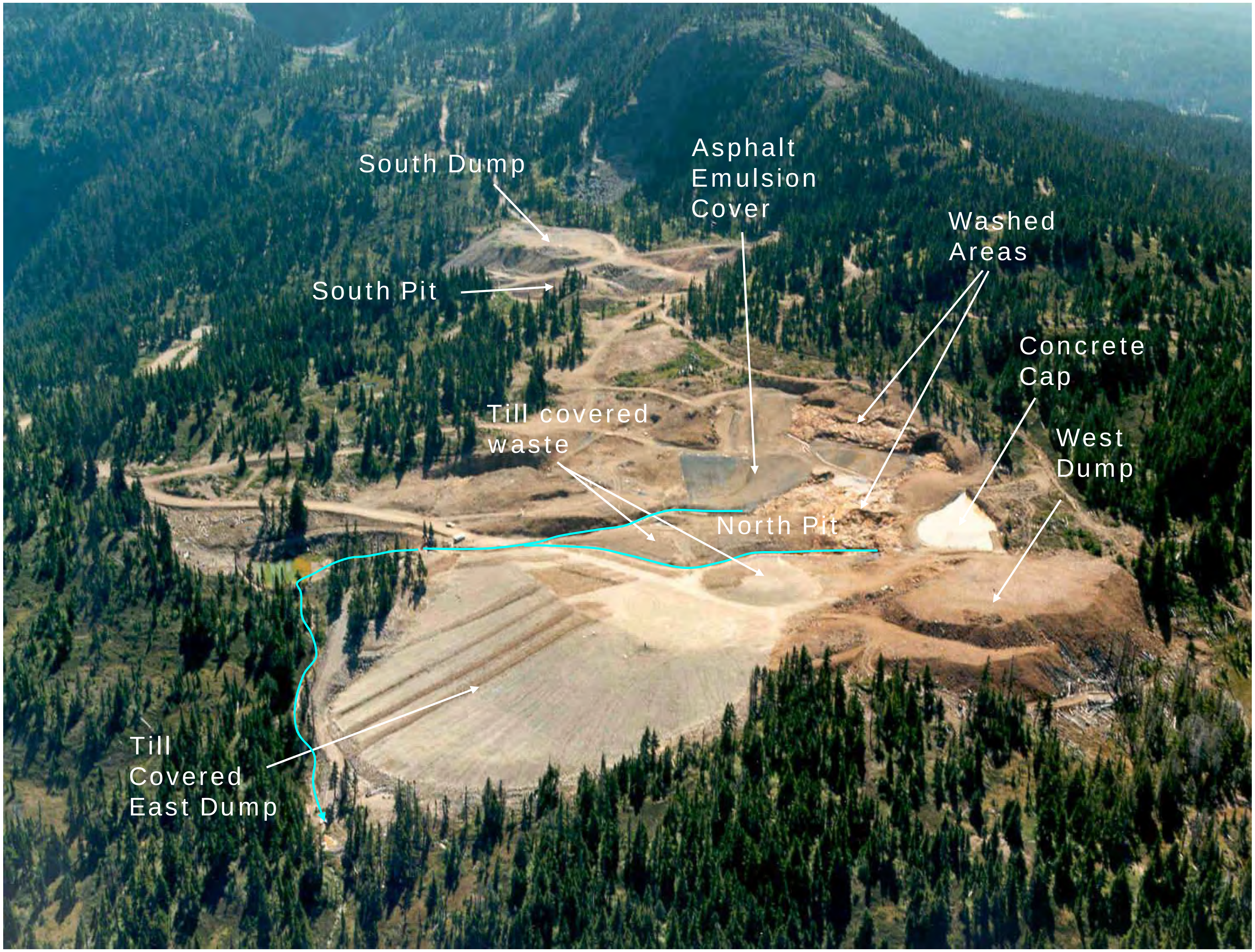

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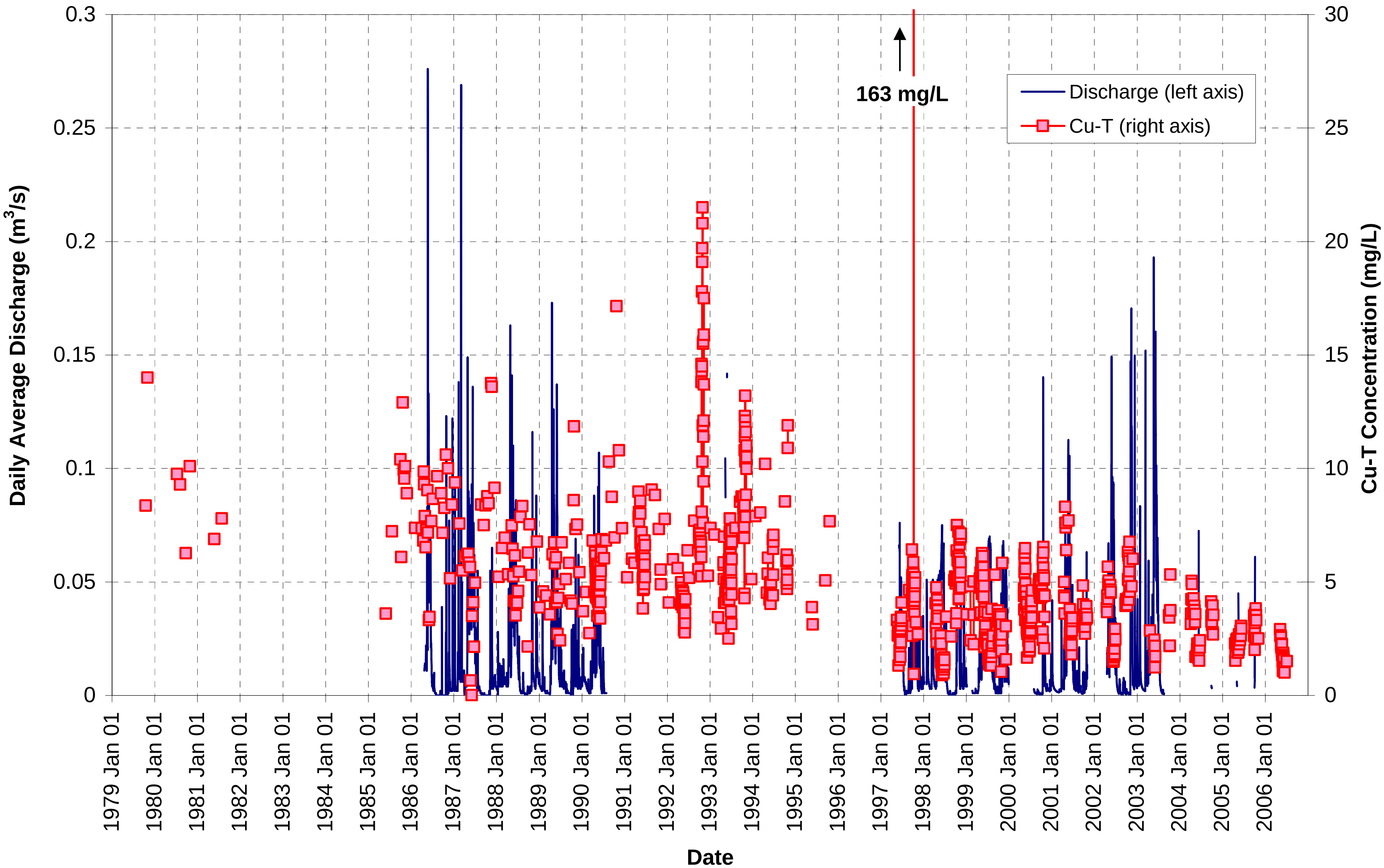
Job No: 1CT001.001	**Tsolum River Partnership**	Detailed Design
Filename: Figure 4.3_CurrentSiteCond_20071127.ppt	Mt. Washington Remediation	**Current Site Conditions Areal Photo**
		Date: November 2007 / Approved: / Figure: 4.3



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Job No: 1CT001.001
Filename: Figure 5.1_PhyrrotiteCreek_20071128.ppt

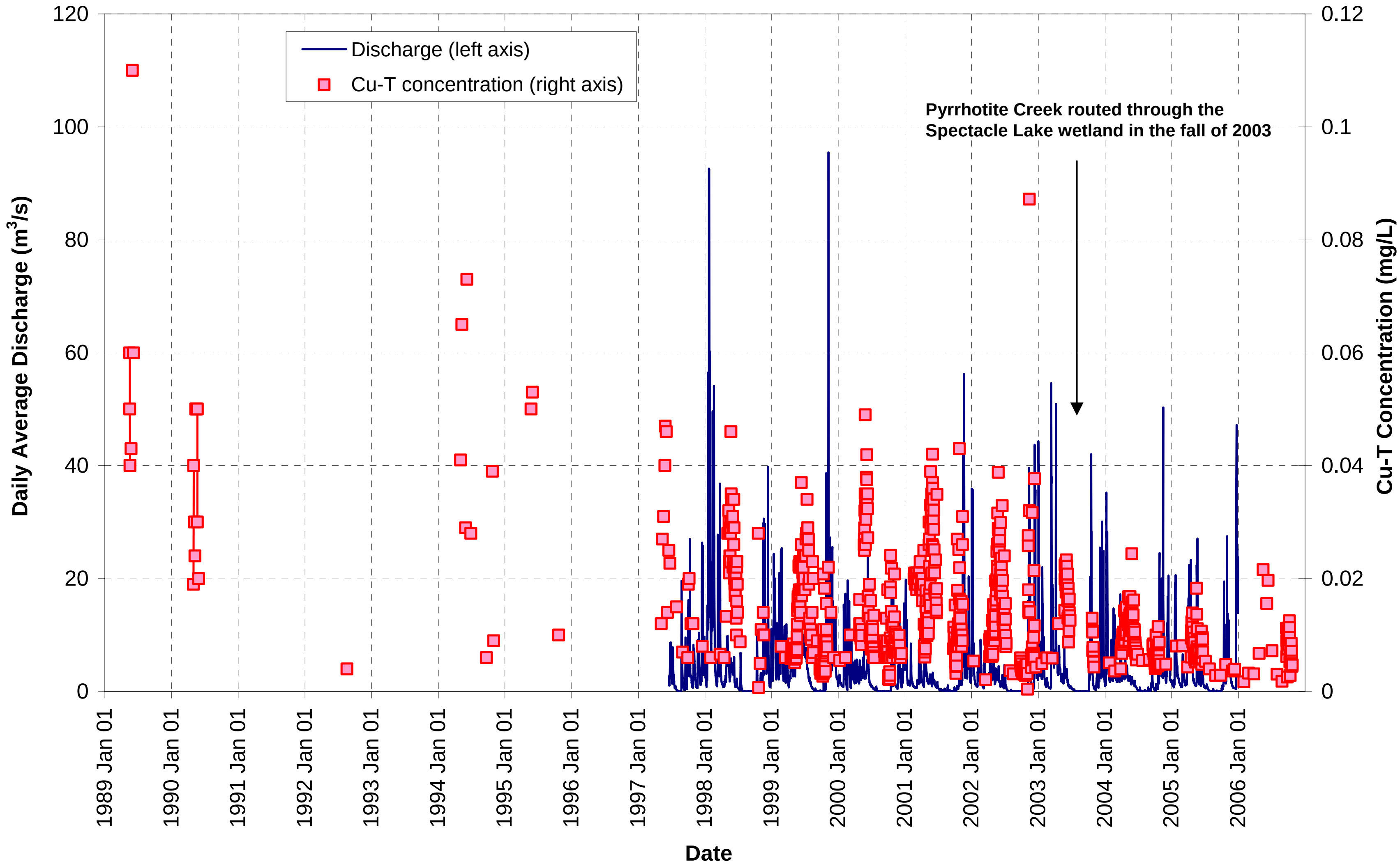
Tsolum River Partnership

Mt. Washington Remediation

Detailed Design

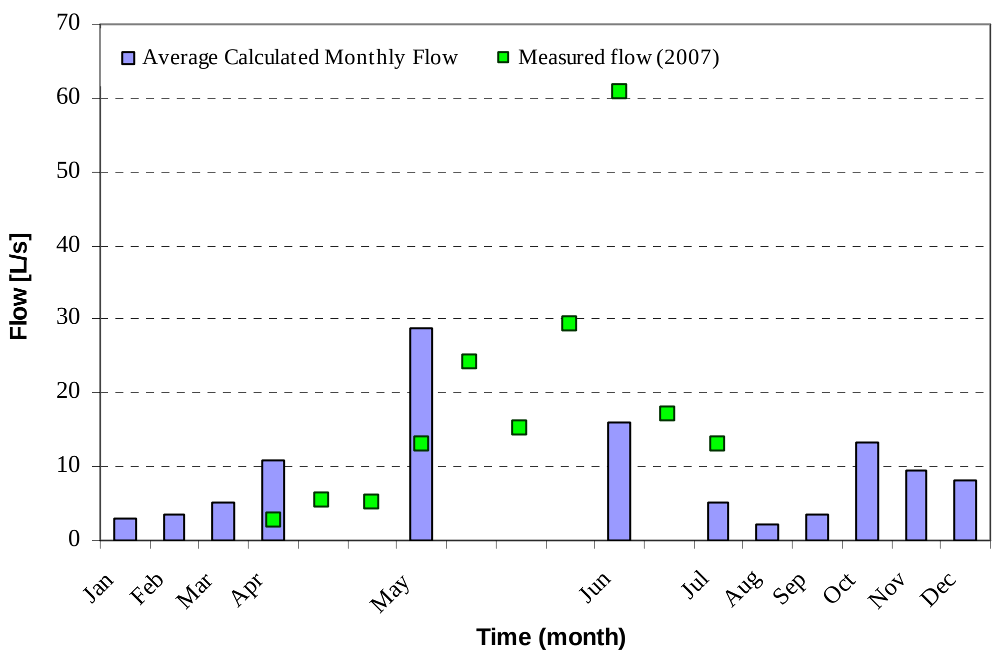
Pyrrhotite Creek at Branch 1200

Date: November 2007
Approved:
Figure: **5.1**

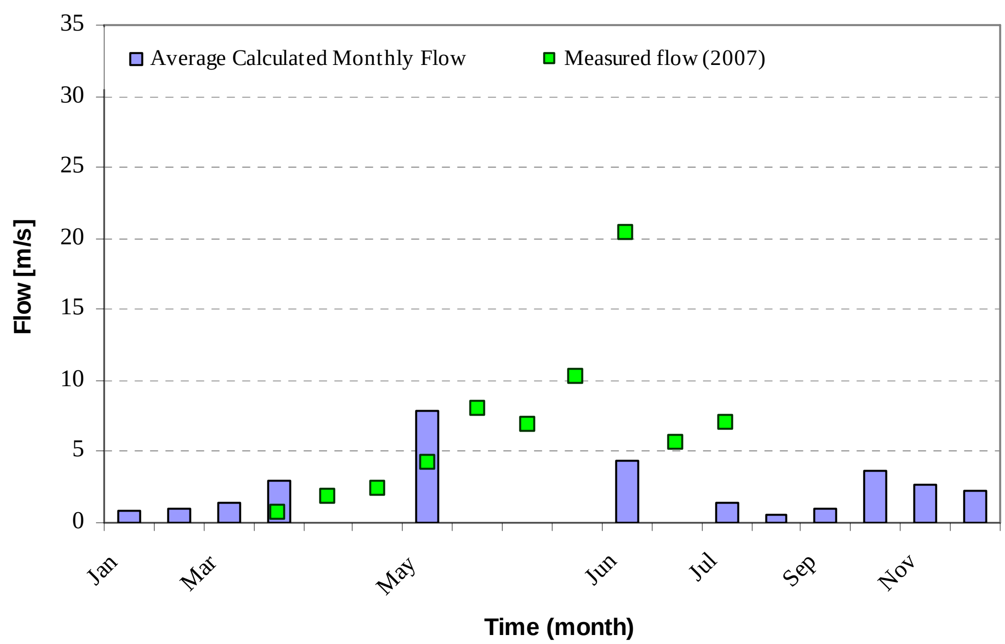


SRK Consulting Engineers and Scientists VANCOUVER	**Tsolum River Partnership**	Detailed Design **Tsolum River below Murex Creek**
Job No: 1CT001.001 Filename: Figure 5.3_PhyrrotiteCreek_20071128.ppt	Mt. Washington Remediation	Date: November 2007 · Approved: · Figure: **5.2**

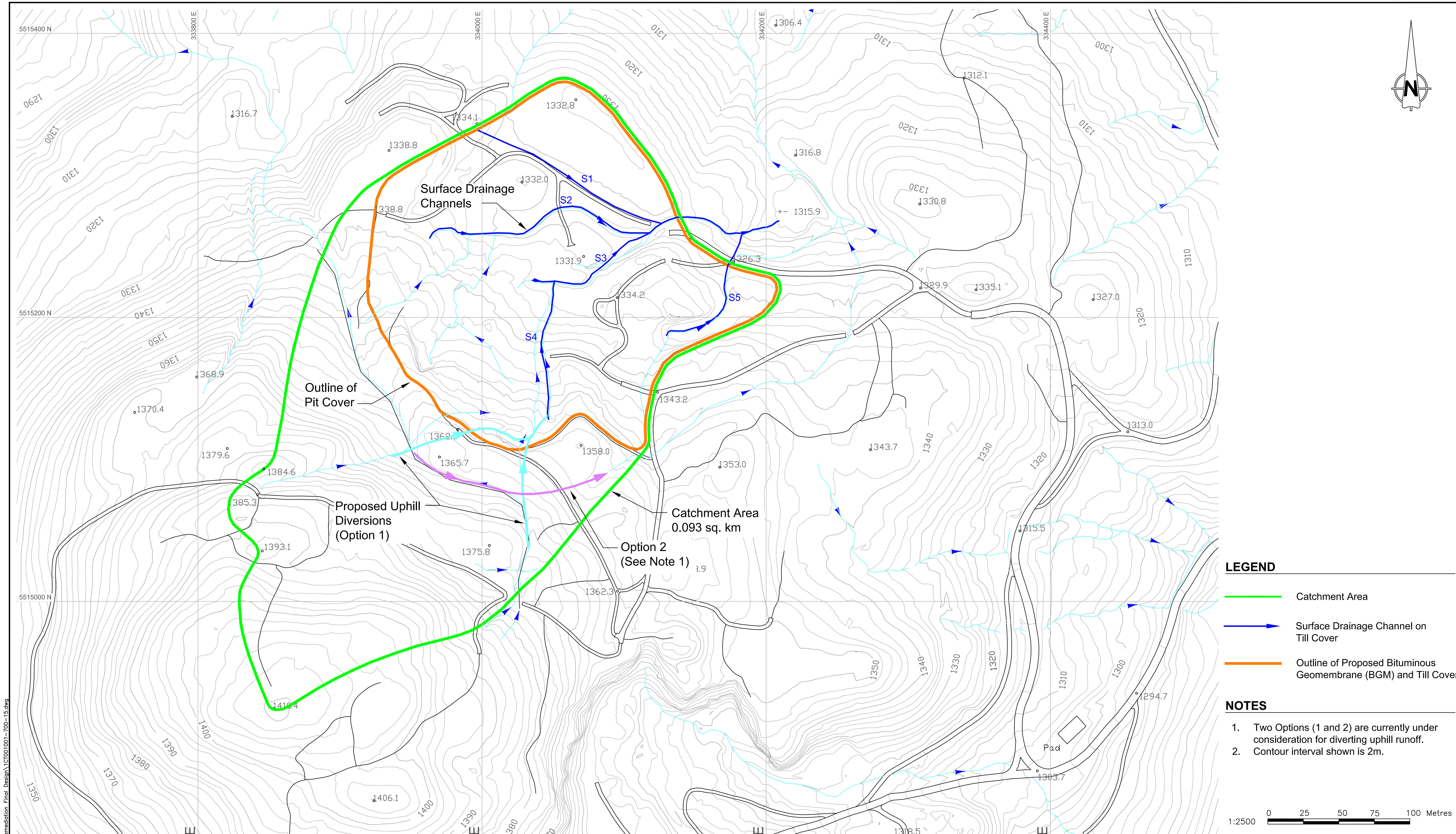
W1+W2 Flow



W3 Flow



SRK Consulting Engineers and Scientists VANCOUVER	Tsolum River Partnership	Detailed Design **Monthly Average and Calculated (2007) Flows at Weir 1+2 and Weir 3**		
Job No: 1CT001.001 Filename: Figure 5.3_Weir1-2and 3_20071128.ppt	Mt. Washington Remediation	Date: November 2007	Approved:	Figure: **5.3**



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Tsolum River Partnership

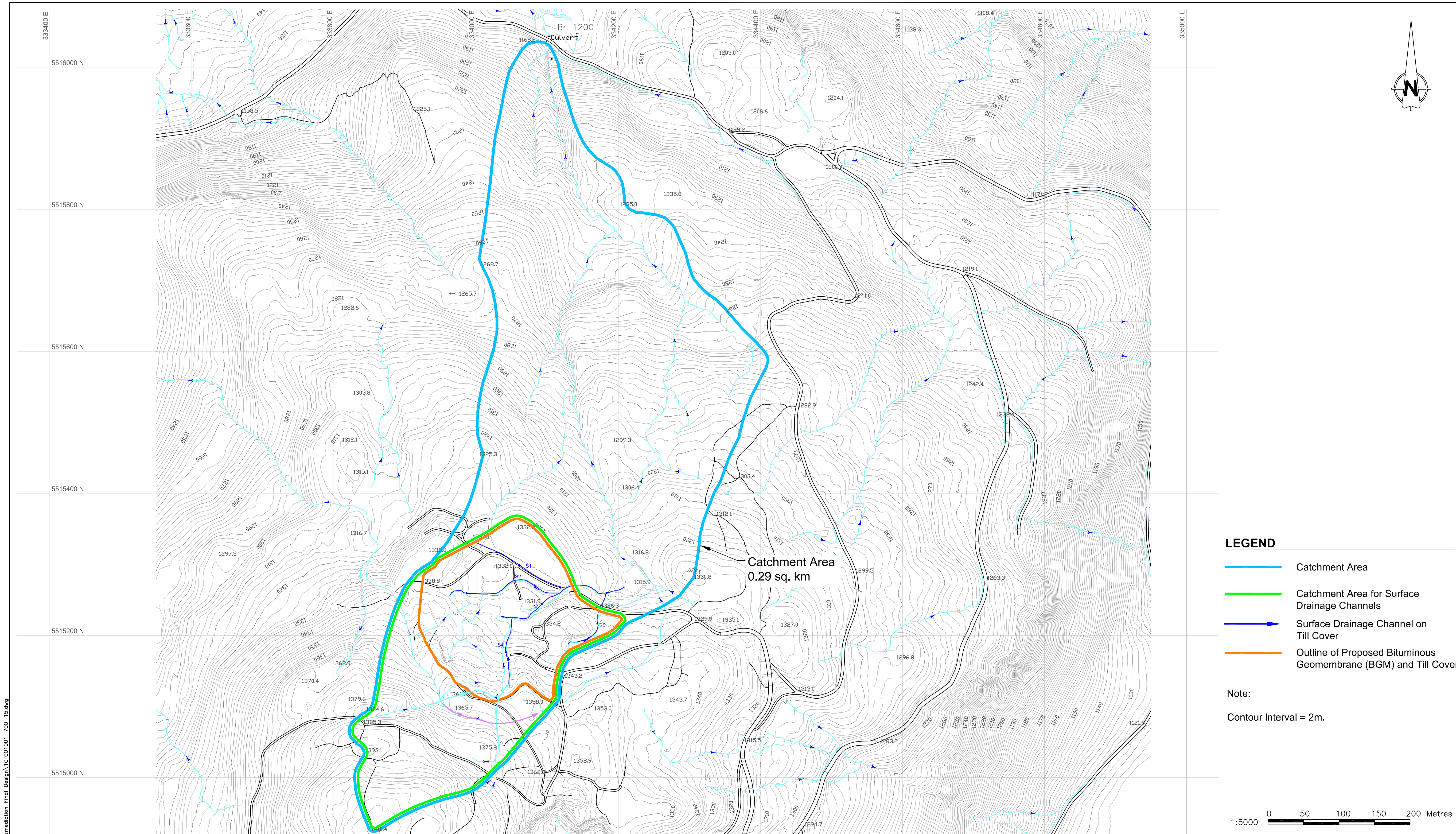
Mt. Washington Remediation

Detailed Design

Catchment Area for Surface Drainage Channels

SRK JOB NO.:	1CT001.001–700
FILE NAME:	1CT001001–700–15.dwg

DATE:	APPROVED:	FIGURE:
Nov. 07	PMH	5.4



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SRK JOB NO.: 1CT001.001–700

FILE NAME: 1CT001001–700–15.dwg

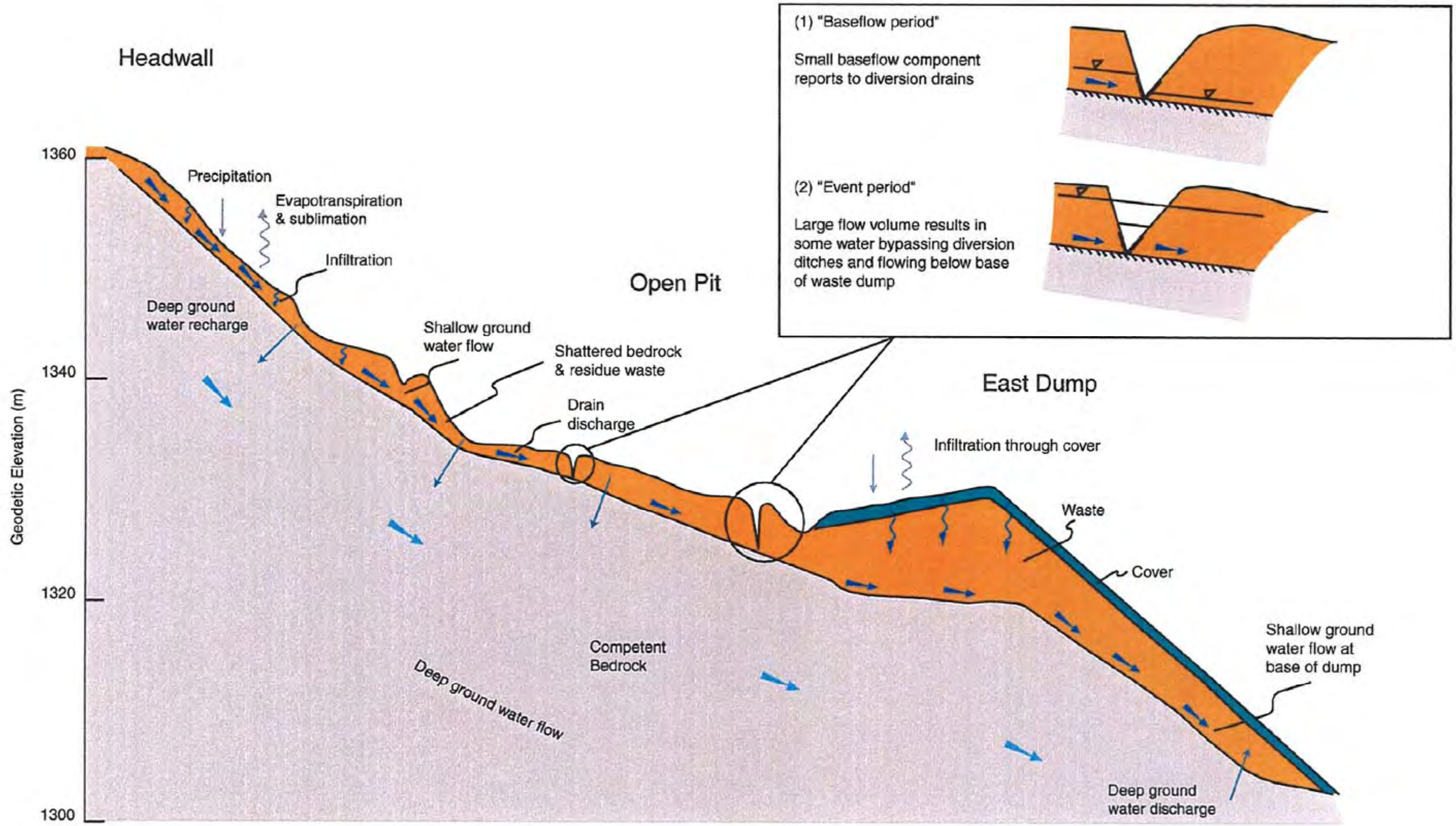
Tsolum River Partnership

Mt. Washington Remediation

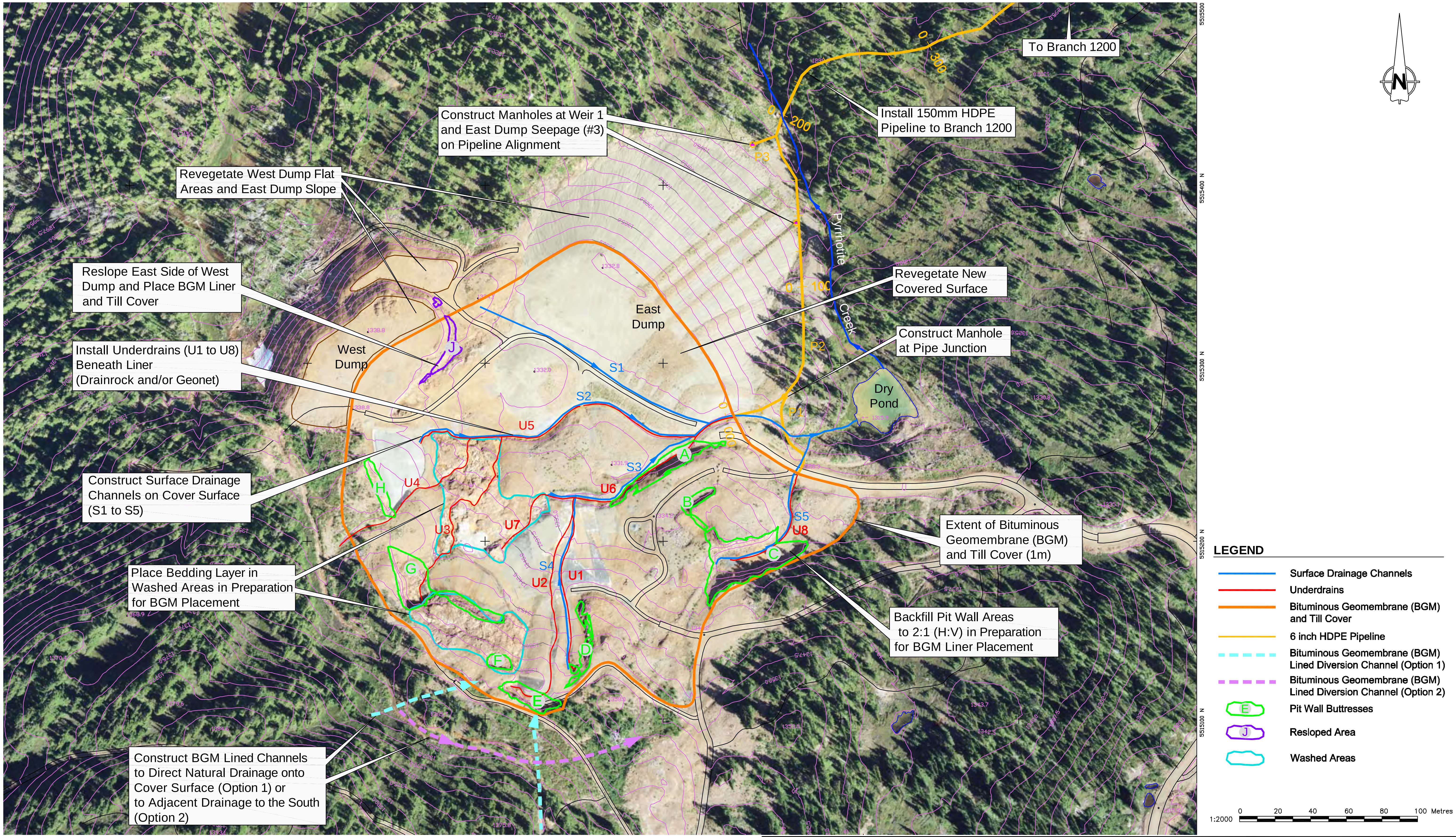
Detailed Design

Catchment Area for Pyrrhotite Creek Diversion

DATE:	APPROVED:	FIGURE:
Nov. 07	PMH	5.5



SRK Consulting Engineers and Scientists VANCOUVER	**Tsolum River Partnership**	Detailed Design **Groundwater Flow Paths**
Job No: 1CT001.001 Filename: Figure 5.6_GWFlowPaths_200711129.ppt	Mt. Washington Remediation	Date: November 2007 / Approved: / Figure: **5.6**



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Tsolum River Partnership

Mt. Washington Remediation

Detailed Design

Remediation Measures

SRK JOB NO.: 1CT001.001–700

FILE NAME: 1CT001001–700–3.dwg

DATE: Nov. 07

APPROVED: PMH

FIGURE: 6.1

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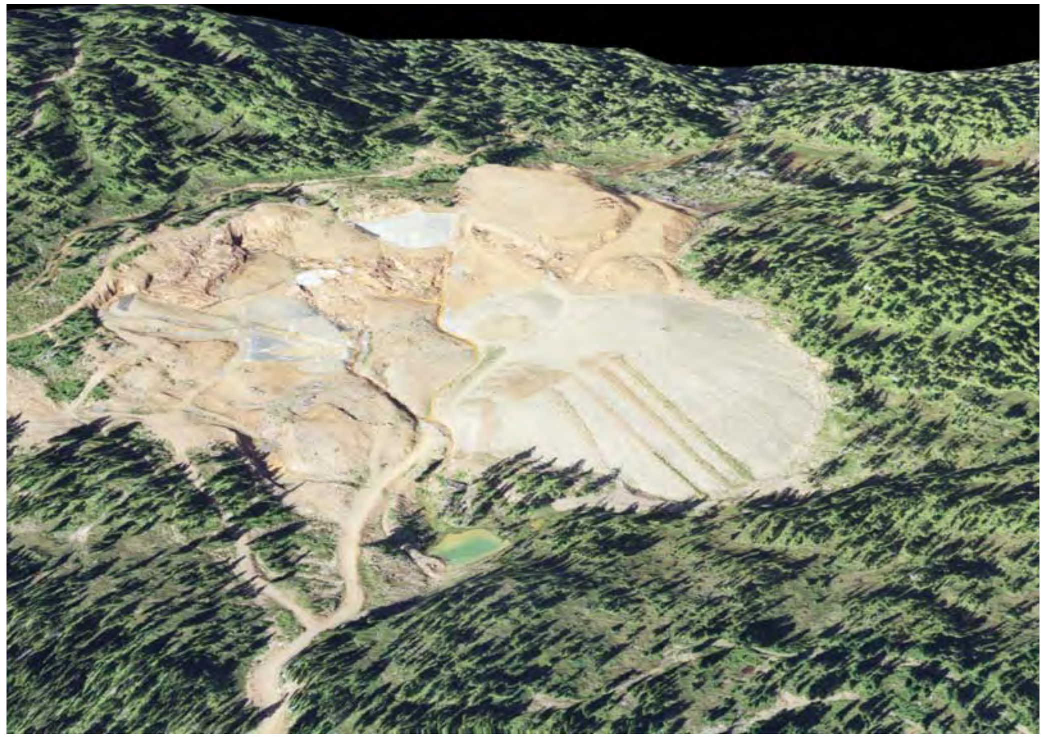
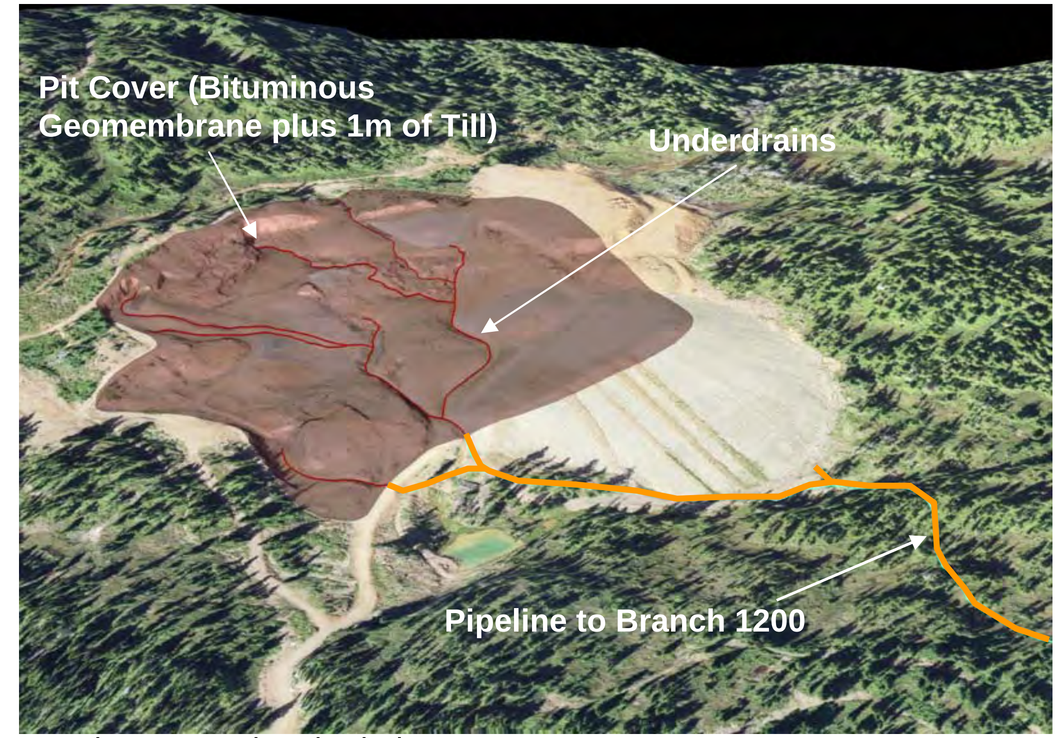
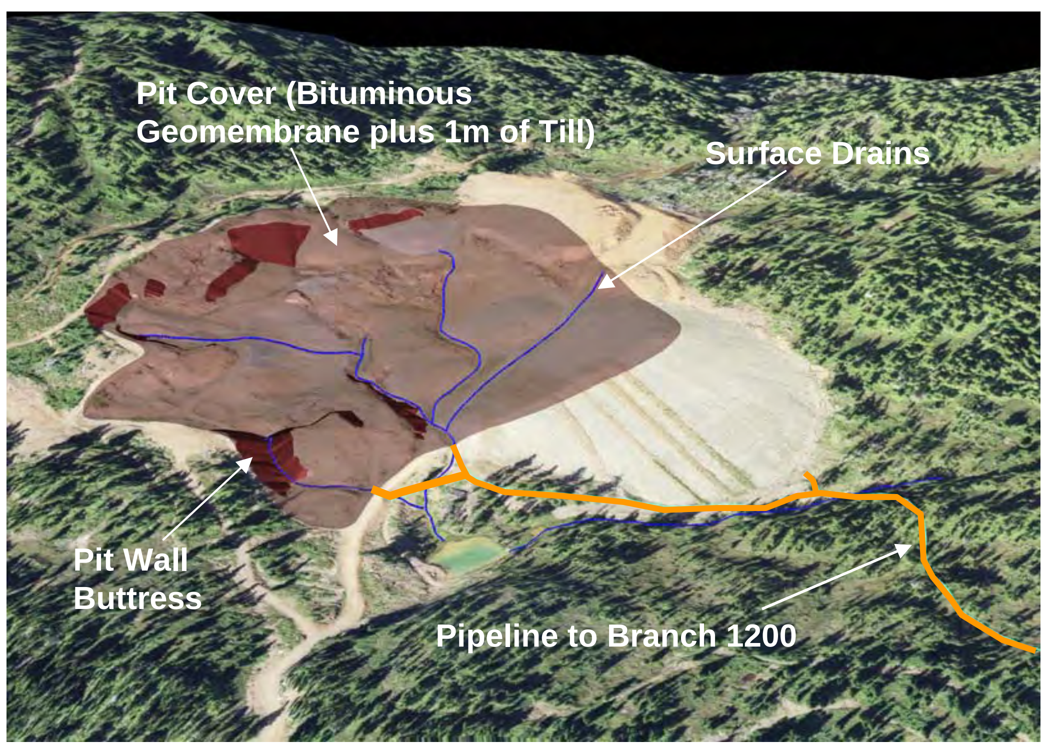


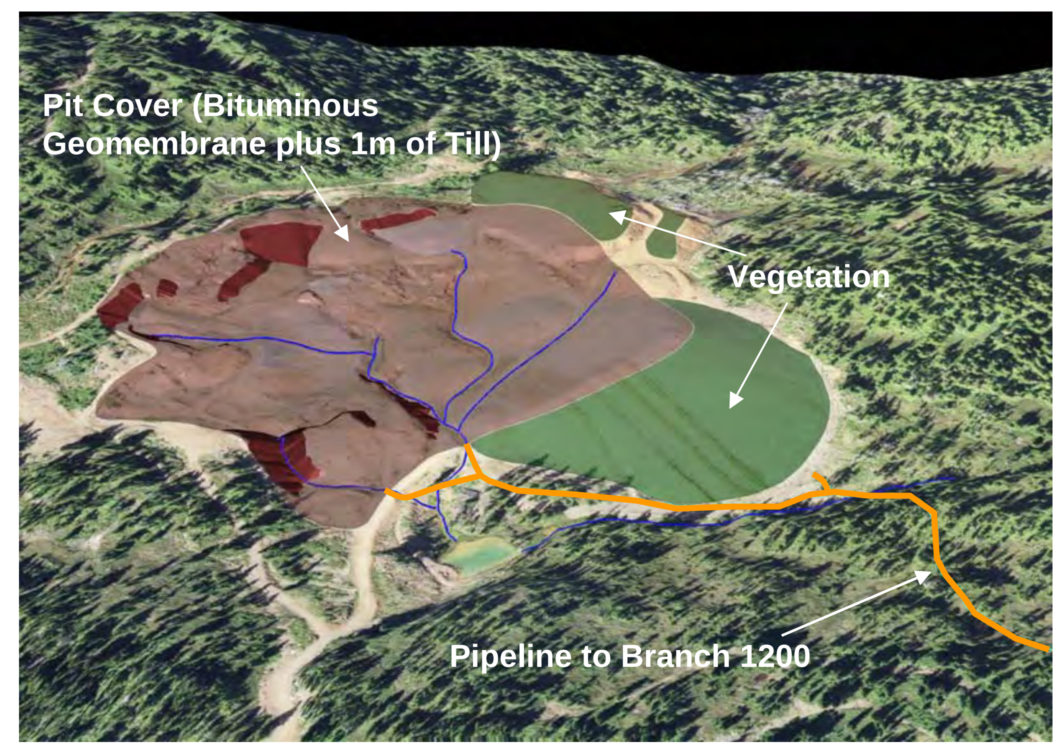
1. Current conditions



2. Pit cover and underdrains

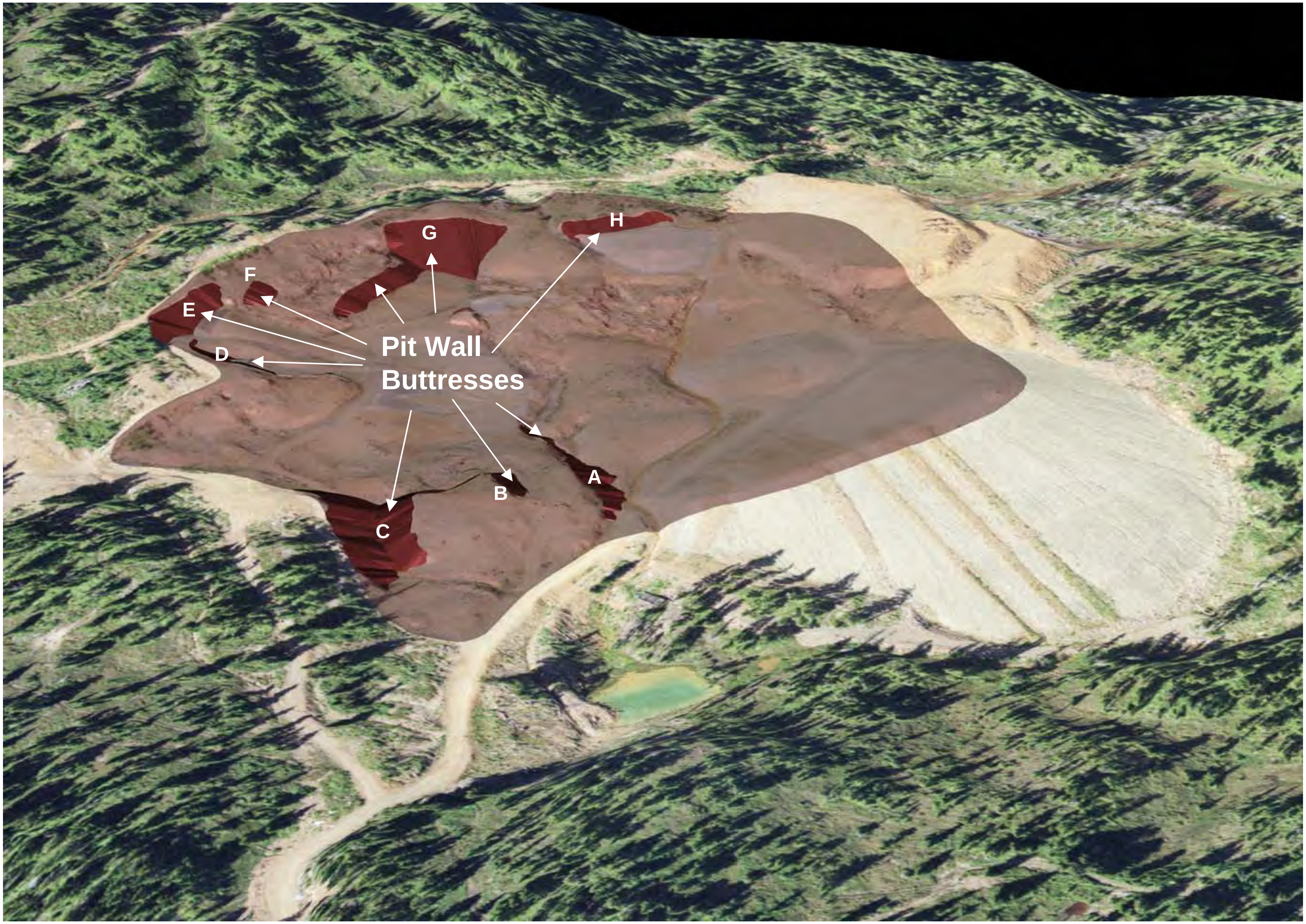


3. Pit Cover and surface drainage



4. Pit Cover, re-vegetation and pipeline to Branch 1200

SRK Consulting Engineers and Scientists VANCOUVER	Tsolum River Partnership	Detailed Design		
		3D Views of Pit Cover and Drains		
Job No: 1CT001.001 Filename: Figure 6.2_PitCover-20071121.ppt	Mt. Washington Remediation	Date: November 2007	Approved:	Figure: 6.2



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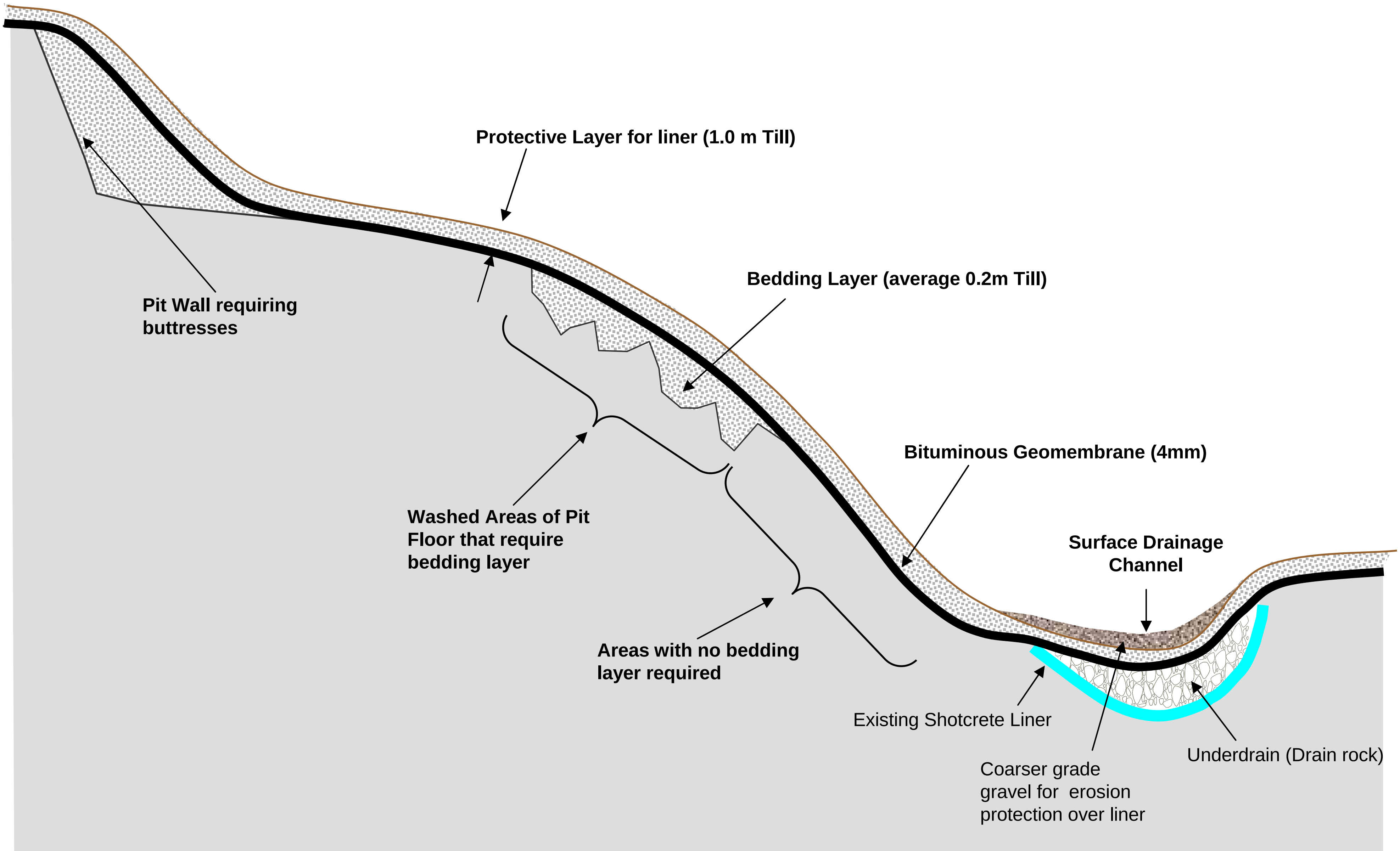
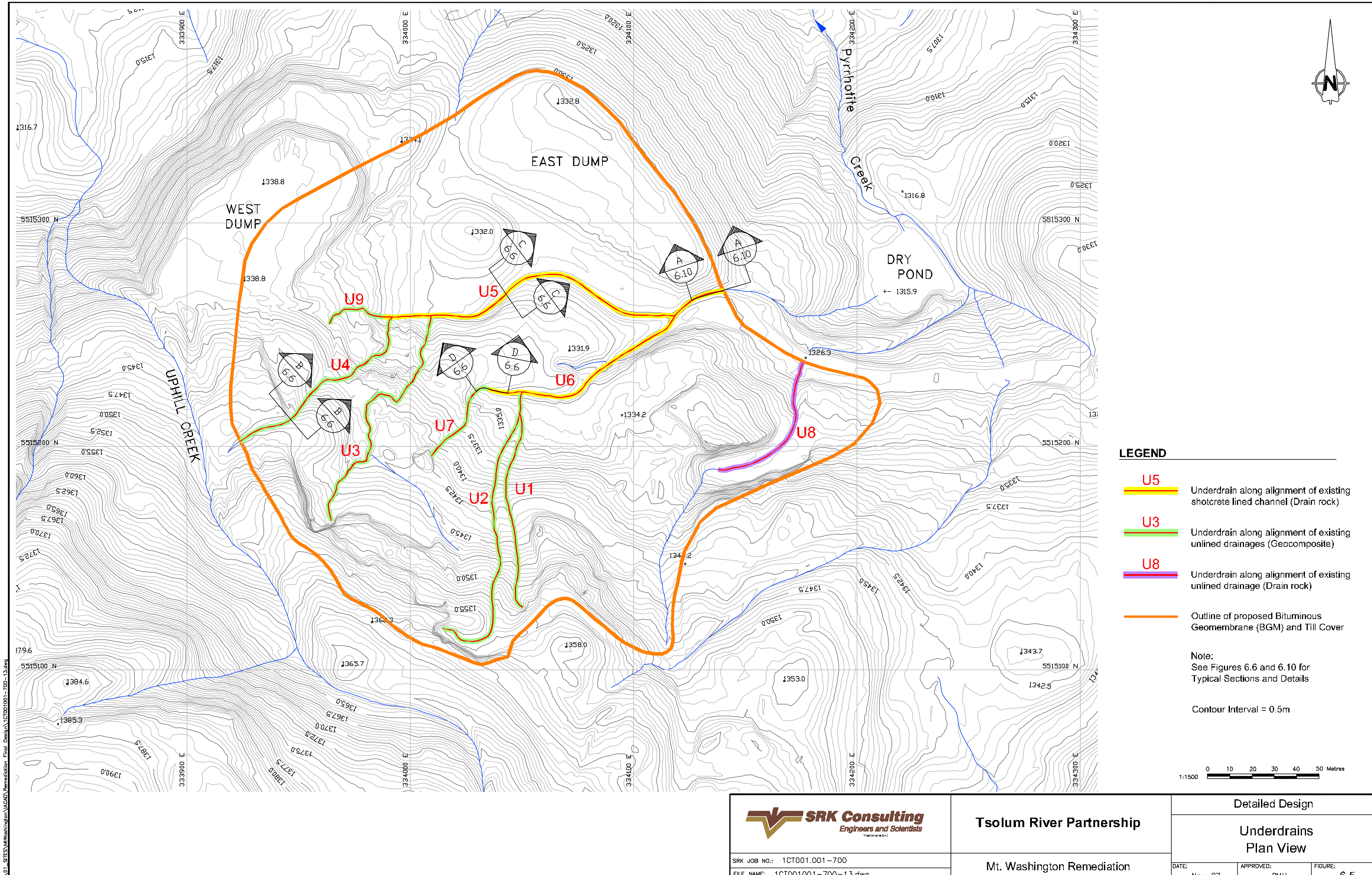
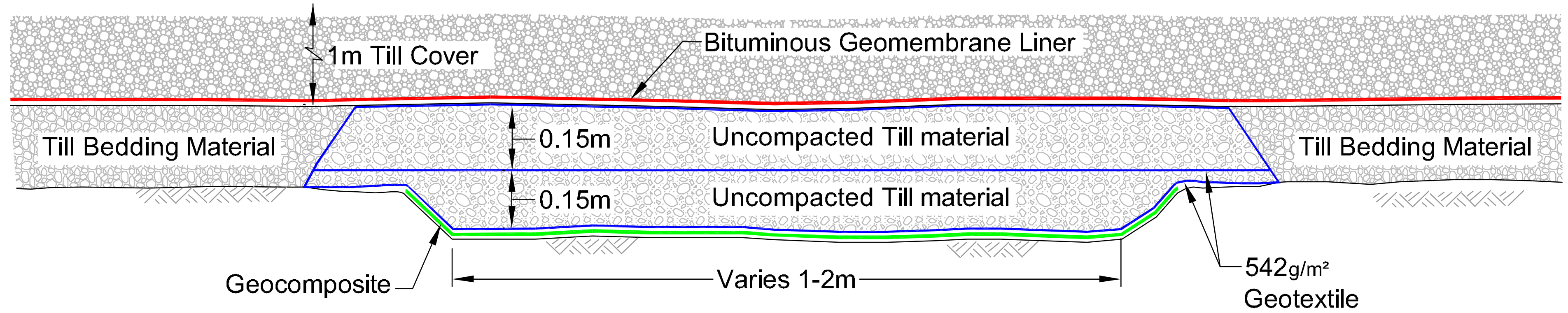
Tsolum River Partnership	Detailed Design	
	3D View of Pit Wall Buttresses	
Job No: 1CT001.001	Mt. Washington Remediation	Date: November 2007
Filename: Figure 6.3_PitWall_20071121.ppt	Approved:	Figure: **6.3**



SRK Consulting Engineers and Scientists VANCOUVER	Tsolum River Partnership	Detailed Design Report
		Schematic of Cover Scenarios
Job No: 1CT001.001 Filename: Figure 6.4_Schedule_20071219.ppt	Mt. Washington Remediation	Date: November 2007 / Approved: / Figure: 6.4

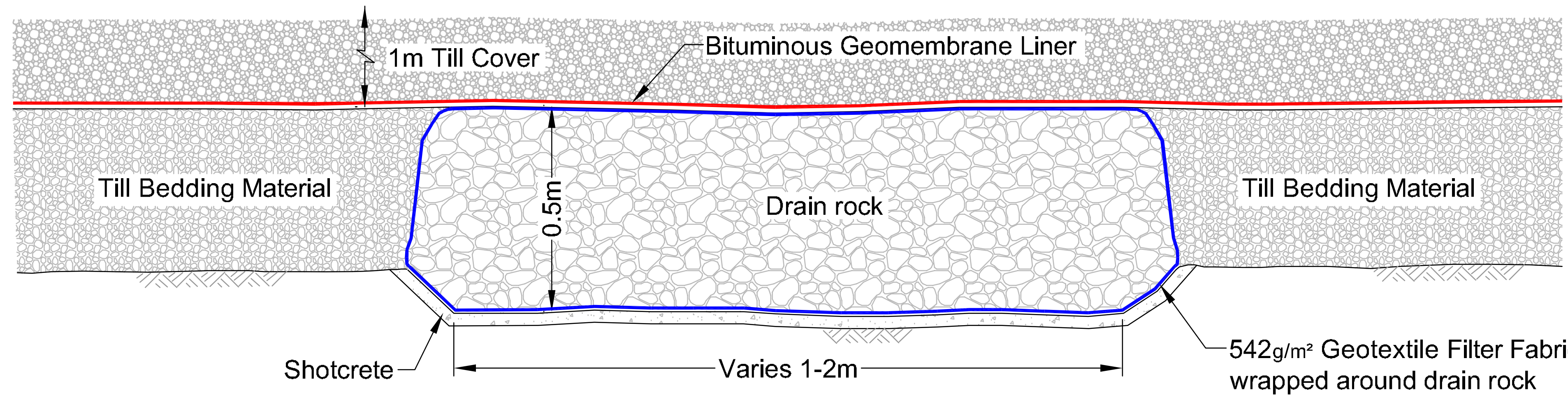

EAST DUMP
WEST DUMP
DRY POND
UPHILL CREEK
Pyrrhotite Creek
U1
U2
U3
U4
U5
U6
U7
U8
U9
LEGEND
U5 Underdrain along alignment of existing shotcrete lined channel (Drain rock)
U3 Underdrain along alignment of existing unlined drainages (Geocomposite)
U8 Underdrain along alignment of existing unlined drainage (Drain rock)
Outline of proposed Bituminous Geomembrane (BGM) and Till Cover
Note:
See Figures 6.6 and 6.10 for Typical Sections and Details
Contour Interval = 0.5m
1:1500
0 10 20 30 40 50 Metres
SRK Consulting
Engineers and Scientists
SRK JOB NO.: 1CT001.001-700
FILE NAME: 1CT001001-700-13.dwg
Tsolum River Partnership
Mt. Washington Remediation
Detailed Design
Underdrains
Plan View
DATE: Nov. 07
APPROVED: PMH
FIGURE: 6.5

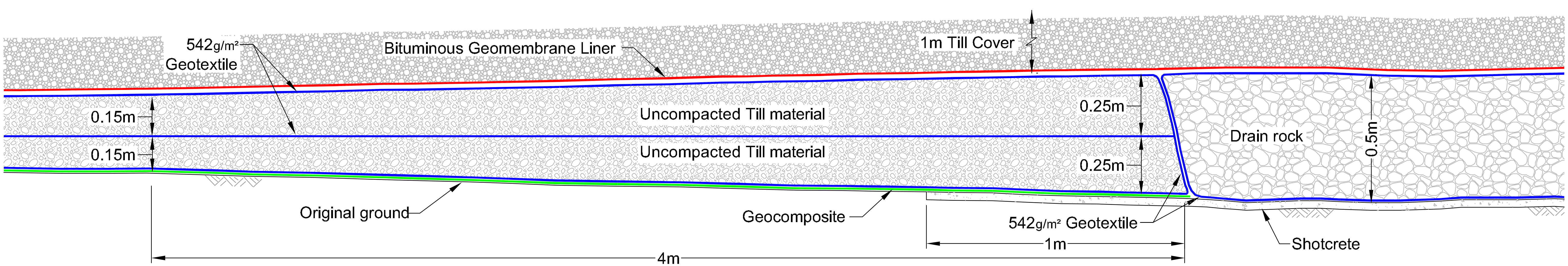
B / 6.5 TYPICAL SECTION WITH GEOCOMPOSITE
(U1,U2,U3,U4,U7,U9)



C / 6.5 TYPICAL SECTION WITH DRAINAGE GRAVEL
(U5,U6,U8)

Note: U8 is not lined with shotcrete
but will have drainage





LONG SECTION
D / 6.5 (TRANSITION FROM GEOCOMPOSITE TO DRAINAGE GRAVEL)

1:15 0 0.2 0.4 0.6 0.8 1.0 m

SRK Consulting Engineers and Scientists Vancouver B.C.	Tsolum River Partnership	Detailed Design
		Underdrains Typical Sections
SRK JOB NO.: 1CT001.001–700	Mt. Washington Remediation	DATE: Nov. 07
FILE NAME: 1CT001001–700–4.dwg		APPROVED: PMH
		FIGURE: 6.6

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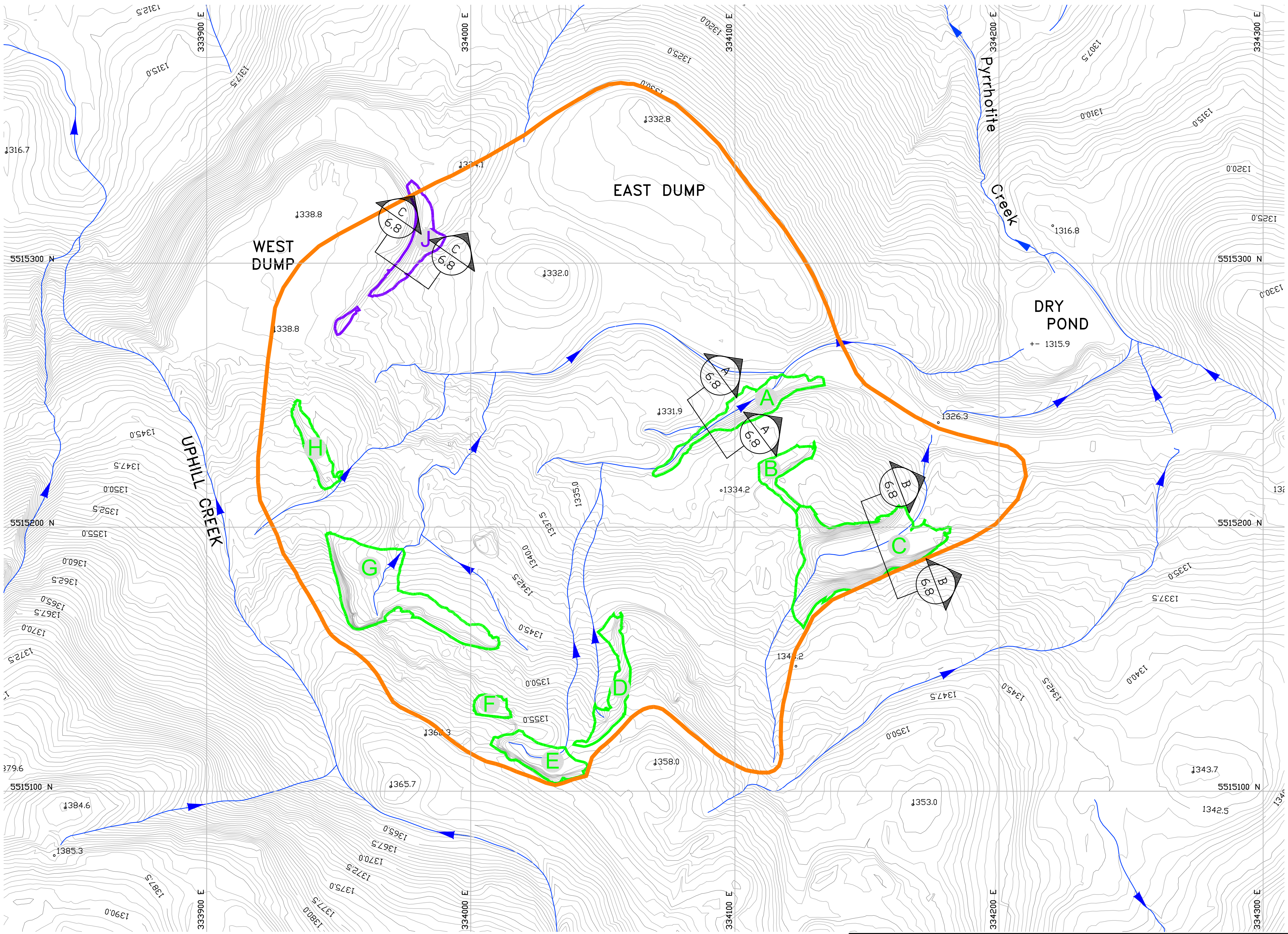

LEGEND

- C — Outline of Pit Wall Buttresses
- J — West Dump Resloping
- Outline of proposed Bituminous Geomembrane (BGM) and Till Cover
- Existing Drainages

Note:
See Figure 6.8 for Typical Sections and Details

Contour Interval = 0.5m

1:1500 — 0 10 20 30 40 50 Metres

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Vancouver B.C.

SRK JOB NO.: 1CT001.001–700	Tsolum River Partnership	Detailed Design
FILE NAME: 1CT001001–700–13.dwg	Mt. Washington Remediation	Pit Wall Buttresses and West Dump Resloping Plan View
		DATE: Nov. 07 / APPROVED: PMH / FIGURE: 6.7

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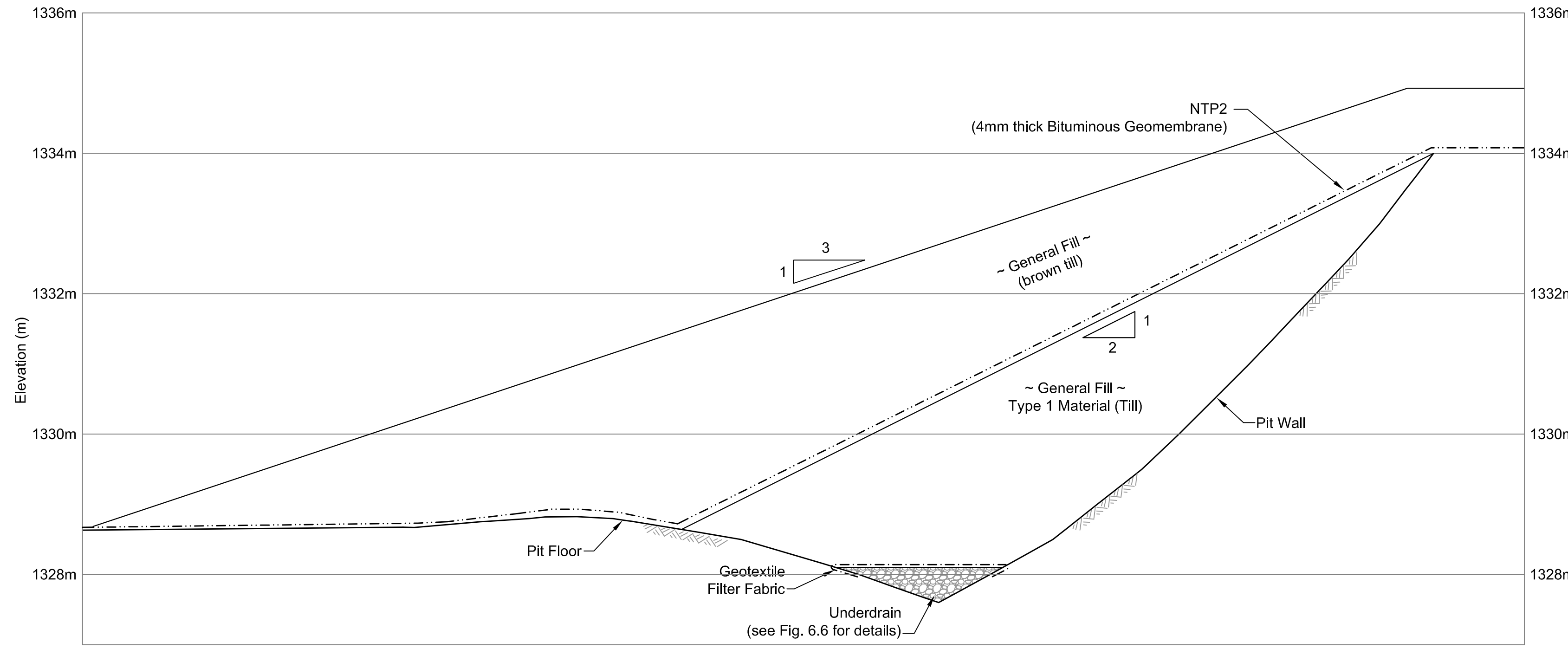
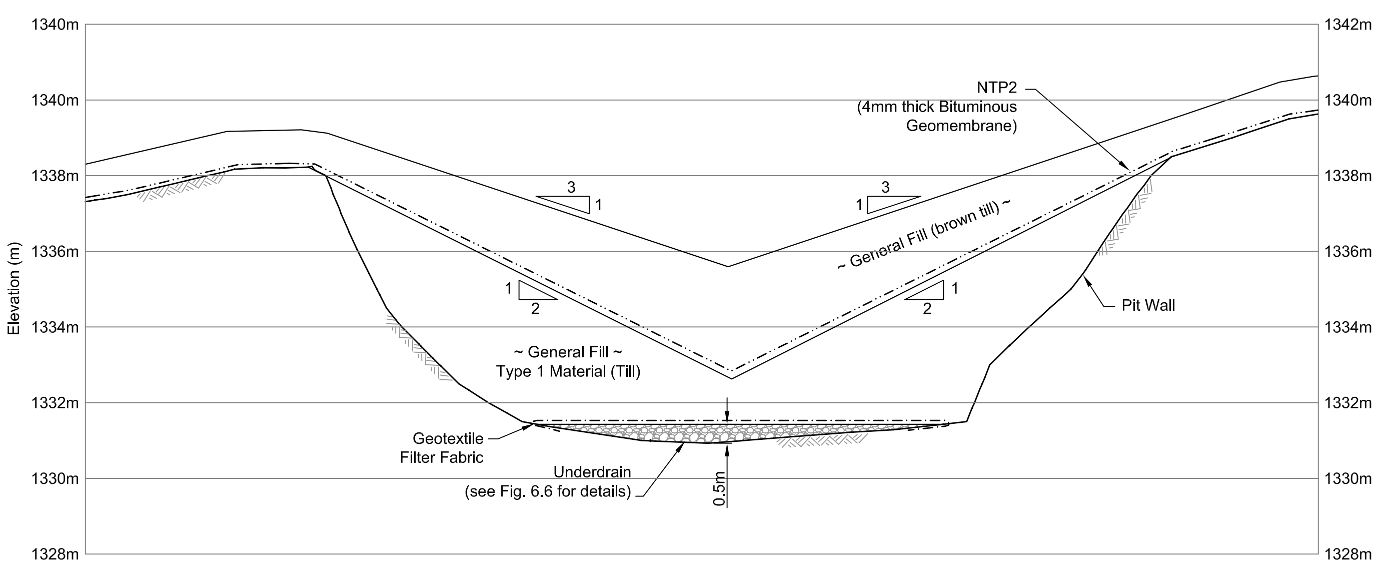
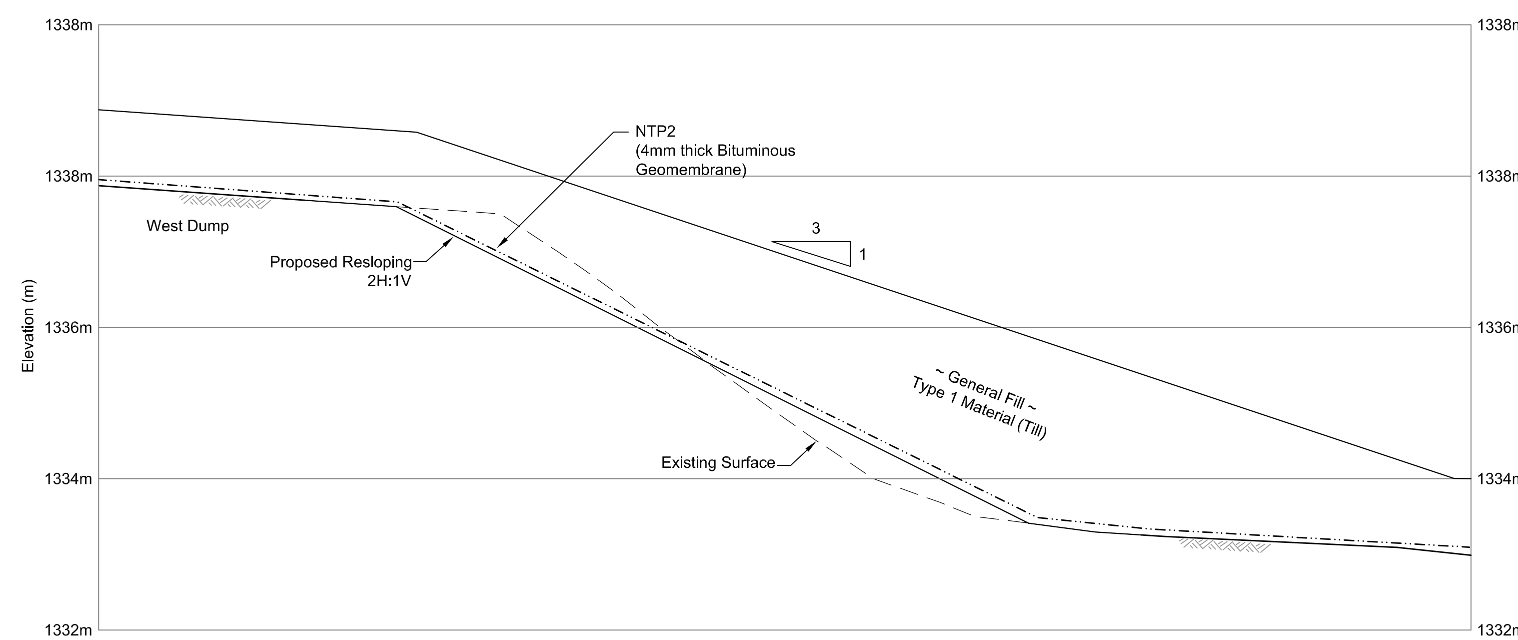


A
6.7
SECTION A
0 0.5 1 1.5 2 2.5
Scale in Metres



B
6.7
SECTION B
0 1 2 3 4 5
Scale in Metres



C
6.7
SECTION C
0 0.5 1 1.5 2 2.5
Scale in Metres

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Vancouver B.C.

SRK JOB NO.: 1CT001.001–700
FILE NAME: 1CT001001–700–4.dwg

Tsolum River Partnership

Mt. Washington Remediation

Detailed Design

Pit Wall Buttresses
Typical Sections

DATE: Nov. 07
APPROVED: PMH
FIGURE: 6.8

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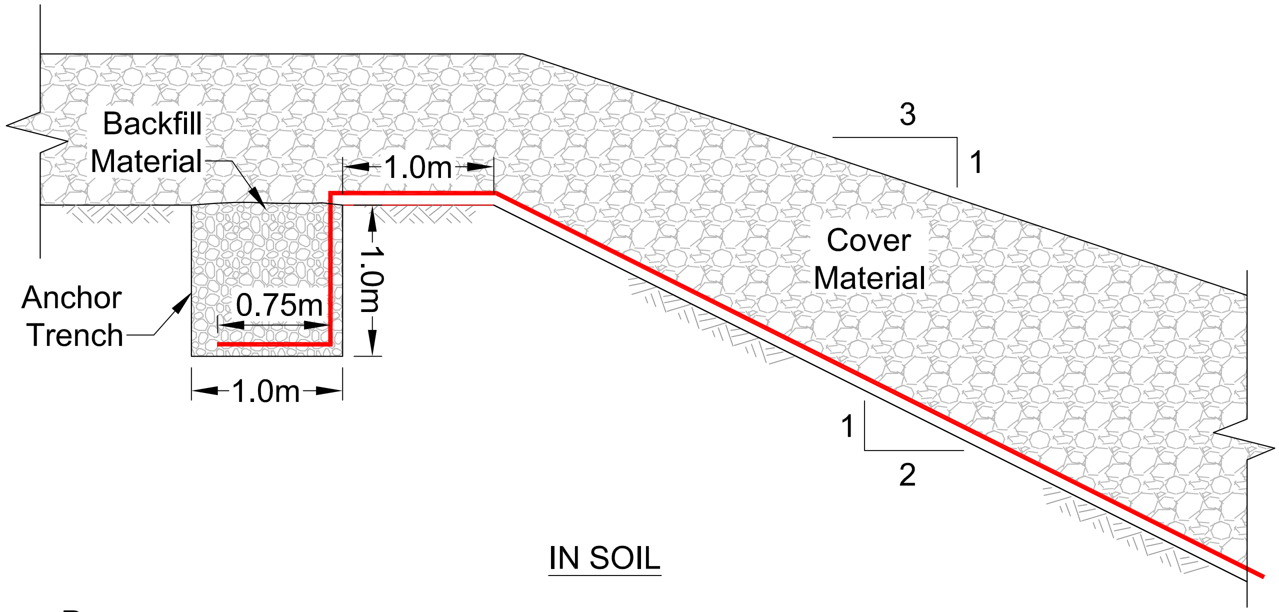
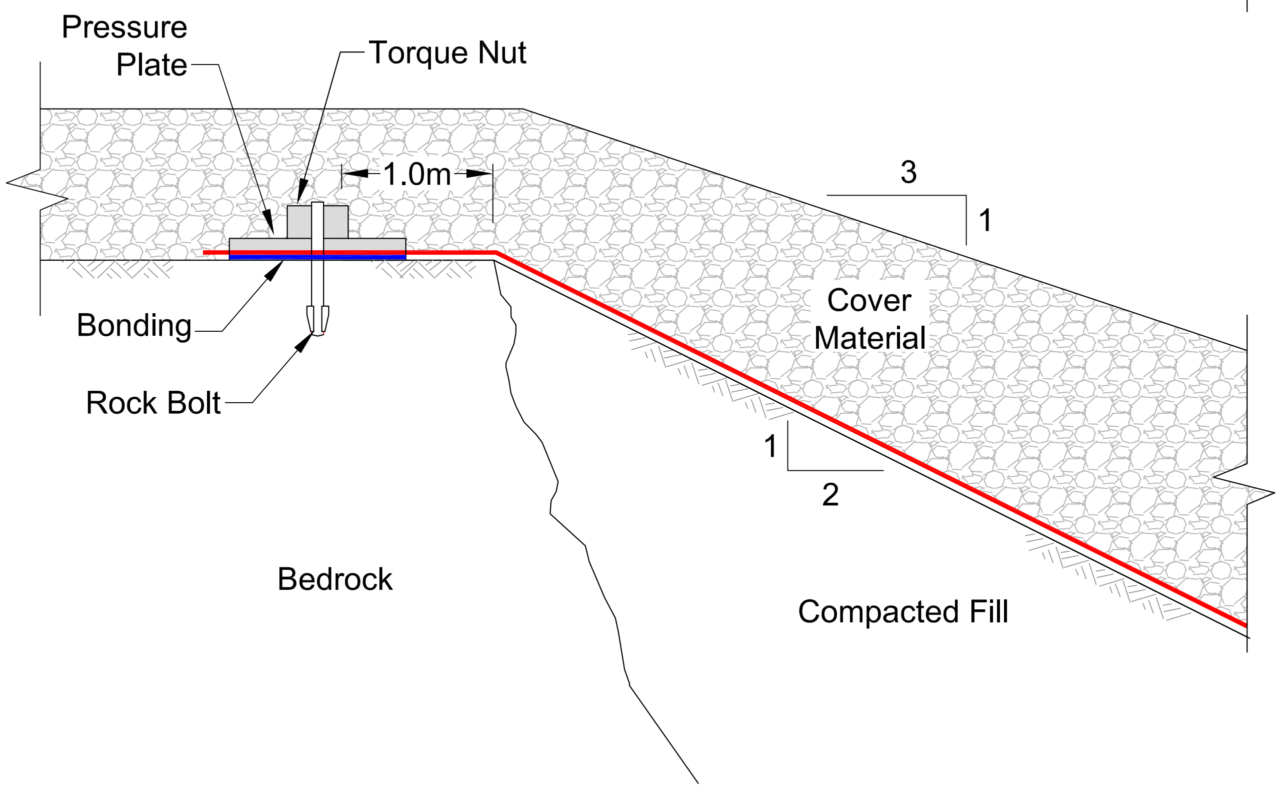
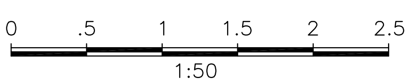


IN SOIL



IN BEDROCK



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Tsolum River Partnership

Mt. Washington Remediation

Detailed Design

Liner Anchor Details

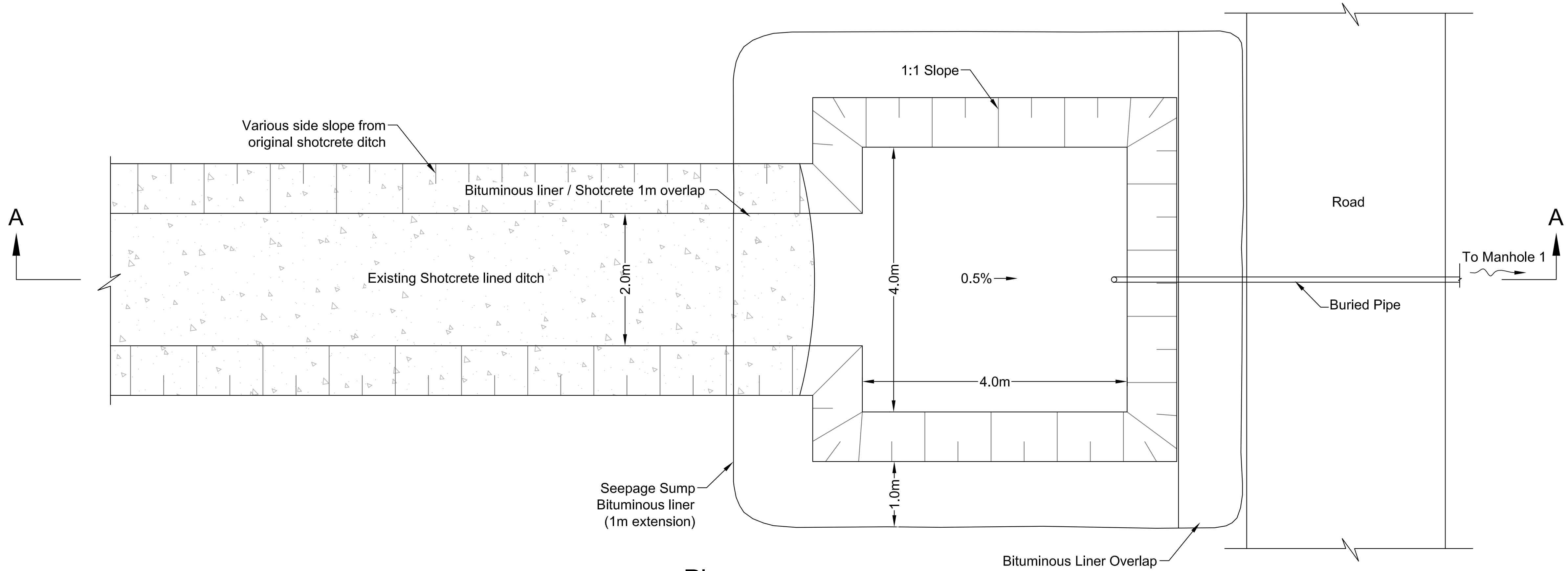
SRK JOB NO.: 1CT001.001–700

FILE NAME: 1CT001001–700–4.dwg

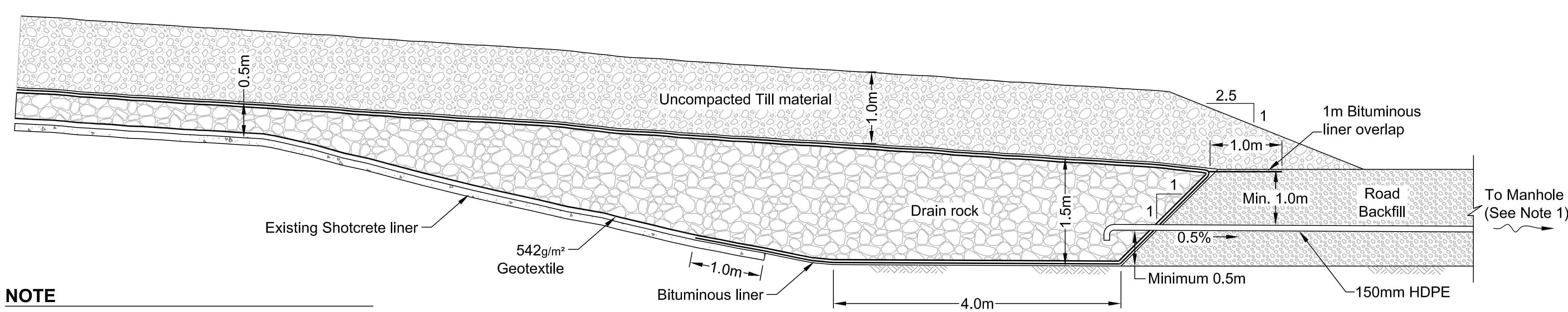
DATE: Nov. 07

APPROVED: PMH

FIGURE: 6.9



Plan



NOTE

1. Airlock will be installed in pipe inside manholes.

Section A-A

1:75 0 1 2 3 4 5 m

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SRK JOB NO.: 1CT001.001–700

FILE NAME: 1CT001001–700–4.dwg

Tsolum River Partnership

Mt. Washington Remediation

Detailed Design

Underdrain Seepage Discharge Details

DATE: Nov. 07 | APPROVED: PMH | FIGURE: 6.10

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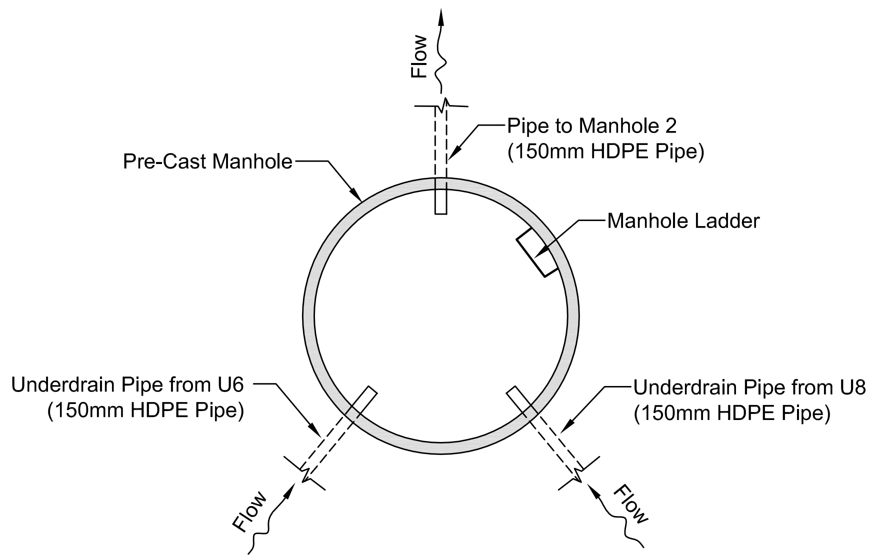
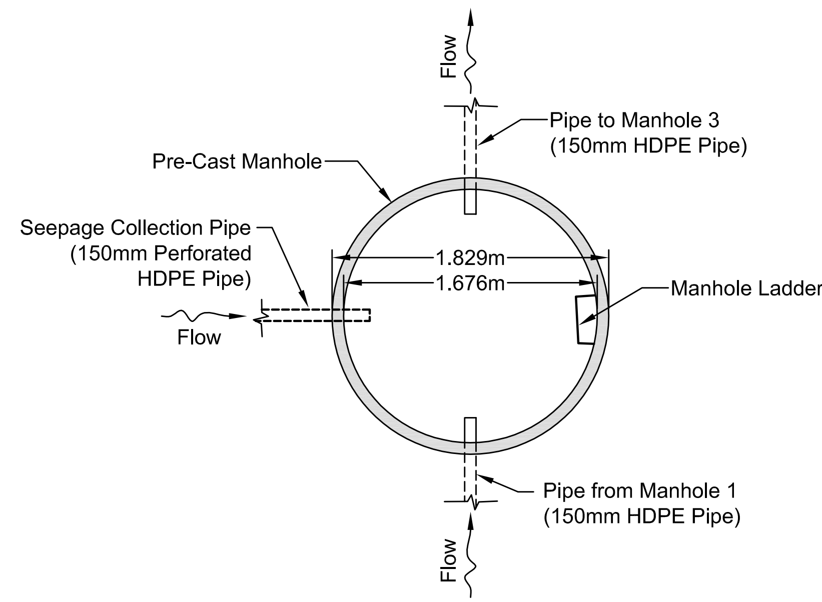
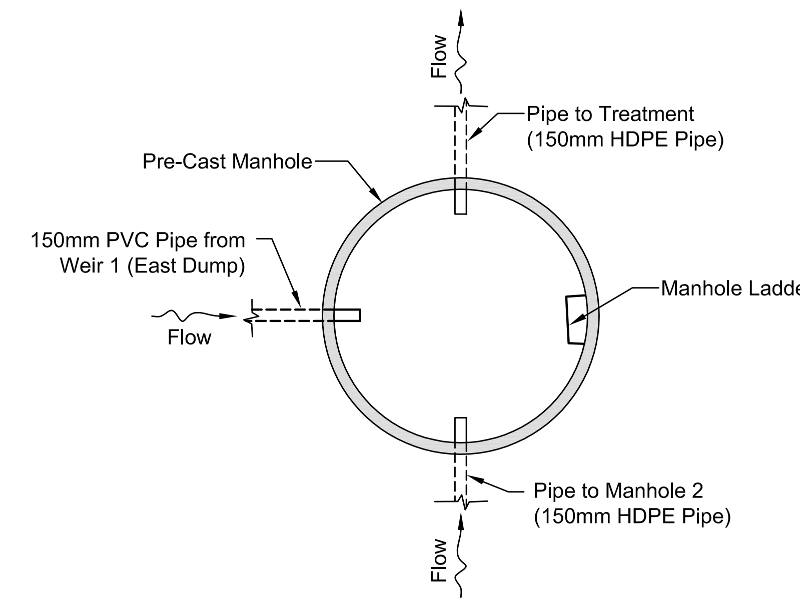
MANHOLE 1 PLAN VIEW



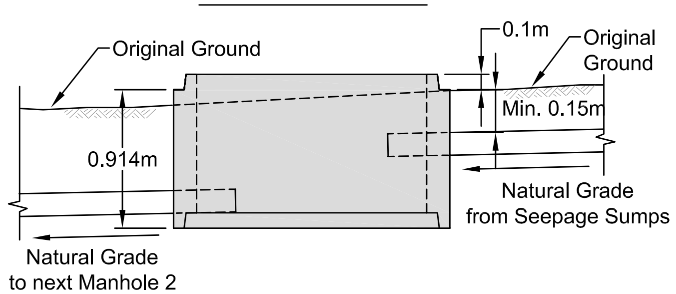
MANHOLE 2 PLAN VIEW



MANHOLE 3 PLAN VIEW



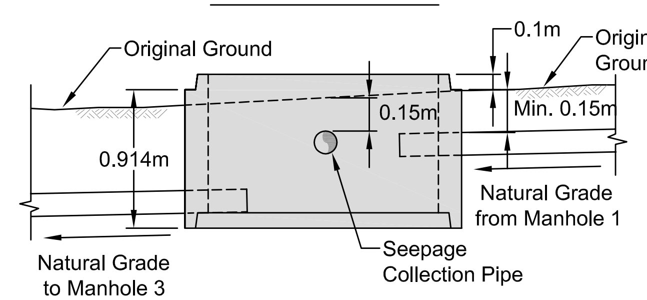
MANHOLE 1 SIDE VIEW



MANHOLE 1
(Pipe Junction)

0 0.5 1 1.5 2 2.5
Scale in Metres

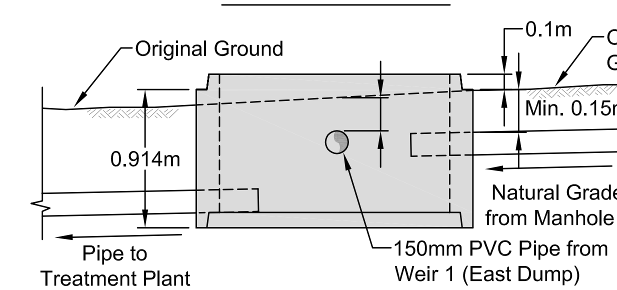
MANHOLE 2 SIDE VIEW



MANHOLE 2
(East Dump Seepage)

0 0.5 1 1.5 2 2.5
Scale in Metres

MANHOLE 3 SIDE VIEW



MANHOLE 3
(Weir 1)

0 0.5 1 1.5 2 2.5
Scale in Metres

NOTE

1. Refer to Figure 7.2 for plan view locations of manholes.
2. All manhole dimensions are identical.

SRK Consulting Engineers and Scientists Vancouver B.C.	**Tsolum River Partnership**	Detailed Design
SRK JOB NO.: 1CT001.001–700		Manhole Typical Details and Sections
FILE NAME: 1CT001001–700–14.dwg	Mt. Washington Remediation	DATE: Nov. 07 / APPROVED: PMH / FIGURE: 6.11

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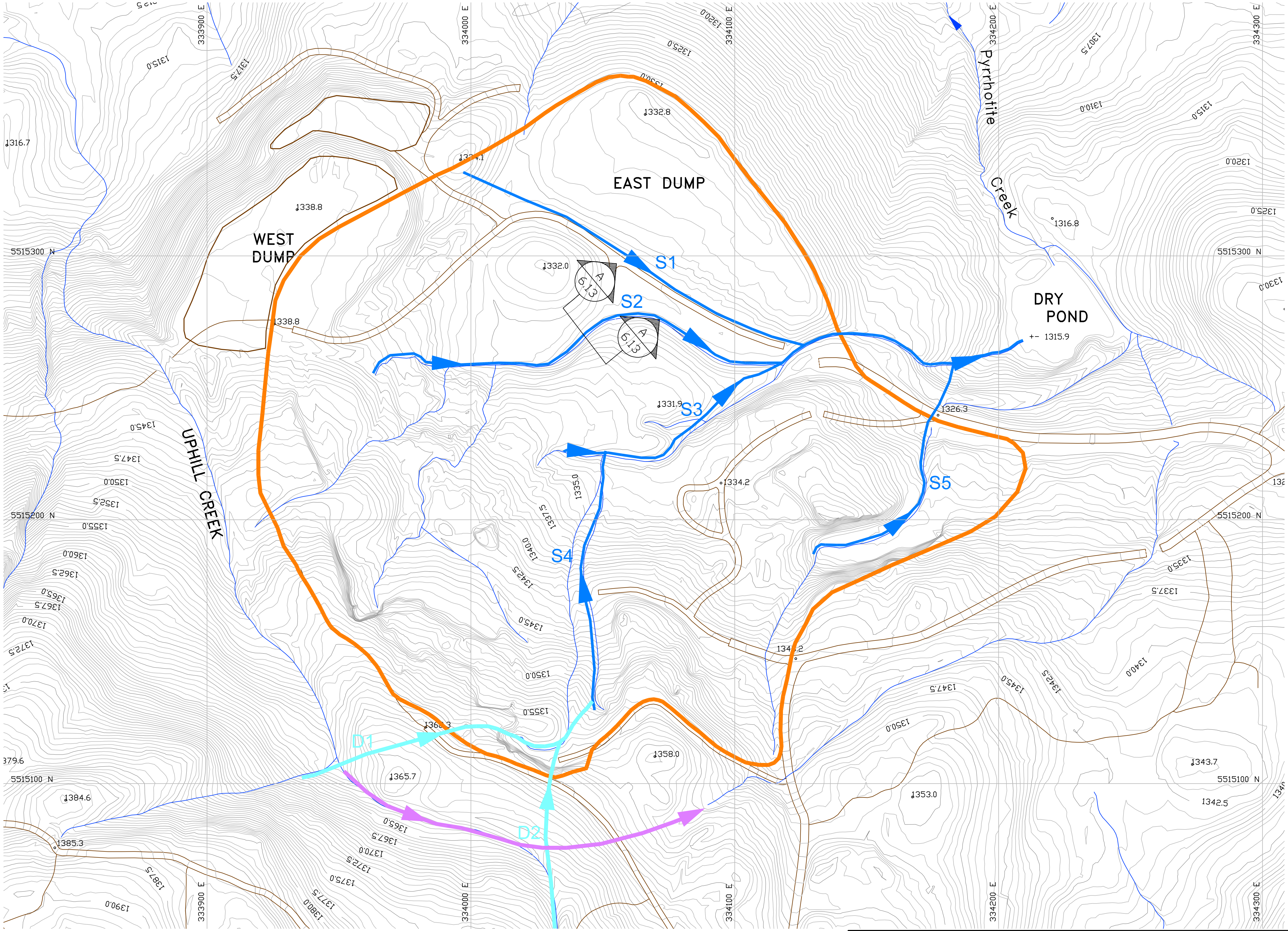

LEGEND

S4	Surface Drainage Channel
D1	Uphill Diversion (Option 1) (See Figure 6.14 for details)
	Uphill Diversion (Option 2)
	Outline of proposed Bituminous Geomembrane (BGM) and Till Cover

NOTES

1. Two Options (1 and 2) are currently under consideration for diverting uphill runoff.
2. See Figure 6.13 for typical sections and details.
3. See Figure 6.14 for plan view.
4. Contour interval shown is 0.5m.

1:1500 0 10 20 30 40 50 Metres

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SRK JOB NO.: 1CT001.001–700

FILE NAME: 1CT001001–700–13.dwg

Tsolum River Partnership

Mt. Washington Remediation

Detailed Design

Surface Drainage Channels
Plan View

DATE: Nov. 07 | APPROVED: PMH | FIGURE: 6.12

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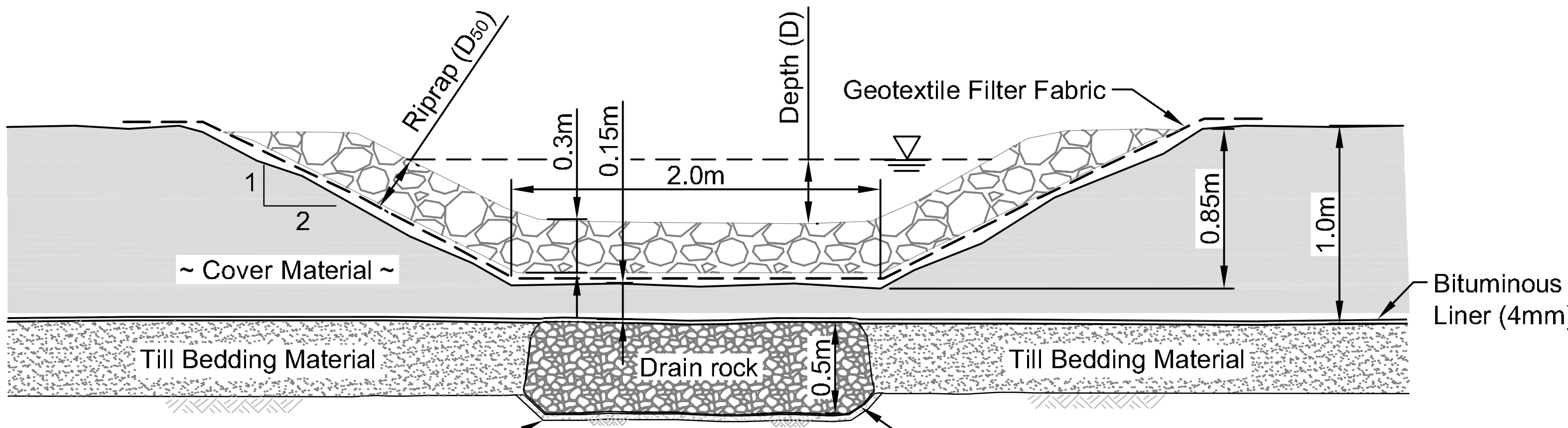
J:\01_SITES\MtWashington\ACAD\Remediation Final Design\1CT001001-700-6.dwg

Q_{200} (m^3/sec)	D Depth of Flow(m)	D_{50} (m)	Slope (m/m)
0.46	0.2	0.3	0.01

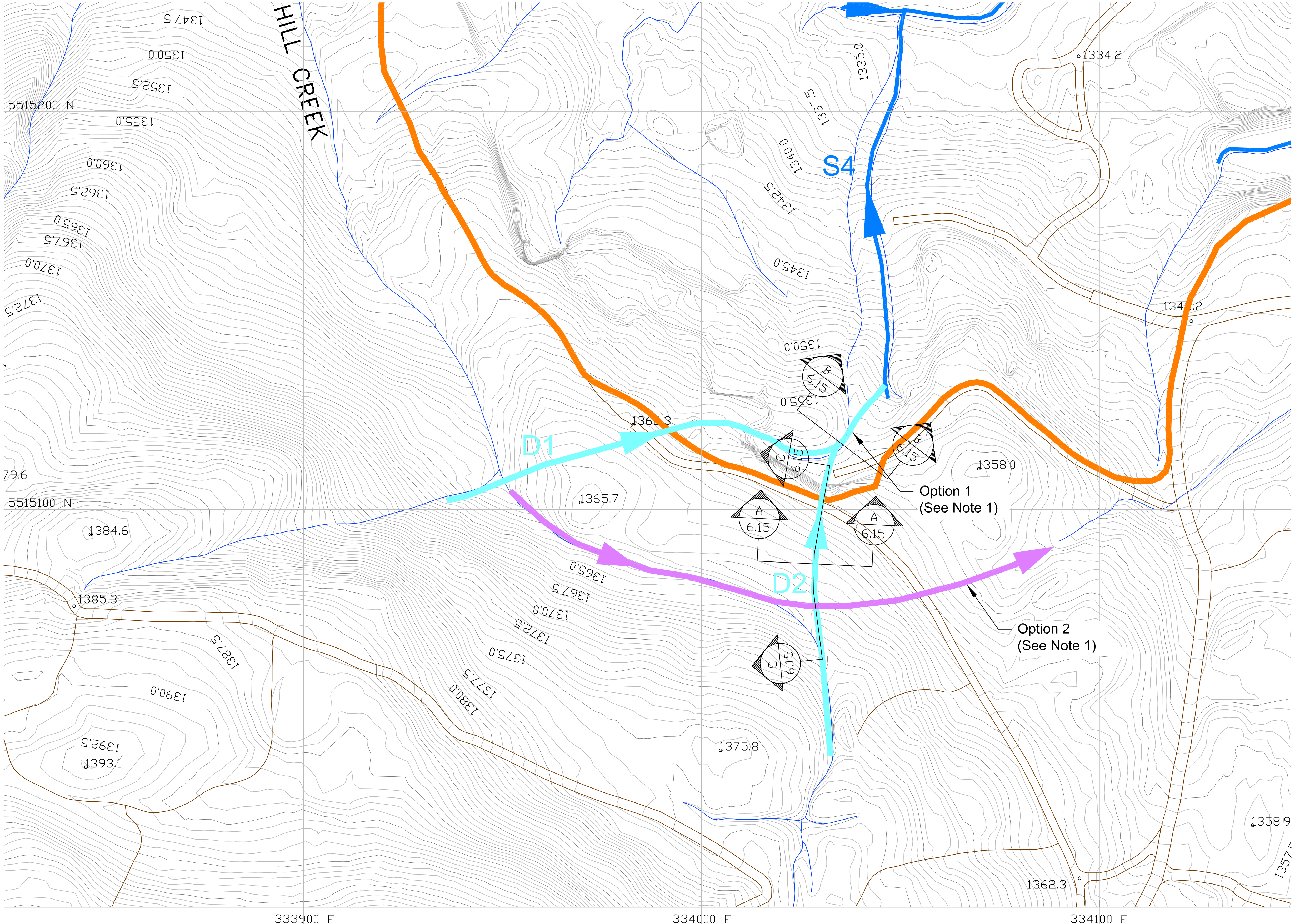


A
6.12

Section A-A

0 0.4 0.8 1.2 1.6 2
Scale in Metres

SRK Consulting Engineers and Scientists Vancouver B.C.	Tsolum River Partnership	Detailed Design
		Typical Section through Surface Drainage Channels
SRK JOB NO.: 1CT001.001–700	Mt. Washington Remediation	DATE: Nov. 07
FILE NAME: 1CT001001–700–6.dwg		APPROVED: PMH
		FIGURE: 6.13



LEGEND

D1	Uphill Diversion (Option 1)
	Uphill Diversion (Option 2)
S4	Surface Drainage Channel (See Figure 6.12 for details)
	Outline of proposed Bitumous Geomembrane (BGM) and Till Cover

NOTES

1. Two Options (1 and 2) are currently under consideration for diverting uphill runoff.
2. See Figure 6.15 for typical sections and details.
3. Contour interval shown is 0.5m.

1:1000 0 10 20 30 40 50 Metres

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Tsolum River Partnership

Mt. Washington Remediation

Detailed Design

Uphill Diversions
Plan View

SRK JOB NO.: 1CT001.001–700
FILE NAME: 1CT001001–700–13.dwg

DATE: Nov. 07 | APPROVED: PMH | FIGURE: 6.14

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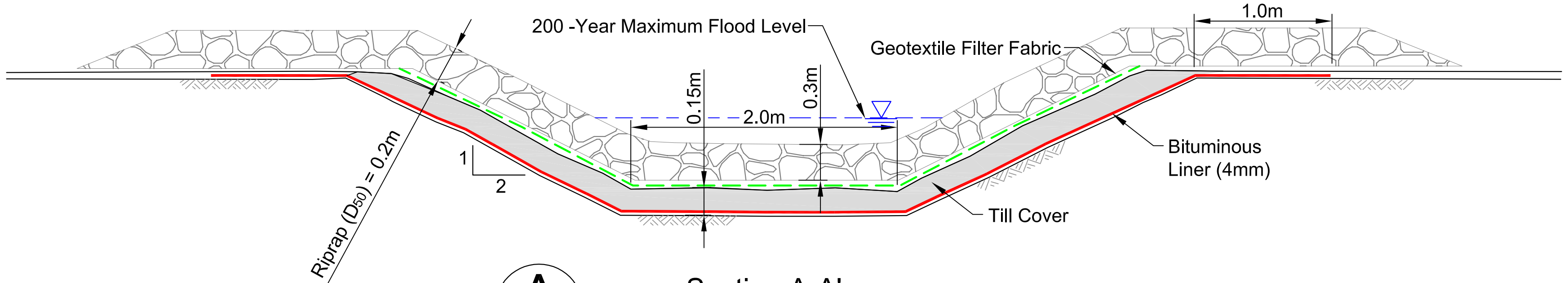
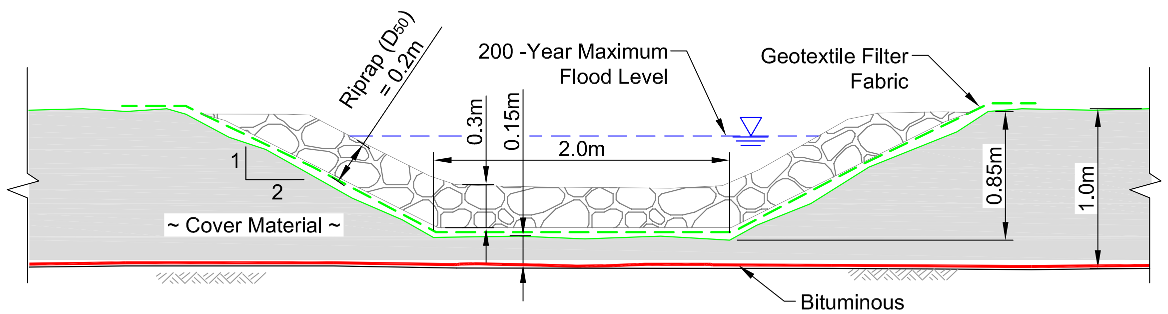
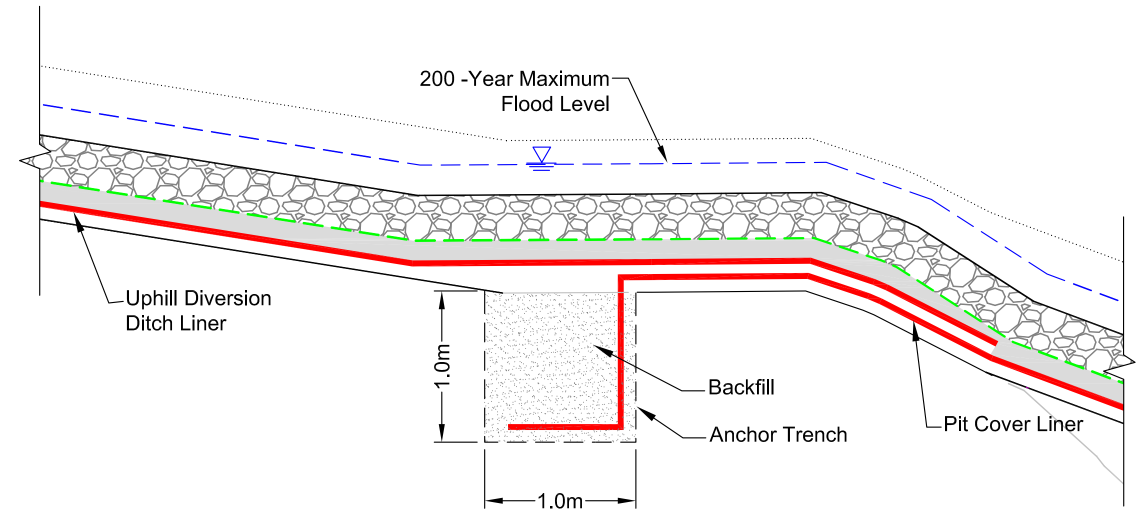


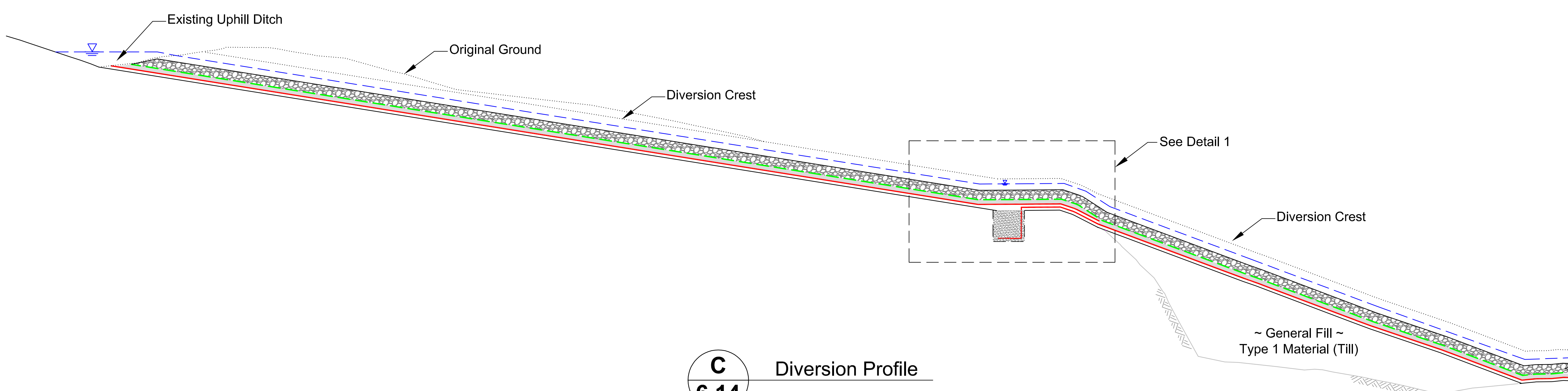
A
6.14
Section A-A'
0 0.5 1 1.5 2 2.5
Scale in Metres



B
6.14
Section B-B'
0 0.5 1 1.5 2 2.5
Scale in Metres

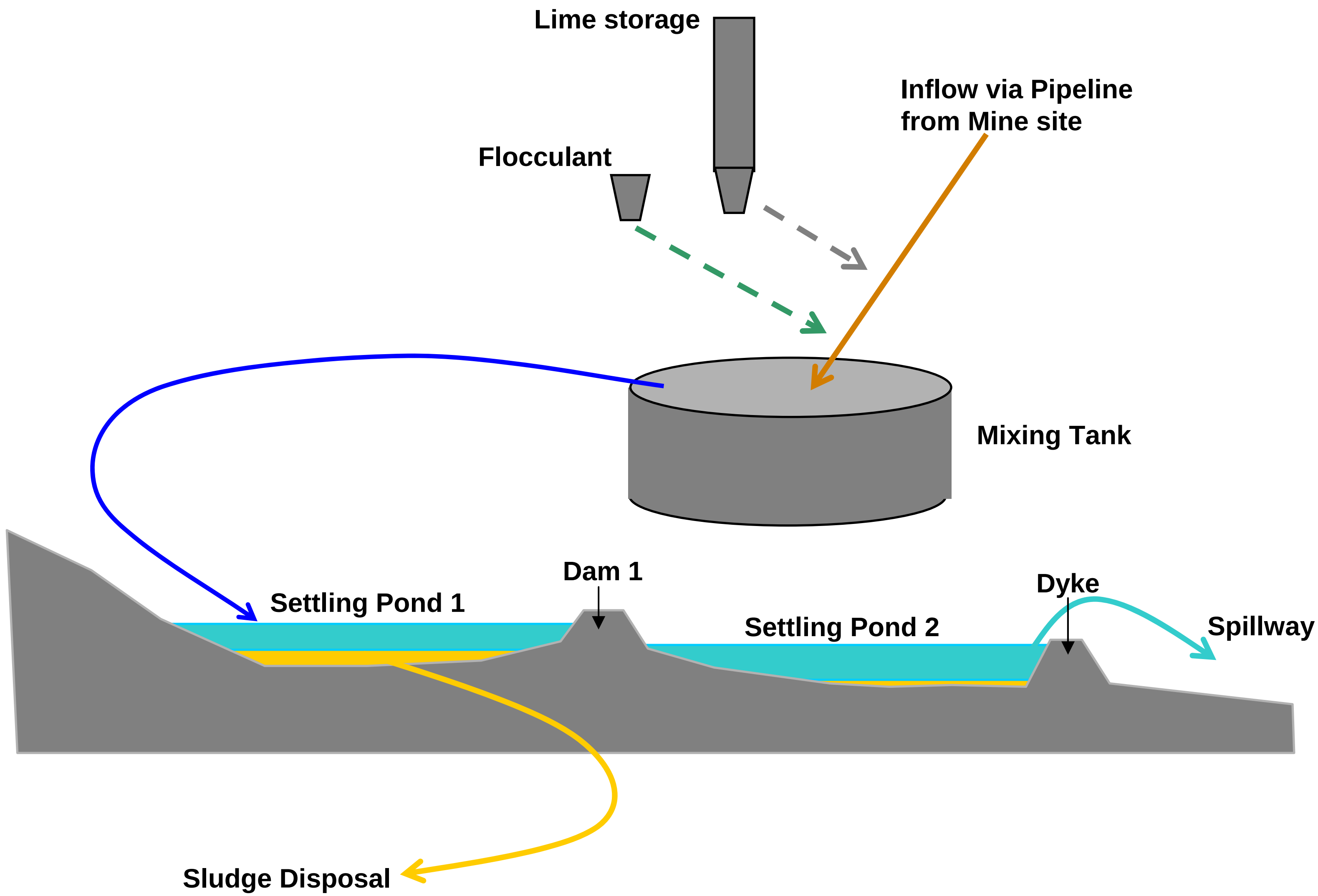


Detail 1
0 0.5 1 1.5 2 2.5
Scale in Metres

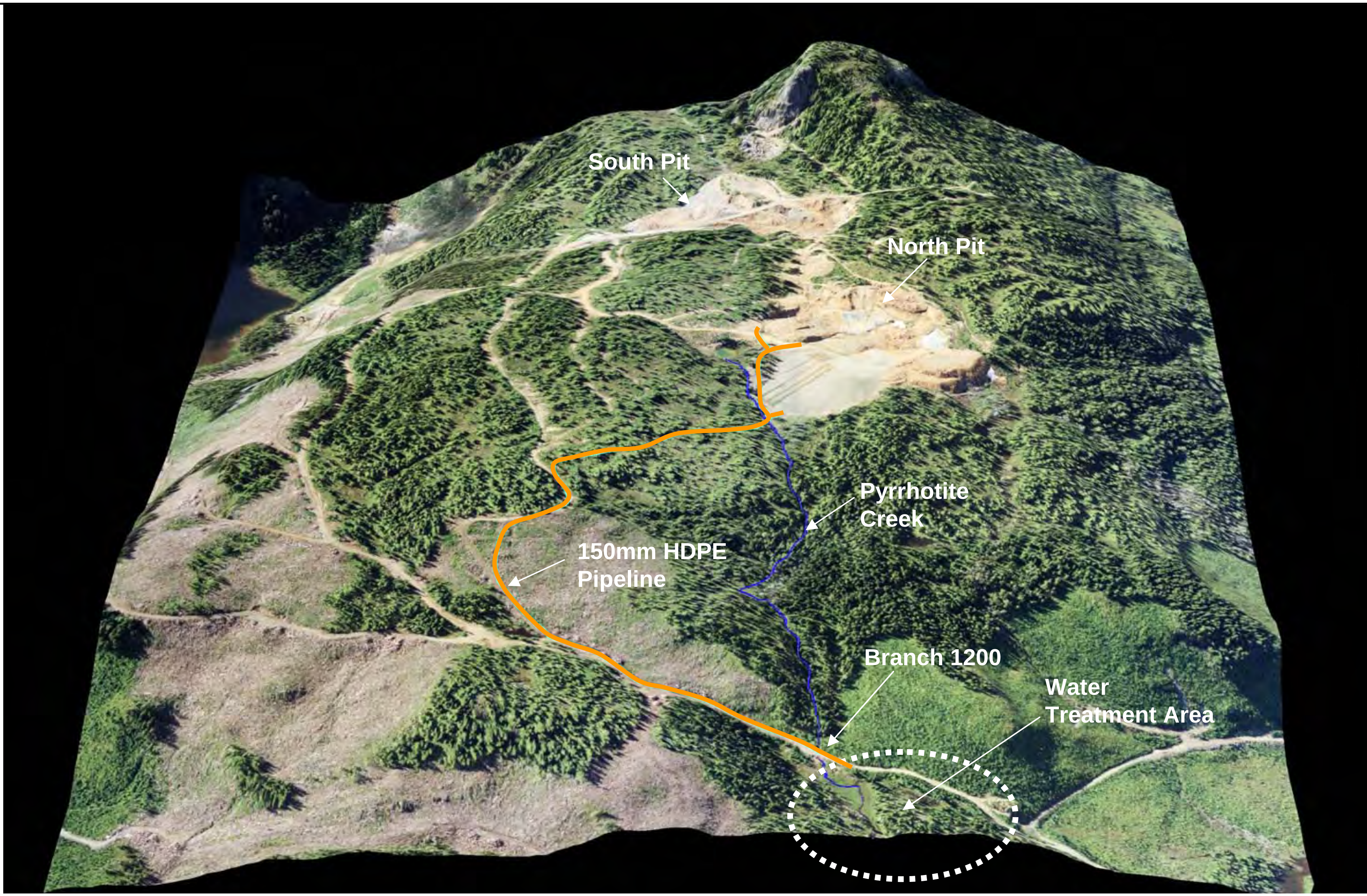


C
6.14
Diversion Profile
0 1 2 3 4 5
Scale in Metres

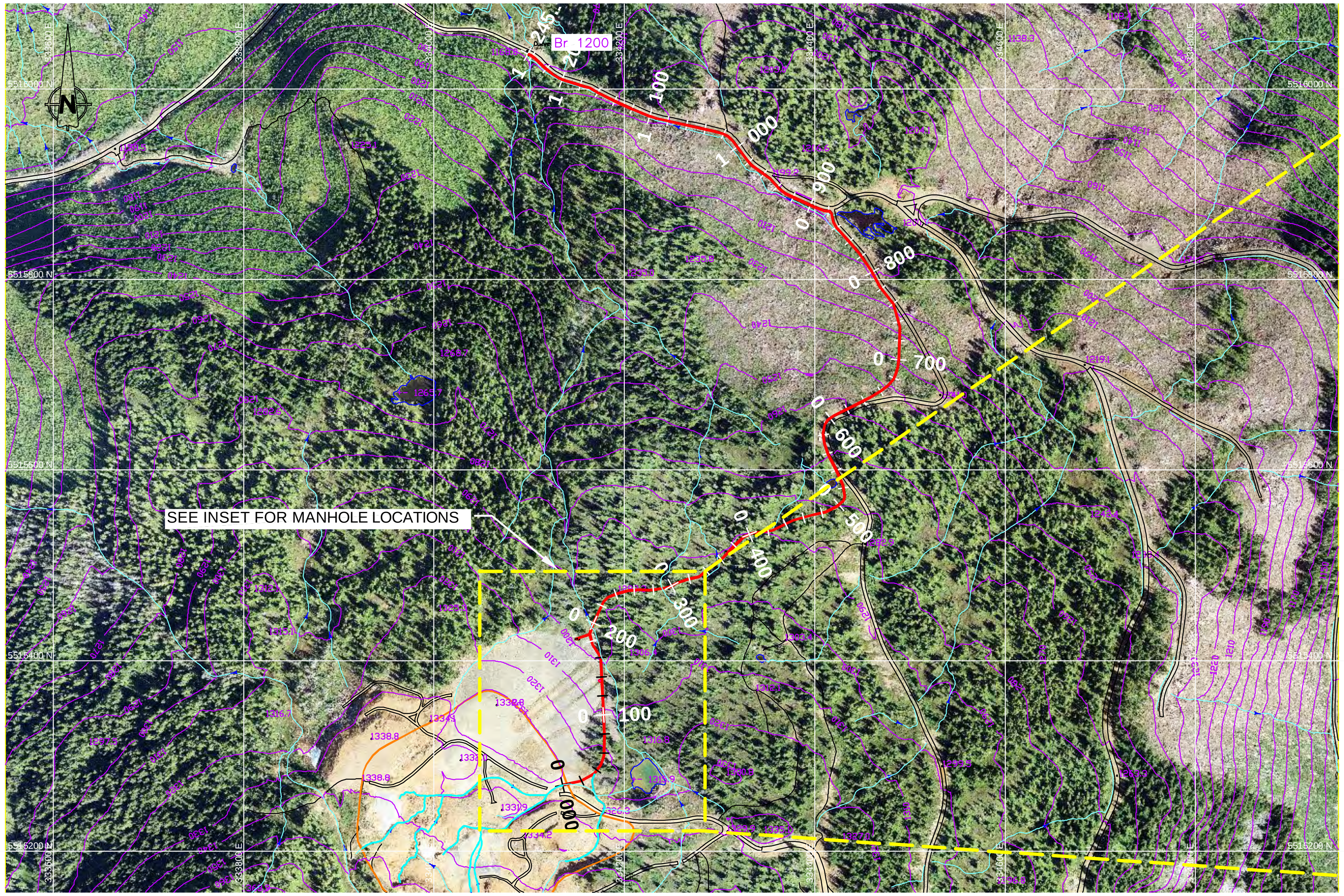
SRK Consulting Engineers and Scientists Vancouver B.C.	Tsolum River Partnership	Detailed Design
SRK JOB NO.: 1CT001.001–700	Mt. Washington Remediation	Uphill Diversion Typical Sections and Profile
FILE NAME: 1CT001001–700–4.dwg		DATE: Nov. 07 · APPROVED: PMH · FIGURE: 6.15



SRK Consulting Engineers and Scientists VANCOUVER	**Tsolum River Partnership**	Detailed Design **Schematic of Water Treatment System**
Job No: 1CT001.001 Filename: Figure 7.1_WaterTreatment_20071121.ppt	Mt. Washington Remediation	Date: November 2007 · Approved: · Figure: **7.1**

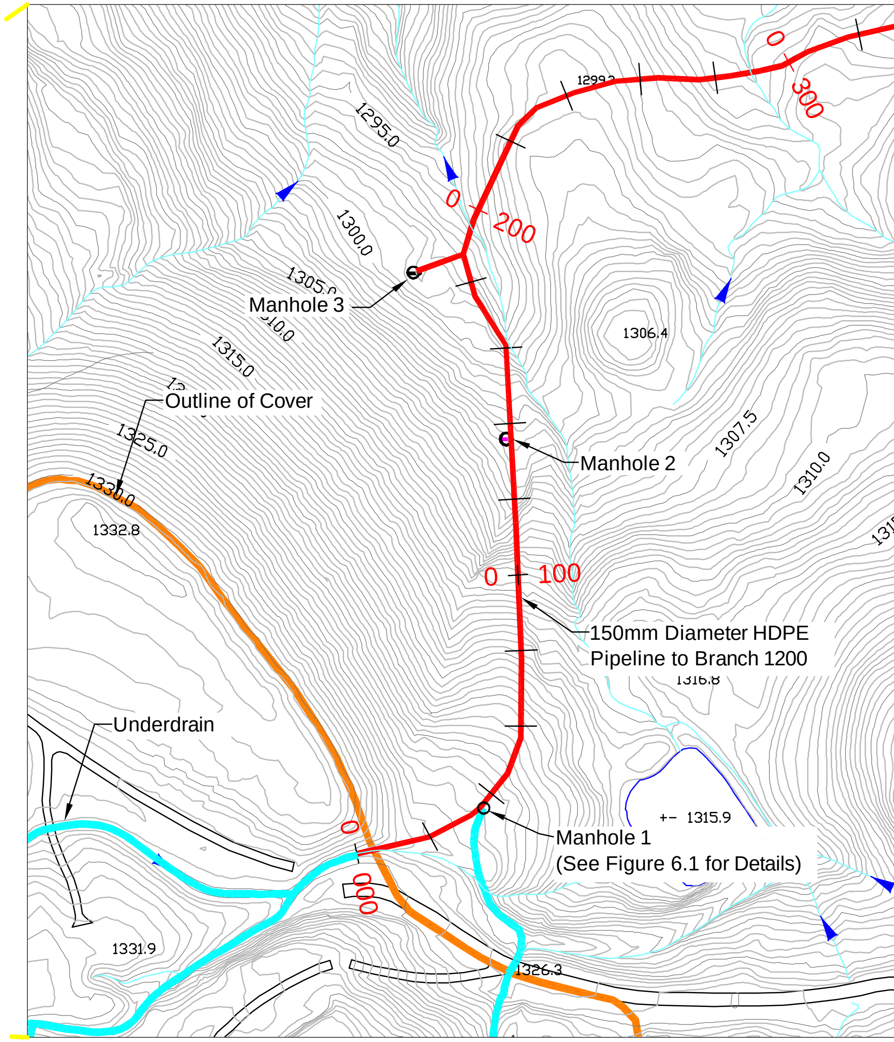


SRK Consulting Engineers and Scientists VANCOUVER	Tsolum River Partnership	Detailed Design
		3D View of Pipeline Alignment
Job No: 1CT001.001	Mt. Washington Remediation	Date: November 2007
Filename: Figure 7.2_Pipeline_20071121.ppt		Approved:
		Figure: 7.2



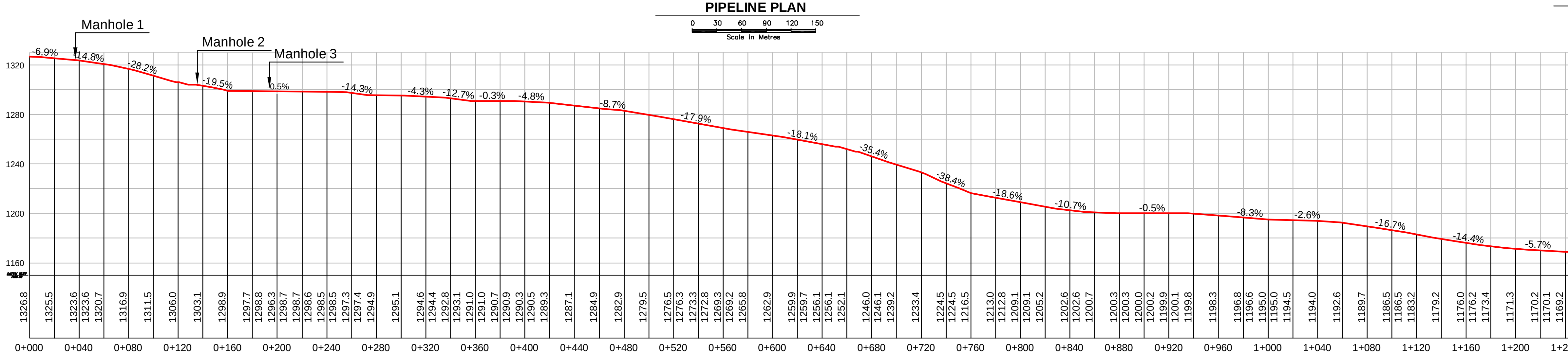
PIPELINE PLAN

0 30 60 90 120 150
Scale in Metres



MANHOLE LOCATIONS

0 10 20 30 40 50
Scale in Metres



PIPELINE PROFILE

0 20 40 60 80 100
Scale in Metres

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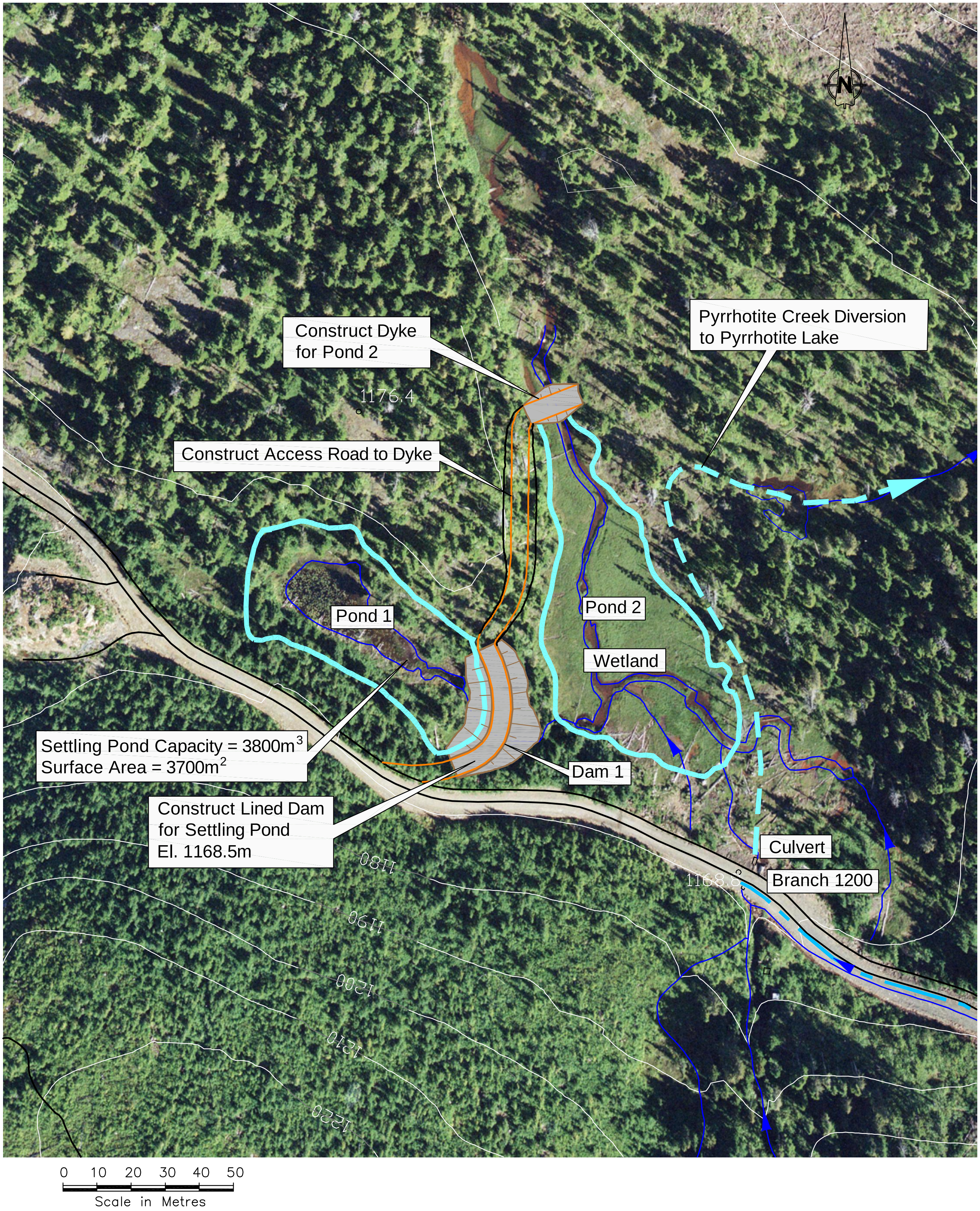
SRK Consulting Engineers and Scientists Vancouver B.C.	Tsolum River Partnership	Detailed Design
		Plan and Profile of Pipeline to Branch 1200
SRK JOB NO.: 1CT001.001	Mt. Washington Remediation	DATE: Nov. 07
FILE NAME: 1CT001001-700-2.dwg		APPROVED: PMH
		FIGURE: 7.3



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Vancouver B.C.

SRK JOB NO.: 1CT001.001-700

FILE NAME: 1CT001001-700-5.dwg

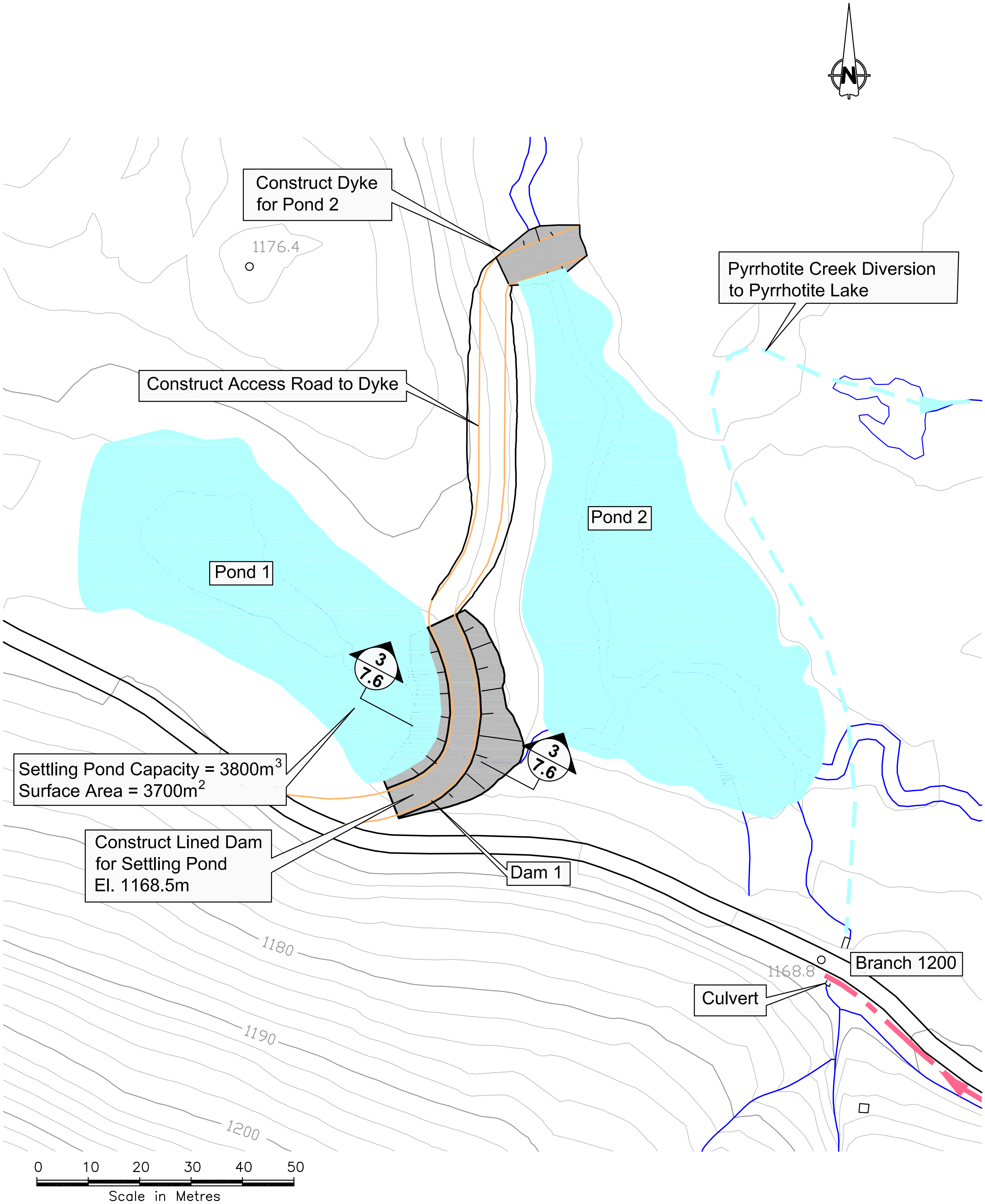
Tsolum River Partnership

Mt. Washington Remediation

Detailed Design

General Arrangement Plan
for Water Treatment System
at Branch 1200

DATE:	APPROVED:	FIGURE:
Nov. 07	PMH	7.4



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SRK Consulting Engineers and Scientists Vancouver B.C.	**Tsolum River Partnership**	Detailed Design
		Layout of Settling Ponds at Branch 1200
SRK JOB NO.: 1CT001.001-700	Mt. Washington Remediation	DATE: Nov. 07
FILE NAME: 1CT001001-700-11.dwg		APPROVED: PMH
		FIGURE: 7.5

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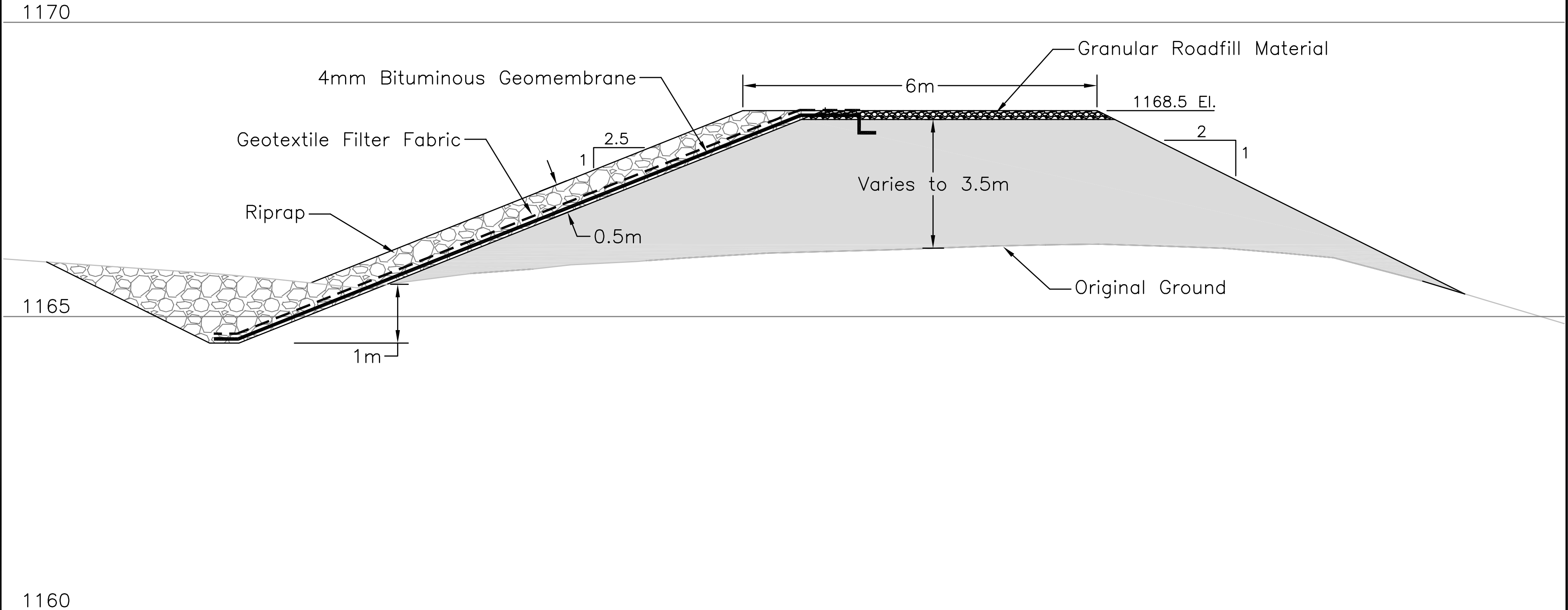
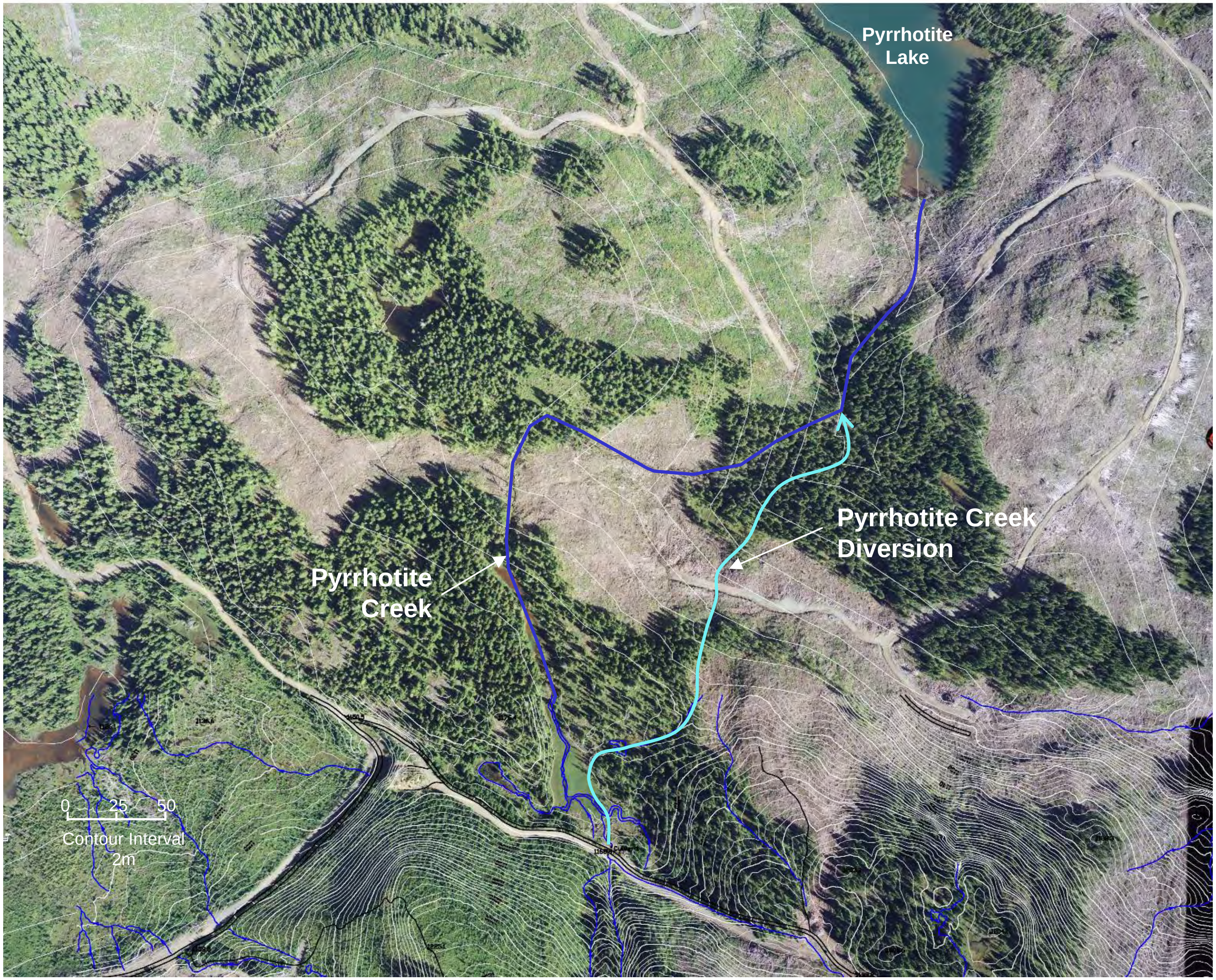


3 / 7.5 **SECTION 3**

1:100 — 0 1 2 3 4 5 Metres

SRK Consulting — Engineers and Scientists, Vancouver B.C.	Tsolum River Partnership	Detailed Design
		Typical Section through Dam at Pond 1
SRK JOB NO.: 1CT001.001-700	Mt. Washington Remediation	DATE: Nov. 07 / APPROVED: PMH / FIGURE: 7.6
FILE NAME: 1CT001001-700-7.dwg		



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Engineers and Scientists
VANCOUVER

Job No: 1CT001.001

Filename: Figure 7.7_AlignmPyrrhCr_20071121.ppt

Tsolum River Partnership

Mt. Washington Remediation

Detailed Design

Alignment of Pyrrhotite Creek Diversion at Branch 1200

Date:	Approved:	Figure:
November 2007		7.7

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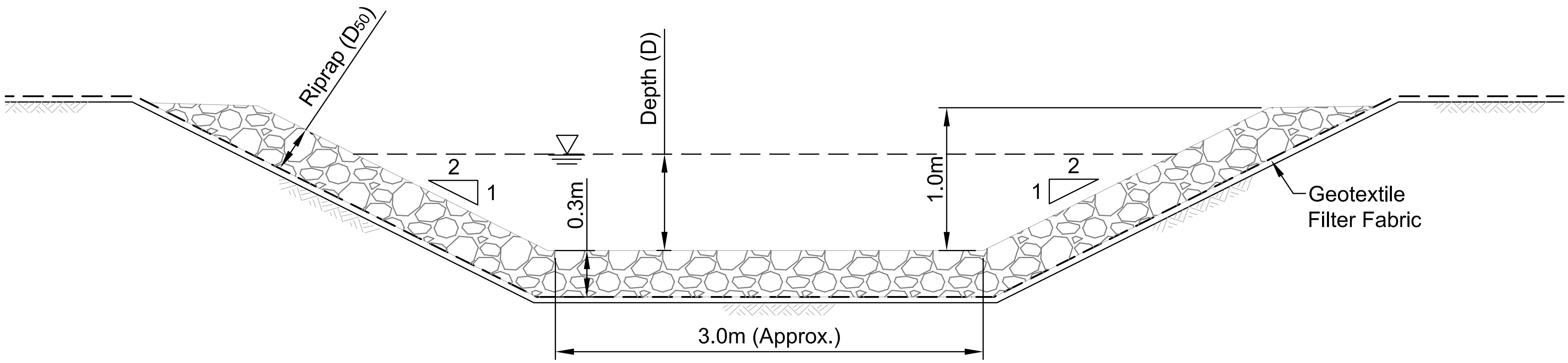
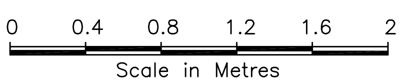
Q_{200} (m^3/sec)	D Depth of Flow(m)	D_{50} (m)	Slope (m/m)
1.22	0.3	0.3	0.01





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Vancouver B.C.

SRK JOB NO.: 1CT001.001−700

FILE NAME: 1CT001001−700−6.dwg

Tsolum River Partnership

Mt. Washington Remediation

Detailed Design

Typical Section through Pyrrhotite Creek Diversion Channel

DATE:	APPROVED:	FIGURE:
Nov. 07	PMH	7.8

Mt Washington Remediation Project Schedule
Year 1

Task Name

Project Approval

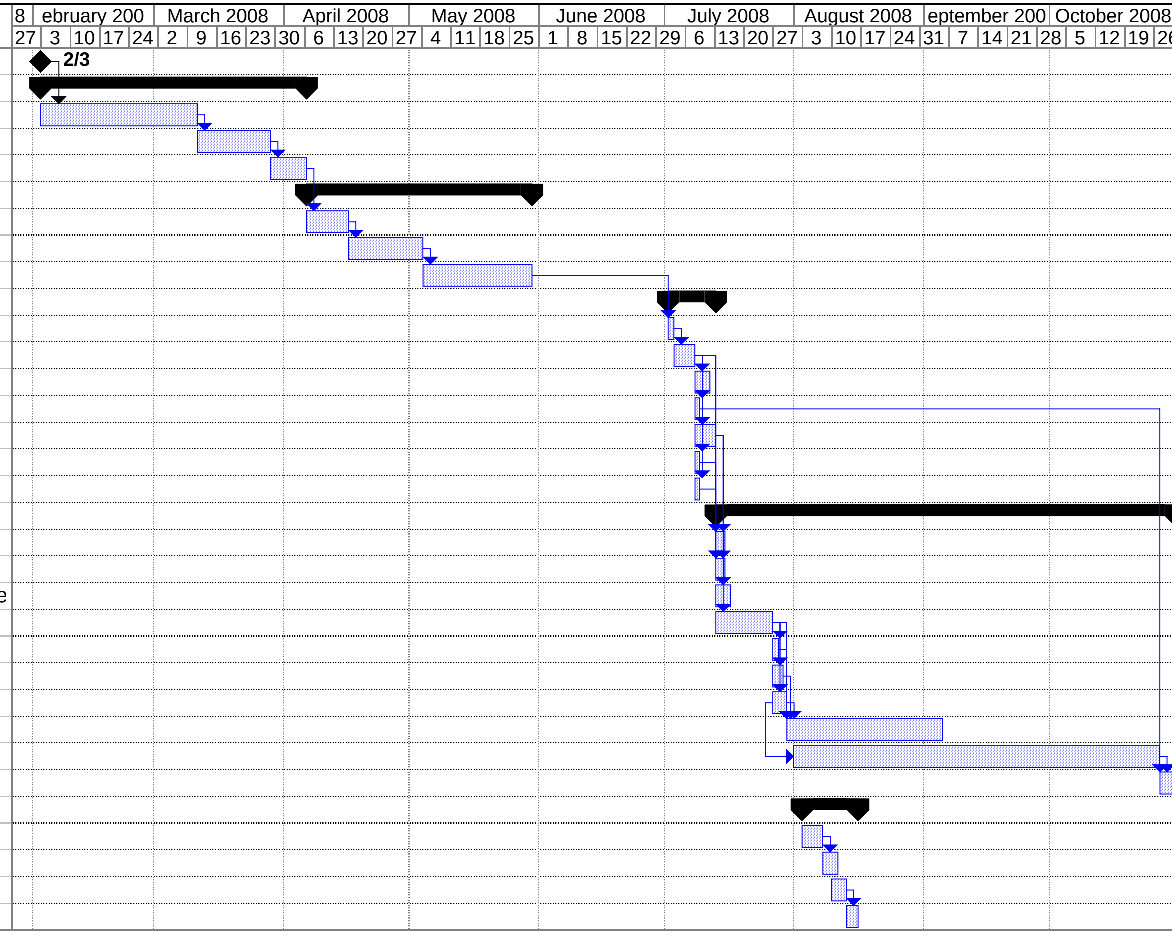
Engineering Design
- Final Design and Construction Drawings
- Technical Specifications
- Contract Documents

Tendering and Contract Award
- Preparation of Tender Package
- Tendering
- Bid Review and Contractor Selection

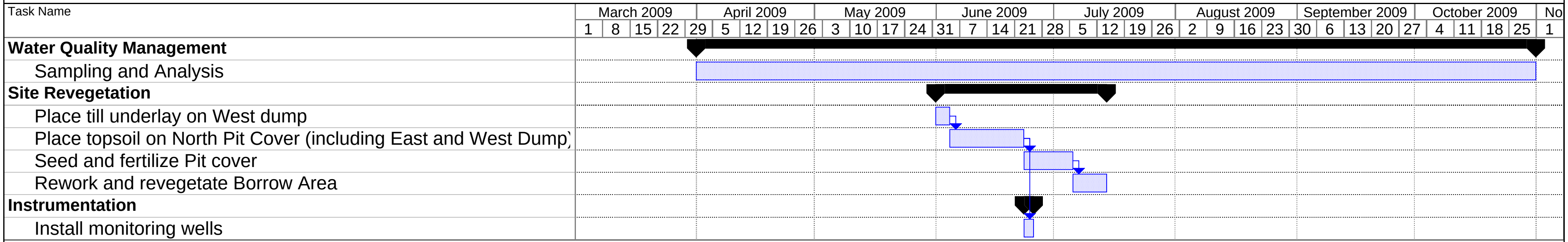
Pre Construction
- Mobilization
- Upgrade Site access road from ski road to borrow
- Develop Borrow Area #1 (Till)
- Develop Borrow Area #2 (Rock)
- Upgrade Haul Road from Borrow to Site
- FOB Geocomposite to Site
- FOB Drain Rock to Site

North Pit Drains and Cover
- Underdrain (Geocomposite)
- Underdrain (Drain Rock)
- Construct sump and seepage discharge system to water treatment pipeline
- Buttress for highwall areas
- Waste Dump Resloping
- Subgrade preparation for Bituminus Liner
- Place bedding material for Bituminous Liner
- Install bituminous liner
- Place liner cover
- Surface drainage Channels

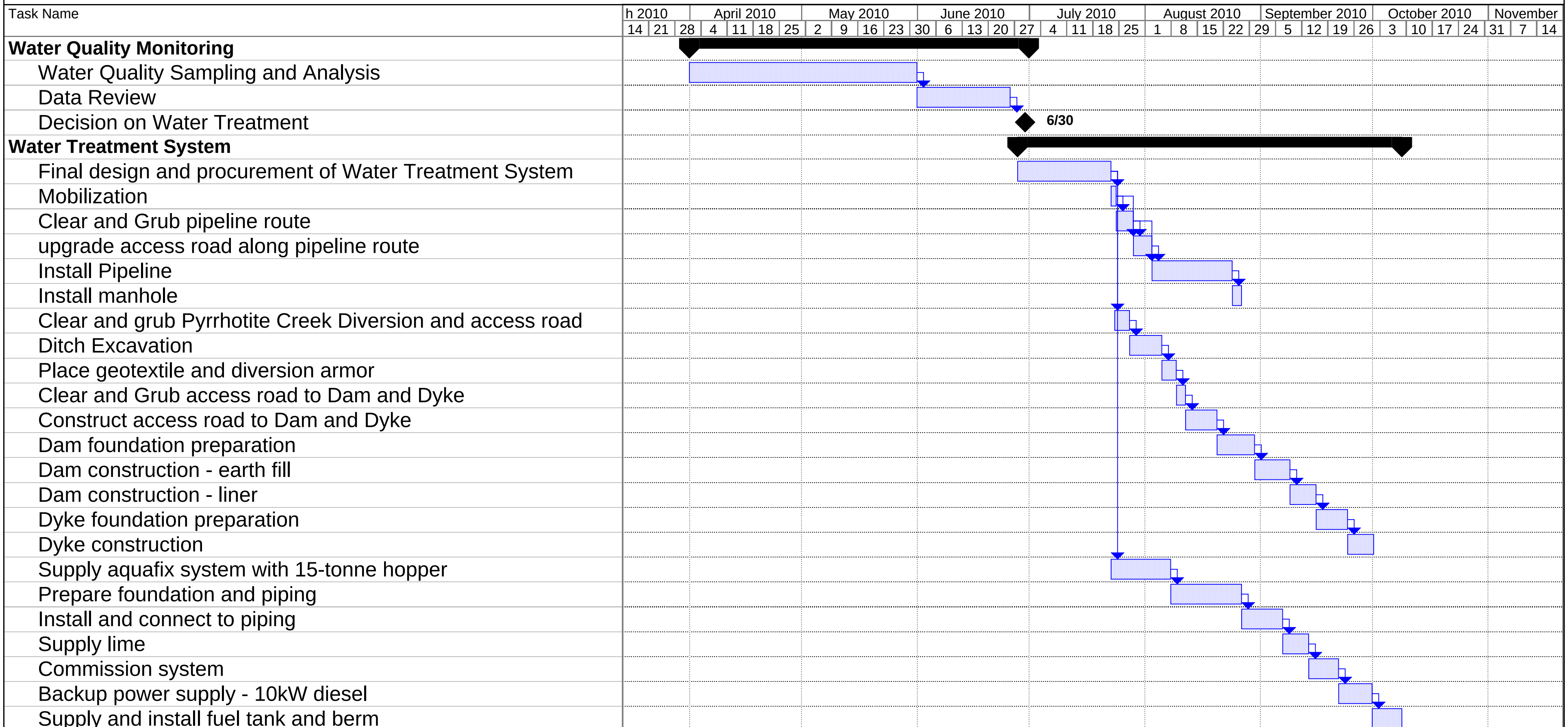
Uphill Diversion Upgrade
- Clear and grub diversion alignment
- Excavate ditch alignment
- Install Bituminous Liner
- Place cushion and riprap armor



Mt Washington Remediation Project Schedule
Year 2



Mt Washington Remediation Project Schedule
Year 3



Appendices

Appendix A
Borrow Source Investigation

SRK Consulting (Canada) Inc.
Suite 2200 – 1066 West Hastings Street
Vancouver, B.C. V6E 3X2
Canada

vancouver@srk.com
www.srk.com

Tel: 604.681.4196
Fax: 604.687.5532

Memorandum

To:	File (Appendix A)	**Date:**	November 26, 2007
cc:	Peter Healey	**From:**	Alvin Tong
Subject:	August 2007 Borrow Source Investigation, Mt Washington Remediation Project	**Project #:**	1CT001.001

1 Introduction

The Tsolum River Partnership retained SRK Consulting (Canada) Inc. (SRK) to develop an Acid Rock Drainage (ARD) remediation plan for the abandoned copper mine on Mt Washington, Vancouver Island. As part of Phase II of the study, SRK conducted an initial investigation to identify potential borrow sites for material that will be used in the proposed remediation.

Chatterton Geoscience Ltd was contracted by SRK to conduct a survey of native surficial materials suitable for the Mt Washington remediation plan. The intent of the survey was to identify the distribution and extent of a variety of glacial and post-glacial materials suitable for subsurface drainage, blanket covering and surface vegetative growth covering within an approximate 10 km haul distance from an abandoned mine site in the area.

On August 27, 2007, Peter Healey, P Eng and Alvin Tong, EIT of SRK and Alan Chatterton, RPF, P Geo, EngL of Chatterton Geoscience Ltd. met at the mine site to review the history of reclamation activities at the site, the preliminary plan for site remediation and the results of the initial survey by Chatterton Geoscience. Figure A-1 of this Appendix A is a 1:30,000 scale topographic map which identifies the roads that were traversed during the preliminary field review and the sites identified by the Chatterton Geocscience survey. Following this on-site meeting, Alvin Tong and Alan Chatterton remained in the area of the mine site to complete a field investigation of the potential sites identified in the initial survey.

Following two days of on foot preliminary review of the area, SRK contracted a track-mounted excavator from Bell Bulldozing Ltd. to excavate a number of test pit at each of the potential sites.

This memorandum summarises the results of the field investigation.

2 Location and Methodology

All the investigated areas were on TimberWest's land. The work was carried out under authorization by TimberWest and under safety supervision of the Prime Contractor, Bell Bulldozing. It was specified that no sellable tree shall be damage during the investigation without approval the land owner.

Alvin Tong and Alan Chatterton conducted a two day preliminary site reconnaissance which began on August 27, 2007. The areas visited are described in detail in Attachment A-1, a memo from Al Chatterton. The test pit locations are shown on Figure A-2.

Bell Bulldozing, who was contracted to carry out the test pit excavations, provided a track mounted Hitachi 100 excavator. Transportation from site to site was on the bed of a truck. This combination allowed quick transport between sites while allowing access into difficult to reach areas.

3 Potential Borrow Sites

A number of potential sources were visually inspected and selected sites were investigated with test pits. The test pits excavated during the investigation were photographed, logged, sampled. Soil conditions and descriptions were made in the field. Detail test pit logs are shown in Attachment A-2. Photographs of the test pits are provided in Attachment A-3. The inspected areas and locations of the test pits are shown on Figure A-2. A description of each potential borrow sources is provided in the following sections.

3.1 Potential Borrow Source #1

The area was identified as a potential glacial deposit area. The area was clear cut and limited surface investigations. Preliminary surface examination showed pockets of soil granular material and bedrock outcrops. Two test pits were excavated in this location near road access and road banks. The top 0.3m of overburden is organic high plasticity sandy silt (topsoil). The topsoil is underlay by an approximately 1m of brown inorganic sandy silt with sand and trace gravel (weathered till). The weathered till is underlay by an approximately 0.9m thick of gray dense inorganic sandy silt with sand and clay (unweathered till). Bedrock was encountered approximately 2m below surface. The matrix of the soil is moist but no water table was encountered in the excavations.

This area is not ideal for borrow source as the bedrock is shallow with minimum overburden. This will require stripping a large surface area to meet the construction volume which is not optimal for tree growth and slope protection.

3.2 Potential Borrow Source #2

This area was also identified as a glacial deposit area. Part of the identified deposit was clear cut with steep road cuts. Preliminary surface examination found few bedrock outcrops at the toe of the road cuts. The outline deposit is surrounded by a wetland area to the south, high road cuts to the south and a creek to the west. Access for test pitting was made difficult due to grown trees that were not to be damage during investigation. Four test pits were excavated in this location near road access and road banks. The top 0.3m of overburden is organic high plasticity sandy silt (topsoil). The topsoil is underlay by an approximately 1.5m of brown dense inorganic sandy silt with sand and trace gravel (weathered till). The weathered till is typically underlay by an approximately 1m thick of gray very dense inorganic sandy silt with sand and clay (unweathered till). Bedrock was encountered approximately 1.8m below surface in two of the pits while it was not encountered in the other pits. The matrix of the soil is moist but no water table was encountered in the excavations.

This area has the highest potential for till material borrow source. Although bedrock was encountered at the expected edge of the borrow area, the two pits excavated within the expected pocket did not encounter bedrock. As noted there are bedrock outcrop spotted along the rock cut, but it is observed that they are approximately 4m below original ground surface. The topographic analysis show the glacial deposit covers a large area which would provide sufficient volume for the construction.

3.3 Potential Burrow Source #3

The area was identified as a granular material deposit. Most of the identified area was clear cut with natural steep slopes surrounding with a flat area by the access road. Preliminary surface investigation found bedrock outcrops and ponded surface water. One test pit was excavated in this location near the edge of the road within the flat ground. The top 0.3m of overburden is organic high plasticity sandy silt (topsoil). The topsoil is underlay by 1.6m of brown dense to very dense inorganic sandy silt with sand and trace gravel (weathered till). Bedrock was encountered at 1.6m. The matrix of the soil is wet and water was seeping from the surface.

This area is not ideal for borrow source as the bedrock is shallow with little overburden. This location will not yield the entire volume required for the construction and other borrow area will be required. The natural steep slopes and low ground will make borrow development difficult.

3.4 South and West Waste Rock Dumps (Potential Borrow #4)

The two waste rock dumps were examined for as potential sources for bedding and granular material. The dumps are located within the mine site. Road access to the south dump is very steep. Three test pits were excavated in the South Dump and two in the West Dump. The test pits were excavated in the South Dump to a depth of about 1.7m and in the West Dump to a depth of 2.6m. The material in both of the Dumps is an uncompacted poorly graded cobble and gravel with sand and silt. There is evidence of segregation in the material from end dump construction.

The oxidation level of the material is different between the two Dumps. The South Dump shows surficial oxidation upwards of 0.3m thick. The material at depth shows little sign of oxidation. Sulphides were found in the rock at depth within the minimal oxidized material. It is speculated that some capping work was done on the South Dump to shed surface water and minimize oxidation within the dump.

The oxidation level of the material in the West Dump is found to be relatively deep. Heavy oxidation is noted throughout the depth of the excavated test pit, upward of 2.6m. Paste pH testing on the rock showed this material to be unsuitable for use as drainrock.

3.5 Potential Burrow Source #5

The area was identified as a fluvial fan. This location is heavily forested which made investigation access very difficult. Two test pits were excavated in this location at the toes of the identified fluvial fan. The top 0.3m of overburden is organic high plasticity sandy silt (topsoil). It overlays a 0.5m thick layer of poorly graded sand and gravel with silt. An approximate 1 m thick layer of grey dense silty sand extents to the bottom of the pit from the sand and gravel layer. The excavation was terminated due to difficult digging.

This area has a high potential for granular borrow material. This is the only area identified in the project location that contains sand and gravel. It is suggested that a further investigation is required to confirm the quality and quantity of the material. Also further laboratory testing on material permeability might be needed to determine if processing is required. The borrow area is approximately 10km from the mine site.

3.6 Potential Burrow Source #6

The area was visually identified as a talus fan. This location is geographically very difficult to access due to steep slopes and rockfall hazard. No test pits were dug in this location due to difficult access and safety reasons. Visually inspection identified possible source of coarse rock for drainage. The rocks are poorly graded and appeared to be inert.

Although this site is a favourable borrow area for the drain rock in the underdrains, access to the site is problematic due to the steep slopes and potential rockfall hazard. If this site is a serious contender for drainrock, a more detailed investigation with a local contractor would be required. Also, the rock would need to be needed to be geochemically tested to ensure it is inert and not potentially acid generating.

4 Laboratory Results

The summary of the laboratory tests done on the samples collected during the investigation are listed below:

- Grain size Analysis using sieves;
- Modified Proctor Compaction Test; and
- Hydrometer grain size analysis

A list of samples collected and tested is shown in Table A-1.

Table A-1: Results of Field Investigation

Sample ID	Sample Type	Depth		Description
		From	To	
SRK-G-16-07	Gravel	0.50	0.6	Bulk SAND AND GRAVEL sample
SRK-T-01-07	Till	1.00	1.1	Bulk SILTY SAND sample
SRK-T-01-07	Till	2.00	2.1	Bulk CLAYEY SILT sample
SRK-T-05-07	Till	1.80	1.9	Bulk SILTY CLAY sample
SRK-T-07-07	Till	1.80	1.9	Bulk SILTY SAND sample
SRK-WR-09-07	Waste Rock	1.50	1.6	Bulk WASTE ROCK sample for geochem testing
SRK-WR-10-07	Waste Rock	1.40	1.5	Bulk WASTE ROCK sample
SRK-WR-11-07	Waste Rock	0.10	0.15	Bulk WASTE ROCK sample for geochem testing
SRK-WR-12-07	Waste Rock	2.00	2.1	Bulk WASTE ROCK sample for geochem testing

The Figure A-3 shows the results from the gradation testing.

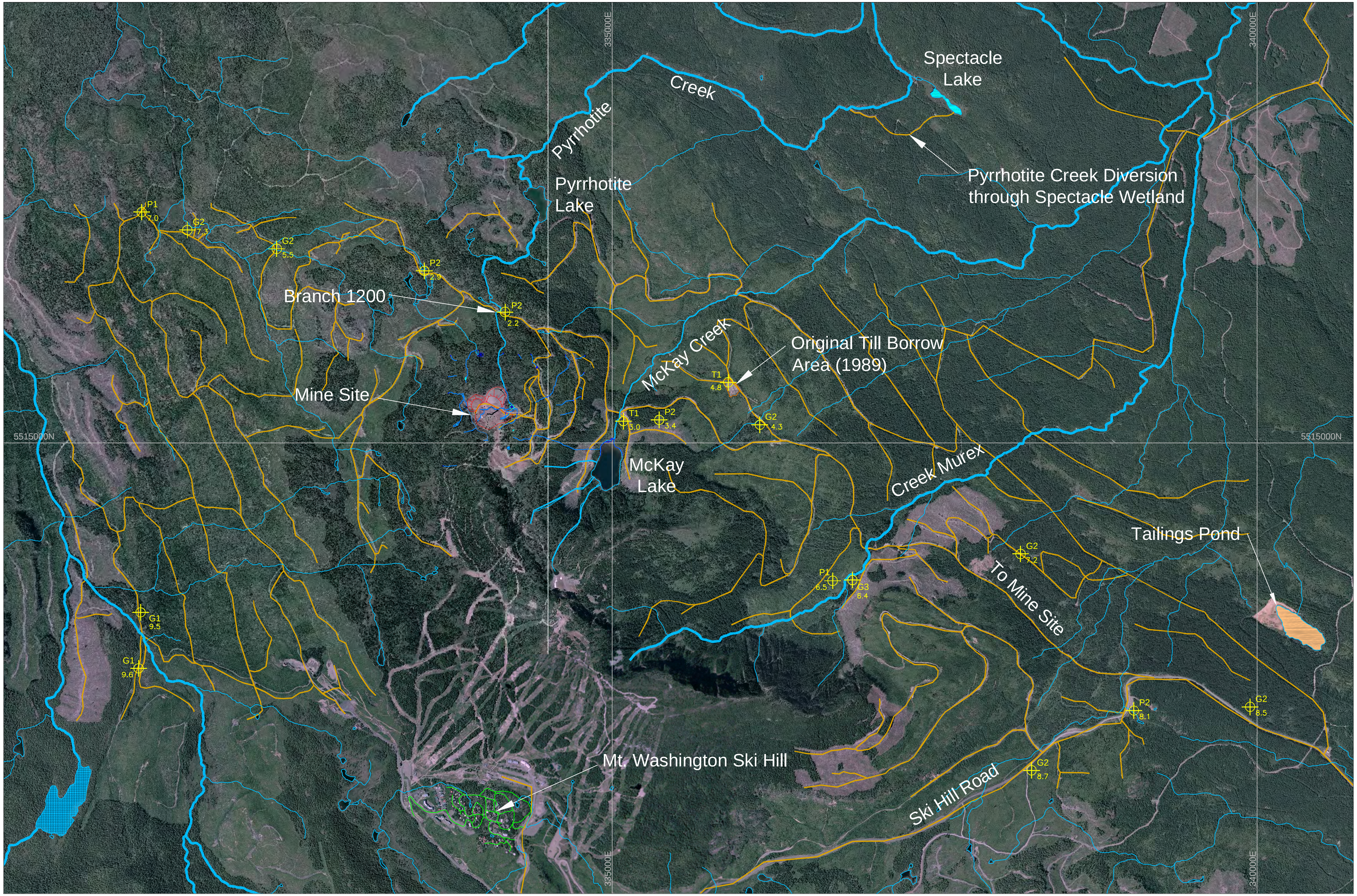
5 Recommendations

Borrow Area #2 was identified as the preferred site for till borrow for the buttress fill, the bedding material and the protective cover for the bituminous geomembrane. A more detailed investigation will be required prior to construction to more accurately determine the extent of the final borrow area and confirmation of the material quantity. For the purposes of the detailed design, borrow area 2 has been renamed as Borrow Area #1 as shown on Figure A-4.

Due to the unfavourable geochemical characteristics of the waste rock in the South dump and the West dump, an alternative source for drain rock is being investigated. Currently Borrow area #6 and transporting drainrock from Cumberland are the two options under consideration.

A second borrow area will need to be developed for riprap. No site has as yet been identified but SRK is confident that a quarry can be developed within 1km of the mine site for this material.

Figures



LEGEND

Borrow Area Potential Site

G - Gravel / Sand
T - Gracial Till
P- Peat

1 - High potential as a material source
2 - Reasonable likelihood of some suitable materials at the site
3 - Marginal potential as a material source

Estimated Haul Distance To Mine Site (km)

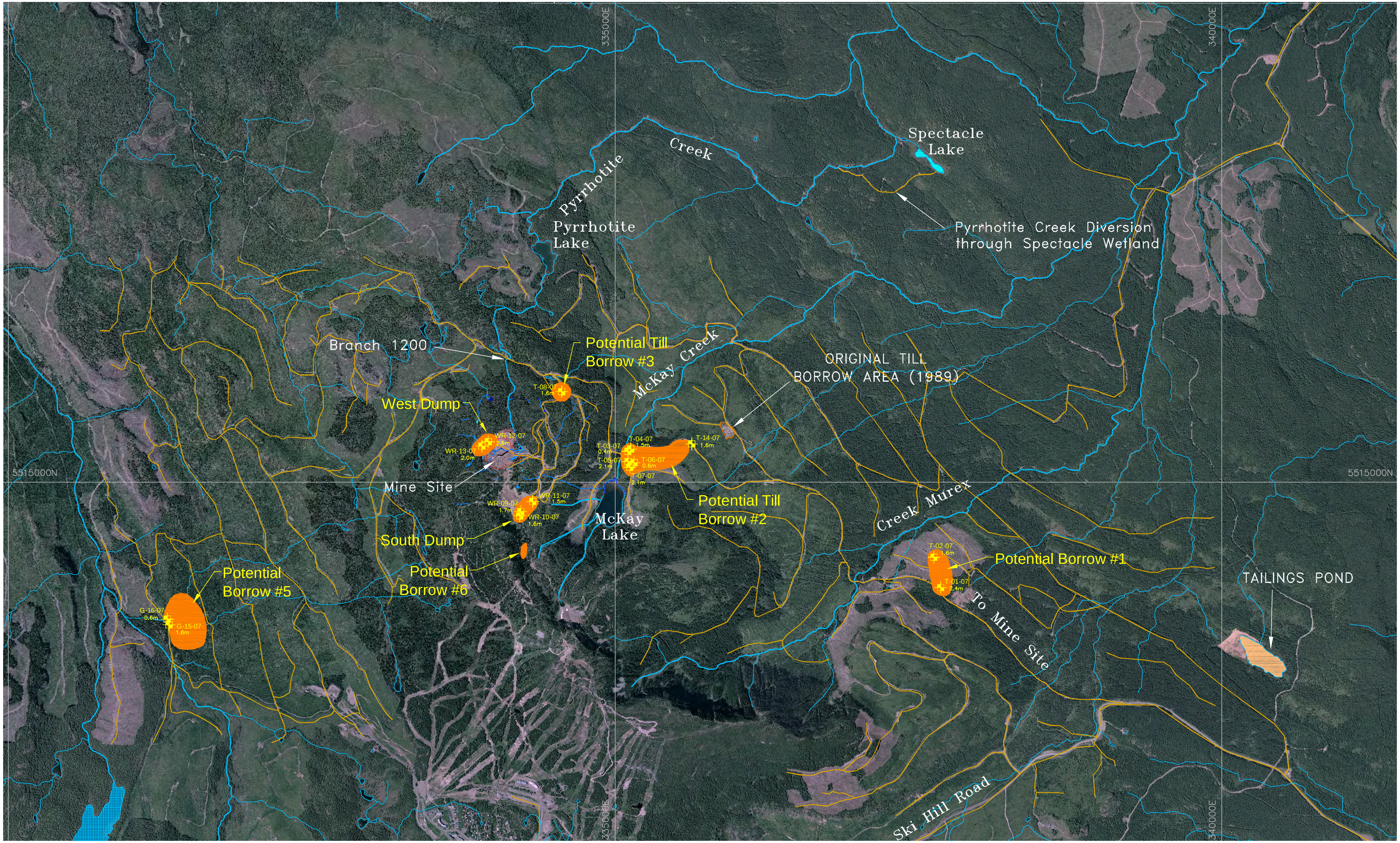
Source: Chatterton Geoscience Ltd.

1:30000

0 150 300 450 600 750
Scale in Metres

SRK Consulting
Engineers and Scientists
Vancouver B.C.

SRK JOB NO.: 1CT001.001–700	**Tsolum River Partnership**	Detailed Design
FILE NAME: 1CT001001–700–8.dwg	Mt. Washington Remediation	Preliminary Borrow Areas
		DATE: Nov. 07 / APPROVED: PMH / FIGURE: A-1



LEGEND

Test Pit Location at Each Potential Borrow Area

1:30000 — 0 150 300 450 600 750 Scale in Metres

SRK Consulting — Engineers and Scientists — Vancouver B.C.

SRK JOB NO.: 1CT001.001–700

FILE NAME: 1CT001001–700–9.dwg

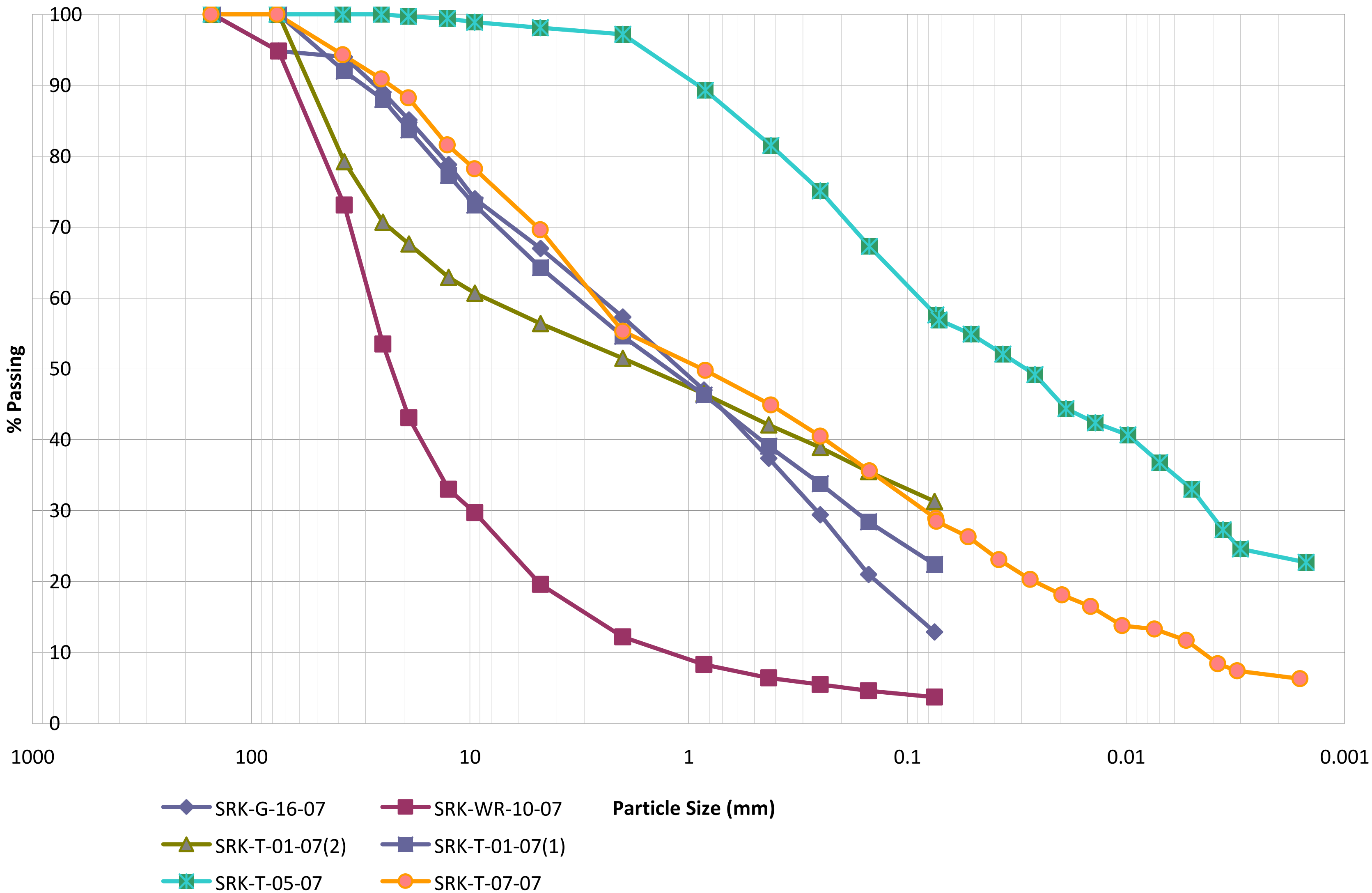
Tsolum River Partnership

Mt. Washington Remediation

Detailed Design

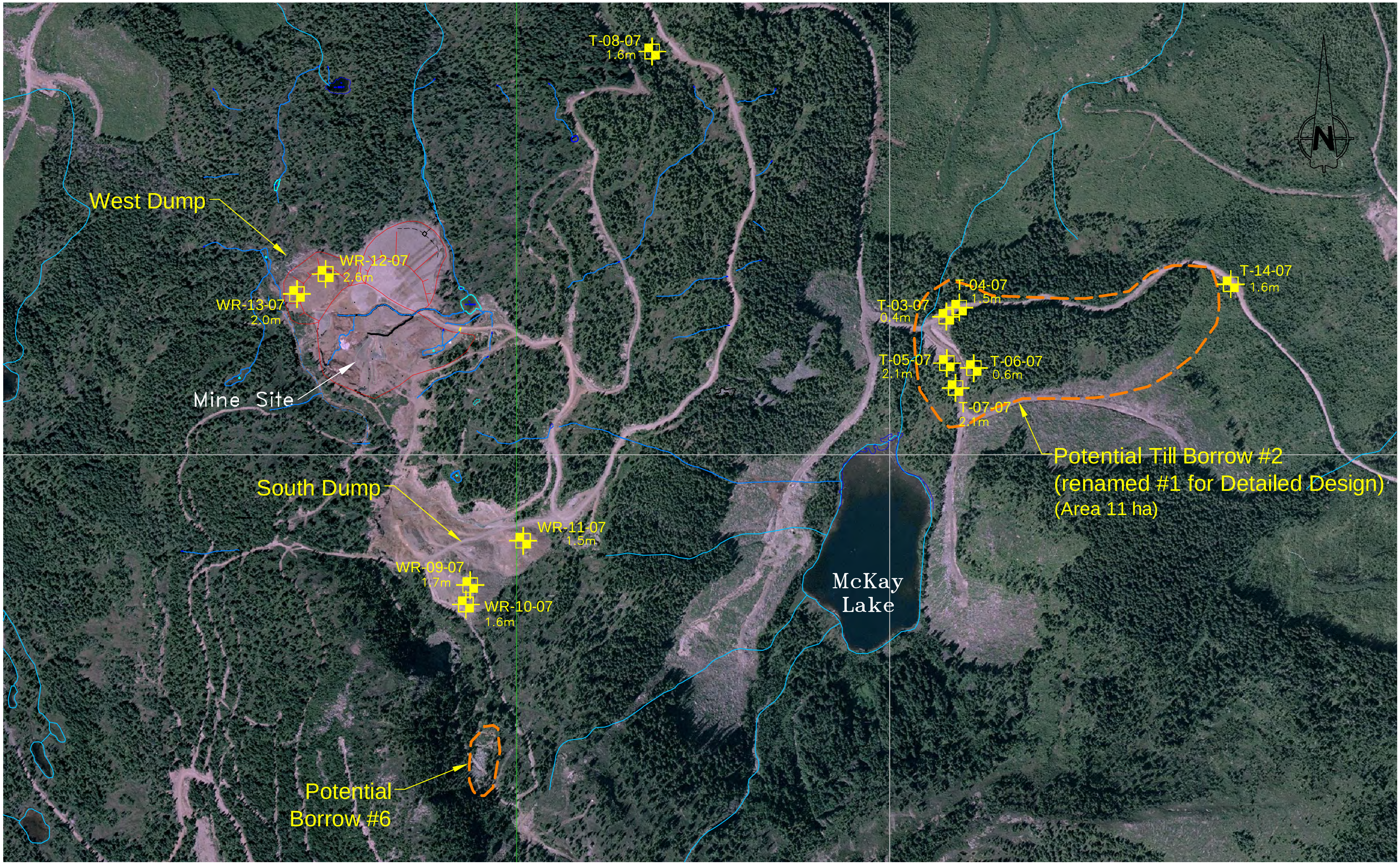
Borrow Area Investigation
Test Pit Location Map

DATE:	APPROVED:	FIGURE:
Nov. 07	PMH	A-2



SRK Consulting Engineers and Scientists VANCOUVER	**Tsolum River Partnership**	Detailed Design **Grain Size Analysis**		
Job No: 1CT001.001 Filename: Figure A-3_GrainSeize_20071126.ppt	Mt. Washington Remediation	Date: November 2007	Approved:	Figure: **A-3**

J:\01_SITES\MtWashington\!ACAD\Remediation Final Design\1CT001001-700-10.dwg



LEGEND

Test Pit Location

NOTE

Riprap borrow area to be determined within 1 km of minesite.

0 100 200 300 400 500

Scale in Metres

SRK Consulting Engineers and Scientists Vancouver B.C.	**Tsolum River Partnership**	Detailed Design
		Selected Borrow Areas
SRK JOB NO.: 1CT001.001-700	Mt. Washington Remediation	DATE: Nov. 07
FILE NAME: 1CT001001-700-10.dwg		APPROVED: PMH
		FIGURE: A-4

Attachment A-1

Chatterton Geoscience Ltd.
Mt Washington Materials Search

Chatterton Geoscience Ltd.
6605 Lakes Road
Duncan, British Columbia
Canada, V9L 5V9

telephone	250-748-8370
cell	250-246-7138
email	chatgeo@shaw.ca

Mount Washington Materials Search

Area: **Mount Washington, Vancouver Island**

Prepared for: **SRK Engineering Ltd**

By: **Alan N. Chatterton, RPF, PGeo, EngL**

Date: September 11, 2007

Date of Field Review: August 27, 2007 to August 30, 2007
Assessors: Alan N. Chatterton, RPF, PGeo, EngL
Alvin Tong, EIT – SRK Engineering Ltd.

Attachments: 1:25,000 scale topographic map

Introduction

Chatterton Geoscience Ltd was contracted by SRK Engineering Ltd. to conduct a survey of native surficial materials suitable for a planned mine reclamation project in the Mount Washington area on Vancouver Island. The intent of this survey was to identify the distribution and extent of a variety of glacial and post-glacial materials suitable for subsurface drainage, blanket covering and surface vegetative growth covering within an approximate 10 km haul distance from an abandoned mine site in the area.

Following an initial survey of available soil, surficial material and bedrock geology information as well as an a review of 1984 government (1:20,000 scale) and 2005 TimberWest Forest Corporation (1:40,000 scale) stereo air photo coverage of the area, a brief summary of the anticipated materials distribution and character was provided to SRK Engineering for preliminary planning purposes. On August 27, 2007, Peter Healey, PEng and Alvin Tong, EIT of SRK Engineering Ltd and Alan Chatterton, RPF, PGeo, EngL of Chatterton Geoscience Ltd. met at the mine site to review the history of reclamation activities at the site and the preliminary plan for additional reclamation activities. Following this on site meeting, Alvin Tong and Alan Chatterton remained in the area of the mine site in order to field review the distribution and extent of available materials for the planned reclamation activities. Following two days of preliminary review of the area, SRK Engineering contracted a track-mounted excavator from Bell Bulldozing Ltd. to complete several excavations in the area to complete a more detailed assessment of the character of the available materials. To that end Mr. Tong completed detailed descriptions of the excavated materials and collected samples for both physical and chemical analyses at selected excavation sites.

The attached 1:25,000 scale topographic map identifies those roads that were traversed during the preliminary field review and the approximated distribution of the excavations completed during the review.

General Surficial Geologic Conditions

The Mount Washington mine site is accessible by logging road from both the east and west sides of the mountain. The immediate area of the mine site is characterized by thin deposits of weathered bedrock (less than 1 m thick), shallow deposits of weathered glacial till overlying bedrock (generally less than 1m thick) and bedrock exposures. Minor wetland areas are distributed about the area of the mine site. These are characterized by thin accumulations of humus materials (less than 1 m thick) overlying either the glacial till or weathered bedrock. There were no indications of glaciofluvial or glacially deposited fluvial sediments identified either during the initial background survey or the subsequent field surveys. Because of the proximity to the height of land, stream channels in the area are relatively minor and, as a consequence have not contributed significantly to post-glacial erosion and deposition of post-glacial fluvial sediments.

The westerly aspect side of Mount Washington was determined to have a similar distribution of sediments to that encountered proximate to the mine site. Surficial materials consisting of thin deposits of weathered bedrock, weathered glacial till and humus deposits associated with localized minor wetlands predominate. Sedimentary bedrock consisting of conglomerates, sandstone and mudstone were identified in the area to the northwest of the mine site. Locally deeper deposits of glacial till (up to 3 m thick) were noted in association with this sedimentary bedrock. Exposures of this sedimentary bedrock indicated that these rocks are susceptible to weathering and that the weathering products are variable in character reflecting the texture of the component sedimentary bedrock. Furthermore, the identified glacial till deposits are derived in large extent from these bedrock types and displayed similar susceptibility to weathering and variation in the character of weathering products. Again, there were no indications of glaciogluvial sediments identified on the western aspect side of Mount Washington. One relatively large post-glacial fluvial fan deposit was identified to the northwest of the Mount Washington cross-country ski area as noted on the attached map. While this fan is relatively large in surface area, access limitations precluded a detailed assessment of the overall thickness of this deposit. Road access to this area skirts the toe of this fan. In this area, the deposit was found to be less than two metres thick overlying either glacial till or bedrock. Furthermore, approximately 1 m of this thickness consists of weathered soil material and there is evidence of near-surface water seepage in the deposit.

The easterly aspect side of Mount Washington was found to have much more extensive areas of glacial till material. Bedrock exposures and near-surface bedrock were observed in many areas but an extensive area of deeper glacial till sediments was identified as shown on the attached map. This glacial till material has thicknesses that frequently exceed 4 metres. This glacial till material is characterized by a surface covering of .5 to 1 m of weathered soil materials that are relatively rich in organic materials. Underlying this surface soil material approximately 2 m to 3m of brown compact glacial till was encountered at most sites. This material has a silty sandy texture. At a depth of approximately 3 to 4 meters the glacial till materials become blue-grey in colour and the clay content of the matrix of this material increases substantially. When compacted it is anticipated that that clay-rich subsurface till material will be relatively slowly permeable to water. There were no accumulations of either glaciofluvial or post-glacial fluvial deposits identified on the east aspect slope of Mount Washington. Again, minor accumulations of humus materials were observed, however, this are relatively limited in extent and seldom exceed 1 m in thickness.

Summary

1. **Subsurface drainage material**

   Coarse textured, free draining native materials were found to be very limited in the Mount Washington area. A single deposit of post-glacial fluvial materials was indentified to the northwest of the Mount Washington cross-country ski lodge. Access limitations precluded a detailed assessment of the character and thickness of the materials at this site.

2. **Blanket covering material**

   Glacial till materials are relatively widely distributed on the east aspect hillslope of Mount Washington. These materials are covered with approximately .5 m to 1 m of surface soil material that is relatively rich in organic material. Below this, 2 m to 3 m of brown silty sandy compact till is generally encountered before reaching a more clay rich grey till at a depth of 3 m to 4 m below the ground surface.

3. **Vegetative growth medium**

   Extensive deposits of organic rich material suitable as a surface coving growth medium were not encountered in the Mount Washington area. The deposits observed seldom exceed 1 m in thickness and are associated with local wetland areas. The .5 m to 1 m thickness of surface soil materials which mantles the entire area appears to be to best source of available growth medium. It may be possible to strip and stockpile some of this material during excavation of other materials required for the reclamation project. As a supplement or alternate to this, it may be possible to hydro-seed and/or seed and fertilize exposed materials on the mine site with erosion control grass/legume plant cover designed to facilitate soil building processes.

Limitations

This assessment report is based on limited surface information that was observed during the preliminary background review, routine field examination and shallow excavations. This factors considered during these reviews consists primarily of topographic features, characteristics of exposed surficial materials and bedrock, indicators of surface and near surface slope water conditions, and indicators of geomorphic processes. This information is supplemented by topographic map data, available geologic and surficial geologic information, and indicators of terrain characteristics observable on air photographs of the area. Field transects were located on the basis of the information provided by the topographic map data, available geologic and surficial geologic information, features observable on air photographs, and was limited by road access within the area. While the report describes those materials identified during both the background and field reviews, the limited information regarding subsurface conditions and the inability to inspect the entire ground surface within and adjacent to the mine site contributes to an inherent level of uncertainty.

Attachment A-2
Test Pit Logs

TEST PIT LOG

SRK Consulting — Engineers and Scientists

PROJECT: Borrow Source Investigation - Testpit Program
LOCATION: Mount Washington
FILE No: MOUNT WASHINGTON (1CT001.001)
BORING DATE: 2007-08-30 **TO** 2007-08-30
DIP: 90.00 **AZIMUTH:**
COORDINATES: 5513825.00 N 331324.00 E **DATUM:**

BOREHOLE: SRK-G-15-07
PAGE: 1 **OF** 1
EXCAVATOR:

SAMPLE CONDITION
- Remoulded
- Undisturbed
- Lost
- Core

TYPE OF SAMPLER
- AS Auger sample
- BS Bulk sample
- PS Piston sample
- SS Split spoon

LABORATORY AND IN SITU TESTS
- C Consolidation
- D Bulk density (kg/m3)
- Dr Specific gravity
- Ksat Saturated hydraulic cond. (cm/s)
- PS Particle size analysis
- Field vane - Intact
- Field vane - Remoulded

DEPTH - ft	DEPTH - m	WELL DETAILS & WATER LEVEL - m	ELEVATION - m / DEPTH - m	DESCRIPTION	UNIFIED CLASSIFICATION	SYMBOL	RECOVERY %	N or RQD	UNDRAINED SHEAR STRENGTH (40, 80, 120) / WATER CONTENT and LIMITS (%) W_P W W_L (10 20 30 40 50 60 70)
			0.00						
			0.00 / -0.10	Organic SILTY SAND with Gravel (Topsoil)	OL				
			0.10 / -0.60	Brown poorly graded SAND and GRAVEL with silt. Some organic content. Subrounded particles. Low plasticity.	GP				
2			0.60 / -1.60	Brown Dense to very dense SILTY SAND with gravel, trace ~1% boulder. Subanuglar particles. Low plasticity.	SM				
4	1								
			1.60	End of testpit					
6	2								
8									

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SRK Consulting
Engineers and Scientists

TEST PIT LOG

PROJECT: Borrow Source Investigation - Testpit Program
LOCATION: Mount Washington
FILE No: MOUNT WASHINGTON (1CT001.001)
BORING DATE: 2007-08-30 **TO** 2007-08-30
DIP: 90.00 **AZIMUTH:**
COORDINATES: 5513872.00 N 331310.00 E **DATUM:**

BOREHOLE: SRK-G-16-07
PAGE: 1 **OF** 1
EXCAVATOR:

SAMPLE CONDITION	TYPE OF SAMPLER	LABORATORY AND IN SITU TESTS	
Remoulded	AS Auger sample	C Consolidation	PS Particle size analysis
Undisturbed	BS Bulk sample	D Bulk density (kg/m3)	Field vane - Intact
Lost	PS Piston sample	Dr Specific gravity	Field vane - Remoulded
Core	SS Split spoon	Ksat Saturated hydraulic cond. (cm/s)	

DEPTH - ft	DEPTH - m	WELL DETAILS & WATER LEVEL - m	ELEVATION - m / DEPTH - m	DESCRIPTION	UNIFIED CLASSIFICATION	SYMBOL	RECOVERY %	N or RQD	UNDRAINED SHEAR STRENGTH (40, 80, 120) / WATER CONTENT and LIMITS (%) W_P W W_L (10 20 30 40 50 60 70)
			0.00 0.00	Organic SILTY SAND with Gravel (Topsoil)	OL				
			-0.20 0.20	Brown poorly graded SAND and GRAVEL with silt. Some organic content. Subrounded particles. Low to no plasticity.	GP				
2			-0.60 0.60	End of testpit					
	1								
4									
6									
	2								
8									

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SRK Consulting
Engineers and Scientists

TEST PIT LOG

PROJECT: Borrow Source Investigation - Testpit Program
LOCATION: Mount Washington
FILE No: MOUNT WASHINGTON (1CT001.001)
BORING DATE: 2007-09-26 **TO** 2007-09-26
DIP: 90.00 **AZIMUTH:**
COORDINATES: 5514132.00 N 337683.00 E **DATUM:**

BOREHOLE: SRK-T-01-07
PAGE: 1 **OF** 1
EXCAVATOR:

SAMPLE CONDITION
- Remoulded
- Undisturbed
- Lost
- Core

TYPE OF SAMPLER
- AS Auger sample
- BS Bulk sample
- PS Piston sample
- SS Split spoon

LABORATORY AND IN SITU TESTS
- C Consolidation
- D Bulk density (kg/m3)
- Dr Specific gravity
- Ksat Saturated hydraulic cond. (cm/s)
- PS Particle size analysis
- Field vane - Intact
- Field vane - Remoulded

DEPTH - ft	DEPTH - m	WELL DETAILS & WATER LEVEL - m	ELEVATION - m / DEPTH - m	DESCRIPTION	UNIFIED CLASSIFICATION	SYMBOL	RECOVERY %	N or RQD	UNDRAINED SHEAR STRENGTH (40, 80, 120) / WATER CONTENT and LIMITS (%) W P, W, W L (10 20 30 40 50 60 70)
			0.00 / 0.00	Organic SILTY SAND with Gravel (Topsoil)	OL				
			-0.20 / 0.20	Brown Dense to very dense SILTY SAND with gravel, trace ~1% boulder. Subrounded particles. Low plasticity	SM				
2	1								
			-1.10 / 1.10	Gray very dense clayey silt with trace of sand and gravel. Low plasticity. Dry pit, moist matrix. Subrounded particles. EOH due to hard digging	ML				
4									
6	2								
			-2.40 / 2.40	End of testpit					
8									

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TEST PIT LOG

SRK Consulting — Engineers and Scientists

PROJECT: Borrow Source Investigation - Testpit Program
LOCATION: Mount Washington
FILE No: MOUNT WASHINGTON (1CT001.001)
BORING DATE: 2007-08-29 **TO** 2007-08-29
DIP: 90.00 **AZIMUTH:**
COORDINATES: 5514382.00 N 337627.00 E **DATUM:**

BOREHOLE: SRK-T-02-07
PAGE: 1 **OF** 1
EXCAVATOR:

SAMPLE CONDITION	TYPE OF SAMPLER	LABORATORY AND IN SITU TESTS	
Remoulded	AS Auger sample	C Consolidation	PS Particle size analysis
Undisturbed	BS Bulk sample	D Bulk density (kg/m3)	Field vane - Intact
Lost	PS Piston sample	Dr Specific gravity	Field vane - Remoulded
Core	SS Split spoon	Ksat Saturated hydraulic cond. (cm/s)	

DEPTH - ft	DEPTH - m	WELL DETAILS & WATER LEVEL - m	ELEVATION - m / DEPTH - m	DESCRIPTION	UNIFIED CLASSIFICATION	SYMBOL	RECOVERY %	N or RQD	UNDRAINED SHEAR STRENGTH (40, 80, 120) / WATER CONTENT and LIMITS (%) W_P W W_L (10 20 30 40 50 60 70)
			0.00 / 0.00	Organic SILTY SAND with Gravel (Topsoil)	OL				
2	1		-0.40 / 0.40	Brown Dense to very dense SILTY SAND with gravel, trace ~1% boulder. Subanuglar particles. Low plasticity. EOH due to hard digging.	SM				
4, 6, 8	2		-1.60 / 1.60	End of testpit					

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TEST PIT LOG

PROJECT: Borrow Source Investigation - Testpit Program
LOCATION: Mount Washington
FILE No: MOUNT WASHINGTON (1CT001.001)
BORING DATE: 2007-08-29 **TO** 2007-08-29
DIP: 90.00 **AZIMUTH:**
COORDINATES: 5515256.00 N 335105.00 E **DATUM:**

BOREHOLE: SRK-T-03-07
PAGE: 1 **OF** 1
EXCAVATOR:

SAMPLE CONDITION	TYPE OF SAMPLER		LABORATORY AND IN SITU TESTS			
Remoulded	AS	Auger sample	C	Consolidation	PS	Particle size analysis
Undisturbed	BS	Bulk sample	D	Bulk density (kg/m3)		Field vane - Intact
Lost	PS	Piston sample	Dr	Specific gravity		Field vane - Remoulded
Core	SS	Split spoon	Ksat	Saturated hydraulic cond. (cm/s)		

DEPTH - ft	DEPTH - m	WELL DETAILS & WATER LEVEL - m	ELEVATION - m / DEPTH - m	DESCRIPTION	UNIFIED CLASSIFICATION	SYMBOL	RECOVERY %	N or RQD	UNDRAINED SHEAR STRENGTH (40, 80, 120) / WATER CONTENT and LIMITS (%) W_P W W_L (10 20 30 40 50 60 70)
			0.00 / 0.00	Brown Dense to very dense SILTY SAND with gravel, trace ~1% boulder. Subrounded particles. Low plasticity	SM				
			-0.40 / 0.40	Bedrock					
2									
	1								
4									
6									
	2								
8									

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TEST PIT LOG

SRK Consulting — Engineers and Scientists

PROJECT: Borrow Source Investigation - Testpit Program
LOCATION: Mount Washington
FILE No: MOUNT WASHINGTON (1CT001.001)
BORING DATE: 2007-08-29 **TO** 2007-08-29
DIP: 90.00 **AZIMUTH:**
COORDINATES: 5515273.00 N 335129.00 E **DATUM:**

BOREHOLE: SRK-T-04-07
PAGE: 1 **OF** 1
EXCAVATOR:

SAMPLE CONDITION
- Remoulded
- Undisturbed
- Lost
- Core

TYPE OF SAMPLER
- AS Auger sample
- BS Bulk sample
- PS Piston sample
- SS Split spoon

LABORATORY AND IN SITU TESTS
- C Consolidation
- D Bulk density (kg/m3)
- Dr Specific gravity
- Ksat Saturated hydraulic cond. (cm/s)
- PS Particle size analysis
- Field vane - Intact
- Field vane - Remoulded

DEPTH - ft	DEPTH - m	WELL DETAILS & WATER LEVEL - m	ELEVATION - m / DEPTH - m	DESCRIPTION	UNIFIED CLASSIFICATION	SYMBOL	RECOVERY %	N or RQD	UNDRAINED SHEAR STRENGTH (40, 80, 120) / WATER CONTENT and LIMITS (%) W_P W W_L (10 20 30 40 50 60 70)
			0.00 / 0.00	Organic SILTY SAND with Gravel (Topsoil)	OL				
			-0.30 / 0.30	Brown Dense to very dense SILTY SAND with gravel, trace ~1% boulder. Subanuglar particles. Low plasticity.	SM				
2			-0.80 / 0.80	Gray very dense clayey silt with trace of sand and gravel. Medium plasticity. Dry pit, moist matrix. Subrounded particles.	ML				
	1		-1.00 / 1.00	Brown Dense to very dense SILTY SAND with gravel, trace ~1% boulder. Subanuglar particles. Low plasticity.	SM				
4			-1.50 / 1.50	Bedrock. EOH					
6	2								
8									

TEST PIT LOG

SRK Consulting — Engineers and Scientists

PROJECT: Borrow Source Investigation - Testpit Program
LOCATION: Mount Washington
FILE No: MOUNT WASHINGTON (1CT001.001)
BORING DATE: 2007-08-29 **TO** 2007-09-26
DIP: 90.00 **AZIMUTH:**
COORDINATES: 5515170.00 N 335106.00 E **DATUM:**

BOREHOLE: SRK-T-05-07
PAGE: 1 **OF** 1
EXCAVATOR:

SAMPLE CONDITION	TYPE OF SAMPLER	LABORATORY AND IN SITU TESTS	
Remoulded	AS Auger sample	C Consolidation	PS Particle size analysis
Undisturbed	BS Bulk sample	D Bulk density (kg/m3)	Field vane - Intact
Lost	PS Piston sample	Dr Specific gravity	Field vane - Remoulded
Core	SS Split spoon	Ksat Saturated hydraulic cond. (cm/s)	

STRATIGRAPHY

DEPTH - ft	DEPTH - m	WELL DETAILS & WATER LEVEL - m	ELEVATION - m / DEPTH - m	DESCRIPTION	UNIFIED CLASSIFICATION	SYMBOL	RECOVERY %	N or RQD	UNDRAINED SHEAR STRENGTH (40 80 120) / WATER CONTENT and LIMITS (%) W_P W W_L (10 20 30 40 50 60 70)
			0.00 0.00	Organic SILTY SAND with Gravel (Topsoil)	OL				
			-0.20 0.20	Brown very dense SILTY SAND with gravel, trace ~1% boulder. Subrounded particles. Medium plasticity.	SM				
2			-0.60 0.60	Gray very dense clayey silt with trace of sand and gravel. Medium to high plasticity. Dry pit, moist matrix. Subrounded particles.	ML				
4	1								
6	2		-2.10 2.10	End of testpit					
8									

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TEST PIT LOG

PROJECT: Borrow Source Investigation - Testpit Program
LOCATION: Mount Washington
FILE No: MOUNT WASHINGTON (1CT001.001)
BORING DATE: 2007-08-29 **TO** 2007-08-29
DIP: 90.00 **AZIMUTH:**
COORDINATES: 5515161.00 N 335156.00 E **DATUM:**

BOREHOLE: SRK-T-06-07
PAGE: 1 **OF** 1
EXCAVATOR:

SAMPLE CONDITION
- Remoulded
- Undisturbed
- Lost
- Core

TYPE OF SAMPLER
- AS Auger sample
- BS Bulk sample
- PS Piston sample
- SS Split spoon

LABORATORY AND IN SITU TESTS
- C Consolidation
- D Bulk density (kg/m3)
- Dr Specific gravity
- Ksat Saturated hydraulic cond. (cm/s)
- PS Particle size analysis
- Field vane - Intact
- Field vane - Remoulded

DEPTH - ft	DEPTH - m	WELL DETAILS & WATER LEVEL - m	ELEVATION - m / DEPTH - m	DESCRIPTION	UNIFIED CLASSIFICATION	SYMBOL	RECOVERY %	N or RQD	UNDRAINED SHEAR STRENGTH (40 80 120) / WATER CONTENT and LIMITS (%) W_P W W_L (10 20 30 40 50 60 70)
			0.00 / 0.00	Organic SILTY SAND with Gravel (Topsoil)	OL				
			-0.20 / 0.20	rown Dense SILTY SAND with gravel. Anuglar particles. Non plastic.	SM				
2			-0.60 / 0.60	Bedrock. EOH					
4	1								
6	2								
8									

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TEST PIT LOG

SRK Consulting — Engineers and Scientists

PROJECT: Borrow Source Investigation - Testpit Program
LOCATION: Mount Washington
FILE No: MOUNT WASHINGTON (1CT001.001)
BORING DATE: 2007-08-29 **TO** 2007-08-29
DIP: 90.00 **AZIMUTH:**
COORDINATES: 5515124.00 N 335122.00 E **DATUM:**

BOREHOLE: SRK-T-07-07
PAGE: 1 **OF** 1
EXCAVATOR:

SAMPLE CONDITION	TYPE OF SAMPLER	LABORATORY AND IN SITU TESTS	
Remoulded	AS Auger sample	C Consolidation	PS Particle size analysis
Undisturbed	BS Bulk sample	D Bulk density (kg/m3)	Field vane - Intact
Lost	PS Piston sample	Dr Specific gravity	Field vane - Remoulded
Core	SS Split spoon	Ksat Saturated hydraulic cond. (cm/s)	

DEPTH - ft	DEPTH - m	WELL DETAILS & WATER LEVEL - m	ELEVATION - m / DEPTH - m	DESCRIPTION	UNIFIED CLASSIFICATION	SYMBOL	RECOVERY %	N or RQD	UNDRAINED SHEAR STRENGTH (40, 80, 120) / WATER CONTENT and LIMITS (%) W_P W W_L (10–70)
			0.00 / 0.00	Organic SILTY SAND with Gravel (Topsoil)	OL				
2, 4, 6	1, 2		-0.30 / 0.30	rown Dense to very dense SILTY SAND with gravel, trace ~1% boulder. Subanuglar particles. Low plasticity.	SM				
8			-2.10 / 2.10	Bedrock. EOH					

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TEST PIT LOG

PROJECT: Borrow Source Investigation - Testpit Program
LOCATION: Mount Washington
FILE No: MOUNT WASHINGTON (1CT001.001)
BORING DATE: 2007-08-29 **TO** 2007-08-29
DIP: 90.00 **AZIMUTH:**
COORDINATES: 5515747.00 N 334560.00 E **DATUM:**

BOREHOLE: SRK-T-08-07
PAGE: 1 **OF** 1
EXCAVATOR:

SAMPLE CONDITION
- Remoulded
- Undisturbed
- Lost
- Core

TYPE OF SAMPLER
- AS Auger sample
- BS Bulk sample
- PS Piston sample
- SS Split spoon

LABORATORY AND IN SITU TESTS
- C Consolidation
- D Bulk density (kg/m3)
- Dr Specific gravity
- Ksat Saturated hydraulic cond. (cm/s)
- PS Particle size analysis
- Field vane - Intact
- Field vane - Remoulded

DEPTH - ft	DEPTH - m	WELL DETAILS & WATER LEVEL - m	ELEVATION - m / DEPTH - m	DESCRIPTION	UNIFIED CLASSIFICATION	SYMBOL	RECOVERY %	N or RQD	UNDRAINED SHEAR STRENGTH (40 80 120) / WATER CONTENT and LIMITS (%) W_P W W_L (10 20 30 40 50 60 70)
			0.00 / 0.00	Organic SILTY SAND with Gravel (Topsoil)	OL				
			-0.30 / 0.30	rown Dense to very dense SILTY SAND with gravel, trace boulder. Subanuglar particles. Low to medium plasticity. Wet matrix. Water seeping in at bottom of pit.	SM				
2									
	1								
4									
			-1.60 / 1.60	Bedrock. EOH					
6									
	2								
8									

TEST PIT LOG

SRK Consulting — Engineers and Scientists

PROJECT: Borrow Source Investigation - Testpit Program
LOCATION: Mount Washington
FILE No: MOUNT WASHINGTON (1CT001.001)
BORING DATE: 2007-08-29 **TO** 2007-08-29
DIP: 90.00 **AZIMUTH:**
COORDINATES: 5515316.00 N 335632.00 E **DATUM:**

BOREHOLE: SRK-T-14-07
PAGE: 1 **OF** 1
EXCAVATOR:

SAMPLE CONDITION	TYPE OF SAMPLER		LABORATORY AND IN SITU TESTS			
Remoulded	AS	Auger sample	C	Consolidation	PS	Particle size analysis
Undisturbed	BS	Bulk sample	D	Bulk density (kg/m3)		Field vane - Intact
Lost	PS	Piston sample	Dr	Specific gravity		Field vane - Remoulded
Core	SS	Split spoon	Ksat	Saturated hydraulic cond. (cm/s)		

DEPTH - ft	DEPTH - m	WELL DETAILS & WATER LEVEL - m	ELEVATION - m / DEPTH - m	DESCRIPTION	UNIFIED CLASSIFICATION	SYMBOL	RECOVERY %	N or RQD	UNDRAINED SHEAR STRENGTH (40, 80, 120) / WATER CONTENT and LIMITS (%) W_P W W_L (10 20 30 40 50 60 70)
			0.00 / 0.00	Brown Dense to very dense SILTY SAND with gravel, trace ~3% boulder. Subanuglar particles. Low to medium plasticity. Wet Matrix. Water seeping in at 1.4m.	SM				
2									
	1								
4									
			-1.60 / 1.60	EOH on boulder					
			-1.60 / 1.60	End of testpit					
6									
	2								
8									

TEST PIT LOG

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PROJECT: Borrow Source Investigation - Testpit Program
LOCATION: South Waste Rock Pile
FILE No: MOUNT WASHINGTON (1CT001.001)
BORING DATE: 2007-08-29 **TO** 2007-08-29
DIP: 90.00 **AZIMUTH:**
COORDINATES: 5514759.00 N 334223.00 E **DATUM:**

BOREHOLE: SRK-WR-09-07
PAGE: 1 **OF** 1
EXCAVATOR:

SAMPLE CONDITION	TYPE OF SAMPLER		LABORATORY AND IN SITU TESTS			
Remoulded	AS	Auger sample	C	Consolidation	PS	Particle size analysis
Undisturbed	BS	Bulk sample	D	Bulk density (kg/m3)		Field vane - Intact
Lost	PS	Piston sample	Dr	Specific gravity		Field vane - Remoulded
Core	SS	Split spoon	Ksat	Saturated hydraulic cond. (cm/s)		

DEPTH - ft	DEPTH - m	WELL DETAILS & WATER LEVEL - m	ELEVATION - m / DEPTH - m	DESCRIPTION	UNIFIED CLASSIFICATION	SYMBOL	RECOVERY %	N or RQD	UNDRAINED SHEAR STRENGTH (40, 80, 120) / WATER CONTENT and LIMITS (%) W_P W W_L (10 20 30 40 50 60 70)
			0.00 0.00	Well graded WASTE ROCK, with cobble and boulder, trace of silt. Anuglar. Loose to little compaction. Oxidation near surface, ~6cm. Wet matrix, dry pit.	GW				
2									
	1								
4									
			-1.70 1.70	End of testpit					
6									
	2								
8									

TEST PIT LOG

SRK Consulting — Engineers and Scientists

PROJECT: Borrow Source Investigation - Testpit Program
LOCATION: South Waste Rock Pile
FILE No: MOUNT WASHINGTON (1CT001.001)
BORING DATE: 2007-08-29 **TO** 2007-08-29
DIP: 90.00 **AZIMUTH:**
COORDINATES: 5514723.00 N 334215.00 E **DATUM:**

BOREHOLE: SRK-WR-10-07
PAGE: 1 **OF** 1
EXCAVATOR:

SAMPLE CONDITION	TYPE OF SAMPLER	LABORATORY AND IN SITU TESTS	
Remoulded	AS Auger sample	C Consolidation	PS Particle size analysis
Undisturbed	BS Bulk sample	D Bulk density (kg/m3)	Field vane - Intact
Lost	PS Piston sample	Dr Specific gravity	Field vane - Remoulded
Core	SS Split spoon	Ksat Saturated hydraulic cond. (cm/s)	

DEPTH - ft	DEPTH - m	WELL DETAILS & WATER LEVEL - m	ELEVATION - m / DEPTH - m	DESCRIPTION	UNIFIED CLASSIFICATION	SYMBOL	RECOVERY %	N or RQD	UNDRAINED SHEAR STRENGTH (40, 80, 120) / WATER CONTENT and LIMITS (%) W_P W W_L (10 20 30 40 50 60 70)
			0.00 / 0.00	Well graded WASTE ROCK, with cobble and boulder, trace of silt. Anuglar. Loose to little compaction. Oxidation near surface, ~5cm. Wet matrix, dry pit.	GW				
2									
	1								
4									
			-1.60 / 1.60	End of testpit					
6									
	2								
8									

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TEST PIT LOG

SRK Consulting — Engineers and Scientists

PROJECT: Borrow Source Investigation - Testpit Program
LOCATION: South Waste Rock Pile
FILE No: MOUNT WASHINGTON (1CT001.001)
BORING DATE: 2007-08-29 **TO** 2007-08-29
DIP: 90.00 **AZIMUTH:**
COORDINATES: 5514841.00 N 334321.00 E **DATUM:**

BOREHOLE: SRK-WR-11-07
PAGE: 1 **OF** 1
EXCAVATOR:

SAMPLE CONDITION	TYPE OF SAMPLER		LABORATORY AND IN SITU TESTS			
Remoulded	AS	Auger sample	C	Consolidation	PS	Particle size analysis
Undisturbed	BS	Bulk sample	D	Bulk density (kg/m3)		Field vane - Intact
Lost	PS	Piston sample	Dr	Specific gravity		Field vane - Remoulded
Core	SS	Split spoon	Ksat	Saturated hydraulic cond. (cm/s)		

DEPTH - ft	DEPTH - m	WELL DETAILS & WATER LEVEL - m	ELEVATION - m / DEPTH - m	DESCRIPTION	UNIFIED CLASSIFICATION	SYMBOL	RECOVERY %	N or RQD	UNDRAINED SHEAR STRENGTH (40 80 120) / WATER CONTENT and LIMITS (%) (W_P W W_L; 10 20 30 40 50 60 70)
			0.00 / 0.00	Well graded WASTE ROCK, with cobble and boulder, trace of silt. Finer material near surface. Anuglar. Loose to little compaction. Heavy oxidation near surface, ~30cm. Wet matrix, dry pit.	GW				
2	1								
4			-1.50 / 1.50	End of testpit					
6	2								
8									

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TEST PIT LOG

PROJECT: Borrow Source Investigation - Testpit Program
LOCATION: West Waste Rock Pile
FILE No: MOUNT WASHINGTON (1CT001.001)
BORING DATE: 2007-08-29 **TO** 2007-08-29
DIP: 90.00 **AZIMUTH:**
COORDINATES: 5515335.00 N 333955.00 E **DATUM:**

BOREHOLE: SRK-WR-12-07
PAGE: 1 **OF** 1
EXCAVATOR:

SAMPLE CONDITION	TYPE OF SAMPLER	LABORATORY AND IN SITU TESTS	
Remoulded	AS Auger sample	C Consolidation	PS Particle size analysis
Undisturbed	BS Bulk sample	D Bulk density (kg/m3)	Field vane - Intact
Lost	PS Piston sample	Dr Specific gravity	Field vane - Remoulded
Core	SS Split spoon	Ksat Saturated hydraulic cond. (cm/s)	

DEPTH - ft	DEPTH - m	WELL DETAILS & WATER LEVEL - m	ELEVATION - m / DEPTH - m	DESCRIPTION	UNIFIED CLASSIFICATION	SYMBOL	RECOVERY %	N or RQD	UNDRAINED SHEAR STRENGTH (40 80 120) / WATER CONTENT and LIMITS (%) W P W W L (10 20 30 40 50 60 70)
			0.00 / 0.00	Well graded WASTE ROCK, with cobble and boulder, trace of silt. Grain size increase with depth and becomes poorly graded near bottom. Anuglar. Loose to little compaction. Oxidation through out the pit. Wet matrix, dry pit.	GW				
2									
	1								
4									
6									
	2								
8									
			-2.60 / 2.60	End of testpit					

SRK Consulting
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TEST PIT LOG

PROJECT: Borrow Source Investigation - Testpit Program
LOCATION: West Waste Rock Pile
FILE No: MOUNT WASHINGTON (1CT001.001)
BORING DATE: 2007-08-29 **TO** 2007-08-29
DIP: 90.00 **AZIMUTH:**
COORDINATES: 5515298.00 N 333902.00 E **DATUM:**

BOREHOLE: SRK-WR-13-07
PAGE: 1 **OF** 1
EXCAVATOR:

SAMPLE CONDITION	TYPE OF SAMPLER		LABORATORY AND IN SITU TESTS			
Remoulded	AS	Auger sample	C	Consolidation	PS	Particle size analysis
Undisturbed	BS	Bulk sample	D	Bulk density (kg/m3)		Field vane - Intact
Lost	PS	Piston sample	Dr	Specific gravity		Field vane - Remoulded
Core	SS	Split spoon	Ksat	Saturated hydraulic cond. (cm/s)		

DEPTH - ft	DEPTH - m	WELL DETAILS & WATER LEVEL - m	STRATIGRAPHY: ELEVATION - m / DEPTH - m	DESCRIPTION	UNIFIED CLASSIFICATION	SYMBOL	RECOVERY %	N or RQD	UNDRAINED SHEAR STRENGTH (40, 80, 120) / WATER CONTENT and LIMITS (%) W_P W W_L (10 20 30 40 50 60 70)
			0.00 / 0.00	Well graded WASTE ROCK, with cobble and boulder, trace of silt. Grain size increase with depth and becomes poorly graded near bottom. Anuglar. Loose to little compaction. Oxidation through out the pit. Wet matrix, dry pit.					
2									
	1				GW				
4									
6									
	2		-2.00 / 2.00	End of testpit					
8									

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Attachment A-3
Test Pit Photos

Photo 1: SRK-G-15-07 - Shallow overburden with traces of sand and gravel at bottom.

Photo 2: SRK-G-16-07 - Shallow overburden with traces of sand and gravel at bottom.

Photo 3: SRK-T-01-07 - Deep pocket of silty sand with gravel (till). Note the weathered material near surface and the unweathered material near bottom.

Photo 4: SRK-T-04-07 - Weathered Till material.

Photo 5: SRK-T-05-07 - Weathered Till overlying unweathered material.

Photo 6: SRK-T-06-07 - Very shallow till overburden.

Photo 7: SRK-7-07-07 - Weathered Till.

Photo 8: SRK-T-08-07 - Weathered Till with gravel; water seeping through.

Photo 9: SRK-T-14-07 - Weathered Till material.

Photo 10: SRK-WR-09-07 - East Dump Waste Rock.

Photo 11: SRK-WR-10-07 - East Dump Waste Rock.

Photo 12: SRK-WR-11-07 - Lower East Dump Waste Rock.

Photo 13: SRK-WR-12-07 - West Dump Waste Rock.

Photo 14: SRK-WR-13-07 - West Dump Waste Rock.

Appendix B
Geochemical Interpretation to Support Remediation Design

SRK Consulting
Engineers and Scientists

SRK Consulting (Canada) Inc.
Suite 2200 – 1066 West Hastings Street
Vancouver, B.C. V6E 3X2
Canada

vancouver@srk.com
www.srk.com

Tel: **604.681.4196**
Fax: **604.687.5532**

Memo

To:	File (Appendix B)	**Date:**	November 21, 2007
cc:		**From:**	Stephen Day
Subject:	Geochemical Interpretation to Support Remediation Design Mount Washington Mine	**Project #:**	1CT001.001

1 Objective and Background

This memorandum describes and discusses geochemical information collected at the Mount Washington Mine site as a component of investigations in 2007 designed to support development of the final remediation plan. The primary purpose of the remediation plan is to address copper loadings from the site that impact water quality in the Tsolum River. The investigations included collection of field and water quality data from three weirs on eleven occasions during the freshet starting in April and ending in July, and a single round of detailed water quality sampling throughout the site on July 9, 2007.

The objective of these investigations was to provide design criteria for the remediation plan.

Previous investigations have concluded that:

- The majority of the copper load originates by snow melt and rainfall contacting oxidizing sulphide-bearing acid-generating rock on the pit floor. A small component of the load originates as shallow groundwater flow through the small highwall of the pit (SRK 2000).
- To continually meet the water quality objective for copper in the Tsolum River, it will be necessary to reduce the copper loading from the site by at least 90% using a cover.

The objective of the current investigations was therefore to refine the requirements for the cover and other aspects of the remediation plan.

2 Investigation Methods

2.1 Weir Monitoring

Weir monitored was conducted on eleven occasions by representatives from the Tsolum River Partnership and BC Ministry of Environment (BCMoE). During each visit, the height of flow in the weir notch was measured and a water sample was collected for laboratory analysis of pH, acidity, sulphate and total and dissolved copper, iron and aluminum. Analysis was performed under supervision of BCMoE. Not all parameters were analyzed on all occasions. Results are provided in Attachment 1.

When sampling started, the weirs and their stilling basins were covered by snow and had to be excavated. As a result, flow measurements are considered to be semi-quantitative.

2.2 Detailed Water Sampling

Detailed water quality sampling was completed on July 9, 2007 by representatives from SRK, the Tsolum River Partnership and Environment Canada. SRK inspected the site and identified 23 potential surface water sampling locations and four groundwater monitoring locations. The latter were selected based on observation of the condition of the wells in 1999 by SRK (2000). In total, 26 water samples were collected including one duplicate and one sample from the South Pit drainage. Sample locations are provided in Table 1 and shown in Attachment 2.

Table 1: Sampling Locations – July 9

Site	General Description
Br 1200	Branch 126
Seep 2	Seep into rock notch in pit
Seep 3	Toe Seep North Dump
Seep 4	Toe Seep North Dump
Seep 5	Toe Seep North Dump
Seep 6	Toe Seep West Dump
Seep 7	Toe Seep West Dump
DIV 8	North end of Uphill Creek
Seep 9	Upstream of snow-filled ditch
Seep 10	Central Channel at Lower Channel
DITCH 11	Drainage from rock notch
DIV 12	Trib to Uphill Creek above pit
DIV 13	Ditch entering dry pond at east end of site
Seep 14	Flow from pipe into Upper Channel
Seep 15	Black pipe near highwall in pit
Seep 16	Headwall
Seep 17	Lower Channel above Upper Channel
Seep 18	Field Duplicate of SEEP 14
Seep 19	South pit outflow
Weir 1	Established Weir
Weir 2	Established Weir
Weir 3	Established Weir
Weir 4	Established Weir
Well 89-13	Existing monitoring well
Well 89-4	Existing monitoring well
Well 89-7	Existing monitoring well
Well 89-3	Existing monitoring well

Water samples were collected into bottles provided by Environment Canada (EC). At each location, bottles were filled with unfiltered water to be tested without preservation, unfiltered water for analysis of “total metals” and filtered (0.45 μm) water for analysis of “dissolved metals”. Samples were filtered at the time of sampling with disposable syringe-type and vacuum cup units. At groundwater wells, existing Waterra tubing and foot valves were discarded and new tubing used to collect the samples directly into bottles. Samples for metal analysis were preserved on site using nitric acid provided in individual pre-measured vials. The bottles were placed in coolers containing gel packs and taken back to EC for analysis.

Field data collected at each location consisted of pH, specific conductivity, oxidation-reduction potential, temperature and flow. Flow was estimated using a variety of techniques depending on the type of flow. At the weirs, the height of water flowing through the notch was measured. At other locations, flows were estimated from profile area and timed floating stick velocity measurement, or by timed filling of a container (pail, bottle or plastic bag) of known volume. The proportion of flow captured had to be estimated. Several measurements were made to evaluate variability of the estimate though nonetheless, these estimates should be considered approximate.

Water samples were analyzed for a pH, specific conductivity, total dissolved solids (TDS), acidity, major anions (chloride, bromide, fluoride, sulphate, alkalinity, nitrate, nitrite) and other elements by ICP-ES and ICP-MS. The ICP-MS method was used to obtain low levels for elements not detected by ICP-ES.

3 Results

3.1 Weir Monitoring

Weir monitoring results are provided in Attachment 1 and summarized in Figures 1, 2 and 3. Results are described below in sequence along the flow path (i.e. Weir 3, then Weir 2 and Weir 1).

3.1.1 Weir 3 – Pit Floor

Weir 3 captures flow originating from ditches draining the pit floor.

Measured flows peaked at 20 L/s on June 6 though a minor peak was observed in mid-May due to overall warming but subsequent cooling resulted in decreasing flows. Drainage pH varied little but was lowest in April (3.3) and generally increased to 3.7 after the flow peaked. Copper and sulphate loadings both peaked in mid-May ahead of the main flow peak. Copper and sulphate concentrations were highest during the first sampling round on April 19 (15 and 257 mg/L, respectively) and thereafter declined as flows peaked. Prior to the loading peak, sulphate concentrations decreased much more rapidly than copper, whereas after the loading peak copper concentrations decreased more rapidly than sulphate.

3.1.2 Weir 2 – Pyrrhotite Creek above Weir 1

Weir 2 captures flows originating from Weir 3, drainage from the east side of the pit floor and clean water runoff to the east of the site. It also receives some seepage from the toe of the East Dump above Weir 1.

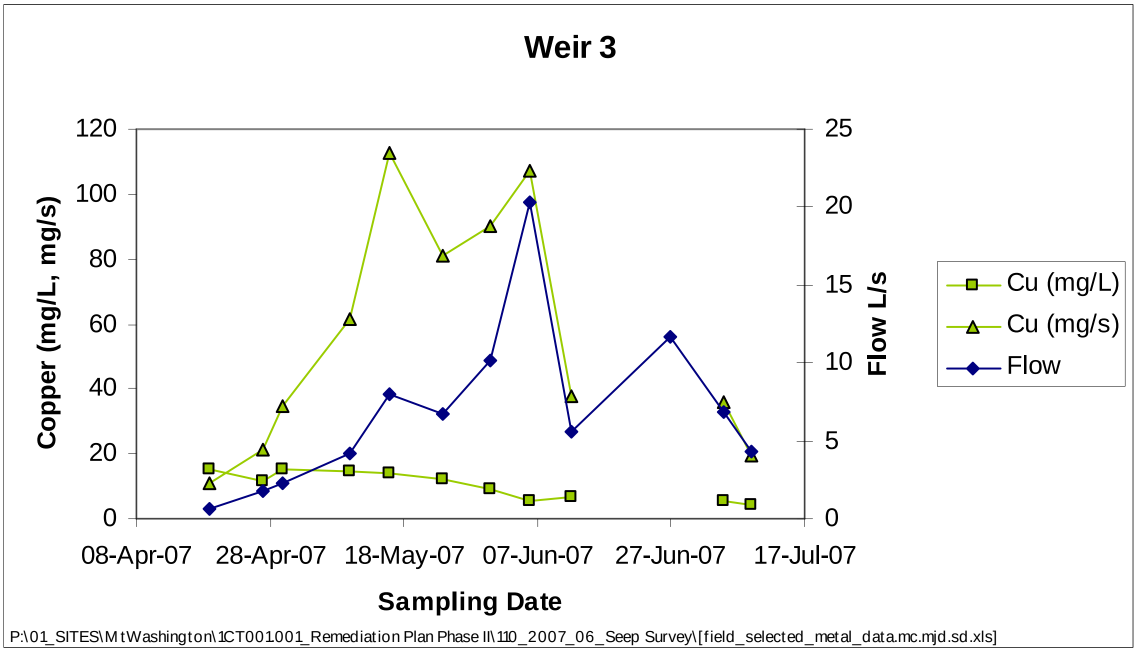
Flow, concentration and loading trends were very similar to Weir 3. Peak flow was 60 L/s on June 6.

Drainage pH was higher than Weir 3 (3.9 to 4.7) but did not show a clear trend during monitoring. Sulphate concentrations were slightly lower than Weir 3 (ranges 189 to 42 mg/L and 260 to 56 mg/L, respectively) but copper concentrations were relatively much lower (ranges 3 to 8 mg/L and 5 to 16 mg/L). Overall the decrease in copper and sulphate showed the same pattern.

3.1.3 Weir 1 – East Dump Seepage

Flow from Weir 1 showed a different pattern from Weirs 3 and 2. Flows increased to May 10 then showed subdued peak until June 12 (range of flows 0.9 to 1.2 L/s) then decreased to 0.2 L on July 9.

Drainage pH increased slightly over the monitoring period rising from 3.3 to 3.5. Sulphate concentrations were consistently higher than the surface water weirs (range 380 to 780 mg/L) whereas copper concentrations overlapped with Weir 3 (range 9 to 19 mg/L). Like the other weirs, copper and sulphate loading both peaked ahead of the main flow peak.



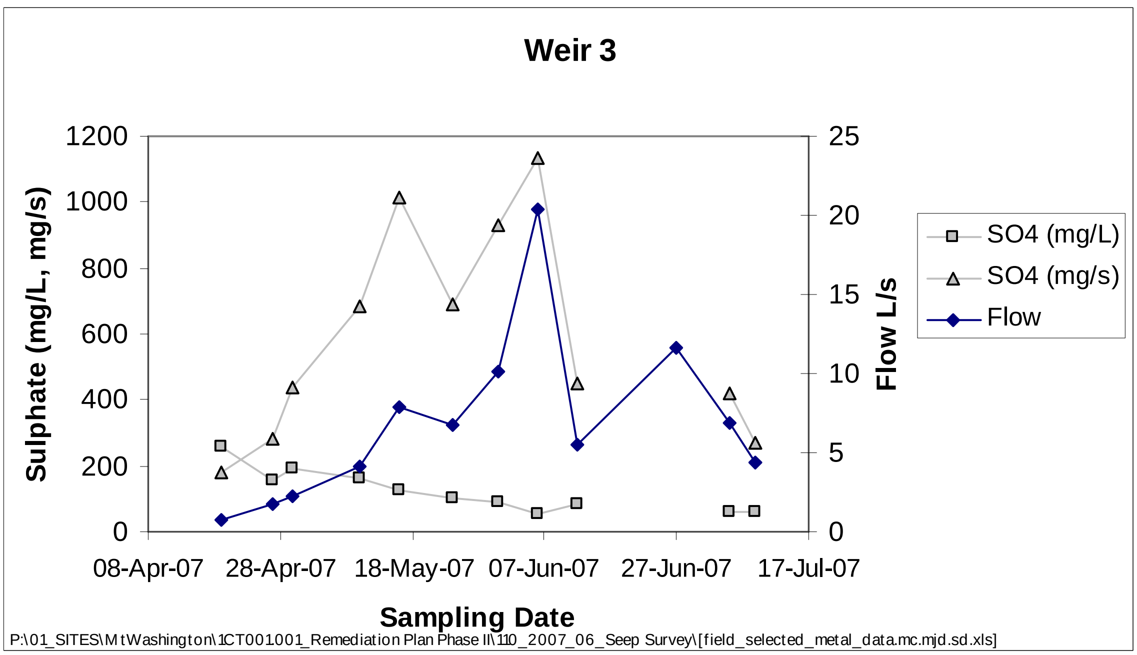
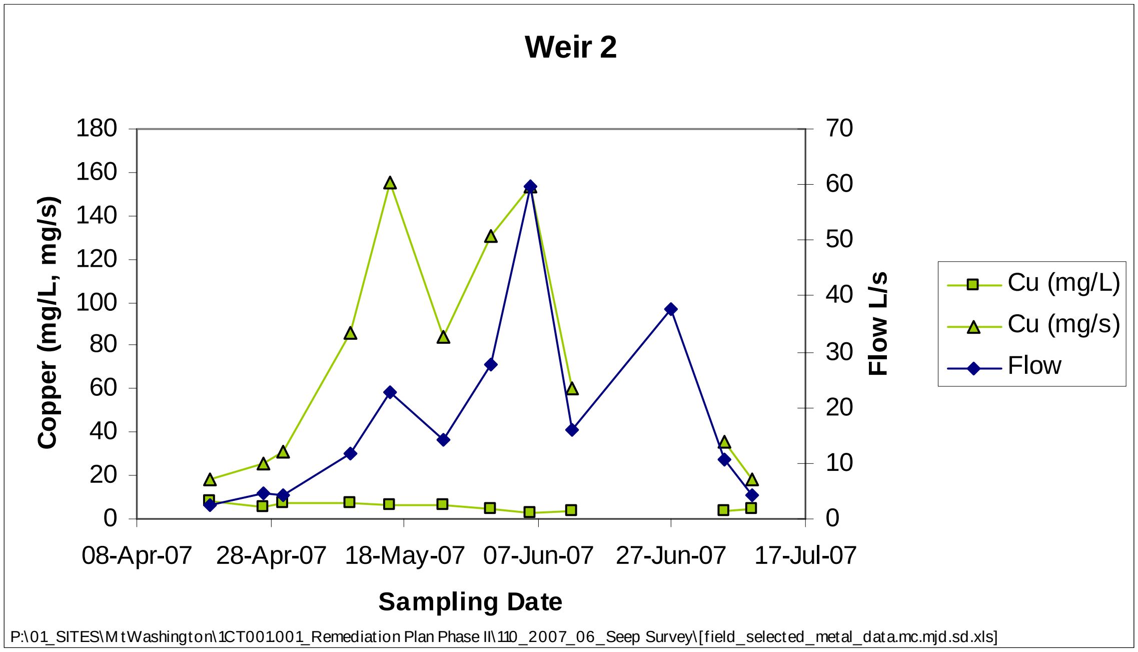


Figure 1: Weir 3 Monitoring Results



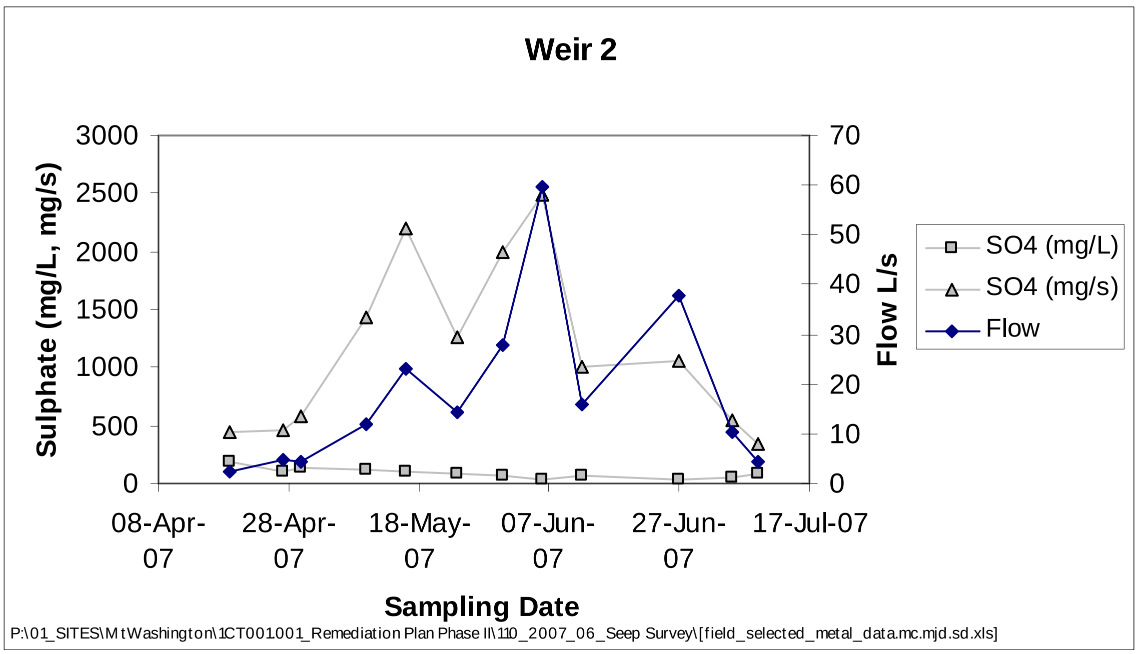
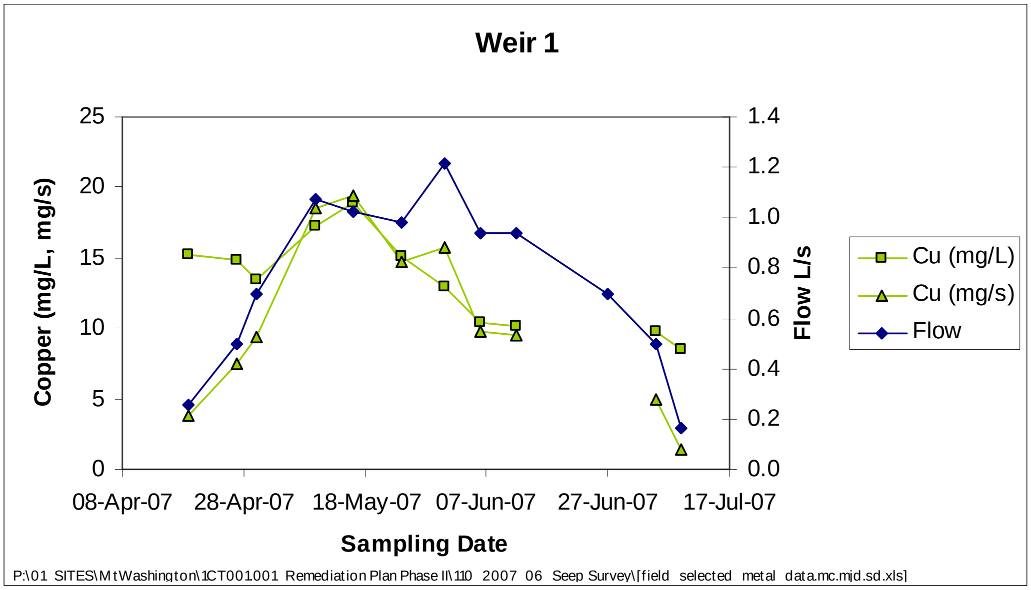


Figure 2: Weir 2 Monitoring Results



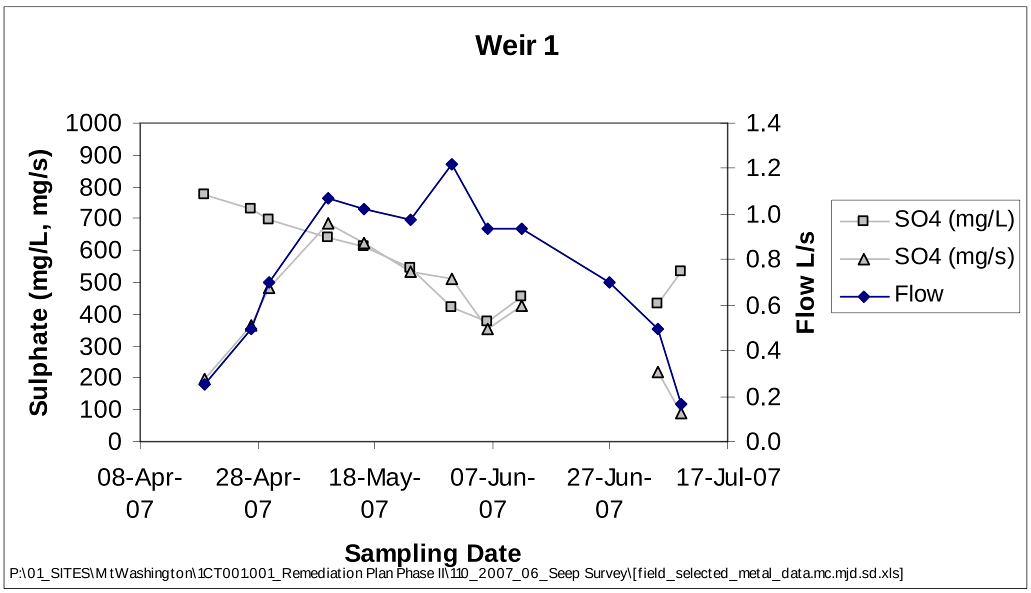


Figure 3: Weir 1 Monitoring Results

3.2 July 9 Water Sampling

3.2.1 Quality Control/Quality Assurance

Laboratory data quality was evaluated by Environment Canada's laboratory. SRK also evaluated the data and determined the ion balances for the majority of samples were unacceptable (-11% to -61%) due to large anion excesses. It was determined based on comparison with conductivity and TDS that sulphate concentrations were incorrect. As a surrogate for actual sulphate measurements, sulphur determined by ICP-ES was used. This resulted in generally acceptable ion balances (better than -14%). All subsequent references to sulphate in the following sections refer to sulphate calculated from sulphur using a factor of 3 (i.e. 96/32).

The single field duplicate showed acceptable results for all parameters except sulphate (RPD 26%) and fluoride (RPD 105%).

3.2.2 Description of Results

Results are provided in Attachment 3 and summarized on the aerial photobase in Attachment 4. The following description of the results is provided for the general source water types

Upgradient Waters

Surface water in Uphill Creek was very dilute (sulphate 3 mg/L), weakly acidic (laboratory pH 6.6) and contained low copper concentrations (9 µg/L).

Groundwater (BH-89-13) also contained low sulphate (14 mg/L) but was slightly alkaline (pH 7.4, alkalinity 30 mg $CaCO_3$/L). Copper was comparable to the surface water (10 µg/L).

Pit Floor

Seeps and ditch waters in the pit floor area tended to have pHs below 4. pH was correlated with acidity showing a range from 10 to nearly 400 mg $CaCO_3$/L. Aluminum (generally 0.7 to 5 mg/L) was also correlated with pH. Iron concentrations were typically very near 1 mg/L and copper concentrations were between 1 and 10 mg/L. The most acidic seep was at location 9 which receives flow from the area of the concrete cap. The pH at this location was 2.83 and sulphate (1155 mg/L), iron (79 mg/L) and aluminum (17 mg/L) concentrations were highest of any location on the pit floor. This location also uniquely had 2.6 mg/L chloride compared to typical concentrations of 0.2 to 0.6-mg/L elsewhere in the pit floor. Copper concentrations were highest at this location but not to the same degree as the other parameters (14 mg/L compared to the next highest value 12 mg/L).

Seep 2 in the so-called “slot” area of the western edge of the pit floor was not as acidic (pH 4.3) but copper concentrations were 4.3 mg/L. The location was upstream of the area where limestone has been applied to the drainage. The downstream location (DITCH 11) had a pH of 7.3 and copper concentration of 0.6 mg/L.

East Dump Seeps

Four seeps were sampled at the toe of the East Dump (Weir 1, Seep 3, 4 and 5). Weir 1 and Seep 3 had similar chemistry showing pH between 3.5 and 4.3, sulphate near 500 mg/L, copper of 10 and 13 mg/L (respectively), highest aluminum concentrations of any location (18 and 26 mg/L) and iron concentrations reflecting the differences in pH. Chloride concentrations were very similar (2.3 and 2.4 mg/L).

In contrast, Seep 5 which may be the surface expression of the toe drain from the eastern side of the dump had somewhat different chemistry due to a higher pH. The pH was near neutral (6.9) and alkalinity was 16 mg $CaCO_3$/L. Sulphate remained relatively elevated (336 mg/L) but copper was lower than Weir 1 and Seep 3 (1.1 mg/L). Seep 5 chloride was 0.3 mg/L.

Seep 4 on the west flank of the dump was weakly acidic (pH 5.6) but relatively dilute (sulphate 22 mg/L, copper 0.14 mg/L).

West Dump Seeps

The two seeps (6 and 7) from the West Dump had pHs between 4 and 5 and concentrations of iron of 0.2 and 0.8 mg/L, respectively; aluminum (4.4 and 1.0 mg/L respectively) and copper (8 and 1 mg/L, respectively) consistent with relationships between metal concentrations and pH shown by the more acidic pH floor samples.

Pyrrhotite Creek

Pyrrhotite Creek was sampled at Weir 2 and Branch 126. The chemistry at both locations was comparable. The creek was acidic (pH 4.3), iron was 0.3 mg/L, aluminum about 0.4 mg/L and copper 4.3 and 2.6 mg/L.

4 Discussion of Results

4.1 Sources of Loadings in the Mine Site Area

4.1.1 Method

The sampling conducted on July 9 was used to provide a "snapshot" of loadings sources within the pit area for sulphate and copper. Sulphate was chosen because it is linked to acidity through the sulphide oxidation process. It is also relatively insensitive to pH changes once dissolved in water and at this site is not expected to enter environments where it could be chemically reduced to sulphide. It can however be affected by mineral precipitation processes and therefore is not considered a true tracer. Of the true tracers (chloride, bromide), only chloride was locally detected in a limited area as will be discussed below.

Loadings contributed by different parts of the site were calculated using the differences in loadings between sampling stations. For example, if the load at a station is L_1 and the loading at the next downstream station is L_2, the load added (or lost) between the stations is L_2-L_1. The results of these calculations for flow, sulphate and copper are shown in Attachment 5. The calculations should be considered in the context of the overall flow, sulphate and copper at Branch 126 on July 9 (8 L/s, 500 mg/s and 20 mg/s, respectively), and need to consider that flows at the weirs are well-quantified but seep flows had to be estimated. The calculations therefore provide an indication of relative flow and load distribution rather than detailed quantification.

4.1.2 Pit Floor Area

Within the pit area, this analysis indicated that the bulk of flow and loading was contributed by the Upper Channel system flowing from Seep 14 and through Weir 4 to Weir 3. Flows were 2.8 L/s, sulphate loading was 267 mg/L and copper was 19 mg/s. The slope contributing to Weir 4 above Seep 14 is shown as contributing very low flow and loss of sulphate (21 mg/s) and copper (3 mg/s). Due to the small flows and the uncertainty caused by division of flow at Seep 15, these estimates are considered very approximate.

Overall the Upper Channel drains fine grained rock rather than exposed pit walls and includes the bench of rock to the west of the "slot" which is thought to be ore-grade material that was shot but not recovered for processing. The elevated loadings from this area are therefore expected.

In contrast, the Central and Lower Channels had lower flows (1.5 L/s), and sulphate (net gain 55 mg/s) and copper loadings (net gain 2.1 mg/s) despite having the worst chemistry in the pit area (Seep 9) albeit in a very small flow (0.05 L/s). The Lower Channel was shown as gaining flow (0.7 L/s) but losing both sulphate (17 mg/s) and copper (0.6 mg/s). The calculated loss is affected by the flow assigned to Seep 9. If the flow is reduced to 0.02 L/s, the loss disappears.

The load contributed by the "slot" was small. Sulphate load was 15 mg/s and copper was 0.2 mg/s. The copper load is affected by the increase in pH that occurs from reaction of the drainage with crushed limestone placed on the floor of the slot.

4.1.3 Pyrrhotite Creek Between Pit and East Dump Toe

Between Weir 3 and Weir 2, flow loss (0.6 L/s) and load loss (5 and 0.3 mg/s, sulphate and copper, respectively) were estimated. All of these apparent losses are within the range of uncertainty for the estimates and would include no loss of flow or load. No significant sources contribute to the creek along this reach and it is not expected that load increase detectably.

4.1.4 East Dump

Weir 1 and Seep 3 contribute a total of 0.3 L/s of flow, 152 mg/s sulphate and 3.3 mg/s copper. Seep 5 contributes a very small flow and therefore contributes little load. The sulphate concentration in this seep (336 mg/L) was elevated but copper concentrations were lower than the acidic seeps (1 mg/L) indicating the water had been partially neutralized.

Compared to the pit floor area, the loads from Weir and Seep 3 are lower though they represent 30% of the sulphate and 16% of copper load at Branch 126 in 4% of the flow due to the elevated concentration. These seeps are thought to originate by both leakage from the pit area ditches and infiltration through the cover (SRK 2000). Support for this conclusion is provided by the coincidence of peak flows in these seeps and the ditches (though with a pattern that suggests flow attenuation) and the presence of chloride concentrations in Weir 1 and Seep 3 (2.3 and 2.4 mg/L) which resemble Seep 9 (2.6 mg/L). BH89-7 has similar chloride concentrations (2.8 mg/L) and is on the flow path between Seep 9 and the East Dump sumps. Elsewhere in the site, chloride concentrations are well below 1 mg/L. The source of chloride in the vicinity of Seep 9 is unknown but it is unlikely to be natural in this geological setting.

These data may indicate that the East Dump seeps originate largely from the pit rather than infiltration through the till cover and that the elevated sulphate and copper concentrations in the East Dump seeps reflect interaction of this water with the oxidized waste rock beneath the cover. This indicates that addressing infiltration into the pit floor should have an effect on copper load seen at the toe of the East Dump.

4.1.5 Downstream of Site in Pyrrhotite Creek

The load at Branch 126 indicates that no additional copper is added downstream of the site. A loss of 0.9 mg/s was calculated which may or may not be real. The loss could reflect the increase in pH that occurs as 3 L/s of water is added from natural slopes upstream of Branch 126. A sulphate load increase of 65 mg/s was calculated which represents 13% of the total load at Branch 126. Given that flows are well-quantified by Weirs 1 and 2, and the Ministry of Environment monitoring station at Branch 126, this load increase may be real. The implied average concentration by the flow and load difference is 22 mg/L which is well above background sulphate concentrations in natural runoff. It is suspected that this loading reflects unaccounted East Dump seepage. At a sulphate concentration of 550 mg/L and load of 66 mg/s the unaccounted flow rate would be 0.1 L/s. This flow could originate from the toe west of Weir 1 where seeps were observed (for example, Seep 5).

4.1.6 Overall Loadings by Different Methods

The weir monitoring data and July 9, 2007 “snapshot” data were used to estimate the proportion of copper loads originating from different parts of the site. These were compared to the estimates calculated by SRK (2000) generated from climatological and flow data available at the time (Table 2). The weir monitoring data were based on flow information collected during the snow melt and are therefore considered to probably have under-estimated flows. Loads from the pit area are shown as >79% for this reason.

All three calculations confirmed the pit area is the main source of load (87%, >79%, 84%, SRK(2000), 2007 weir data, July 9 data respectively). Within the pit, the pit floor is the main source and specifically that part of the floor draining to the Upper Channel. In the July 2007 calculation, the Lower and Central Channels are shown as 0% due to the load loss in the channel, therefore this load appears in the East Dump seeps.

The East Dump seeps account for <10% to 16% of load. The weir data indicated that 10% of load indicated from background sources but specific monitoring data for these sources indicated that these waters carry very low copper concentrations and the contribution to copper load is negligible (<1%). The 10% estimate from the weirs reflected the uncertainties inherent in the flow data.

Table 2: Loading Contributions for Copper by Source Calculated Using Different Methods

Source	Average Annual SRK 2000	2007 Weir Monitoring	July 2007 Sampling
Total Pit Area		>79%	
Pit Highwall	16%		10%
Pit Floor	71%		
Upper Channel			74%
Lower and Central Channel			0
East Dump Seep (E Dump+Pit)	13%	<10%	16%
Background	1%	11%	<1%

Further confirmation that the pit area is the main source of the Cu load recorded at Branch 1200, an independent analysis was completed by comparing the Cu load leaving the site (Weirs 1 and 2) and the Cu load at Branch 1200.

Between April 19 and June 12, a total of 9 grab samples were taken at these weirs. However, on only 2 of these occasions were near-coincidental water quality samples taken at Branch 1200. Although the sampling frequency at Branch 1200 was much greater than at the weirs, the sampling dates rarely coincided.

To make a fair comparison of the data, SRK patched the Branch 1200 Cu conc. record by linear interpolation and then computed the 2-hourly loadings as shown on Figure 4. This allowed all observed combined loading at Weirs 1 & 2 to be compared with coincidental loading estimates at Branch 1200. Figure 4 demonstrates that the combined loadings at the two weirs represent virtually all the Cu loading observed at Branch 1200.

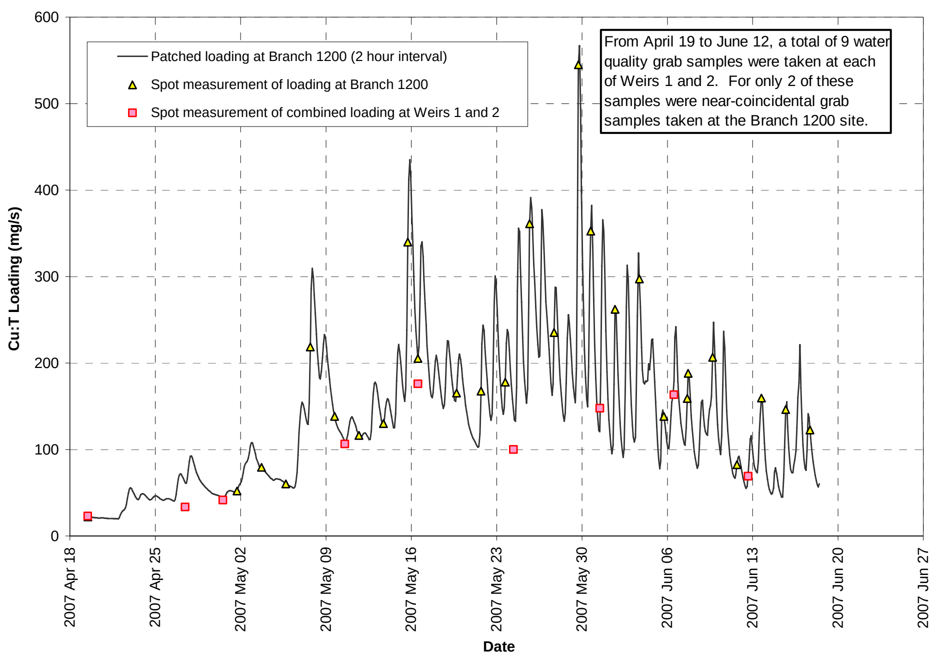


Figure 4: Comparison of Load at Branch 1200 with Combined Load at Weirs 1 and 2

4.2 Infiltration Design Criterion for Cover

As described in Section 1, a load reduction of 90% is needed to meet the water quality objective for copper in the Tsolum River. Remediation planning has been predicated on the assumption that this loading reduction can be achieved by also reducing the water contacting the oxidize rock by at least 90%. As loading (L) is the product of flow (Q) and copper concentration ([Cu]):

L = Q.[Cu]

the assumption is that if Q decreases by 90% and L also decreases by 90% then [Cu] is constant. Whether [Cu] remains constant when a cover is applied will depend on the solubility of minerals formed during oxidation of the rock. Copper originates by oxidation of chalcopyrite:

$$CuFeS_2 + 4O_2 + 7H_2O \rightarrow FeSO_4 + CuSO_4$$

Iron (ferrous) sulphate in turn oxidizes to form iron hydroxide and acidity:

$$FeSO_4 + \tfrac{1}{4}O_2 + \tfrac{5}{2}H_2O \rightarrow Fe(OH)_3 + SO_4^{\ 2-} + 2H^+$$

Most iron at the site originates by oxidation of pyrite to produce ferrous sulphate which likewise produces ferric hydroxide when it oxidizes.

Iron hydroxide has relatively low solubility and precipitates resulting in the overall “rusty” appearance of the site. Its solubility is controlled by pH and provides a reasonable explanation for the distribution of iron in surface waters at the site (Figure 5). Copper sulphate in contrast is highly soluble and will dissolve to produce copper and sulphate in solution. Copper concentrations at the site are weakly correlated with pH but are well below the solubility of copper minerals except under near pH neutral conditions where copper concentrations are near the solubility of malachite (copper carbonate) and tenorite (copper oxide). It is more likely that under acidic conditions in the pit area copper is co-precipitating with iron hydroxide and copper release is controlled by the solubility of ferric hydroxide, in which case predicting the pH conditions beneath the cover will be important.

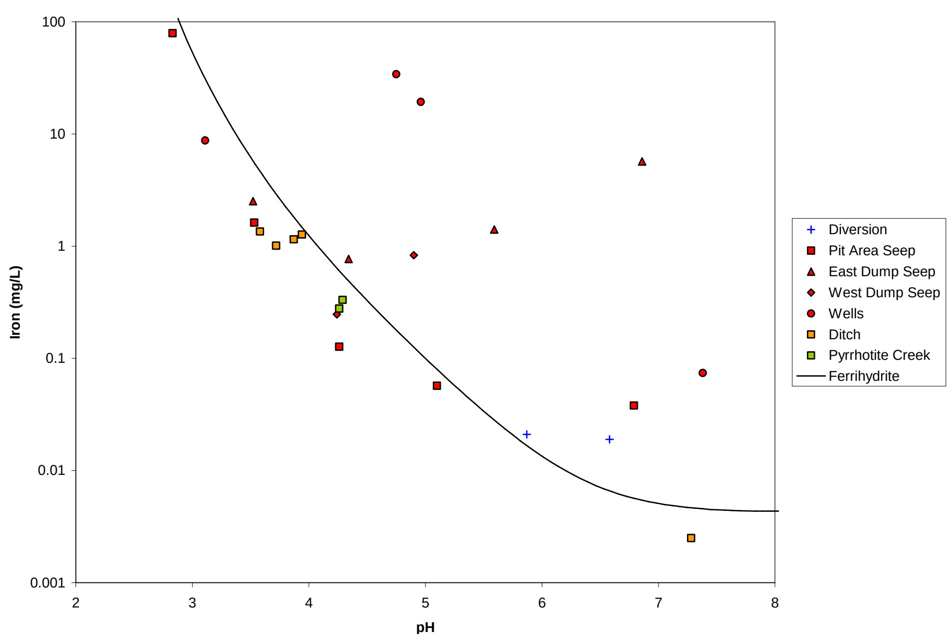


Figure 5: Iron Concentrations as a Function of pH Compared to the Ideal Solubility of Ferrihydrite

To evaluate the pH effect of an order of magnitude decrease in the contact of water with the oxidized waste rock, dissolution and oxidation of ferrous sulphate to ferric hydroxide modelled for water to rock ratios. As expected, pH decreases as the water to rock ratio decreases (Figure 6) but an order of magnitude change in water to rock ratio results in roughly 0.2 to 0.3 decrease in pH corresponding to less than order of magnitude increase in hydrogen ions. This shift in pH results in roughly a 100% increase in iron concentrations in solution (Figure 5). Assuming that copper is also released by the same process, copper concentrations would also increase by roughly 100%.

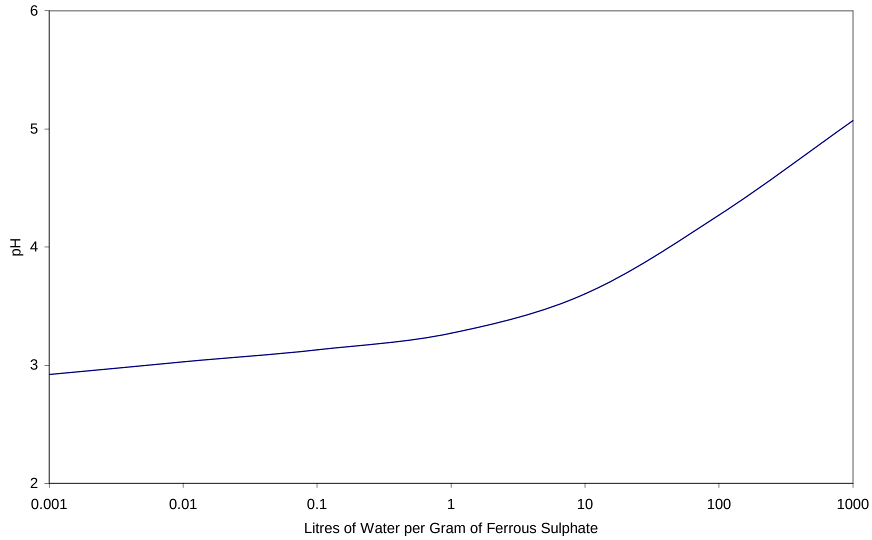


Figure 6: Effect of Water to Rock Ratio on pH For Dissolution and Oxidation of Ferrous Sulphate to Ferric Hydroxide

Based on the requirement for a y reduction load (where y = 90%) and the calculation of about 100% increase in copper concentration in water with an order of magnitude flow reduction, the actual flow reduction needed can be estimated from the current condition:

$$L = Q_1.[Cu]$$

and the target condition:

$$L(1-y) = Q_2.x[Cu]$$

where x is the factor for the increase in copper concentrations beneath the cover (x≈2), the required flow reduction is:

$$\frac{Q_2}{Q_1} = \frac{(1-y)}{x}$$

or a flow reduction of about 95% to achieve the load reduction of 90% with x=2. Based on this requirement for a large flow reduction, the decision was made to use a geosynthetic cover rather than an engineered soil cover. This type of cover not only exceeds the required flow reduction, but also limits actual water contact to rock below imperfections in the cover rather than simply reducing flow in contact with all rock below the cover.

5 Conclusions

The following is concluded from specific work conducted in 2007:

- Copper loads originate mainly from the pit floor and more specifically in the eastern part of the pit including the bench of highly fractured on the eastern edge of the pit.
- Distribution of loads shown by weir monitoring and pit area sampling in 2007 were consistent with load distribution calculated in 2000.
- Anomalous chloride concentrations in one area of the pit and in the seepage from the East Dump suggest that copper load emerging from the toe of the East Dump is largely a result of leaching of the dump by water originating in the pit rather than infiltration through the soil cover on the dump.
- Reduction of water contact with the pit floor is not expected to result in a directly proportional decrease in loads because copper concentrations in water beneath a cover will increase due to a predicted decrease in pH. A 90% reduction in load will require roughly a 95% reduction in flow.

List of Attachments

Attachment 1 Weir Monitoring Results

Attachment 2 July 9, 2007 Water Sampling Locations

Attachment 3.1 July 9, 2007 Water Chemistry Data – Laboratory Report

Attachment 3.2 July 9, 2007 Water Chemistry Data – Compiled Data

Attachment 4 July 9, 2007 Summary of Water Chemistry Data

Attachment 5 July 9, 2007 Loading Interpretation

Attachment 1
Weir Monitoring Results

Weir 1

EMS ID	REQUISITION ID	START DATE	YEAR	MONTH	DAY	TIME	pH (pH units)	Acidity pH 4.5 (mg/L)	Acidity pH 8.3 (mg/L)	Sulfate: Dissolved (mg/L)	Sulfate: Total (mg/L)	Cu-D (mg/L)	Fe-D (mg/L)	Fe-D (mg/L)	Fe-T (mg/L)	Al-D (mg/L)	Al-T (mg/L)
E233324	50136081	4/19/2007 12:00	2007	04	19	12:00 PM	3.5	61.2	229	776		15.1	15.2	2.8	3.17	34.2	34.5
E233324	50135582	4/27/2007 12:30	2007	04	27	12:30 PM	3.3			729			14.9		8.39		35.7
E233324	50135583	4/30/2007 12:45	2007	04	30	12:45 PM	3.3	83.3	255	695		15.1	13.4	7.74		33.7	29.9
E233324	50135584	5/10/2007 13:30	2007	05	10	1:30 PM	3.3			639			17.3		7.41		29.9
E233324	50136494	5/16/2007 12:35	2007	05	16	12:35 PM	3.2	115	269	610		18.4	18.9	8.87	9.44	26.5	27.5
E233324	50135585	5/24/2007 11:15	2007	05	24	11:15 AM	3.3			546			15.1		7.15		23.4
E233324	50135586	5/31/2007 11:40	2007	05	31	11:40 AM	3.3	71	211	420		12.3	12.9	6.4	6.45	16.8	16.9
E233324	50135587	6/6/2007 15:20	2007	06	06	3:20 PM	3.3			376			10.4		4.8		14.2
E233324	50135580	6/12/2007 14:35	2007	06	12	2:35 PM	3.4	57.7	216	457		10.5	10.2	3.65	3.67	16.9	16.5
E233324	50139368	7/5/2007 13:00	2007	07	05	1:00 PM	3.5	54.2	161	434		9.58	9.82	2.32	2.64	18.5	19.1

Weir 2

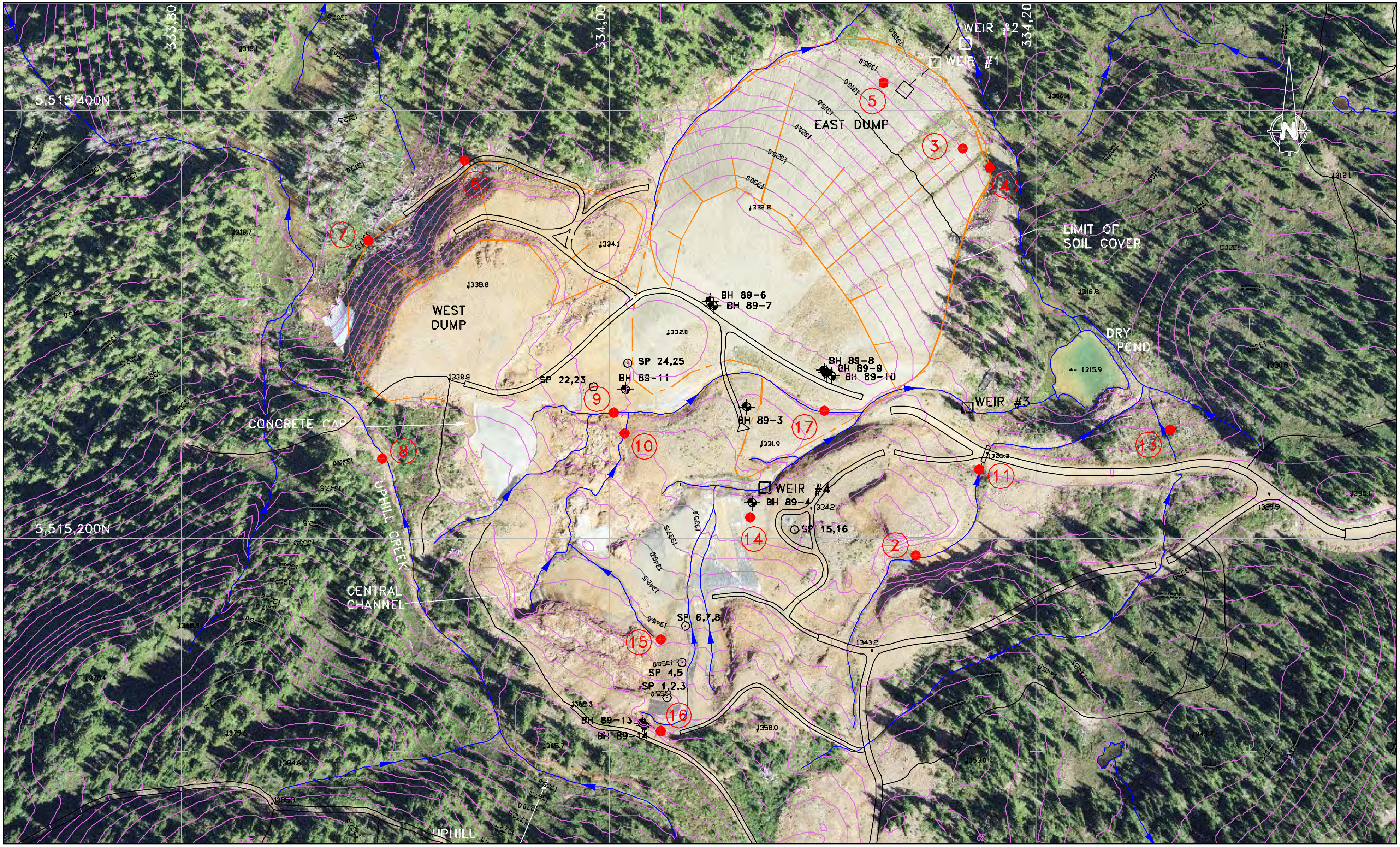
EMS ID	REQUISITION ID	START DATE	YEAR	MONTH	DAY	TIME	pH (pH units)	Acidity pH 4.5 (mg/L)	Acidity pH 8.3 (mg/L)	Sulfate: Dissolved (mg/L)	Sulfate: Total (mg/L)	Cu-D (mg/L)	Cu-T (mg/L)	Fe-D (mg/L)	Fe-T (mg/L)	Al-D (mg/L)	Al-T (mg/L)
E233325	50136082	4/19/2007 12:15	2007	04	19	12:15 PM	4.1	5.7	57.2	189		8.26	7.94	0.072	0.713	7.3	7.29
E233325	50135588	4/27/2007 12:20	2007	04	27	12:20 PM	4.1			97.8			5.4		0.913		4.72
E233325	50135589	4/30/2007 12:46	2007	04	30	12:46 PM	4	6.8	52.8	133		7.09	7.19	0.845	1.08	6.54	6.73
E233325	50135590	5/10/2007 13:25	2007	05	10	1:25 PM	3.9			121			7.3		1.44		5.44
E233325	50136495	5/16/2007 12:40	2007	05	16	12:40 PM	3.9	5.7	52.8	96		6.61	6.78	0.267	0.82	3.88	4.03
E233325	50135591	5/24/2007 11:20	2007	05	24	11:20 AM	3.9			89.1			5.94		1.32		3.68
E233325	50135592	5/31/2007 11:45	2007	05	31	11:45 AM	4	1.6	44.3	71.4		4.34	4.7	0.29	0.679	2.44	2.55
E233325	50135593	6/6/2007 15:20	2007	06	06	3:20 PM	4.2			41.6			2.57		0.973		1.42
E233325	50135594	6/12/2007 14:40	2007	06	12	2:40 PM	4.4			63.1			3.78		0.803		2.17
E233325	50135594	6/12/2007 14:40	2007	06	12	2:40 PM							3.57				2.07
E233325	50135595	6/27/2007 14:20	2007	06	27	2:20 PM	4.7	0.5	13.6	28.1		2.1		0.113		1.02	
E233325	50139369	7/5/2007 13:05	2007	07	05	1:05 PM	4.1	3.6	23.5	51.4		3.42	3.39	0.275	0.311	1.8	1.78

Weir 3

EMS ID	REQUISITION ID	DATE	YEAR	MONTH	DAY	TIME	pH (pH units)	Acidity pH 4.5 (mg/L)	Acidity pH 8.3 (mg/L)	Sulfate: Dissolved (mg/L)	Sulfate: Total (mg/L)	Cu-D (mg/L)	Cu-T (mg/L)	Fe-D (mg/L)	Fe-T (mg/L)	Al-D (mg/L)	Al-T (mg/L)
E234264	50136083	4/19/2007 14:00	2007	04	19	2:00 PM	3.4	34.6	112	257		16.2	15.5	0.531	4.98	9.62	9.42
E234264	50135596	4/27/2007 12:15	2007	04	27	12:15 PM	3.4			156			11.8		6.48		7.11
E234264	50135597	4/30/2007 12:50	2007	04	30	12:50 PM	3.3	36.9	104	192		15.4	15.2	5.5	6.54	9.18	9.25
E234264	50135598	5/10/2007 13:40	2007	05	10	1:40 PM	3.4			165			14.8		6.45		7.21
E234264	50136496	5/16/2007 12:15	2007	05	16	12:15 PM	3.4	45.4	137	128			14.2		2.82		6.31
E234264	50136496	5/16/2007 12:15	2007	05	16	12:15 PM							13.1				6.14
E234264	50135599	5/24/2007 11:25	2007	05	24	11:25 AM	3.5			102			12		5.26		5.34
E234264	50135600	5/31/2007 11:35	2007	05	31	11:35 AM	3.6	24.7	78.9	91.6		8.1	8.93	1.53	2.14	3.63	3.85
E234264	50135601	6/6/2007 15:15	2007	06	06	3:15 PM	3.7			55.8			5.27		2.47		2.44
E234264	50135602	6/12/2007 14:30	2007	06	12	2:30 PM	3.6			81.4			6.78		2.86		3.07
E234264	50139370	7/5/2007 13:15	2007	07	05	1:15 PM	3.7	15.1	40.2	61.1		5.07	5.2	0.694	1.15	2.29	2.29

Attachment 2
Seep Sampling Locations
July 9, 2007

J:\01_SITES\MtWashington\ACAD\Remediation Final Design\1CT001001-700-12.dwg



LEGEND

WEIR #2	V-NOTCH WEIR
	SEEP SAMPLE
	MONITORING WELL
	STANDPIPE PIEZOMTER

0 20 40 60 80 100

Scale in Metres

SRK Consulting
Engineers and Scientists
Vancouver B.C.

SRK JOB NO.: 1CT001.001-700

FILE NAME: 1CT001001-700-12.dwg

Tsolum River Partnership

Mt. Washington Remediation

Detailed Design

Seep Sampling Locations
July 9, 2007

DATE: Nov. 07

APPROVED: PMH

FIGURE: Attachment 2

Attachment 3.1
Water Chemistry Data – Laboratory Report
July 9, 2007

Pacific Environmental Science Centre

2645 Dollarton Highway
North Vancouver, BC. Canada V7H - 1B1
Phone (604) 924-2500 Fax (604) 924-2555

Environment Canada Environnement Canada

Friday October 12, 2007 At 2:52PM

Final Analytical Results with QC data

PESC FOLDER # : 200700768

Location:	MT WASHINGTON
Type of Sample:	Fresh Water/General (FWGE)
Submitted By:	Stephen Day Oceanic Plaza 22nd Floor 1066 West Hastings Street Vancouver, BC Canada V6E 3X2 Phone: 604 681 4196 Fax: 604 687 5532 Rob.McCandless@ec.gc.ca
Logged In:	Tuesday July 10, 2007
Completed:	Friday October 12, 2007 (4306 results)
Client Code:	2518-901 2518-901 EP PAB INDUSTRIAL PRG
Sample Priority:	Normal

Authorized by: ______________________________

Richard Strub
QA Officer

Notes:

METALS BOTTLES NOT PRESERVED. - JULY 10, 2007 NBB
Some samples may have elevated Fe and Cu and Low pH - July 10, 2007 NBB
500ML PLASTIC BOTTLE RECEIVED FOR GENERAL INORGANICS TESTING.

TEST DESCRIPTION	MATRIX	RESULT	MDL	UNITS

Order No: 159261 - BR 1200 **Arrival Temperature: 14°C**

Start Date: 7/9/2007 12:00:00AM

General

TEST DESCRIPTION	MATRIX	RESULT	MDL	UNITS
***Acidity total&pH4.5**				
Acidity to pH 4.5	FWGE	2	1	mg CaCO3 / L
Acidity, Total	FWGE	21	1	mg CaCO3 / L
***AlkalinityTot-pH4.5**				
Alkalinity to pH 4.5	FWGE	< 0.5	0.5	mg CaCO3 / L
***ICA (Cl F SO4)**				
Chloride (Cl)	FWGE	< 0.1	0.1	mg/L
Fluoride (F)	FWGE	< 0.01	0.01	mg/L
Sulphate (SO4)	FWGE	64	3	mg/L
***ICA (NO2 NO3 Br)**				
Bromide (Br)	FWGE	< 0.05	0.05	mg/L
Nitrogen, Nitrate as N	FWGE	0.016	0.002	mg/L
Nitrogen, Nitrite as N	FWGE	< 0.005	0.005	mg/L
***pH**				
pH	FWGE	4.26	0.01	pH Units
***Residue: Filterable**				
Solids, Total Dissolved (FR)	FWGE	139	10	mg/L
***SpecificConductance**				
Conductivity	FWGE	161	2	uS/cm

Metals

TEST DESCRIPTION	MATRIX	RESULT	MDL	UNITS
***ICP Dissolved**				
Aluminum (Al)	FWGE	2.43	0.05	mg/L
Antimony (Sb)	FWGE	< 0.05	0.05	mg/L
Arsenic (As)	FWGE	< 0.05	0.05	mg/L
Barium (Ba)	FWGE	0.004	0.001	mg/L
Berylium (Be)	FWGE	< 0.001	0.001	mg/L
Boron (B)	FWGE	< 0.01	0.01	mg/L
Cadmium (Cd)	FWGE	< 0.005	0.005	mg/L
Calcium (Ca)	FWGE	16.3	0.1	mg/L
Chromium (Cr)	FWGE	< 0.005	0.005	mg/L
Cobalt (Co)	FWGE	0.025	0.005	mg/L
Copper (Cu)	FWGE	2.58	0.005	mg/L
Iron (Fe)	FWGE	0.278	0.005	mg/L
Lead (Pb)	FWGE	< 0.05	0.05	mg/L
Magnesium (Mg)	FWGE	2.4	0.1	mg/L
Manganese (Mn)	FWGE	0.38	0.001	mg/L
Molybdenum (Mo)	FWGE	< 0.01	0.01	mg/L
Nickel (Ni)	FWGE	< 0.02	0.02	mg/L
Phosphorus (P)	FWGE	< 0.1	0.1	mg/L
Potassium (K)	FWGE	0.5	0.1	mg/L
Selenium (Se)	FWGE	< 0.05	0.05	mg/L

TEST DESCRIPTION	MATRIX	RESULT	MDL	UNITS
Silicon (Si)	FWGE	3.25	0.05	mg/L
Silver (Ag)	FWGE	< 0.01	0.01	mg/L
Sodium (Na)	FWGE	0.6	0.1	mg/L
Strontium (Sr)	FWGE	0.032	0.001	mg/L
Sulfur (S)	FWGE	21.9	0.05	mg/L
Tin (Sn)	FWGE	< 0.05	0.05	mg/L
Titanium (Ti)	FWGE	< 0.002	0.002	mg/L
Vanadium (V)	FWGE	< 0.01	0.01	mg/L
Zinc (Zn)	FWGE	0.091	0.002	mg/L
***ICP Total**				
Aluminum (Al)	FWGE	2.36	0.06	mg/L
Antimony (Sb)	FWGE	< 0.06	0.06	mg/L
Arsenic (As)	FWGE	< 0.06	0.06	mg/L
Barium (Ba)	FWGE	0.004	0.001	mg/L
Berylium (Be)	FWGE	< 0.001	0.001	mg/L
Boron (B)	FWGE	< 0.01	0.01	mg/L
Cadmium (Cd)	FWGE	< 0.006	0.006	mg/L
Calcium (Ca)	FWGE	16.0	0.1	mg/L
Chromium (Cr)	FWGE	< 0.006	0.006	mg/L
Cobalt (Co)	FWGE	0.024	0.006	mg/L
Copper (Cu)	FWGE	2.66	0.02	mg/L
Iron (Fe)	FWGE	0.35	0.05	mg/L
Lead (Pb)	FWGE	< 0.06	0.06	mg/L
Magnesium (Mg)	FWGE	2.2	0.1	mg/L
Manganese (Mn)	FWGE	0.375	0.001	mg/L
Molybdenum (Mo)	FWGE	< 0.01	0.01	mg/L
Nickel (Ni)	FWGE	< 0.02	0.02	mg/L
Phosphorus (P)	FWGE	< 0.1	0.1	mg/L
Potassium (K)	FWGE	0.5	0.1	mg/L
Selenium (Se)	FWGE	< 0.06	0.06	mg/L
Silicon (Si)	FWGE	3.25	0.06	mg/L
Silver (Ag)	FWGE	< 0.01	0.01	mg/L
Sodium (Na)	FWGE	0.6	0.1	mg/L
Strontium (Sr)	FWGE	0.031	0.001	mg/L
Sulfur (S)	FWGE	21.6	0.06	mg/L
Tin (Sn)	FWGE	< 0.06	0.06	mg/L
Titanium (Ti)	FWGE	0.003	0.002	mg/L
Vanadium (V)	FWGE	< 0.01	0.01	mg/L
Zinc (Zn)	FWGE	0.085	0.002	mg/L
***ICPMS Dissolved.**				
Aluminum (Al)	FWGE	2430	0.2	ug/L
Antimony (Sb)	FWGE	0.047	0.005	ug/L
Arsenic (As)	FWGE	0.6	0.1	ug/L
Barium (Ba)	FWGE	3.31	0.02	ug/L
Berylium (Be)	FWGE	0.080	0.002	ug/L
Bismuth (Bi)	FWGE	< 0.02	0.02	ug/L
Cadmium (Cd)	FWGE	0.49	0.01	ug/L
Chromium (Cr)	FWGE	< 0.2	0.2	ug/L
Cobalt (Co)	FWGE	24.8	0.005	ug/L
Copper (Cu)	FWGE	2580	0.05	ug/L
Lead (Pb)	FWGE	0.09	0.01	ug/L
Lithium (Li)	FWGE	1.37	0.05	ug/L

TEST DESCRIPTION	MATRIX	RESULT	MDL	UNITS
Manganese (Mn)	FWGE	361	0.005	ug/L
Molybdenum (Mo)	FWGE	< 0.05	0.05	ug/L
Nickel (Ni)	FWGE	15.7	0.05	ug/L
Selenium (Se)	FWGE	< 0.2	0.2	ug/L
Silver (Ag)	FWGE	< 0.02	0.02	ug/L
Strontium (Sr)	FWGE	30.6	0.005	ug/L
Thallium (Tl)	FWGE	0.037	0.002	ug/L
Tin (Sn)	FWGE	< 0.01	0.01	ug/L
Uranium (U)	FWGE	0.037	0.002	ug/L
Vanadium (V)	FWGE	< 0.05	0.05	ug/L
Zinc (Zn)	FWGE	72.4	0.1	ug/L
***ICPMS Total.**				
Aluminum (Al)	FWGE	2360	0.2	ug/L
Antimony (Sb)	FWGE	0.046	0.005	ug/L
Arsenic (As)	FWGE	0.6	0.1	ug/L
Barium (Ba)	FWGE	3.44	0.02	ug/L
Berylium (Be)	FWGE	0.067	0.002	ug/L
Bismuth (Bi)	FWGE	< 0.02	0.02	ug/L
Cadmium (Cd)	FWGE	0.42	0.01	ug/L
Chromium (Cr)	FWGE	0.2	0.2	ug/L
Cobalt (Co)	FWGE	21.9	0.005	ug/L
Copper (Cu)	FWGE	2660	0.05	ug/L
Lead (Pb)	FWGE	0.14	0.01	ug/L
Lithium (Li)	FWGE	1.69	0.05	ug/L
Manganese (Mn)	FWGE	375	0.005	ug/L
Molybdenum (Mo)	FWGE	0.06	0.05	ug/L
Nickel (Ni)	FWGE	14.2	0.05	ug/L
Selenium (Se)	FWGE	0.3	0.2	ug/L
Silver (Ag)	FWGE	0.07	0.02	ug/L
Strontium (Sr)	FWGE	29.7	0.005	ug/L
Thallium (Tl)	FWGE	0.021	0.002	ug/L
Tin (Sn)	FWGE	0.85	0.01	ug/L
Uranium (U)	FWGE	0.037	0.002	ug/L
Vanadium (V)	FWGE	0.05	0.05	ug/L
Zinc (Zn)	FWGE	52.5	0.1	ug/L

Order No: 159262 - BH-89-3
Start Date: 7/9/2007 12:00:00AM

General

***Acidity total&pH4.5**				
Acidity to pH 4.5	FWGE	< 1	1	mg CaCO3 / L
Acidity, Total	FWGE	32	1	mg CaCO3 / L
***AlkalinityTot-pH4.5**				
Alkalinity to pH 4.5	FWGE	< 0.5	0.5	mg CaCO3 / L
Alkalinity, Total	FWGE	< 0.5	0.5	mg CaCO3 / L
***ICA (Cl F SO4)**				

TEST DESCRIPTION	MATRIX	RESULT	MDL	UNITS
Chloride (Cl)	FWGE	0.3	0.1	mg/L
Fluoride (F)	FWGE	0.08	0.01	mg/L
Sulphate (SO4)	FWGE	210	5	mg/L
***ICA (NO2 NO3 Br)**				
Bromide (Br)	FWGE	< 0.05	0.05	mg/L
Nitrogen, Nitrate as N	FWGE	0.028	0.002	mg/L
Nitrogen, Nitrite as N	FWGE	< 0.005	0.005	mg/L
***pH**				
pH	FWGE	4.96	0.01	pH Units
***Residue: Filterable**				
Solids, Total Dissolved (FR)	FWGE	290	10	mg/L
***SpecificConductance**				
Conductivity	FWGE	422	2	uS/cm
Metals				
***ICP Dissolved**				
Aluminum (Al)	FWGE	0.08	0.05	mg/L
Antimony (Sb)	FWGE	< 0.05	0.05	mg/L
Arsenic (As)	FWGE	< 0.05	0.05	mg/L
Barium (Ba)	FWGE	0.004	0.001	mg/L
Berylium (Be)	FWGE	< 0.001	0.001	mg/L
Boron (B)	FWGE	< 0.01	0.01	mg/L
Cadmium (Cd)	FWGE	< 0.005	0.005	mg/L
Calcium (Ca)	FWGE	52.1	0.1	mg/L
Chromium (Cr)	FWGE	< 0.005	0.005	mg/L
Cobalt (Co)	FWGE	0.048	0.005	mg/L
Copper (Cu)	FWGE	0.156	0.005	mg/L
Iron (Fe)	FWGE	19.3	0.005	mg/L
Lead (Pb)	FWGE	< 0.05	0.05	mg/L
Magnesium (Mg)	FWGE	6.1	0.1	mg/L
Manganese (Mn)	FWGE	1.65	0.001	mg/L
Molybdenum (Mo)	FWGE	< 0.01	0.01	mg/L
Nickel (Ni)	FWGE	0.04	0.02	mg/L
Phosphorus (P)	FWGE	< 0.1	0.1	mg/L
Potassium (K)	FWGE	1.2	0.1	mg/L
Selenium (Se)	FWGE	< 0.05	0.05	mg/L
Silicon (Si)	FWGE	9.31	0.05	mg/L
Silver (Ag)	FWGE	< 0.01	0.01	mg/L
Sodium (Na)	FWGE	2.1	0.1	mg/L
Strontium (Sr)	FWGE	0.084	0.001	mg/L
Sulfur (S)	FWGE	61.3	0.05	mg/L
Tin (Sn)	FWGE	< 0.05	0.05	mg/L
Titanium (Ti)	FWGE	< 0.002	0.002	mg/L
Vanadium (V)	FWGE	< 0.01	0.01	mg/L
Zinc (Zn)	FWGE	0.205	0.002	mg/L
***ICP Total**				
Aluminum (Al)	FWGE	16	0.06	mg/L
Antimony (Sb)	FWGE	< 0.06	0.06	mg/L
Arsenic (As)	FWGE	0.45	0.06	mg/L
Barium (Ba)	FWGE	0.046	0.001	mg/L
Berylium (Be)	FWGE	< 0.001	0.001	mg/L

TEST DESCRIPTION	MATRIX	RESULT	MDL	UNITS
Boron (B)	FWGE	< 0.01	0.01	mg/L
Cadmium (Cd)	FWGE	< 0.006	0.006	mg/L
Calcium (Ca)	FWGE	52.9	0.1	mg/L
Chromium (Cr)	FWGE	0.026	0.006	mg/L
Cobalt (Co)	FWGE	0.058	0.006	mg/L
Copper (Cu)	FWGE	1.64	0.02	mg/L
Iron (Fe)	FWGE	36.4	0.05	mg/L
Lead (Pb)	FWGE	< 0.06	0.06	mg/L
Magnesium (Mg)	FWGE	9.2	0.1	mg/L
Manganese (Mn)	FWGE	1.77	0.001	mg/L
Molybdenum (Mo)	FWGE	< 0.01	0.01	mg/L
Nickel (Ni)	FWGE	0.05	0.02	mg/L
Phosphorus (P)	FWGE	< 0.1	0.1	mg/L
Potassium (K)	FWGE	2.8	0.1	mg/L
Selenium (Se)	FWGE	< 0.06	0.06	mg/L
Silicon (Si)	FWGE	34.9	0.06	mg/L
Silver (Ag)	FWGE	< 0.01	0.01	mg/L
Sodium (Na)	FWGE	3.6	0.1	mg/L
Strontium (Sr)	FWGE	0.114	0.001	mg/L
Sulfur (S)	FWGE	63.4	0.06	mg/L
Tin (Sn)	FWGE	< 0.06	0.06	mg/L
Titanium (Ti)	FWGE	0.792	0.002	mg/L
Vanadium (V)	FWGE	0.04	0.01	mg/L
Zinc (Zn)	FWGE	0.301	0.002	mg/L
***ICPMS Dissolved.**				
Aluminum (Al)	FWGE	75.4	0.2	ug/L
Antimony (Sb)	FWGE	0.159	0.005	ug/L
Arsenic (As)	FWGE	12.5	0.1	ug/L
Barium (Ba)	FWGE	3.64	0.02	ug/L
Berylium (Be)	FWGE	0.029	0.002	ug/L
Bismuth (Bi)	FWGE	< 0.02	0.02	ug/L
Cadmium (Cd)	FWGE	0.16	0.01	ug/L
Chromium (Cr)	FWGE	< 0.2	0.2	ug/L
Cobalt (Co)	FWGE	47.6	0.005	ug/L
Copper (Cu)	FWGE	135	0.05	ug/L
Lead (Pb)	FWGE	0.58	0.01	ug/L
Lithium (Li)	FWGE	2.76	0.05	ug/L
Manganese (Mn)	FWGE	1650	0.005	ug/L
Molybdenum (Mo)	FWGE	0.05	0.05	ug/L
Nickel (Ni)	FWGE	35	0.05	ug/L
Selenium (Se)	FWGE	< 0.2	0.2	ug/L
Silver (Ag)	FWGE	< 0.02	0.02	ug/L
Strontium (Sr)	FWGE	87.7	0.005	ug/L
Thallium (Tl)	FWGE	0.031	0.002	ug/L
Tin (Sn)	FWGE	< 0.01	0.01	ug/L
Uranium (U)	FWGE	0.003	0.002	ug/L
Vanadium (V)	FWGE	< 0.05	0.05	ug/L
Zinc (Zn)	FWGE	157	0.1	ug/L
***ICPMS Total.**				
Aluminum (Al)	FWGE	16000	0.2	ug/L
Antimony (Sb)	FWGE	4.72	0.005	ug/L
Arsenic (As)	FWGE	450	0.1	ug/L

TEST DESCRIPTION	MATRIX	RESULT	MDL	UNITS
Barium (Ba)	FWGE	33	0.02	ug/L
Berylium (Be)	FWGE	0.147	0.002	ug/L
Bismuth (Bi)	FWGE	0.40	0.02	ug/L
Cadmium (Cd)	FWGE	0.25	0.01	ug/L
Chromium (Cr)	FWGE	16.1	0.2	ug/L
Cobalt (Co)	FWGE	40.4	0.005	ug/L
Copper (Cu)	FWGE	1640	0.05	ug/L
Lead (Pb)	FWGE	24.5	0.01	ug/L
Lithium (Li)	FWGE	7.91	0.05	ug/L
Manganese (Mn)	FWGE	1770	0.005	ug/L
Molybdenum (Mo)	FWGE	1.54	0.05	ug/L
Nickel (Ni)	FWGE	36.4	0.05	ug/L
Selenium (Se)	FWGE	0.4	0.2	ug/L
Silver (Ag)	FWGE	1.16	0.02	ug/L
Strontium (Sr)	FWGE	119	0.005	ug/L
Thallium (Tl)	FWGE	0.049	0.002	ug/L
Tin (Sn)	FWGE	0.66	0.01	ug/L
Uranium (U)	FWGE	0.164	0.002	ug/L
Vanadium (V)	FWGE	28.2	0.05	ug/L
Zinc (Zn)	FWGE	199	0.1	ug/L

Order No: 159263 - WEIR 4
Start Date: 7/9/2007 12:00:00AM

General

TEST DESCRIPTION	MATRIX	RESULT	MDL	UNITS
***Acidity total&pH4.5**				
Acidity to pH 4.5	FWGE	15	1	mg CaCO3 / L
Acidity, Total	FWGE	50	1	mg CaCO3 / L
***AlkalinityTot-pH4.5**				
Alkalinity to pH 4.5	FWGE	< 0.5	0.5	mg CaCO3 / L
***ICA (Cl F SO4)**				
Chloride (Cl)	FWGE	0.3	0.1	mg/L
Fluoride (F)	FWGE	0.09	0.01	mg/L
Sulphate (SO4)	FWGE	155	5	mg/L
***ICA (NO2 NO3 Br)**				
Bromide (Br)	FWGE	< 0.05	0.05	mg/L
Nitrogen, Nitrate as N	FWGE	0.020	0.002	mg/L
Nitrogen, Nitrite as N	FWGE	0.006	0.005	mg/L
***pH**				
pH	FWGE	3.58	0.01	pH Units
***Residue: Filterable**				
Solids, Total Dissolved (FR)	FWGE	226	10	mg/L
***SpecificConductance**				
Conductivity	FWGE	287	2	uS/cm

Metals

***ICP Dissolved**

TEST DESCRIPTION	MATRIX	RESULT	MDL	UNITS
Aluminum (Al)	FWGE	3.67	0.05	mg/L
Antimony (Sb)	FWGE	< 0.05	0.05	mg/L
Arsenic (As)	FWGE	< 0.05	0.05	mg/L
Barium (Ba)	FWGE	0.002	0.001	mg/L
Berylium (Be)	FWGE	< 0.001	0.001	mg/L
Boron (B)	FWGE	0.01	0.01	mg/L
Cadmium (Cd)	FWGE	< 0.005	0.005	mg/L
Calcium (Ca)	FWGE	15.5	0.1	mg/L
Chromium (Cr)	FWGE	< 0.005	0.005	mg/L
Cobalt (Co)	FWGE	0.040	0.005	mg/L
Copper (Cu)	FWGE	8.2	0.005	mg/L
Iron (Fe)	FWGE	1.35	0.005	mg/L
Lead (Pb)	FWGE	< 0.05	0.05	mg/L
Magnesium (Mg)	FWGE	3.8	0.1	mg/L
Manganese (Mn)	FWGE	0.423	0.001	mg/L
Molybdenum (Mo)	FWGE	< 0.01	0.01	mg/L
Nickel (Ni)	FWGE	0.02	0.02	mg/L
Phosphorus (P)	FWGE	< 0.1	0.1	mg/L
Potassium (K)	FWGE	0.8	0.1	mg/L
Selenium (Se)	FWGE	< 0.05	0.05	mg/L
Silicon (Si)	FWGE	6.09	0.05	mg/L
Silver (Ag)	FWGE	< 0.01	0.01	mg/L
Sodium (Na)	FWGE	0.8	0.1	mg/L
Strontium (Sr)	FWGE	0.029	0.001	mg/L
Sulfur (S)	FWGE	34.1	0.05	mg/L
Tin (Sn)	FWGE	< 0.05	0.05	mg/L
Titanium (Ti)	FWGE	< 0.002	0.002	mg/L
Vanadium (V)	FWGE	< 0.01	0.01	mg/L
Zinc (Zn)	FWGE	0.127	0.002	mg/L
***ICP Total**				
Aluminum (Al)	FWGE	3.6	0.06	mg/L
Antimony (Sb)	FWGE	< 0.06	0.06	mg/L
Arsenic (As)	FWGE	< 0.06	0.06	mg/L
Barium (Ba)	FWGE	0.001	0.001	mg/L
Berylium (Be)	FWGE	< 0.001	0.001	mg/L
Boron (B)	FWGE	< 0.01	0.01	mg/L
Cadmium (Cd)	FWGE	< 0.006	0.006	mg/L
Calcium (Ca)	FWGE	15.7	0.1	mg/L
Chromium (Cr)	FWGE	< 0.006	0.006	mg/L
Cobalt (Co)	FWGE	0.039	0.006	mg/L
Copper (Cu)	FWGE	8.31	0.02	mg/L
Iron (Fe)	FWGE	1.29	0.05	mg/L
Lead (Pb)	FWGE	< 0.06	0.06	mg/L
Magnesium (Mg)	FWGE	3.5	0.1	mg/L
Manganese (Mn)	FWGE	0.448	0.001	mg/L
Molybdenum (Mo)	FWGE	< 0.01	0.01	mg/L
Nickel (Ni)	FWGE	0.02	0.02	mg/L
Phosphorus (P)	FWGE	< 0.1	0.1	mg/L
Potassium (K)	FWGE	0.6	0.1	mg/L
Selenium (Se)	FWGE	< 0.06	0.06	mg/L
Silicon (Si)	FWGE	5.85	0.06	mg/L
Silver (Ag)	FWGE	< 0.01	0.01	mg/L

TEST DESCRIPTION	MATRIX	RESULT	MDL	UNITS
Sodium (Na)	FWGE	0.7	0.1	mg/L
Strontium (Sr)	FWGE	0.028	0.001	mg/L
Sulfur (S)	FWGE	33.4	0.06	mg/L
Tin (Sn)	FWGE	< 0.06	0.06	mg/L
Titanium (Ti)	FWGE	< 0.002	0.002	mg/L
Vanadium (V)	FWGE	< 0.01	0.01	mg/L
Zinc (Zn)	FWGE	0.121	0.002	mg/L
***ICPMS Dissolved.**				
Aluminum (Al)	FWGE	3670	0.2	ug/L
Antimony (Sb)	FWGE	0.117	0.005	ug/L
Arsenic (As)	FWGE	1.2	0.1	ug/L
Barium (Ba)	FWGE	2.13	0.02	ug/L
Berylium (Be)	FWGE	0.154	0.002	ug/L
Bismuth (Bi)	FWGE	< 0.02	0.02	ug/L
Cadmium (Cd)	FWGE	0.93	0.01	ug/L
Chromium (Cr)	FWGE	0.5	0.2	ug/L
Cobalt (Co)	FWGE	36.7	0.005	ug/L
Copper (Cu)	FWGE	8200	0.05	ug/L
Lead (Pb)	FWGE	0.20	0.01	ug/L
Lithium (Li)	FWGE	2.73	0.05	ug/L
Manganese (Mn)	FWGE	418	0.005	ug/L
Molybdenum (Mo)	FWGE	< 0.05	0.05	ug/L
Nickel (Ni)	FWGE	20.7	0.05	ug/L
Selenium (Se)	FWGE	0.2	0.2	ug/L
Silver (Ag)	FWGE	0.37	0.02	ug/L
Strontium (Sr)	FWGE	28.1	0.005	ug/L
Thallium (Tl)	FWGE	0.093	0.002	ug/L
Tin (Sn)	FWGE	< 0.01	0.01	ug/L
Uranium (U)	FWGE	0.202	0.002	ug/L
Vanadium (V)	FWGE	< 0.05	0.05	ug/L
Zinc (Zn)	FWGE	121	0.1	ug/L
***ICPMS Total.**				
Aluminum (Al)	FWGE	3600	0.2	ug/L
Antimony (Sb)	FWGE	0.084	0.005	ug/L
Arsenic (As)	FWGE	1.2	0.1	ug/L
Barium (Ba)	FWGE	1.29	0.02	ug/L
Berylium (Be)	FWGE	0.160	0.002	ug/L
Bismuth (Bi)	FWGE	< 0.02	0.02	ug/L
Cadmium (Cd)	FWGE	0.77	0.01	ug/L
Chromium (Cr)	FWGE	0.6	0.2	ug/L
Cobalt (Co)	FWGE	34.2	0.005	ug/L
Copper (Cu)	FWGE	8310	0.05	ug/L
Lead (Pb)	FWGE	0.12	0.01	ug/L
Lithium (Li)	FWGE	3.23	0.05	ug/L
Manganese (Mn)	FWGE	448	0.005	ug/L
Molybdenum (Mo)	FWGE	< 0.05	0.05	ug/L
Nickel (Ni)	FWGE	19	0.05	ug/L
Selenium (Se)	FWGE	< 0.2	0.2	ug/L
Silver (Ag)	FWGE	0.40	0.02	ug/L
Strontium (Sr)	FWGE	28.6	0.005	ug/L
Thallium (Tl)	FWGE	0.069	0.002	ug/L
Tin (Sn)	FWGE	0.56	0.01	ug/L

TEST DESCRIPTION	MATRIX	RESULT	MDL	UNITS
Uranium (U)	FWGE	0.189	0.002	ug/L
Vanadium (V)	FWGE	< 0.05	0.05	ug/L
Zinc (Zn)	FWGE	84.6	0.1	ug/L

Order No: 159264 - BH 89-4
Start Date: 7/9/2007 12:00:00AM

General

TEST DESCRIPTION	MATRIX	RESULT	MDL	UNITS
***Acidity total&pH4.5**				
Acidity to pH 4.5	FWGE	< 1	1	mg CaCO3 / L
Acidity, Total	FWGE	82	1	mg CaCO3 / L
***AlkalinityTot-pH4.5**				
Alkalinity to pH 4.5	FWGE	< 0.5	0.5	mg CaCO3 / L
***ICA (Cl F SO4)**				
Chloride (Cl)	FWGE	0.6	0.1	mg/L
Fluoride (F)	FWGE	< 0.01	0.01	mg/L
Sulphate (SO4)	FWGE	345	10	mg/L
***ICA (NO2 NO3 Br)**				
Bromide (Br)	FWGE	< 0.05	0.05	mg/L
Nitrogen, Nitrate as N	FWGE	0.003	0.002	mg/L
Nitrogen, Nitrite as N	FWGE	< 0.005	0.005	mg/L
***pH**				
pH	FWGE	4.75	0.01	pH Units
***Residue: Filterable**				
Solids, Total Dissolved (FR)	FWGE	520	10	mg/L
***SpecificConductance**				
Conductivity	FWGE	509	2	uS/cm

Metals

TEST DESCRIPTION	MATRIX	RESULT	MDL	UNITS
***ICP Dissolved**				
Aluminum (Al)	FWGE	3.20	0.05	mg/L
Antimony (Sb)	FWGE	< 0.05	0.05	mg/L
Arsenic (As)	FWGE	0.12	0.05	mg/L
Barium (Ba)	FWGE	0.002	0.001	mg/L
Berylium (Be)	FWGE	< 0.001	0.001	mg/L
Boron (B)	FWGE	0.02	0.01	mg/L
Cadmium (Cd)	FWGE	< 0.005	0.005	mg/L
Calcium (Ca)	FWGE	69.1	0.1	mg/L
Chromium (Cr)	FWGE	< 0.005	0.005	mg/L
Cobalt (Co)	FWGE	0.084	0.005	mg/L
Copper (Cu)	FWGE	2.81	0.005	mg/L
Iron (Fe)	FWGE	34.1	0.005	mg/L
Lead (Pb)	FWGE	< 0.05	0.05	mg/L
Magnesium (Mg)	FWGE	9.7	0.1	mg/L
Manganese (Mn)	FWGE	1.87	0.001	mg/L
Molybdenum (Mo)	FWGE	< 0.01	0.01	mg/L
Nickel (Ni)	FWGE	0.06	0.02	mg/L

TEST DESCRIPTION	MATRIX	RESULT	MDL	UNITS
Phosphorus (P)	FWGE	< 0.1	0.1	mg/L
Potassium (K)	FWGE	1.4	0.1	mg/L
Selenium (Se)	FWGE	< 0.05	0.05	mg/L
Silicon (Si)	FWGE	12.2	0.05	mg/L
Silver (Ag)	FWGE	< 0.01	0.01	mg/L
Sodium (Na)	FWGE	2.1	0.1	mg/L
Strontium (Sr)	FWGE	0.120	0.001	mg/L
Sulfur (S)	FWGE	91.6	0.05	mg/L
Tin (Sn)	FWGE	< 0.05	0.05	mg/L
Titanium (Ti)	FWGE	< 0.002	0.002	mg/L
Vanadium (V)	FWGE	< 0.01	0.01	mg/L
Zinc (Zn)	FWGE	0.314	0.002	mg/L
***ICP Total**				
Aluminum (Al)	FWGE	35.1	0.06	mg/L
Antimony (Sb)	FWGE	< 0.06	0.06	mg/L
Arsenic (As)	FWGE	1.80	0.06	mg/L
Barium (Ba)	FWGE	0.009	0.001	mg/L
Berylium (Be)	FWGE	< 0.001	0.001	mg/L
Boron (B)	FWGE	0.02	0.01	mg/L
Cadmium (Cd)	FWGE	0.024	0.006	mg/L
Calcium (Ca)	FWGE	68.3	0.1	mg/L
Chromium (Cr)	FWGE	0.007	0.006	mg/L
Cobalt (Co)	FWGE	0.090	0.006	mg/L
Copper (Cu)	FWGE	3.33	0.02	mg/L
Iron (Fe)	FWGE	37.3	0.05	mg/L
Lead (Pb)	FWGE	< 0.06	0.06	mg/L
Magnesium (Mg)	FWGE	10.0	0.1	mg/L
Manganese (Mn)	FWGE	1.94	0.001	mg/L
Molybdenum (Mo)	FWGE	< 0.01	0.01	mg/L
Nickel (Ni)	FWGE	0.07	0.02	mg/L
Phosphorus (P)	FWGE	< 0.1	0.1	mg/L
Potassium (K)	FWGE	1.3	0.1	mg/L
Selenium (Se)	FWGE	< 0.06	0.06	mg/L
Silicon (Si)	FWGE	25.2	0.06	mg/L
Silver (Ag)	FWGE	< 0.01	0.01	mg/L
Sodium (Na)	FWGE	2.3	0.1	mg/L
Strontium (Sr)	FWGE	0.129	0.001	mg/L
Sulfur (S)	FWGE	94.8	0.06	mg/L
Tin (Sn)	FWGE	< 0.06	0.06	mg/L
Titanium (Ti)	FWGE	0.049	0.002	mg/L
Vanadium (V)	FWGE	< 0.01	0.01	mg/L
Zinc (Zn)	FWGE	0.330	0.002	mg/L
***ICPMS Dissolved.**				
Aluminum (Al)	FWGE	3200	0.2	ug/L
Antimony (Sb)	FWGE	1.3	0.005	ug/L
Arsenic (As)	FWGE	130	0.1	ug/L
Barium (Ba)	FWGE	2.35	0.02	ug/L
Berylium (Be)	FWGE	0.187	0.002	ug/L
Bismuth (Bi)	FWGE	< 0.02	0.02	ug/L
Cadmium (Cd)	FWGE	1.98	0.01	ug/L
Chromium (Cr)	FWGE	0.6	0.2	ug/L
Cobalt (Co)	FWGE	76.1	0.005	ug/L

TEST DESCRIPTION	MATRIX	RESULT	MDL	UNITS
Copper (Cu)	FWGE	2810	0.05	ug/L
Lead (Pb)	FWGE	0.27	0.01	ug/L
Lithium (Li)	FWGE	4.91	0.05	ug/L
Manganese (Mn)	FWGE	1870	0.005	ug/L
Molybdenum (Mo)	FWGE	0.09	0.05	ug/L
Nickel (Ni)	FWGE	52.7	0.05	ug/L
Selenium (Se)	FWGE	< 0.2	0.2	ug/L
Silver (Ag)	FWGE	< 0.02	0.02	ug/L
Strontium (Sr)	FWGE	123	0.005	ug/L
Thallium (Tl)	FWGE	0.170	0.002	ug/L
Tin (Sn)	FWGE	< 0.01	0.01	ug/L
Uranium (U)	FWGE	0.172	0.002	ug/L
Vanadium (V)	FWGE	0.26	0.05	ug/L
Zinc (Zn)	FWGE	244	0.1	ug/L
***ICPMS Total.**				
Aluminum (Al)	FWGE	35100	0.2	ug/L
Antimony (Sb)	FWGE	5.6	0.005	ug/L
Arsenic (As)	FWGE	1800	0.1	ug/L
Barium (Ba)	FWGE	6.33	0.02	ug/L
Berylium (Be)	FWGE	0.390	0.002	ug/L
Bismuth (Bi)	FWGE	0.05	0.02	ug/L
Cadmium (Cd)	FWGE	1.92	0.01	ug/L
Chromium (Cr)	FWGE	4.6	0.2	ug/L
Cobalt (Co)	FWGE	62.8	0.005	ug/L
Copper (Cu)	FWGE	3330	0.05	ug/L
Lead (Pb)	FWGE	0.71	0.01	ug/L
Lithium (Li)	FWGE	5.11	0.05	ug/L
Manganese (Mn)	FWGE	1940	0.005	ug/L
Molybdenum (Mo)	FWGE	0.55	0.05	ug/L
Nickel (Ni)	FWGE	43.6	0.05	ug/L
Selenium (Se)	FWGE	0.2	0.2	ug/L
Silver (Ag)	FWGE	0.45	0.02	ug/L
Strontium (Sr)	FWGE	122	0.005	ug/L
Thallium (Tl)	FWGE	0.161	0.002	ug/L
Tin (Sn)	FWGE	0.36	0.01	ug/L
Uranium (U)	FWGE	0.856	0.002	ug/L
Vanadium (V)	FWGE	3.02	0.05	ug/L
Zinc (Zn)	FWGE	199	0.1	ug/L

Order No: 159265 - BH 89-13

Start Date: 7/9/2007 12:00:00AM

General

TEST DESCRIPTION	MATRIX	RESULT	MDL	UNITS
***Acidity total&pH4.5**				
Acidity to pH 4.5	FWGE	< 1	1	mg CaCO3 / L
Acidity, Total	FWGE	2	1	mg CaCO3 / L
***AlkalinityTot-pH4.5**				

TEST DESCRIPTION	MATRIX	RESULT	MDL	UNITS
Alkalinity to pH 4.5	FWGE	30	0.5	mg CaCO3 / L
***ICA (Cl F SO4)**				
Chloride (Cl)	FWGE	0.5	0.1	mg/L
Fluoride (F)	FWGE	0.03	0.01	mg/L
Sulphate (SO4)	FWGE	12.5	0.5	mg/L
***ICA (NO2 NO3 Br)**				
Bromide (Br)	FWGE	< 0.05	0.05	mg/L
Nitrogen, Nitrate as N	FWGE	0.015	0.002	mg/L
Nitrogen, Nitrite as N	FWGE	0.006	0.005	mg/L
***pH**				
pH	FWGE	7.38	0.01	pH Units
***Residue: Filterable**				
Solids, Total Dissolved (FR)	FWGE	55	10	mg/L
Analysis performed after recommended hold time.				
***SpecificConductance**				
Conductivity	FWGE	88	2	uS/cm
Metals				
***ICP Dissolved**				
Aluminum (Al)	FWGE	< 0.05	0.05	mg/L
Antimony (Sb)	FWGE	< 0.05	0.05	mg/L
Arsenic (As)	FWGE	< 0.05	0.05	mg/L
Barium (Ba)	FWGE	< 0.001	0.001	mg/L
Berylium (Be)	FWGE	< 0.001	0.001	mg/L
Boron (B)	FWGE	0.01	0.01	mg/L
Cadmium (Cd)	FWGE	< 0.005	0.005	mg/L
Calcium (Ca)	FWGE	13.5	0.1	mg/L
Chromium (Cr)	FWGE	< 0.005	0.005	mg/L
Cobalt (Co)	FWGE	< 0.005	0.005	mg/L
Copper (Cu)	FWGE	0.011	0.005	mg/L
Iron (Fe)	FWGE	0.074	0.005	mg/L
Lead (Pb)	FWGE	< 0.05	0.05	mg/L
Magnesium (Mg)	FWGE	2.6	0.1	mg/L
Manganese (Mn)	FWGE	0.025	0.001	mg/L
Molybdenum (Mo)	FWGE	< 0.01	0.01	mg/L
Nickel (Ni)	FWGE	< 0.02	0.02	mg/L
Phosphorus (P)	FWGE	< 0.1	0.1	mg/L
Potassium (K)	FWGE	0.7	0.1	mg/L
Selenium (Se)	FWGE	< 0.05	0.05	mg/L
Silicon (Si)	FWGE	2.56	0.05	mg/L
Silver (Ag)	FWGE	< 0.01	0.01	mg/L
Sodium (Na)	FWGE	0.7	0.1	mg/L
Strontium (Sr)	FWGE	0.024	0.001	mg/L
Sulfur (S)	FWGE	4.79	0.05	mg/L
Tin (Sn)	FWGE	< 0.05	0.05	mg/L
Titanium (Ti)	FWGE	< 0.002	0.002	mg/L
Vanadium (V)	FWGE	< 0.01	0.01	mg/L
Zinc (Zn)	FWGE	0.018	0.002	mg/L
***ICP Total**				
Aluminum (Al)	FWGE	2.80	0.06	mg/L
Antimony (Sb)	FWGE	< 0.06	0.06	mg/L

TEST DESCRIPTION	MATRIX	RESULT	MDL	UNITS
Arsenic (As)	FWGE	0.14	0.06	mg/L
Barium (Ba)	FWGE	0.011	0.001	mg/L
Berylium (Be)	FWGE	< 0.001	0.001	mg/L
Boron (B)	FWGE	0.02	0.01	mg/L
Cadmium (Cd)	FWGE	< 0.006	0.006	mg/L
Calcium (Ca)	FWGE	12.8	0.1	mg/L
Chromium (Cr)	FWGE	< 0.006	0.006	mg/L
Cobalt (Co)	FWGE	< 0.006	0.006	mg/L
Copper (Cu)	FWGE	0.17	0.02	mg/L
Iron (Fe)	FWGE	7.05	0.05	mg/L
Lead (Pb)	FWGE	< 0.06	0.06	mg/L
Magnesium (Mg)	FWGE	3.1	0.1	mg/L
Manganese (Mn)	FWGE	0.142	0.001	mg/L
Molybdenum (Mo)	FWGE	< 0.01	0.01	mg/L
Nickel (Ni)	FWGE	< 0.02	0.02	mg/L
Phosphorus (P)	FWGE	< 0.1	0.1	mg/L
Potassium (K)	FWGE	1.8	0.1	mg/L
Selenium (Se)	FWGE	< 0.06	0.06	mg/L
Silicon (Si)	FWGE	6.83	0.06	mg/L
Silver (Ag)	FWGE	< 0.01	0.01	mg/L
Sodium (Na)	FWGE	0.8	0.1	mg/L
Strontium (Sr)	FWGE	0.027	0.001	mg/L
Sulfur (S)	FWGE	4.81	0.06	mg/L
Tin (Sn)	FWGE	< 0.06	0.06	mg/L
Titanium (Ti)	FWGE	0.114	0.002	mg/L
Vanadium (V)	FWGE	< 0.01	0.01	mg/L
Zinc (Zn)	FWGE	0.028	0.002	mg/L
***ICPMS Dissolved.**				
Aluminum (Al)	FWGE	5.6	0.2	ug/L
Antimony (Sb)	FWGE	0.244	0.005	ug/L
Arsenic (As)	FWGE	2.7	0.1	ug/L
Barium (Ba)	FWGE	0.51	0.02	ug/L
Berylium (Be)	FWGE	< 0.002	0.002	ug/L
Bismuth (Bi)	FWGE	< 0.02	0.02	ug/L
Cadmium (Cd)	FWGE	0.02	0.01	ug/L
Chromium (Cr)	FWGE	< 0.2	0.2	ug/L
Cobalt (Co)	FWGE	0.311	0.005	ug/L
Copper (Cu)	FWGE	10.3	0.05	ug/L
Lead (Pb)	FWGE	0.07	0.01	ug/L
Lithium (Li)	FWGE	1.03	0.05	ug/L
Manganese (Mn)	FWGE	23.4	0.005	ug/L
Molybdenum (Mo)	FWGE	0.06	0.05	ug/L
Nickel (Ni)	FWGE	1.61	0.05	ug/L
Selenium (Se)	FWGE	< 0.2	0.2	ug/L
Silver (Ag)	FWGE	0.02	0.02	ug/L
Strontium (Sr)	FWGE	22.7	0.005	ug/L
Thallium (Tl)	FWGE	0.029	0.002	ug/L
Tin (Sn)	FWGE	< 0.01	0.01	ug/L
Uranium (U)	FWGE	< 0.002	0.002	ug/L
Vanadium (V)	FWGE	0.07	0.05	ug/L
Zinc (Zn)	FWGE	8.8	0.1	ug/L
***ICPMS Total.**				

TEST DESCRIPTION	MATRIX	RESULT	MDL	UNITS
Aluminum (Al)	FWGE	2800	0.2	ug/L
Antimony (Sb)	FWGE	2.79	0.005	ug/L
Arsenic (As)	FWGE	146	0.1	ug/L
Barium (Ba)	FWGE	10.7	0.02	ug/L
Berylium (Be)	FWGE	0.049	0.002	ug/L
Bismuth (Bi)	FWGE	0.22	0.02	ug/L
Cadmium (Cd)	FWGE	0.06	0.01	ug/L
Chromium (Cr)	FWGE	2.7	0.2	ug/L
Cobalt (Co)	FWGE	3.07	0.005	ug/L
Copper (Cu)	FWGE	144	0.05	ug/L
Lead (Pb)	FWGE	5.47	0.01	ug/L
Lithium (Li)	FWGE	2.57	0.05	ug/L
Manganese (Mn)	FWGE	132	0.005	ug/L
Molybdenum (Mo)	FWGE	1.68	0.05	ug/L
Nickel (Ni)	FWGE	3.06	0.05	ug/L
Selenium (Se)	FWGE	0.2	0.2	ug/L
Silver (Ag)	FWGE	3.41	0.02	ug/L
Strontium (Sr)	FWGE	28.2	0.005	ug/L
Thallium (Tl)	FWGE	0.070	0.002	ug/L
Tin (Sn)	FWGE	0.57	0.01	ug/L
Uranium (U)	FWGE	0.028	0.002	ug/L
Vanadium (V)	FWGE	6.68	0.05	ug/L
Zinc (Zn)	FWGE	17.7	0.1	ug/L

Order No: 159266 - BH 89-7
Start Date: 7/9/2007 12:00:00AM

General

TEST DESCRIPTION	MATRIX	RESULT	MDL	UNITS
***Acidity total&pH4.5**				
Acidity to pH 4.5	FWGE	70	1	mg CaCO3 / L
Acidity, Total	FWGE	137	1	mg CaCO3 / L
***AlkalinityTot-pH4.5**				
Alkalinity to pH 4.5	FWGE	< 0.5	0.5	mg CaCO3 / L
***ICA (Cl F SO4)**				
Chloride (Cl)	FWGE	2.8	0.1	mg/L
Fluoride (F)	FWGE	< 0.01	0.01	mg/L
Sulphate (SO4)	FWGE	366	30	mg/L
Analysis performed after recommended hold time.				
***ICA (NO2 NO3 Br)**				
Bromide (Br)	FWGE	< 0.05	0.05	mg/L
Nitrogen, Nitrate as N	FWGE	0.021	0.002	mg/L
Nitrogen, Nitrite as N	FWGE	< 0.005	0.005	mg/L
***pH**				
pH	FWGE	3.11	0.01	pH Units
***Residue: Filterable**				
Solids, Total Dissolved (FR)	FWGE	518	10	mg/L

TEST DESCRIPTION	MATRIX	RESULT	MDL	UNITS
***SpecificConductance**				
Conductivity	FWGE	771	2	uS/cm
Metals				
***ICP Dissolved**				
Aluminum (Al) *Orig run # 17834*	FWGE	11.6	0.05	mg/L
Antimony (Sb) *Orig run # 17834*	FWGE	< 0.05	0.05	mg/L
Arsenic (As) *Orig run # 17834*	FWGE	< 0.05	0.05	mg/L
Barium (Ba) *Orig run # 17834*	FWGE	0.003	0.001	mg/L
Berylium (Be) *Orig run # 17834*	FWGE	< 0.001	0.001	mg/L
Boron (B) *Orig run # 17834*	FWGE	0.01	0.01	mg/L
Cadmium (Cd) *Orig run # 17834*	FWGE	< 0.005	0.005	mg/L
Calcium (Ca) *Orig run # 17834*	FWGE	60.8	0.1	mg/L
Chromium (Cr) *Orig run # 17834*	FWGE	< 0.005	0.005	mg/L
Cobalt (Co) *Orig run # 17834*	FWGE	0.077	0.005	mg/L
Copper (Cu) *Orig run # 17834*	FWGE	9.81	0.005	mg/L
Iron (Fe) *Orig run # 17834*	FWGE	8.77	0.005	mg/L
Lead (Pb) *Orig run # 17834*	FWGE	< 0.05	0.05	mg/L
Magnesium (Mg) *Orig run # 17834*	FWGE	5.9	0.1	mg/L
Manganese (Mn) *Orig run # 17834*	FWGE	0.719	0.001	mg/L
Molybdenum (Mo) *Orig run # 17834*	FWGE	< 0.01	0.01	mg/L
Nickel (Ni) *Orig run # 17834*	FWGE	0.05	0.02	mg/L
Phosphorus (P) *Orig run # 17834*	FWGE	< 0.1	0.1	mg/L
Potassium (K) *Orig run # 17834*	FWGE	1.3	0.1	mg/L
Selenium (Se) *Orig run # 17834*	FWGE	< 0.05	0.05	mg/L
Silicon (Si)	FWGE	14.6	0.05	mg/L

TEST DESCRIPTION	MATRIX	RESULT	MDL	UNITS
Orig run # 17834				
Silver (Ag)	FWGE	< 0.01	0.01	mg/L
Orig run # 17834				
Sodium (Na)	FWGE	1.6	0.1	mg/L
Orig run # 17834				
Strontium (Sr)	FWGE	0.102	0.001	mg/L
Orig run # 17834				
Sulfur (S)	FWGE	100	0.05	mg/L
Orig run # 17834				
Tin (Sn)	FWGE	< 0.05	0.05	mg/L
Orig run # 17834				
Titanium (Ti)	FWGE	< 0.002	0.002	mg/L
Orig run # 17834				
Vanadium (V)	FWGE	< 0.01	0.01	mg/L
Orig run # 17834				
Zinc (Zn)	FWGE	0.309	0.002	mg/L
Orig run # 17834				
***ICP Total**				
Aluminum (Al)	FWGE	11.4	0.06	mg/L
Antimony (Sb)	FWGE	< 0.06	0.06	mg/L
Arsenic (As)	FWGE	< 0.06	0.06	mg/L
Barium (Ba)	FWGE	0.004	0.001	mg/L
Berylium (Be)	FWGE	< 0.001	0.001	mg/L
Boron (B)	FWGE	0.02	0.01	mg/L
Cadmium (Cd)	FWGE	< 0.006	0.006	mg/L
Calcium (Ca)	FWGE	56.1	0.1	mg/L
Chromium (Cr)	FWGE	< 0.006	0.006	mg/L
Cobalt (Co)	FWGE	0.079	0.006	mg/L
Copper (Cu)	FWGE	9.49	0.02	mg/L
Iron (Fe)	FWGE	14.9	0.05	mg/L
Lead (Pb)	FWGE	< 0.06	0.06	mg/L
Magnesium (Mg)	FWGE	5.7	0.1	mg/L
Manganese (Mn)	FWGE	0.734	0.001	mg/L
Molybdenum (Mo)	FWGE	< 0.01	0.01	mg/L
Nickel (Ni)	FWGE	0.05	0.02	mg/L
Phosphorus (P)	FWGE	< 0.1	0.1	mg/L
Potassium (K)	FWGE	1.2	0.1	mg/L
Selenium (Se)	FWGE	< 0.06	0.06	mg/L
Silicon (Si)	FWGE	15.4	0.06	mg/L
Silver (Ag)	FWGE	< 0.01	0.01	mg/L
Sodium (Na)	FWGE	1.6	0.1	mg/L
Strontium (Sr)	FWGE	0.106	0.001	mg/L
Sulfur (S)	FWGE	103	0.06	mg/L
Tin (Sn)	FWGE	< 0.06	0.06	mg/L
Titanium (Ti)	FWGE	0.013	0.002	mg/L
Vanadium (V)	FWGE	< 0.01	0.01	mg/L
Zinc (Zn)	FWGE	0.292	0.002	mg/L
***ICPMS Dissolved.**				
Aluminum (Al)	FWGE	10488	0.2	ug/L

TEST DESCRIPTION	MATRIX	RESULT	MDL	UNITS
Antimony (Sb)	FWGE	0.042	0.005	ug/L
Arsenic (As)	FWGE	3.0	0.1	ug/L
Barium (Ba)	FWGE	2.78	0.02	ug/L
Berylium (Be)	FWGE	0.316	0.002	ug/L
Bismuth (Bi)	FWGE	< 0.02	0.02	ug/L
Cadmium (Cd)	FWGE	1.88	0.01	ug/L
Chromium (Cr)	FWGE	1.2	0.2	ug/L
Cobalt (Co)	FWGE	67.4	0.005	ug/L
Copper (Cu)	FWGE	8563	0.05	ug/L
Lead (Pb)	FWGE	21.3	0.01	ug/L
Lithium (Li)	FWGE	7.49	0.05	ug/L
Manganese (Mn)	FWGE	678	0.005	ug/L
Molybdenum (Mo)	FWGE	< 0.05	0.05	ug/L
Nickel (Ni)	FWGE	43.3	0.05	ug/L
Selenium (Se)	FWGE	0.3	0.2	ug/L
Silver (Ag)	FWGE	0.63	0.02	ug/L
Strontium (Sr)	FWGE	105	0.005	ug/L
Thallium (Tl)	FWGE	0.034	0.002	ug/L
Tin (Sn)	FWGE	< 0.01	0.01	ug/L
Uranium (U)	FWGE	0.241	0.002	ug/L
Vanadium (V)	FWGE	0.14	0.05	ug/L
Zinc (Zn)	FWGE	247	0.1	ug/L
***ICPMS Total.**				
Aluminum (Al)	FWGE	11400	0.2	ug/L
Antimony (Sb)	FWGE	0.225	0.005	ug/L
Arsenic (As)	FWGE	61.7	0.1	ug/L
Barium (Ba)	FWGE	3.69	0.02	ug/L
Berylium (Be)	FWGE	0.294	0.002	ug/L
Bismuth (Bi)	FWGE	0.11	0.02	ug/L
Cadmium (Cd)	FWGE	1.66	0.01	ug/L
Chromium (Cr)	FWGE	1.4	0.2	ug/L
Cobalt (Co)	FWGE	64.7	0.005	ug/L
Copper (Cu)	FWGE	8777	0.05	ug/L
Lead (Pb)	FWGE	23.2	0.01	ug/L
Lithium (Li)	FWGE	8.07	0.05	ug/L
Manganese (Mn)	FWGE	734	0.005	ug/L
Molybdenum (Mo)	FWGE	0.09	0.05	ug/L
Nickel (Ni)	FWGE	40.8	0.05	ug/L
Selenium (Se)	FWGE	0.3	0.2	ug/L
Silver (Ag)	FWGE	1.98	0.02	ug/L
Strontium (Sr)	FWGE	106	0.005	ug/L
Thallium (Tl)	FWGE	0.024	0.002	ug/L
Tin (Sn)	FWGE	0.11	0.01	ug/L
Uranium (U)	FWGE	0.240	0.002	ug/L
Vanadium (V)	FWGE	0.60	0.05	ug/L
Zinc (Zn)	FWGE	190	0.1	ug/L

Order No: 159267 - WEIR 3

Start Date: 7/9/2007 12:00:00AM

TEST DESCRIPTION	MATRIX	RESULT	MDL	UNITS
General				
***Acidity total&pH4.5**				
Acidity to pH 4.5	FWGE	9	1	mg CaCO3 / L
Acidity, Total	FWGE	30	1	mg CaCO3 / L
***AlkalinityTot-pH4.5**				
Alkalinity to pH 4.5	FWGE	< 0.5	0.5	mg CaCO3 / L
***ICA (Cl F SO4)**				
Chloride (Cl)	FWGE	0.3	0.1	mg/L
Fluoride (F)	FWGE	0.05	0.01	mg/L
Sulphate (SO4)	FWGE	90	3	mg/L
***ICA (NO2 NO3 Br)**				
Bromide (Br)	FWGE	< 0.05	0.05	mg/L
Nitrogen, Nitrate as N	FWGE	0.012	0.002	mg/L
Nitrogen, Nitrite as N	FWGE	< 0.005	0.005	mg/L
***pH**				
pH	FWGE	3.72	0.01	pH Units
***Residue: Filterable**				
Solids, Total Dissolved (FR)	FWGE	127	10	mg/L
***SpecificConductance**				
Conductivity	FWGE	184	2	uS/cm
Metals				
***ICP Dissolved**				
Aluminum (Al)	FWGE	2.05	0.05	mg/L
Antimony (Sb)	FWGE	< 0.05	0.05	mg/L
Arsenic (As)	FWGE	< 0.05	0.05	mg/L
Barium (Ba)	FWGE	0.002	0.001	mg/L
Berylium (Be)	FWGE	< 0.001	0.001	mg/L
Boron (B)	FWGE	0.02	0.01	mg/L
Cadmium (Cd)	FWGE	< 0.005	0.005	mg/L
Calcium (Ca)	FWGE	10.9	0.1	mg/L
Chromium (Cr)	FWGE	< 0.005	0.005	mg/L
Cobalt (Co)	FWGE	0.021	0.005	mg/L
Copper (Cu)	FWGE	3.98	0.005	mg/L
Iron (Fe)	FWGE	1.01	0.005	mg/L
Lead (Pb)	FWGE	< 0.05	0.05	mg/L
Magnesium (Mg)	FWGE	2.0	0.1	mg/L
Manganese (Mn)	FWGE	0.237	0.001	mg/L
Molybdenum (Mo)	FWGE	< 0.01	0.01	mg/L
Nickel (Ni)	FWGE	< 0.02	0.02	mg/L
Phosphorus (P)	FWGE	< 0.1	0.1	mg/L
Potassium (K)	FWGE	4.0	0.1	mg/L
Orig run # 17834				
Selenium (Se)	FWGE	< 0.05	0.05	mg/L
Silicon (Si)	FWGE	3.37	0.05	mg/L
Silver (Ag)	FWGE	< 0.01	0.01	mg/L

TEST DESCRIPTION	MATRIX	RESULT	MDL	UNITS
Sodium (Na)	FWGE	0.8	0.1	mg/L
Strontium (Sr)	FWGE	0.019	0.001	mg/L
Sulfur (S)	FWGE	20.6	0.05	mg/L
Tin (Sn)	FWGE	< 0.05	0.05	mg/L
Titanium (Ti)	FWGE	< 0.002	0.002	mg/L
Vanadium (V)	FWGE	< 0.01	0.01	mg/L
Zinc (Zn)	FWGE	0.084	0.002	mg/L
***ICP Total**				
Aluminum (Al)	FWGE	1.96	0.06	mg/L
Antimony (Sb)	FWGE	< 0.06	0.06	mg/L
Arsenic (As)	FWGE	< 0.06	0.06	mg/L
Barium (Ba)	FWGE	0.002	0.001	mg/L
Berylium (Be)	FWGE	< 0.001	0.001	mg/L
Boron (B)	FWGE	0.02	0.01	mg/L
Cadmium (Cd)	FWGE	< 0.006	0.006	mg/L
Calcium (Ca)	FWGE	10.1	0.1	mg/L
Chromium (Cr)	FWGE	< 0.006	0.006	mg/L
Cobalt (Co)	FWGE	0.020	0.006	mg/L
Copper (Cu)	FWGE	4.36	0.02	mg/L
Iron (Fe)	FWGE	1.76	0.05	mg/L
Lead (Pb)	FWGE	< 0.06	0.06	mg/L
Magnesium (Mg)	FWGE	1.8	0.1	mg/L
Manganese (Mn)	FWGE	0.231	0.001	mg/L
Molybdenum (Mo)	FWGE	< 0.01	0.01	mg/L
Nickel (Ni)	FWGE	< 0.02	0.02	mg/L
Phosphorus (P)	FWGE	< 0.1	0.1	mg/L
Potassium (K)	FWGE	0.4	0.1	mg/L
Selenium (Se)	FWGE	< 0.06	0.06	mg/L
Silicon (Si)	FWGE	3.46	0.06	mg/L
Silver (Ag)	FWGE	< 0.01	0.01	mg/L
Sodium (Na)	FWGE	0.4	0.1	mg/L
Strontium (Sr)	FWGE	0.018	0.001	mg/L
Sulfur (S)	FWGE	20.3	0.06	mg/L
Tin (Sn)	FWGE	< 0.06	0.06	mg/L
Titanium (Ti)	FWGE	0.003	0.002	mg/L
Vanadium (V)	FWGE	< 0.01	0.01	mg/L
Zinc (Zn)	FWGE	0.074	0.002	mg/L
Zinc (Zn)	FWGE	0.071	0.002	mg/L
***ICPMS Dissolved.**				
Aluminum (Al)	FWGE	2050	0.2	ug/L
Antimony (Sb)	FWGE	0.500	0.005	ug/L
Arsenic (As)	FWGE	3.1	0.1	ug/L
Barium (Ba)	FWGE	1.65	0.02	ug/L
Berylium (Be)	FWGE	0.091	0.002	ug/L
Bismuth (Bi)	FWGE	< 0.02	0.02	ug/L
Cadmium (Cd)	FWGE	0.58	0.01	ug/L
Chromium (Cr)	FWGE	0.3	0.2	ug/L
Cobalt (Co)	FWGE	19	0.005	ug/L
Copper (Cu)	FWGE	3980	0.05	ug/L
Lead (Pb)	FWGE	1.60	0.01	ug/L
Lithium (Li)	FWGE	19	0.05	ug/L
Manganese (Mn)	FWGE	218	0.005	ug/L

TEST DESCRIPTION	MATRIX	RESULT	MDL	UNITS
Molybdenum (Mo)	FWGE	0.10	0.05	ug/L
Nickel (Ni)	FWGE	11.2	0.05	ug/L
Selenium (Se)	FWGE	< 0.2	0.2	ug/L
Silver (Ag)	FWGE	0.07	0.02	ug/L
Strontium (Sr)	FWGE	18.4	0.005	ug/L
Thallium (Tl)	FWGE	0.215	0.002	ug/L
Tin (Sn)	FWGE	< 0.01	0.01	ug/L
Uranium (U)	FWGE	0.103	0.002	ug/L
Vanadium (V)	FWGE	< 0.05	0.05	ug/L
Zinc (Zn)	FWGE	82.7	0.1	ug/L
***ICPMS Total.**				
Aluminum (Al)	FWGE	1960	0.2	ug/L
Antimony (Sb)	FWGE	0.086	0.005	ug/L
Arsenic (As)	FWGE	21.0	0.1	ug/L
Barium (Ba)	FWGE	1.25	0.02	ug/L
Berylium (Be)	FWGE	0.079	0.002	ug/L
Bismuth (Bi)	FWGE	< 0.02	0.02	ug/L
Cadmium (Cd)	FWGE	0.41	0.01	ug/L
Chromium (Cr)	FWGE	0.3	0.2	ug/L
Cobalt (Co)	FWGE	17.1	0.005	ug/L
Copper (Cu)	FWGE	4360	0.05	ug/L
Lead (Pb)	FWGE	0.13	0.01	ug/L
Lithium (Li)	FWGE	1.58	0.05	ug/L
Manganese (Mn)	FWGE	200	0.005	ug/L
Molybdenum (Mo)	FWGE	< 0.05	0.05	ug/L
Nickel (Ni)	FWGE	9.06	0.05	ug/L
Selenium (Se)	FWGE	< 0.2	0.2	ug/L
Silver (Ag)	FWGE	0.36	0.02	ug/L
Strontium (Sr)	FWGE	16.1	0.005	ug/L
Thallium (Tl)	FWGE	0.039	0.002	ug/L
Tin (Sn)	FWGE	0.40	0.01	ug/L
Uranium (U)	FWGE	0.092	0.002	ug/L
Vanadium (V)	FWGE	0.08	0.05	ug/L
Zinc (Zn)	FWGE	44.0	0.1	ug/L

Order No: 159268 - SEEP 9
Start Date: 7/9/2007 12:00:00AM

General

***Acidity total&pH4.5**				
Acidity to pH 4.5	FWGE	222	1	mg CaCO3 / L
Acidity, Total	FWGE	385	1	mg CaCO3 / L
***AlkalinityTot-pH4.5**				
Alkalinity to pH 4.5	FWGE	< 0.5	0.5	mg CaCO3 / L
***ICA (Cl F SO4)**				
Chloride (Cl)	FWGE	2.6	0.1	mg/L
Fluoride (F)	FWGE	0.36	0.01	mg/L

TEST DESCRIPTION	MATRIX	RESULT	MDL	UNITS
Sulphate (SO4)	FWGE	648	50	mg/L
***ICA (NO2 NO3 Br)**				
Bromide (Br)	FWGE	0.05	0.05	mg/L
Nitrogen, Nitrate as N	FWGE	0.002	0.002	mg/L
Nitrogen, Nitrite as N	FWGE	< 0.005	0.005	mg/L
***pH**				
pH	FWGE	2.83	0.01	pH Units
***Residue: Filterable**				
Solids, Total Dissolved (FR)	FWGE	1350	10	mg/L
Analysis performed after recommended hold time.				
***SpecificConductance**				
Conductivity	FWGE	1262	2	uS/cm

Metals

TEST DESCRIPTION	MATRIX	RESULT	MDL	UNITS
***ICP Dissolved**				
Aluminum (Al)	FWGE	17.2	0.05	mg/L
Antimony (Sb)	FWGE	< 0.05	0.05	mg/L
Arsenic (As)	FWGE	< 0.05	0.05	mg/L
Barium (Ba)	FWGE	0.009	0.001	mg/L
Berylium (Be)	FWGE	< 0.001	0.001	mg/L
Boron (B)	FWGE	0.05	0.01	mg/L
Cadmium (Cd)	FWGE	< 0.005	0.005	mg/L
Calcium (Ca)	FWGE	59.9	0.1	mg/L
Chromium (Cr)	FWGE	< 0.005	0.005	mg/L
Cobalt (Co)	FWGE	0.237	0.005	mg/L
Copper (Cu)	FWGE	13.8	0.005	mg/L
Iron (Fe)	FWGE	79.2	0.005	mg/L
Lead (Pb)	FWGE	< 0.05	0.05	mg/L
Magnesium (Mg)	FWGE	16.7	0.1	mg/L
Manganese (Mn)	FWGE	1.54	0.001	mg/L
Molybdenum (Mo)	FWGE	< 0.01	0.01	mg/L
Nickel (Ni)	FWGE	0.04	0.02	mg/L
Phosphorus (P)	FWGE	< 0.1	0.1	mg/L
Potassium (K)	FWGE	1.3	0.1	mg/L
Selenium (Se)	FWGE	< 0.05	0.05	mg/L
Silicon (Si)	FWGE	28.3	0.05	mg/L
Silver (Ag)	FWGE	< 0.01	0.01	mg/L
Sodium (Na)	FWGE	3.9	0.1	mg/L
Strontium (Sr)	FWGE	0.149	0.001	mg/L
Sulfur (S)	FWGE	201	0.05	mg/L
Tin (Sn)	FWGE	< 0.05	0.05	mg/L
Titanium (Ti)	FWGE	0.003	0.002	mg/L
Vanadium (V)	FWGE	< 0.01	0.01	mg/L
Zinc (Zn)	FWGE	0.685	0.002	mg/L
***ICP Total**				
Aluminum (Al)	FWGE	18.8	0.06	mg/L
Antimony (Sb)	FWGE	< 0.06	0.06	mg/L
Arsenic (As)	FWGE	< 0.06	0.06	mg/L
Barium (Ba)	FWGE	0.010	0.001	mg/L
Berylium (Be)	FWGE	< 0.001	0.001	mg/L
Boron (B)	FWGE	0.02	0.01	mg/L

TEST DESCRIPTION	MATRIX	RESULT	MDL	UNITS
Cadmium (Cd)	FWGE	< 0.006	0.006	mg/L
Calcium (Ca)	FWGE	61.6	0.1	mg/L
Chromium (Cr)	FWGE	< 0.006	0.006	mg/L
Cobalt (Co)	FWGE	0.243	0.006	mg/L
Copper (Cu)	FWGE	15.2	0.02	mg/L
Iron (Fe)	FWGE	81.7	0.05	mg/L
Lead (Pb)	FWGE	< 0.06	0.06	mg/L
Magnesium (Mg)	FWGE	15.8	0.1	mg/L
Manganese (Mn)	FWGE	1.53	0.001	mg/L
Molybdenum (Mo)	FWGE	< 0.01	0.01	mg/L
Nickel (Ni)	FWGE	0.04	0.02	mg/L
Phosphorus (P)	FWGE	< 0.1	0.1	mg/L
Potassium (K)	FWGE	1.3	0.1	mg/L
Selenium (Se)	FWGE	< 0.06	0.06	mg/L
Silicon (Si)	FWGE	30.6	0.06	mg/L
Silver (Ag)	FWGE	< 0.01	0.01	mg/L
Sodium (Na)	FWGE	3.5	0.1	mg/L
Strontium (Sr)	FWGE	0.141	0.001	mg/L
Sulfur (S)	FWGE	206	0.06	mg/L
Tin (Sn)	FWGE	< 0.06	0.06	mg/L
Titanium (Ti)	FWGE	0.006	0.002	mg/L
Vanadium (V)	FWGE	< 0.01	0.01	mg/L
Zinc (Zn)	FWGE	0.725	0.002	mg/L
***ICPMS Dissolved.**				
Aluminum (Al)	FWGE	17200	0.2	ug/L
Antimony (Sb)	FWGE	0.036	0.005	ug/L
Arsenic (As)	FWGE	4.3	0.1	ug/L
Barium (Ba)	FWGE	8.06	0.02	ug/L
Berylium (Be)	FWGE	0.664	0.002	ug/L
Bismuth (Bi)	FWGE	< 0.02	0.02	ug/L
Cadmium (Cd)	FWGE	3.45	0.01	ug/L
Chromium (Cr)	FWGE	2.5	0.2	ug/L
Cobalt (Co)	FWGE	191	0.005	ug/L
Copper (Cu)	FWGE	13800	0.05	ug/L
Lead (Pb)	FWGE	0.48	0.01	ug/L
Lithium (Li)	FWGE	25.2	0.05	ug/L
Manganese (Mn)	FWGE	1540	0.005	ug/L
Molybdenum (Mo)	FWGE	0.05	0.05	ug/L
Nickel (Ni)	FWGE	28.4	0.05	ug/L
Selenium (Se)	FWGE	0.2	0.2	ug/L
Silver (Ag)	FWGE	0.55	0.02	ug/L
Strontium (Sr)	FWGE	133	0.005	ug/L
Thallium (Tl)	FWGE	0.072	0.002	ug/L
Tin (Sn)	FWGE	< 0.01	0.01	ug/L
Uranium (U)	FWGE	0.566	0.002	ug/L
Vanadium (V)	FWGE	< 0.05	0.05	ug/L
Zinc (Zn)	FWGE	685	0.1	ug/L
***ICPMS Total.**				
Aluminum (Al)	FWGE	18800	0.2	ug/L
Antimony (Sb)	FWGE	0.058	0.005	ug/L
Arsenic (As)	FWGE	7.0	0.1	ug/L
Barium (Ba)	FWGE	8.19	0.02	ug/L

TEST DESCRIPTION	MATRIX	RESULT	MDL	UNITS
Berylium (Be)	FWGE	0.644	0.002	ug/L
Bismuth (Bi)	FWGE	< 0.02	0.02	ug/L
Cadmium (Cd)	FWGE	3.14	0.01	ug/L
Chromium (Cr)	FWGE	2.6	0.2	ug/L
Cobalt (Co)	FWGE	182	0.005	ug/L
Copper (Cu)	FWGE	15200	0.05	ug/L
Lead (Pb)	FWGE	0.52	0.01	ug/L
Lithium (Li)	FWGE	25.4	0.05	ug/L
Manganese (Mn)	FWGE	1530	0.005	ug/L
Molybdenum (Mo)	FWGE	0.07	0.05	ug/L
Nickel (Ni)	FWGE	26.9	0.05	ug/L
Selenium (Se)	FWGE	0.3	0.2	ug/L
Silver (Ag)	FWGE	0.60	0.02	ug/L
Strontium (Sr)	FWGE	130	0.005	ug/L
Thallium (Tl)	FWGE	0.038	0.002	ug/L
Tin (Sn)	FWGE	0.06	0.01	ug/L
Uranium (U)	FWGE	0.558	0.002	ug/L
Vanadium (V)	FWGE	0.06	0.05	ug/L
Zinc (Zn)	FWGE	725	0.1	ug/L

Order No: 159269 - SEEP 10
Start Date: 7/9/2007 12:00:00AM

General

***Acidity total&pH4.5**				
Acidity to pH 4.5	FWGE	4	1	mg CaCO3 / L
Acidity, Total	FWGE	17	1	mg CaCO3 / L
***AlkalinityTot-pH4.5**				
Alkalinity to pH 4.5	FWGE	< 0.5	0.5	mg CaCO3 / L
***ICA (Cl F SO4)**				
Chloride (Cl)	FWGE	0.3	0.1	mg/L
Fluoride (F)	FWGE	0.03	0.01	mg/L
Sulphate (SO4)	FWGE	99	3	mg/L
***ICA (NO2 NO3 Br)**				
Bromide (Br)	FWGE	< 0.05	0.05	mg/L
Nitrogen, Nitrate as N	FWGE	0.004	0.002	mg/L
Nitrogen, Nitrite as N	FWGE	0.008	0.005	mg/L
***pH**				
pH	FWGE	3.94	0.01	pH Units
***Residue: Filterable**				
Solids, Total Dissolved (FR)	FWGE	78	10	mg/L
***SpecificConductance**				
Conductivity	FWGE	118	2	uS/cm

Metals

***ICP Dissolved**				
Aluminum (Al)	FWGE	0.86	0.05	mg/L

TEST DESCRIPTION	MATRIX	RESULT	MDL	UNITS
Antimony (Sb)	FWGE	< 0.05	0.05	mg/L
Arsenic (As)	FWGE	< 0.05	0.05	mg/L
Barium (Ba)	FWGE	0.002	0.001	mg/L
Berylium (Be)	FWGE	< 0.001	0.001	mg/L
Boron (B)	FWGE	0.06	0.01	mg/L
Cadmium (Cd)	FWGE	< 0.005	0.005	mg/L
Calcium (Ca)	FWGE	8.4	0.1	mg/L
Chromium (Cr)	FWGE	< 0.005	0.005	mg/L
Cobalt (Co)	FWGE	0.010	0.005	mg/L
Copper (Cu)	FWGE	2.12	0.005	mg/L
Iron (Fe)	FWGE	1.27	0.005	mg/L
Lead (Pb)	FWGE	< 0.05	0.05	mg/L
Magnesium (Mg)	FWGE	0.9	0.1	mg/L
Manganese (Mn)	FWGE	0.121	0.001	mg/L
Molybdenum (Mo)	FWGE	< 0.01	0.01	mg/L
Nickel (Ni)	FWGE	< 0.02	0.02	mg/L
Phosphorus (P)	FWGE	< 0.1	0.1	mg/L
Potassium (K)	FWGE	0.4	0.1	mg/L
Selenium (Se)	FWGE	< 0.05	0.05	mg/L
Silicon (Si)	FWGE	1.84	0.05	mg/L
Silver (Ag)	FWGE	< 0.01	0.01	mg/L
Sodium (Na)	FWGE	0.3	0.1	mg/L
Strontium (Sr)	FWGE	0.015	0.001	mg/L
Sulfur (S)	FWGE	12.8	0.05	mg/L
Tin (Sn)	FWGE	< 0.05	0.05	mg/L
Titanium (Ti)	FWGE	< 0.002	0.002	mg/L
Vanadium (V)	FWGE	< 0.01	0.01	mg/L
Zinc (Zn)	FWGE	0.051	0.002	mg/L
***ICP Total**				
Aluminum (Al)	FWGE	0.95	0.06	mg/L
Antimony (Sb)	FWGE	< 0.06	0.06	mg/L
Arsenic (As)	FWGE	0.12	0.06	mg/L
Barium (Ba)	FWGE	0.002	0.001	mg/L
Berylium (Be)	FWGE	< 0.001	0.001	mg/L
Boron (B)	FWGE	0.02	0.01	mg/L
Cadmium (Cd)	FWGE	< 0.006	0.006	mg/L
Calcium (Ca)	FWGE	8.1	0.1	mg/L
Chromium (Cr)	FWGE	< 0.006	0.006	mg/L
Cobalt (Co)	FWGE	0.010	0.006	mg/L
Copper (Cu)	FWGE	2.05	0.02	mg/L
Iron (Fe)	FWGE	2.18	0.05	mg/L
Lead (Pb)	FWGE	< 0.06	0.06	mg/L
Magnesium (Mg)	FWGE	0.9	0.1	mg/L
Manganese (Mn)	FWGE	0.120	0.001	mg/L
Molybdenum (Mo)	FWGE	< 0.01	0.01	mg/L
Nickel (Ni)	FWGE	< 0.02	0.02	mg/L
Phosphorus (P)	FWGE	< 0.1	0.1	mg/L
Potassium (K)	FWGE	0.4	0.1	mg/L
Selenium (Se)	FWGE	< 0.06	0.06	mg/L
Silicon (Si)	FWGE	2.03	0.06	mg/L
Silver (Ag)	FWGE	< 0.01	0.01	mg/L
Sodium (Na)	FWGE	0.3	0.1	mg/L

TEST DESCRIPTION	MATRIX	RESULT	MDL	UNITS
Strontium (Sr)	FWGE	0.015	0.001	mg/L
Sulfur (S)	FWGE	12.8	0.06	mg/L
Tin (Sn)	FWGE	< 0.06	0.06	mg/L
Titanium (Ti)	FWGE	0.007	0.002	mg/L
Vanadium (V)	FWGE	< 0.01	0.01	mg/L
Zinc (Zn)	FWGE	0.044	0.002	mg/L
***ICPMS Dissolved.**				
Aluminum (Al)	FWGE	860	0.2	ug/L
Antimony (Sb)	FWGE	0.085	0.005	ug/L
Arsenic (As)	FWGE	44.9	0.1	ug/L
Barium (Ba)	FWGE	1.43	0.02	ug/L
Berylium (Be)	FWGE	0.036	0.002	ug/L
Bismuth (Bi)	FWGE	< 0.02	0.02	ug/L
Cadmium (Cd)	FWGE	0.33	0.01	ug/L
Chromium (Cr)	FWGE	< 0.2	0.2	ug/L
Cobalt (Co)	FWGE	9.28	0.005	ug/L
Copper (Cu)	FWGE	2120	0.05	ug/L
Lead (Pb)	FWGE	0.15	0.01	ug/L
Lithium (Li)	FWGE	0.92	0.05	ug/L
Manganese (Mn)	FWGE	106	0.005	ug/L
Molybdenum (Mo)	FWGE	< 0.05	0.05	ug/L
Nickel (Ni)	FWGE	2.44	0.05	ug/L
Selenium (Se)	FWGE	< 0.2	0.2	ug/L
Silver (Ag)	FWGE	0.16	0.02	ug/L
Strontium (Sr)	FWGE	12.7	0.005	ug/L
Thallium (Tl)	FWGE	0.010	0.002	ug/L
Tin (Sn)	FWGE	< 0.01	0.01	ug/L
Uranium (U)	FWGE	0.031	0.002	ug/L
Vanadium (V)	FWGE	< 0.05	0.05	ug/L
Zinc (Zn)	FWGE	39.5	0.1	ug/L
***ICPMS Total.**				
Aluminum (Al)	FWGE	950	0.2	ug/L
Antimony (Sb)	FWGE	0.106	0.005	ug/L
Arsenic (As)	FWGE	94.1	0.1	ug/L
Barium (Ba)	FWGE	1.49	0.02	ug/L
Berylium (Be)	FWGE	0.037	0.002	ug/L
Bismuth (Bi)	FWGE	< 0.02	0.02	ug/L
Cadmium (Cd)	FWGE	0.30	0.01	ug/L
Chromium (Cr)	FWGE	0.3	0.2	ug/L
Cobalt (Co)	FWGE	9.07	0.005	ug/L
Copper (Cu)	FWGE	2050	0.05	ug/L
Lead (Pb)	FWGE	0.23	0.01	ug/L
Lithium (Li)	FWGE	1.02	0.05	ug/L
Manganese (Mn)	FWGE	105	0.005	ug/L
Molybdenum (Mo)	FWGE	0.07	0.05	ug/L
Nickel (Ni)	FWGE	2.49	0.05	ug/L
Selenium (Se)	FWGE	< 0.2	0.2	ug/L
Silver (Ag)	FWGE	0.42	0.02	ug/L
Strontium (Sr)	FWGE	13.2	0.005	ug/L
Thallium (Tl)	FWGE	0.009	0.002	ug/L
Tin (Sn)	FWGE	1.16	0.01	ug/L
Uranium (U)	FWGE	0.035	0.002	ug/L

TEST DESCRIPTION	MATRIX	RESULT	MDL	UNITS
Vanadium (V)	FWGE	< 0.05	0.05	ug/L
Zinc (Zn)	FWGE	28.9	0.1	ug/L

Order No: 159270 - SEEP 16
Start Date: 7/9/2007 12:00:00AM

General

TEST DESCRIPTION	MATRIX	RESULT	MDL	UNITS
***Acidity total&pH4.5**				
Acidity to pH 4.5	FWGE	< 1	1	mg CaCO3 / L
Acidity, Total	FWGE	3	1	mg CaCO3 / L
***AlkalinityTot-pH4.5**				
Alkalinity, Total	FWGE	< 0.5	0.5	mg CaCO3 / L
***ICA (Cl F SO4)**				
Chloride (Cl)	FWGE	0.3	0.1	mg/L
Fluoride (F)	FWGE	0.01	0.01	mg/L
Sulphate (SO4)	FWGE	10.9	0.5	mg/L
***ICA (NO2 NO3 Br)**				
Bromide (Br)	FWGE	< 0.05	0.05	mg/L
Nitrogen, Nitrate as N	FWGE	0.006	0.002	mg/L
Nitrogen, Nitrite as N	FWGE	0.007	0.005	mg/L
***pH**				
pH	FWGE	5.10	0.01	pH Units
***Residue: Filterable**				
Solids, Total Dissolved (FR)	FWGE	< 10	10	mg/L
***SpecificConductance**				
Conductivity	FWGE	14	2	uS/cm

Metals

TEST DESCRIPTION	MATRIX	RESULT	MDL	UNITS
***ICP Dissolved**				
Aluminum (Al)	FWGE	0.09	0.05	mg/L
Antimony (Sb)	FWGE	< 0.05	0.05	mg/L
Arsenic (As)	FWGE	< 0.05	0.05	mg/L
Barium (Ba)	FWGE	< 0.001	0.001	mg/L
Berylium (Be)	FWGE	< 0.001	0.001	mg/L
Boron (B)	FWGE	0.07	0.01	mg/L
Cadmium (Cd)	FWGE	< 0.005	0.005	mg/L
Calcium (Ca)	FWGE	1.0	0.1	mg/L
Chromium (Cr)	FWGE	< 0.005	0.005	mg/L
Cobalt (Co)	FWGE	< 0.005	0.005	mg/L
Copper (Cu)	FWGE	0.138	0.005	mg/L
Iron (Fe)	FWGE	0.057	0.005	mg/L
Lead (Pb)	FWGE	< 0.05	0.05	mg/L
Magnesium (Mg)	FWGE	0.2	0.1	mg/L
Manganese (Mn)	FWGE	0.039	0.001	mg/L
Molybdenum (Mo)	FWGE	< 0.01	0.01	mg/L
Nickel (Ni)	FWGE	< 0.02	0.02	mg/L
Phosphorus (P)	FWGE	< 0.1	0.1	mg/L

TEST DESCRIPTION	MATRIX	RESULT	MDL	UNITS
Potassium (K)	FWGE	0.2	0.1	mg/L
Selenium (Se)	FWGE	< 0.05	0.05	mg/L
Silicon (Si)	FWGE	1.12	0.05	mg/L
Silver (Ag)	FWGE	< 0.01	0.01	mg/L
Sodium (Na)	FWGE	0.4	0.1	mg/L
Strontium (Sr)	FWGE	0.004	0.001	mg/L
Sulfur (S)	FWGE	1.50	0.05	mg/L
Tin (Sn)	FWGE	< 0.05	0.05	mg/L
Titanium (Ti)	FWGE	< 0.002	0.002	mg/L
Vanadium (V)	FWGE	< 0.01	0.01	mg/L
Zinc (Zn)	FWGE	0.013	0.002	mg/L
***ICP Total**				
Aluminum (Al)	FWGE	0.18	0.06	mg/L
Antimony (Sb)	FWGE	< 0.06	0.06	mg/L
Arsenic (As)	FWGE	< 0.06	0.06	mg/L
Barium (Ba)	FWGE	0.001	0.001	mg/L
Berylium (Be)	FWGE	< 0.001	0.001	mg/L
Boron (B)	FWGE	0.02	0.01	mg/L
Cadmium (Cd)	FWGE	< 0.006	0.006	mg/L
Calcium (Ca)	FWGE	1.1	0.1	mg/L
Chromium (Cr)	FWGE	< 0.006	0.006	mg/L
Cobalt (Co)	FWGE	< 0.006	0.006	mg/L
Copper (Cu)	FWGE	0.14	0.02	mg/L
Iron (Fe)	FWGE	0.17	0.05	mg/L
Lead (Pb)	FWGE	< 0.06	0.06	mg/L
Magnesium (Mg)	FWGE	0.2	0.1	mg/L
Manganese (Mn)	FWGE	0.039	0.001	mg/L
Molybdenum (Mo)	FWGE	< 0.01	0.01	mg/L
Nickel (Ni)	FWGE	< 0.02	0.02	mg/L
Phosphorus (P)	FWGE	< 0.1	0.1	mg/L
Potassium (K)	FWGE	0.2	0.1	mg/L
Selenium (Se)	FWGE	< 0.06	0.06	mg/L
Silicon (Si)	FWGE	1.19	0.06	mg/L
Silver (Ag)	FWGE	< 0.01	0.01	mg/L
Sodium (Na)	FWGE	0.4	0.1	mg/L
Strontium (Sr)	FWGE	0.005	0.001	mg/L
Sulfur (S)	FWGE	1.48	0.06	mg/L
Tin (Sn)	FWGE	< 0.06	0.06	mg/L
Titanium (Ti)	FWGE	< 0.002	0.002	mg/L
Vanadium (V)	FWGE	< 0.01	0.01	mg/L
Zinc (Zn)	FWGE	0.008	0.002	mg/L
***ICPMS Dissolved.**				
Aluminum (Al)	FWGE	92.5	0.2	ug/L
Antimony (Sb)	FWGE	0.588	0.005	ug/L
Arsenic (As)	FWGE	4.4	0.1	ug/L
Barium (Ba)	FWGE	0.63	0.02	ug/L
Berylium (Be)	FWGE	0.010	0.002	ug/L
Bismuth (Bi)	FWGE	< 0.02	0.02	ug/L
Cadmium (Cd)	FWGE	0.04	0.01	ug/L
Chromium (Cr)	FWGE	< 0.2	0.2	ug/L
Cobalt (Co)	FWGE	1.26	0.005	ug/L
Copper (Cu)	FWGE	121	0.05	ug/L

TEST DESCRIPTION	MATRIX	RESULT	MDL	UNITS
Lead (Pb)	FWGE	0.02	0.01	ug/L
Lithium (Li)	FWGE	0.17	0.05	ug/L
Manganese (Mn)	FWGE	33.1	0.005	ug/L
Molybdenum (Mo)	FWGE	0.05	0.05	ug/L
Nickel (Ni)	FWGE	1.74	0.05	ug/L
Selenium (Se)	FWGE	< 0.2	0.2	ug/L
Silver (Ag)	FWGE	0.10	0.02	ug/L
Strontium (Sr)	FWGE	3.38	0.005	ug/L
Thallium (Tl)	FWGE	0.014	0.002	ug/L
Tin (Sn)	FWGE	< 0.01	0.01	ug/L
Uranium (U)	FWGE	< 0.002	0.002	ug/L
Vanadium (V)	FWGE	< 0.05	0.05	ug/L
Zinc (Zn)	FWGE	8.3	0.1	ug/L
***ICPMS Total.**				
Aluminum (Al)	FWGE	129	0.2	ug/L
Antimony (Sb)	FWGE	0.579	0.005	ug/L
Arsenic (As)	FWGE	6.3	0.1	ug/L
Barium (Ba)	FWGE	0.78	0.02	ug/L
Berylium (Be)	FWGE	0.011	0.002	ug/L
Bismuth (Bi)	FWGE	< 0.02	0.02	ug/L
Cadmium (Cd)	FWGE	0.03	0.01	ug/L
Chromium (Cr)	FWGE	0.2	0.2	ug/L
Cobalt (Co)	FWGE	1.27	0.005	ug/L
Copper (Cu)	FWGE	109	0.05	ug/L
Lead (Pb)	FWGE	0.09	0.01	ug/L
Lithium (Li)	FWGE	0.24	0.05	ug/L
Manganese (Mn)	FWGE	32.6	0.005	ug/L
Molybdenum (Mo)	FWGE	0.06	0.05	ug/L
Nickel (Ni)	FWGE	1.82	0.05	ug/L
Selenium (Se)	FWGE	< 0.2	0.2	ug/L
Silver (Ag)	FWGE	0.13	0.02	ug/L
Strontium (Sr)	FWGE	3.61	0.005	ug/L
Thallium (Tl)	FWGE	0.013	0.002	ug/L
Tin (Sn)	FWGE	0.17	0.01	ug/L
Uranium (U)	FWGE	< 0.002	0.002	ug/L
Vanadium (V)	FWGE	0.06	0.05	ug/L
Zinc (Zn)	FWGE	6.3	0.1	ug/L

Order No: 159271 - SEEP 17
Start Date: 7/9/2007 12:00:00AM

General

TEST DESCRIPTION	MATRIX	RESULT	MDL	UNITS
***Acidity total&pH4.5**				
Acidity to pH 4.5	FWGE	6	1	mg CaCO3 / L
Acidity, Total	FWGE	16	1	mg CaCO3 / L
***AlkalinityTot-pH4.5**				
Alkalinity to pH 4.5	FWGE	< 0.5	0.5	mg CaCO3 / L

TEST DESCRIPTION	MATRIX	RESULT	MDL	UNITS
***ICA (Cl F SO4)**				
Chloride (Cl)	FWGE	0.2	0.1	mg/L
Fluoride (F)	FWGE	0.01	0.01	mg/L
Sulphate (SO4)	FWGE	103	3	mg/L
Analysis performed after recommended hold time.				
***ICA (NO2 NO3 Br)**				
Bromide (Br)	FWGE	< 0.05	0.05	mg/L
Nitrogen, Nitrate as N	FWGE	0.008	0.002	mg/L
Nitrogen, Nitrite as N	FWGE	0.006	0.005	mg/L
***pH**				
pH	FWGE	3.87	0.01	pH Units
***Residue: Filterable**				
Solids, Total Dissolved (FR)	FWGE	50	10	mg/L
Analysis performed after recommended hold time.				
***SpecificConductance**				
Conductivity	FWGE	95	2	uS/cm
Metals				
***ICP Dissolved**				
Aluminum (Al)	FWGE	0.70	0.05	mg/L
Antimony (Sb)	FWGE	< 0.05	0.05	mg/L
Arsenic (As)	FWGE	< 0.05	0.05	mg/L
Barium (Ba)	FWGE	0.001	0.001	mg/L
Berylium (Be)	FWGE	< 0.001	0.001	mg/L
Boron (B)	FWGE	0.10	0.01	mg/L
Cadmium (Cd)	FWGE	< 0.005	0.005	mg/L
Calcium (Ca)	FWGE	6.1	0.1	mg/L
Chromium (Cr)	FWGE	< 0.005	0.005	mg/L
Cobalt (Co)	FWGE	0.008	0.005	mg/L
Copper (Cu)	FWGE	1.18	0.005	mg/L
Iron (Fe)	FWGE	1.15	0.005	mg/L
Lead (Pb)	FWGE	< 0.05	0.05	mg/L
Magnesium (Mg)	FWGE	0.6	0.1	mg/L
Manganese (Mn)	FWGE	0.089	0.001	mg/L
Molybdenum (Mo)	FWGE	< 0.01	0.01	mg/L
Nickel (Ni)	FWGE	< 0.02	0.02	mg/L
Phosphorus (P)	FWGE	< 0.1	0.1	mg/L
Potassium (K)	FWGE	0.3	0.1	mg/L
Selenium (Se)	FWGE	< 0.05	0.05	mg/L
Silicon (Si)	FWGE	1.44	0.05	mg/L
Silver (Ag)	FWGE	< 0.01	0.01	mg/L
Sodium (Na)	FWGE	0.2	0.1	mg/L
Strontium (Sr)	FWGE	0.011	0.001	mg/L
Sulfur (S)	FWGE	9.67	0.05	mg/L
Tin (Sn)	FWGE	< 0.05	0.05	mg/L
Titanium (Ti)	FWGE	< 0.002	0.002	mg/L
Vanadium (V)	FWGE	< 0.01	0.01	mg/L
Zinc (Zn)	FWGE	0.039	0.002	mg/L
***ICP Total**				
Aluminum (Al)	FWGE	0.68	0.06	mg/L

TEST DESCRIPTION	MATRIX	RESULT	MDL	UNITS
Antimony (Sb)	FWGE	< 0.06	0.06	mg/L
Arsenic (As)	FWGE	0.06	0.06	mg/L
Barium (Ba)	FWGE	0.001	0.001	mg/L
Berylium (Be)	FWGE	< 0.001	0.001	mg/L
Boron (B)	FWGE	< 0.01	0.01	mg/L
Cadmium (Cd)	FWGE	< 0.006	0.006	mg/L
Calcium (Ca)	FWGE	5.7	0.1	mg/L
Chromium (Cr)	FWGE	< 0.006	0.006	mg/L
Cobalt (Co)	FWGE	0.008	0.006	mg/L
Copper (Cu)	FWGE	1.26	0.02	mg/L
Iron (Fe)	FWGE	2.46	0.05	mg/L
Lead (Pb)	FWGE	< 0.06	0.06	mg/L
Magnesium (Mg)	FWGE	0.6	0.1	mg/L
Manganese (Mn)	FWGE	0.083	0.001	mg/L
Molybdenum (Mo)	FWGE	< 0.01	0.01	mg/L
Nickel (Ni)	FWGE	< 0.02	0.02	mg/L
Phosphorus (P)	FWGE	< 0.1	0.1	mg/L
Potassium (K)	FWGE	0.3	0.1	mg/L
Selenium (Se)	FWGE	< 0.06	0.06	mg/L
Silicon (Si)	FWGE	1.28	0.06	mg/L
Silver (Ag)	FWGE	< 0.01	0.01	mg/L
Sodium (Na)	FWGE	0.2	0.1	mg/L
Strontium (Sr)	FWGE	0.010	0.001	mg/L
Sulfur (S)	FWGE	9.89	0.06	mg/L
Tin (Sn)	FWGE	< 0.06	0.06	mg/L
Titanium (Ti)	FWGE	< 0.002	0.002	mg/L
Vanadium (V)	FWGE	< 0.01	0.01	mg/L
Zinc (Zn)	FWGE	0.035	0.002	mg/L
***ICPMS Dissolved.**				
Aluminum (Al)	FWGE	700	0.2	ug/L
Antimony (Sb)	FWGE	0.036	0.005	ug/L
Arsenic (As)	FWGE	10.5	0.1	ug/L
Barium (Ba)	FWGE	1.05	0.02	ug/L
Berylium (Be)	FWGE	0.027	0.002	ug/L
Bismuth (Bi)	FWGE	< 0.02	0.02	ug/L
Cadmium (Cd)	FWGE	0.23	0.01	ug/L
Chromium (Cr)	FWGE	< 0.2	0.2	ug/L
Cobalt (Co)	FWGE	7.43	0.005	ug/L
Copper (Cu)	FWGE	1180	0.05	ug/L
Lead (Pb)	FWGE	0.12	0.01	ug/L
Lithium (Li)	FWGE	0.74	0.05	ug/L
Manganese (Mn)	FWGE	80	0.005	ug/L
Molybdenum (Mo)	FWGE	< 0.05	0.05	ug/L
Nickel (Ni)	FWGE	1.87	0.05	ug/L
Selenium (Se)	FWGE	< 0.2	0.2	ug/L
Silver (Ag)	FWGE	0.14	0.02	ug/L
Strontium (Sr)	FWGE	9.76	0.005	ug/L
Thallium (Tl)	FWGE	0.005	0.002	ug/L
Tin (Sn)	FWGE	< 0.01	0.01	ug/L
Uranium (U)	FWGE	0.026	0.002	ug/L
Vanadium (V)	FWGE	< 0.05	0.05	ug/L
Zinc (Zn)	FWGE	30.0	0.1	ug/L

TEST DESCRIPTION	MATRIX	RESULT	MDL	UNITS
***ICPMS Total.**				
Aluminum (Al)	FWGE	680	0.2	ug/L
Antimony (Sb)	FWGE	0.067	0.005	ug/L
Arsenic (As)	FWGE	55.1	0.1	ug/L
Barium (Ba)	FWGE	1.04	0.02	ug/L
Berylium (Be)	FWGE	0.026	0.002	ug/L
Bismuth (Bi)	FWGE	< 0.02	0.02	ug/L
Cadmium (Cd)	FWGE	0.19	0.01	ug/L
Chromium (Cr)	FWGE	< 0.2	0.2	ug/L
Cobalt (Co)	FWGE	6.93	0.005	ug/L
Copper (Cu)	FWGE	1260	0.05	ug/L
Lead (Pb)	FWGE	0.16	0.01	ug/L
Lithium (Li)	FWGE	0.88	0.05	ug/L
Manganese (Mn)	FWGE	73.7	0.005	ug/L
Molybdenum (Mo)	FWGE	0.06	0.05	ug/L
Nickel (Ni)	FWGE	6.33	0.05	ug/L
Selenium (Se)	FWGE	< 0.2	0.2	ug/L
Silver (Ag)	FWGE	0.32	0.02	ug/L
Strontium (Sr)	FWGE	10	0.005	ug/L
Thallium (Tl)	FWGE	0.004	0.002	ug/L
Tin (Sn)	FWGE	0.19	0.01	ug/L
Uranium (U)	FWGE	0.026	0.002	ug/L
Vanadium (V)	FWGE	0.05	0.05	ug/L
Zinc (Zn)	FWGE	21.0	0.1	ug/L

Order No: 159272 - SEEP 2

Start Date: 7/9/2007 12:00:00AM

General

TEST DESCRIPTION	MATRIX	RESULT	MDL	UNITS
***Acidity total&pH4.5**				
Acidity to pH 4.5	FWGE	< 1	1	mg CaCO3 / L
Acidity, Total	FWGE	11	1	mg CaCO3 / L
***AlkalinityTot-pH4.5**				
Alkalinity to pH 4.5	FWGE	< 0.5	0.5	mg CaCO3 / L
***ICA (Cl F SO4)**				
Chloride (Cl)	FWGE	0.3	0.1	mg/L
Fluoride (F)	FWGE	0.04	0.01	mg/L
Sulphate (SO4)	FWGE	101	3	mg/L
Analysis performed after recommended hold time.				
***ICA (NO2 NO3 Br)**				
Bromide (Br)	FWGE	< 0.05	0.05	mg/L
Nitrogen, Nitrate as N	FWGE	0.017	0.002	mg/L
Nitrogen, Nitrite as N	FWGE	< 0.005	0.005	mg/L
***pH**				
pH	FWGE	4.26	0.01	pH Units
***Residue: Filterable**				

TEST DESCRIPTION	MATRIX	RESULT	MDL	UNITS
Solids, Total Dissolved (FR)	FWGE	505	10	mg/L
Analysis performed after recommended hold time.				
***SpecificConductance**				
Conductivity	FWGE	123	2	uS/cm

Metals

TEST DESCRIPTION	MATRIX	RESULT	MDL	UNITS
***ICP Dissolved**				
Aluminum (Al)	FWGE	0.68	0.05	mg/L
Antimony (Sb)	FWGE	< 0.05	0.05	mg/L
Arsenic (As)	FWGE	< 0.05	0.05	mg/L
Barium (Ba)	FWGE	0.006	0.001	mg/L
Berylium (Be)	FWGE	< 0.001	0.001	mg/L
Boron (B)	FWGE	0.05	0.01	mg/L
Cadmium (Cd)	FWGE	< 0.005	0.005	mg/L
Calcium (Ca)	FWGE	10.3	0.1	mg/L
Chromium (Cr)	FWGE	< 0.005	0.005	mg/L
Cobalt (Co)	FWGE	0.020	0.005	mg/L
Copper (Cu)	FWGE	4.33	0.005	mg/L
Iron (Fe)	FWGE	0.127	0.005	mg/L
Lead (Pb)	FWGE	< 0.05	0.05	mg/L
Magnesium (Mg)	FWGE	2.2	0.1	mg/L
Manganese (Mn)	FWGE	0.272	0.001	mg/L
Molybdenum (Mo)	FWGE	< 0.01	0.01	mg/L
Nickel (Ni)	FWGE	< 0.02	0.02	mg/L
Phosphorus (P)	FWGE	< 0.1	0.1	mg/L
Potassium (K)	FWGE	0.7	0.1	mg/L
Selenium (Se)	FWGE	< 0.05	0.05	mg/L
Silicon (Si)	FWGE	2.48	0.05	mg/L
Silver (Ag)	FWGE	< 0.01	0.01	mg/L
Sodium (Na)	FWGE	0.4	0.1	mg/L
Strontium (Sr)	FWGE	0.023	0.001	mg/L
Sulfur (S)	FWGE	15.8	0.05	mg/L
Tin (Sn)	FWGE	< 0.05	0.05	mg/L
Titanium (Ti)	FWGE	< 0.002	0.002	mg/L
Vanadium (V)	FWGE	< 0.01	0.01	mg/L
Zinc (Zn)	FWGE	0.094	0.002	mg/L
***ICP Total**				
Aluminum (Al)	FWGE	0.87	0.06	mg/L
Antimony (Sb)	FWGE	< 0.06	0.06	mg/L
Arsenic (As)	FWGE	< 0.06	0.06	mg/L
Barium (Ba)	FWGE	0.006	0.001	mg/L
Berylium (Be)	FWGE	< 0.001	0.001	mg/L
Boron (B)	FWGE	< 0.01	0.01	mg/L
Cadmium (Cd)	FWGE	< 0.006	0.006	mg/L
Calcium (Ca)	FWGE	10.8	0.1	mg/L
Chromium (Cr)	FWGE	< 0.006	0.006	mg/L
Cobalt (Co)	FWGE	0.019	0.006	mg/L
Copper (Cu)	FWGE	4.62	0.02	mg/L
Iron (Fe)	FWGE	1.57	0.05	mg/L
Lead (Pb)	FWGE	< 0.06	0.06	mg/L
Magnesium (Mg)	FWGE	2.0	0.1	mg/L
Manganese (Mn)	FWGE	0.291	0.001	mg/L

TEST DESCRIPTION	MATRIX	RESULT	MDL	UNITS
Molybdenum (Mo)	FWGE	< 0.01	0.01	mg/L
Nickel (Ni)	FWGE	< 0.02	0.02	mg/L
Phosphorus (P)	FWGE	< 0.1	0.1	mg/L
Potassium (K)	FWGE	0.7	0.1	mg/L
Selenium (Se)	FWGE	< 0.06	0.06	mg/L
Silicon (Si)	FWGE	2.31	0.06	mg/L
Silver (Ag)	FWGE	< 0.01	0.01	mg/L
Sodium (Na)	FWGE	0.4	0.1	mg/L
Strontium (Sr)	FWGE	0.022	0.001	mg/L
Sulfur (S)	FWGE	16.1	0.06	mg/L
Tin (Sn)	FWGE	< 0.06	0.06	mg/L
Titanium (Ti)	FWGE	0.005	0.002	mg/L
Vanadium (V)	FWGE	< 0.01	0.01	mg/L
Zinc (Zn)	FWGE	0.087	0.002	mg/L
***ICPMS Dissolved.**				
Aluminum (Al)	FWGE	680	0.2	ug/L
Antimony (Sb)	FWGE	0.019	0.005	ug/L
Arsenic (As)	FWGE	0.1	0.1	ug/L
Barium (Ba)	FWGE	5.13	0.02	ug/L
Berylium (Be)	FWGE	0.062	0.002	ug/L
Bismuth (Bi)	FWGE	< 0.02	0.02	ug/L
Cadmium (Cd)	FWGE	0.65	0.01	ug/L
Chromium (Cr)	FWGE	< 0.2	0.2	ug/L
Cobalt (Co)	FWGE	17.6	0.005	ug/L
Copper (Cu)	FWGE	4330	0.05	ug/L
Lead (Pb)	FWGE	0.06	0.01	ug/L
Lithium (Li)	FWGE	1.22	0.05	ug/L
Manganese (Mn)	FWGE	261	0.005	ug/L
Molybdenum (Mo)	FWGE	< 0.05	0.05	ug/L
Nickel (Ni)	FWGE	14	0.05	ug/L
Selenium (Se)	FWGE	< 0.2	0.2	ug/L
Silver (Ag)	FWGE	0.18	0.02	ug/L
Strontium (Sr)	FWGE	19.9	0.005	ug/L
Thallium (Tl)	FWGE	0.111	0.002	ug/L
Tin (Sn)	FWGE	< 0.01	0.01	ug/L
Uranium (U)	FWGE	0.063	0.002	ug/L
Vanadium (V)	FWGE	< 0.05	0.05	ug/L
Zinc (Zn)	FWGE	74.2	0.1	ug/L
***ICPMS Total.**				
Aluminum (Al)	FWGE	870	0.2	ug/L
Antimony (Sb)	FWGE	0.048	0.005	ug/L
Arsenic (As)	FWGE	2.2	0.1	ug/L
Barium (Ba)	FWGE	5.64	0.02	ug/L
Berylium (Be)	FWGE	0.070	0.002	ug/L
Bismuth (Bi)	FWGE	< 0.02	0.02	ug/L
Cadmium (Cd)	FWGE	0.58	0.01	ug/L
Chromium (Cr)	FWGE	< 0.2	0.2	ug/L
Cobalt (Co)	FWGE	17	0.005	ug/L
Copper (Cu)	FWGE	4620	0.05	ug/L
Lead (Pb)	FWGE	0.13	0.01	ug/L
Lithium (Li)	FWGE	1.49	0.05	ug/L
Manganese (Mn)	FWGE	255	0.005	ug/L

TEST DESCRIPTION	MATRIX	RESULT	MDL	UNITS
Molybdenum (Mo)	FWGE	0.05	0.05	ug/L
Nickel (Ni)	FWGE	14.8	0.05	ug/L
Selenium (Se)	FWGE	< 0.2	0.2	ug/L
Silver (Ag)	FWGE	0.25	0.02	ug/L
Strontium (Sr)	FWGE	21.2	0.005	ug/L
Thallium (Tl)	FWGE	0.104	0.002	ug/L
Tin (Sn)	FWGE	0.66	0.01	ug/L
Uranium (U)	FWGE	0.071	0.002	ug/L
Vanadium (V)	FWGE	0.10	0.05	ug/L
Zinc (Zn)	FWGE	55.8	0.1	ug/L

Order No: 159273 - SEEP 3
Start Date: 7/9/2007 12:00:00AM

General

TEST DESCRIPTION	MATRIX	RESULT	MDL	UNITS
***Acidity total&pH4.5**				
Acidity to pH 4.5	FWGE	14	1	mg CaCO3 / L
Acidity, Total	FWGE	162	1	mg CaCO3 / L
***AlkalinityTot-pH4.5**				
Alkalinity to pH 4.5	FWGE	< 0.5	0.5	mg CaCO3 / L
***ICA (Cl F SO4)**				
Chloride (Cl)	FWGE	2.4	0.1	mg/L
Fluoride (F)	FWGE	0.04	0.01	mg/L
Sulphate (SO4)	FWGE	994	30	mg/L
Analysis performed after recommended hold time.				
***ICA (NO2 NO3 Br)**				
Bromide (Br)	FWGE	0.13	0.05	mg/L
Nitrogen, Nitrate as N	FWGE	0.179	0.002	mg/L
Nitrogen, Nitrite as N	FWGE	< 0.005	0.005	mg/L
***pH**				
pH	FWGE	4.34	0.01	pH Units
***Residue: Filterable**				
Solids, Total Dissolved (FR)	FWGE	923	10	mg/L
Analysis performed after recommended hold time.				
***SpecificConductance**				
Conductivity	FWGE	926	2	uS/cm

Metals

TEST DESCRIPTION	MATRIX	RESULT	MDL	UNITS
***ICP Dissolved**				
Aluminum (Al)	FWGE	25.8	0.05	mg/L
Antimony (Sb)	FWGE	< 0.05	0.05	mg/L
Arsenic (As)	FWGE	< 0.05	0.05	mg/L
Barium (Ba)	FWGE	0.013	0.001	mg/L
Berylium (Be)	FWGE	< 0.001	0.001	mg/L
Boron (B)	FWGE	0.03	0.01	mg/L
Cadmium (Cd)	FWGE	< 0.005	0.005	mg/L

TEST DESCRIPTION	MATRIX	RESULT	MDL	UNITS
Calcium (Ca)	FWGE	122	0.1	mg/L
Chromium (Cr)	FWGE	< 0.005	0.005	mg/L
Cobalt (Co)	FWGE	0.232	0.005	mg/L
Copper (Cu)	FWGE	13.5	0.005	mg/L
Iron (Fe)	FWGE	0.77	0.005	mg/L
Lead (Pb)	FWGE	< 0.05	0.05	mg/L
Magnesium (Mg)	FWGE	22.0	0.1	mg/L
Manganese (Mn)	FWGE	3.47	0.001	mg/L
Molybdenum (Mo)	FWGE	< 0.01	0.01	mg/L
Nickel (Ni)	FWGE	0.14	0.02	mg/L
Phosphorus (P)	FWGE	< 0.1	0.1	mg/L
Potassium (K)	FWGE	3.1	0.1	mg/L
Selenium (Se)	FWGE	< 0.05	0.05	mg/L
Silicon (Si)	FWGE	11.3	0.05	mg/L
Silver (Ag)	FWGE	< 0.01	0.01	mg/L
Sodium (Na)	FWGE	3.7	0.1	mg/L
Strontium (Sr)	FWGE	0.237	0.001	mg/L
Sulfur (S)	FWGE	189	0.05	mg/L
Tin (Sn)	FWGE	< 0.05	0.05	mg/L
Titanium (Ti)	FWGE	< 0.002	0.002	mg/L
Vanadium (V)	FWGE	< 0.01	0.01	mg/L
Zinc (Zn)	FWGE	0.657	0.002	mg/L
***ICP Total**				
Aluminum (Al)	FWGE	26.6	0.06	mg/L
Antimony (Sb)	FWGE	< 0.06	0.06	mg/L
Arsenic (As)	FWGE	< 0.06	0.06	mg/L
Barium (Ba)	FWGE	0.012	0.001	mg/L
Berylium (Be)	FWGE	< 0.001	0.001	mg/L
Boron (B)	FWGE	0.01	0.01	mg/L
Cadmium (Cd)	FWGE	< 0.006	0.006	mg/L
Calcium (Ca)	FWGE	132	0.1	mg/L
Chromium (Cr)	FWGE	< 0.006	0.006	mg/L
Cobalt (Co)	FWGE	0.239	0.006	mg/L
Copper (Cu)	FWGE	13.7	0.02	mg/L
Iron (Fe)	FWGE	1.24	0.05	mg/L
Lead (Pb)	FWGE	< 0.06	0.06	mg/L
Magnesium (Mg)	FWGE	19.0	0.1	mg/L
Manganese (Mn)	FWGE	3.57	0.001	mg/L
Molybdenum (Mo)	FWGE	< 0.01	0.01	mg/L
Nickel (Ni)	FWGE	0.14	0.02	mg/L
Phosphorus (P)	FWGE	< 0.1	0.1	mg/L
Potassium (K)	FWGE	3.3	0.1	mg/L
Selenium (Se)	FWGE	< 0.06	0.06	mg/L
Silicon (Si)	FWGE	11.7	0.06	mg/L
Silver (Ag)	FWGE	< 0.01	0.01	mg/L
Sodium (Na)	FWGE	3.3	0.1	mg/L
Strontium (Sr)	FWGE	0.260	0.001	mg/L
Sulfur (S)	FWGE	189	0.06	mg/L
Tin (Sn)	FWGE	< 0.06	0.06	mg/L
Titanium (Ti)	FWGE	0.003	0.002	mg/L
Vanadium (V)	FWGE	< 0.01	0.01	mg/L
Zinc (Zn)	FWGE	0.723	0.002	mg/L

TEST DESCRIPTION	MATRIX	RESULT	MDL	UNITS
***ICPMS Dissolved.**				
Aluminum (Al)	FWGE	25800	0.2	ug/L
Antimony (Sb)	FWGE	0.044	0.005	ug/L
Arsenic (As)	FWGE	0.6	0.1	ug/L
Barium (Ba)	FWGE	11	0.02	ug/L
Berylium (Be)	FWGE	0.565	0.002	ug/L
Bismuth (Bi)	FWGE	< 0.02	0.02	ug/L
Cadmium (Cd)	FWGE	3.70	0.01	ug/L
Chromium (Cr)	FWGE	0.4	0.2	ug/L
Cobalt (Co)	FWGE	210	0.005	ug/L
Copper (Cu)	FWGE	13500	0.05	ug/L
Lead (Pb)	FWGE	0.10	0.01	ug/L
Lithium (Li)	FWGE	8.86	0.05	ug/L
Manganese (Mn)	FWGE	3470	0.005	ug/L
Molybdenum (Mo)	FWGE	0.20	0.05	ug/L
Nickel (Ni)	FWGE	111	0.05	ug/L
Selenium (Se)	FWGE	0.9	0.2	ug/L
Silver (Ag)	FWGE	0.12	0.02	ug/L
Strontium (Sr)	FWGE	258	0.005	ug/L
Thallium (Tl)	FWGE	0.079	0.002	ug/L
Tin (Sn)	FWGE	< 0.01	0.01	ug/L
Uranium (U)	FWGE	0.162	0.002	ug/L
Vanadium (V)	FWGE	0.09	0.05	ug/L
Zinc (Zn)	FWGE	657	0.1	ug/L
***ICPMS Total.**				
Aluminum (Al)	FWGE	26600	0.2	ug/L
Antimony (Sb)	FWGE	0.054	0.005	ug/L
Arsenic (As)	FWGE	0.7	0.1	ug/L
Barium (Ba)	FWGE	10.8	0.02	ug/L
Berylium (Be)	FWGE	0.572	0.002	ug/L
Bismuth (Bi)	FWGE	< 0.02	0.02	ug/L
Cadmium (Cd)	FWGE	3.40	0.01	ug/L
Chromium (Cr)	FWGE	0.3	0.2	ug/L
Cobalt (Co)	FWGE	203	0.005	ug/L
Copper (Cu)	FWGE	13700	0.05	ug/L
Lead (Pb)	FWGE	3.52	0.01	ug/L
Lithium (Li)	FWGE	9.89	0.05	ug/L
Manganese (Mn)	FWGE	3570	0.005	ug/L
Molybdenum (Mo)	FWGE	0.41	0.05	ug/L
Nickel (Ni)	FWGE	106	0.05	ug/L
Selenium (Se)	FWGE	0.8	0.2	ug/L
Silver (Ag)	FWGE	0.18	0.02	ug/L
Strontium (Sr)	FWGE	266	0.005	ug/L
Thallium (Tl)	FWGE	0.062	0.002	ug/L
Tin (Sn)	FWGE	0.01	0.01	ug/L
Uranium (U)	FWGE	0.161	0.002	ug/L
Vanadium (V)	FWGE	< 0.05	0.05	ug/L
Zinc (Zn)	FWGE	723	0.1	ug/L

TEST DESCRIPTION	MATRIX	RESULT	MDL	UNITS

Order No: 159274 - SEEP 4
Start Date: 7/9/2007 12:00:00AM

General

TEST DESCRIPTION	MATRIX	RESULT	MDL	UNITS
***Acidity total&pH4.5**				
Acidity to pH 4.5	FWGE	< 1	1	mg CaCO3 / L
Acidity, Total	FWGE	5	1	mg CaCO3 / L
***AlkalinityTot-pH4.5**				
Alkalinity, Total	FWGE	0.8	0.5	mg CaCO3 / L
***ICA (Cl F SO4)**				
Chloride (Cl)	FWGE	0.2	0.1	mg/L
Fluoride (F)	FWGE	< 0.01	0.01	mg/L
Sulphate (SO4)	FWGE	23	5	mg/L
***ICA (NO2 NO3 Br)**				
Bromide (Br)	FWGE	< 0.05	0.05	mg/L
Nitrogen, Nitrate as N	FWGE	0.011	0.002	mg/L
Nitrogen, Nitrite as N	FWGE	< 0.005	0.005	mg/L
***pH**				
pH	FWGE	5.59	0.01	pH Units
***Residue: Filterable**				
Solids, Total Dissolved (FR)	FWGE	324	10	mg/L
Analysis performed after recommended hold time.				
***SpecificConductance**				
Conductivity	FWGE	57	2	uS/cm

Metals

TEST DESCRIPTION	MATRIX	RESULT	MDL	UNITS
***ICP Dissolved**				
Aluminum (Al)	FWGE	0.17	0.05	mg/L
Antimony (Sb)	FWGE	< 0.05	0.05	mg/L
Arsenic (As)	FWGE	< 0.05	0.05	mg/L
Barium (Ba)	FWGE	0.003	0.001	mg/L
Berylium (Be)	FWGE	< 0.001	0.001	mg/L
Boron (B)	FWGE	0.02	0.01	mg/L
Cadmium (Cd)	FWGE	< 0.005	0.005	mg/L
Calcium (Ca)	FWGE	5.9	0.1	mg/L
Chromium (Cr)	FWGE	< 0.005	0.005	mg/L
Cobalt (Co)	FWGE	< 0.005	0.005	mg/L
Copper (Cu)	FWGE	0.169	0.005	mg/L
Iron (Fe)	FWGE	1.41	0.005	mg/L
Lead (Pb)	FWGE	< 0.05	0.05	mg/L
Magnesium (Mg)	FWGE	1.0	0.1	mg/L
Manganese (Mn)	FWGE	0.233	0.001	mg/L
Molybdenum (Mo)	FWGE	< 0.01	0.01	mg/L
Nickel (Ni)	FWGE	< 0.02	0.02	mg/L
Phosphorus (P)	FWGE	< 0.1	0.1	mg/L

TEST DESCRIPTION	MATRIX	RESULT	MDL	UNITS
Potassium (K)	FWGE	0.4	0.1	mg/L
Selenium (Se)	FWGE	< 0.05	0.05	mg/L
Silicon (Si)	FWGE	1.32	0.05	mg/L
Silver (Ag)	FWGE	< 0.01	0.01	mg/L
Sodium (Na)	FWGE	0.4	0.1	mg/L
Strontium (Sr)	FWGE	0.019	0.001	mg/L
Sulfur (S)	FWGE	7.44	0.05	mg/L
Tin (Sn)	FWGE	< 0.05	0.05	mg/L
Titanium (Ti)	FWGE	< 0.002	0.002	mg/L
Vanadium (V)	FWGE	< 0.01	0.01	mg/L
Zinc (Zn)	FWGE	0.014	0.002	mg/L
***ICP Total**				
Aluminum (Al)	FWGE	0.22	0.06	mg/L
Antimony (Sb)	FWGE	< 0.06	0.06	mg/L
Arsenic (As)	FWGE	< 0.06	0.06	mg/L
Barium (Ba)	FWGE	0.004	0.001	mg/L
Berylium (Be)	FWGE	< 0.001	0.001	mg/L
Boron (B)	FWGE	< 0.01	0.01	mg/L
Cadmium (Cd)	FWGE	< 0.006	0.006	mg/L
Calcium (Ca)	FWGE	7.0	0.1	mg/L
Chromium (Cr)	FWGE	< 0.006	0.006	mg/L
Cobalt (Co)	FWGE	< 0.006	0.006	mg/L
Copper (Cu)	FWGE	0.16	0.02	mg/L
Iron (Fe)	FWGE	1.49	0.05	mg/L
Lead (Pb)	FWGE	< 0.06	0.06	mg/L
Magnesium (Mg)	FWGE	0.9	0.1	mg/L
Manganese (Mn)	FWGE	0.248	0.001	mg/L
Molybdenum (Mo)	FWGE	< 0.01	0.01	mg/L
Nickel (Ni)	FWGE	< 0.02	0.02	mg/L
Phosphorus (P)	FWGE	< 0.1	0.1	mg/L
Potassium (K)	FWGE	0.4	0.1	mg/L
Selenium (Se)	FWGE	< 0.06	0.06	mg/L
Silicon (Si)	FWGE	1.21	0.06	mg/L
Silver (Ag)	FWGE	< 0.01	0.01	mg/L
Sodium (Na)	FWGE	0.4	0.1	mg/L
Strontium (Sr)	FWGE	0.018	0.001	mg/L
Sulfur (S)	FWGE	7.52	0.06	mg/L
Tin (Sn)	FWGE	< 0.06	0.06	mg/L
Titanium (Ti)	FWGE	0.002	0.002	mg/L
Vanadium (V)	FWGE	< 0.01	0.01	mg/L
Zinc (Zn)	FWGE	0.012	0.002	mg/L
***ICPMS Dissolved.**				
Aluminum (Al)	FWGE	162	0.2	ug/L
Antimony (Sb)	FWGE	0.034	0.005	ug/L
Arsenic (As)	FWGE	1.6	0.1	ug/L
Barium (Ba)	FWGE	2.38	0.02	ug/L
Berylium (Be)	FWGE	0.006	0.002	ug/L
Bismuth (Bi)	FWGE	< 0.02	0.02	ug/L
Cadmium (Cd)	FWGE	0.03	0.01	ug/L
Chromium (Cr)	FWGE	< 0.2	0.2	ug/L
Cobalt (Co)	FWGE	3.36	0.005	ug/L
Copper (Cu)	FWGE	138	0.05	ug/L

TEST DESCRIPTION	MATRIX	RESULT	MDL	UNITS
Lead (Pb)	FWGE	0.04	0.01	ug/L
Lithium (Li)	FWGE	0.30	0.05	ug/L
Manganese (Mn)	FWGE	221	0.005	ug/L
Molybdenum (Mo)	FWGE	< 0.05	0.05	ug/L
Nickel (Ni)	FWGE	1.25	0.05	ug/L
Selenium (Se)	FWGE	< 0.2	0.2	ug/L
Silver (Ag)	FWGE	< 0.02	0.02	ug/L
Strontium (Sr)	FWGE	15.6	0.005	ug/L
Thallium (Tl)	FWGE	0.004	0.002	ug/L
Tin (Sn)	FWGE	< 0.01	0.01	ug/L
Uranium (U)	FWGE	< 0.002	0.002	ug/L
Vanadium (V)	FWGE	< 0.05	0.05	ug/L
Zinc (Zn)	FWGE	7.1	0.1	ug/L
***ICPMS Total.**				
Aluminum (Al)	FWGE	202	0.2	ug/L
Antimony (Sb)	FWGE	0.044	0.005	ug/L
Arsenic (As)	FWGE	1.5	0.1	ug/L
Barium (Ba)	FWGE	2.30	0.02	ug/L
Berylium (Be)	FWGE	0.011	0.002	ug/L
Bismuth (Bi)	FWGE	< 0.02	0.02	ug/L
Cadmium (Cd)	FWGE	0.03	0.01	ug/L
Chromium (Cr)	FWGE	< 0.2	0.2	ug/L
Cobalt (Co)	FWGE	3.1	0.005	ug/L
Copper (Cu)	FWGE	124	0.05	ug/L
Lead (Pb)	FWGE	0.10	0.01	ug/L
Lithium (Li)	FWGE	0.37	0.05	ug/L
Manganese (Mn)	FWGE	201	0.005	ug/L
Molybdenum (Mo)	FWGE	< 0.05	0.05	ug/L
Nickel (Ni)	FWGE	1.31	0.05	ug/L
Selenium (Se)	FWGE	< 0.2	0.2	ug/L
Silver (Ag)	FWGE	0.03	0.02	ug/L
Strontium (Sr)	FWGE	15.7	0.005	ug/L
Thallium (Tl)	FWGE	0.003	0.002	ug/L
Tin (Sn)	FWGE	0.33	0.01	ug/L
Uranium (U)	FWGE	0.002	0.002	ug/L
Vanadium (V)	FWGE	< 0.05	0.05	ug/L
Zinc (Zn)	FWGE	5.0	0.1	ug/L

Order No: 159275 - SEEP 5
Start Date: 7/9/2007 12:00:00AM

General

TEST DESCRIPTION	MATRIX	RESULT	MDL	UNITS
***Acidity total&pH4.5**				
Acidity to pH 4.5	FWGE	< 1	1	mg CaCO3 / L
Acidity, Total	FWGE	4	1	mg CaCO3 / L
***AlkalinityTot-pH4.5**				
Alkalinity to pH 4.5	FWGE	16.4	0.5	mg CaCO3 / L

TEST DESCRIPTION	MATRIX	RESULT	MDL	UNITS
***ICA (Cl F SO4)**				
Chloride (Cl)	FWGE	0.3	0.1	mg/L
Fluoride (F)	FWGE	0.08	0.01	mg/L
Sulphate (SO4)	FWGE	339	10	mg/L
***ICA (NO2 NO3 Br)**				
Bromide (Br)	FWGE	< 0.05	0.05	mg/L
Nitrogen, Nitrate as N	FWGE	0.017	0.002	mg/L
Nitrogen, Nitrite as N	FWGE	0.008	0.005	mg/L
***pH**				
pH	FWGE	6.86	0.01	pH Units
***Residue: Filterable**				
Solids, Total Dissolved (FR)	FWGE	647	10	mg/L
***SpecificConductance**				
Conductivity	FWGE	653	2	uS/cm
Metals				
***ICP Dissolved**				
Aluminum (Al)	FWGE	< 0.05	0.05	mg/L
Antimony (Sb)	FWGE	< 0.05	0.05	mg/L
Arsenic (As)	FWGE	< 0.05	0.05	mg/L
Barium (Ba)	FWGE	0.022	0.001	mg/L
Berylium (Be)	FWGE	< 0.001	0.001	mg/L
Boron (B)	FWGE	0.02	0.01	mg/L
Cadmium (Cd)	FWGE	< 0.005	0.005	mg/L
Calcium (Ca)	FWGE	112	0.1	mg/L
Chromium (Cr)	FWGE	< 0.005	0.005	mg/L
Cobalt (Co)	FWGE	0.041	0.005	mg/L
Copper (Cu)	FWGE	1.13	0.005	mg/L
Iron (Fe)	FWGE	5.7	0.005	mg/L
Lead (Pb)	FWGE	< 0.05	0.05	mg/L
Magnesium (Mg)	FWGE	10.2	0.1	mg/L
Manganese (Mn)	FWGE	1.3	0.001	mg/L
Molybdenum (Mo)	FWGE	< 0.01	0.01	mg/L
Nickel (Ni)	FWGE	0.04	0.02	mg/L
Phosphorus (P)	FWGE	< 0.1	0.1	mg/L
Potassium (K)	FWGE	3.0	0.1	mg/L
Selenium (Se)	FWGE	< 0.05	0.05	mg/L
Silicon (Si)	FWGE	6.91	0.05	mg/L
Silver (Ag)	FWGE	< 0.01	0.01	mg/L
Sodium (Na)	FWGE	2.6	0.1	mg/L
Strontium (Sr)	FWGE	0.279	0.001	mg/L
Sulfur (S)	FWGE	112	0.05	mg/L
Tin (Sn)	FWGE	< 0.05	0.05	mg/L
Titanium (Ti)	FWGE	< 0.002	0.002	mg/L
Vanadium (V)	FWGE	< 0.01	0.01	mg/L
Zinc (Zn)	FWGE	0.165	0.002	mg/L
***ICP Total**				
Aluminum (Al)	FWGE	1.22	0.06	mg/L
Antimony (Sb)	FWGE	< 0.06	0.06	mg/L
Arsenic (As)	FWGE	< 0.06	0.06	mg/L
Barium (Ba)	FWGE	0.021	0.001	mg/L

TEST DESCRIPTION	MATRIX	RESULT	MDL	UNITS
Berylium (Be)	FWGE	< 0.001	0.001	mg/L
Boron (B)	FWGE	< 0.01	0.01	mg/L
Cadmium (Cd)	FWGE	< 0.006	0.006	mg/L
Calcium (Ca)	FWGE	120	0.1	mg/L
Chromium (Cr)	FWGE	< 0.006	0.006	mg/L
Cobalt (Co)	FWGE	0.039	0.006	mg/L
Copper (Cu)	FWGE	1.48	0.02	mg/L
Iron (Fe)	FWGE	6.28	0.05	mg/L
Lead (Pb)	FWGE	< 0.06	0.06	mg/L
Magnesium (Mg)	FWGE	9.2	0.1	mg/L
Manganese (Mn)	FWGE	1.41	0.001	mg/L
Molybdenum (Mo)	FWGE	< 0.01	0.01	mg/L
Nickel (Ni)	FWGE	0.04	0.02	mg/L
Phosphorus (P)	FWGE	< 0.1	0.1	mg/L
Potassium (K)	FWGE	2.7	0.1	mg/L
Selenium (Se)	FWGE	< 0.06	0.06	mg/L
Silicon (Si)	FWGE	7.49	0.06	mg/L
Silver (Ag)	FWGE	< 0.01	0.01	mg/L
Sodium (Na)	FWGE	2.4	0.1	mg/L
Strontium (Sr)	FWGE	0.301	0.001	mg/L
Sulfur (S)	FWGE	112	0.06	mg/L
Tin (Sn)	FWGE	< 0.06	0.06	mg/L
Titanium (Ti)	FWGE	< 0.002	0.002	mg/L
Vanadium (V)	FWGE	< 0.01	0.01	mg/L
Zinc (Zn)	FWGE	0.162	0.002	mg/L
***ICPMS Dissolved.**				
Aluminum (Al)	FWGE	18.7	0.2	ug/L
Antimony (Sb)	FWGE	0.212	0.005	ug/L
Arsenic (As)	FWGE	26.7	0.1	ug/L
Barium (Ba)	FWGE	20.3	0.02	ug/L
Berylium (Be)	FWGE	0.044	0.002	ug/L
Bismuth (Bi)	FWGE	< 0.02	0.02	ug/L
Cadmium (Cd)	FWGE	0.70	0.01	ug/L
Chromium (Cr)	FWGE	< 0.2	0.2	ug/L
Cobalt (Co)	FWGE	35.1	0.005	ug/L
Copper (Cu)	FWGE	1130	0.05	ug/L
Lead (Pb)	FWGE	< 0.01	0.01	ug/L
Lithium (Li)	FWGE	3.32	0.05	ug/L
Manganese (Mn)	FWGE	1300	0.005	ug/L
Molybdenum (Mo)	FWGE	0.69	0.05	ug/L
Nickel (Ni)	FWGE	36.9	0.05	ug/L
Selenium (Se)	FWGE	0.3	0.2	ug/L
Silver (Ag)	FWGE	< 0.02	0.02	ug/L
Strontium (Sr)	FWGE	284	0.005	ug/L
Thallium (Tl)	FWGE	0.026	0.002	ug/L
Tin (Sn)	FWGE	< 0.01	0.01	ug/L
Uranium (U)	FWGE	0.014	0.002	ug/L
Vanadium (V)	FWGE	< 0.05	0.05	ug/L
Zinc (Zn)	FWGE	101	0.1	ug/L
***ICPMS Total.**				
Aluminum (Al)	FWGE	1220	0.2	ug/L
Antimony (Sb)	FWGE	0.211	0.005	ug/L

TEST DESCRIPTION	MATRIX	RESULT	MDL	UNITS
Arsenic (As)	FWGE	62.5	0.1	ug/L
Barium (Ba)	FWGE	19.5	0.02	ug/L
Berylium (Be)	FWGE	0.075	0.002	ug/L
Bismuth (Bi)	FWGE	< 0.02	0.02	ug/L
Cadmium (Cd)	FWGE	0.64	0.01	ug/L
Chromium (Cr)	FWGE	0.2	0.2	ug/L
Cobalt (Co)	FWGE	33.7	0.005	ug/L
Copper (Cu)	FWGE	1480	0.05	ug/L
Lead (Pb)	FWGE	0.71	0.01	ug/L
Lithium (Li)	FWGE	4.13	0.05	ug/L
Manganese (Mn)	FWGE	1410	0.005	ug/L
Molybdenum (Mo)	FWGE	0.69	0.05	ug/L
Nickel (Ni)	FWGE	36.1	0.05	ug/L
Selenium (Se)	FWGE	0.3	0.2	ug/L
Silver (Ag)	FWGE	0.07	0.02	ug/L
Strontium (Sr)	FWGE	301	0.005	ug/L
Thallium (Tl)	FWGE	0.018	0.002	ug/L
Tin (Sn)	FWGE	1.19	0.01	ug/L
Uranium (U)	FWGE	0.041	0.002	ug/L
Vanadium (V)	FWGE	0.06	0.05	ug/L
Zinc (Zn)	FWGE	86.9	0.1	ug/L

Order No: 159276 - SEEP 6
Start Date: 7/9/2007 12:00:00AM

General

***Acidity total&pH4.5**				
Acidity to pH 4.5	FWGE	1	1	mg CaCO3 / L
Acidity, Total	FWGE	33	1	mg CaCO3 / L
***AlkalinityTot-pH4.5**				
Alkalinity to pH 4.5	FWGE	< 0.5	0.5	mg CaCO3 / L
***ICA (Cl F SO4)**				
Chloride (Cl)	FWGE	0.8	0.1	mg/L
Fluoride (F)	FWGE	< 0.01	0.01	mg/L
Sulphate (SO4)	FWGE	136	5	mg/L
Analysis performed after recommended hold time.				
***ICA (NO2 NO3 Br)**				
Bromide (Br)	FWGE	< 0.05	0.05	mg/L
Nitrogen, Nitrate as N	FWGE	0.024	0.002	mg/L
Nitrogen, Nitrite as N	FWGE	< 0.005	0.005	mg/L
***pH**				
pH	FWGE	4.24	0.01	pH Units
***Residue: Filterable**				
Solids, Total Dissolved (FR)	FWGE	457	10	mg/L
Analysis performed after recommended hold time.				
***SpecificConductance**				

TEST DESCRIPTION	MATRIX	RESULT	MDL	UNITS
Conductivity	FWGE	122	2	uS/cm
Metals				
***ICP Dissolved**				
Aluminum (Al)	FWGE	4.46	0.05	mg/L
Antimony (Sb)	FWGE	< 0.05	0.05	mg/L
Arsenic (As)	FWGE	< 0.05	0.05	mg/L
Barium (Ba)	FWGE	0.004	0.001	mg/L
Berylium (Be)	FWGE	< 0.001	0.001	mg/L
Boron (B)	FWGE	0.01	0.01	mg/L
Cadmium (Cd)	FWGE	< 0.005	0.005	mg/L
Calcium (Ca)	FWGE	6.2	0.1	mg/L
Chromium (Cr)	FWGE	< 0.005	0.005	mg/L
Cobalt (Co)	FWGE	0.024	0.005	mg/L
Copper (Cu)	FWGE	4.77	0.005	mg/L
Iron (Fe)	FWGE	0.247	0.005	mg/L
Lead (Pb)	FWGE	< 0.05	0.05	mg/L
Magnesium (Mg)	FWGE	1.2	0.1	mg/L
Manganese (Mn)	FWGE	0.169	0.001	mg/L
Molybdenum (Mo)	FWGE	< 0.01	0.01	mg/L
Nickel (Ni)	FWGE	< 0.02	0.02	mg/L
Phosphorus (P)	FWGE	< 0.1	0.1	mg/L
Potassium (K)	FWGE	0.9	0.1	mg/L
Selenium (Se)	FWGE	< 0.05	0.05	mg/L
Silicon (Si)	FWGE	2.69	0.05	mg/L
Silver (Ag)	FWGE	< 0.01	0.01	mg/L
Sodium (Na)	FWGE	0.6	0.1	mg/L
Strontium (Sr)	FWGE	0.025	0.001	mg/L
Sulfur (S)	FWGE	18.4	0.05	mg/L
Tin (Sn)	FWGE	< 0.05	0.05	mg/L
Titanium (Ti)	FWGE	< 0.002	0.002	mg/L
Vanadium (V)	FWGE	< 0.01	0.01	mg/L
Zinc (Zn)	FWGE	0.089	0.002	mg/L
***ICPMS Dissolved.**				
Aluminum (Al)	FWGE	4460	0.2	ug/L
Antimony (Sb)	FWGE	0.037	0.005	ug/L
Arsenic (As)	FWGE	1.4	0.1	ug/L
Barium (Ba)	FWGE	4.02	0.02	ug/L
Berylium (Be)	FWGE	0.141	0.002	ug/L
Bismuth (Bi)	FWGE	< 0.02	0.02	ug/L
Cadmium (Cd)	FWGE	0.53	0.01	ug/L
Chromium (Cr)	FWGE	< 0.2	0.2	ug/L
Cobalt (Co)	FWGE	20.4	0.005	ug/L
Copper (Cu)	FWGE	4770	0.05	ug/L
Lead (Pb)	FWGE	0.23	0.01	ug/L
Lithium (Li)	FWGE	1.97	0.05	ug/L
Manganese (Mn)	FWGE	154	0.005	ug/L
Molybdenum (Mo)	FWGE	< 0.05	0.05	ug/L
Nickel (Ni)	FWGE	9.25	0.05	ug/L
Selenium (Se)	FWGE	< 0.2	0.2	ug/L
Silver (Ag)	FWGE	< 0.02	0.02	ug/L
Strontium (Sr)	FWGE	24	0.005	ug/L

TEST DESCRIPTION	MATRIX	RESULT	MDL	UNITS
Thallium (Tl)	FWGE	0.012	0.002	ug/L
Tin (Sn)	FWGE	0.04	0.01	ug/L
Uranium (U)	FWGE	0.011	0.002	ug/L
Vanadium (V)	FWGE	< 0.05	0.05	ug/L
Zinc (Zn)	FWGE	77.8	0.1	ug/L
***ICPMS Total.**				
Aluminum (Al)	FWGE	4840	0.2	ug/L
Antimony (Sb)	FWGE	0.035	0.005	ug/L
Arsenic (As)	FWGE	1.2	0.1	ug/L
Barium (Ba)	FWGE	4.05	0.02	ug/L
Berylium (Be)	FWGE	0.114	0.002	ug/L
Bismuth (Bi)	FWGE	< 0.02	0.02	ug/L
Cadmium (Cd)	FWGE	0.46	0.01	ug/L
Chromium (Cr)	FWGE	< 0.2	0.2	ug/L
Cobalt (Co)	FWGE	21	0.005	ug/L
Copper (Cu)	FWGE	5360	0.05	ug/L
Lead (Pb)	FWGE	0.26	0.01	ug/L
Lithium (Li)	FWGE	2.04	0.05	ug/L
Manganese (Mn)	FWGE	159	0.005	ug/L
Molybdenum (Mo)	FWGE	< 0.05	0.05	ug/L
Nickel (Ni)	FWGE	9.52	0.05	ug/L
Selenium (Se)	FWGE	< 0.2	0.2	ug/L
Silver (Ag)	FWGE	0.02	0.02	ug/L
Strontium (Sr)	FWGE	25.4	0.005	ug/L
Thallium (Tl)	FWGE	0.009	0.002	ug/L
Tin (Sn)	FWGE	0.47	0.01	ug/L
Uranium (U)	FWGE	0.011	0.002	ug/L
Vanadium (V)	FWGE	< 0.05	0.05	ug/L
Zinc (Zn)	FWGE	56.6	0.1	ug/L

Order No: 159277 - SEEP 7
Start Date: 7/9/2007 12:00:00AM

General

TEST DESCRIPTION	MATRIX	RESULT	MDL	UNITS
***Acidity total&pH4.5**				
Acidity to pH 4.5	FWGE	< 1	1	mg CaCO3 / L
Acidity, Total	FWGE	7	1	mg CaCO3 / L
***AlkalinityTot-pH4.5**				
Alkalinity to pH 4.5	FWGE	< 0.5	0.5	mg CaCO3 / L
***ICA (Cl F SO4)**				
Chloride (Cl)	FWGE	0.3	0.1	mg/L
Fluoride (F)	FWGE	< 0.01	0.01	mg/L
Sulphate (SO4)	FWGE	37	1	mg/L
Analysis performed after recommended hold time.				
***ICA (NO2 NO3 Br)**				
Bromide (Br)	FWGE	< 0.05	0.05	mg/L
Nitrogen, Nitrate as N	FWGE	0.024	0.002	mg/L

TEST DESCRIPTION	MATRIX	RESULT	MDL	UNITS
Nitrogen, Nitrite as N	FWGE	0.018	0.005	mg/L
***pH**				
pH	FWGE	4.90	0.01	pH Units
***Residue: Filterable**				
Solids, Total Dissolved (FR)	FWGE	96	10	mg/L
***SpecificConductance**				
Conductivity	FWGE	42	2	uS/cm
Metals				
***ICP Dissolved**				
Aluminum (Al)	FWGE	0.92	0.05	mg/L
Antimony (Sb)	FWGE	< 0.05	0.05	mg/L
Arsenic (As)	FWGE	< 0.05	0.05	mg/L
Barium (Ba)	FWGE	0.002	0.001	mg/L
Berylium (Be)	FWGE	< 0.001	0.001	mg/L
Boron (B)	FWGE	0.01	0.01	mg/L
Cadmium (Cd)	FWGE	< 0.005	0.005	mg/L
Calcium (Ca)	FWGE	3.3	0.1	mg/L
Chromium (Cr)	FWGE	< 0.005	0.005	mg/L
Cobalt (Co)	FWGE	0.007	0.005	mg/L
Copper (Cu)	FWGE	1.05	0.005	mg/L
Iron (Fe)	FWGE	0.831	0.005	mg/L
Lead (Pb)	FWGE	< 0.05	0.05	mg/L
Magnesium (Mg)	FWGE	0.6	0.1	mg/L
Manganese (Mn)	FWGE	0.068	0.001	mg/L
Molybdenum (Mo)	FWGE	< 0.01	0.01	mg/L
Nickel (Ni)	FWGE	< 0.02	0.02	mg/L
Phosphorus (P)	FWGE	< 0.1	0.1	mg/L
Potassium (K)	FWGE	0.4	0.1	mg/L
Selenium (Se)	FWGE	< 0.05	0.05	mg/L
Silicon (Si)	FWGE	1.72	0.05	mg/L
Silver (Ag)	FWGE	< 0.01	0.01	mg/L
Sodium (Na)	FWGE	0.4	0.1	mg/L
Strontium (Sr)	FWGE	0.010	0.001	mg/L
Sulfur (S)	FWGE	5.35	0.05	mg/L
Tin (Sn)	FWGE	< 0.05	0.05	mg/L
Titanium (Ti)	FWGE	< 0.002	0.002	mg/L
Vanadium (V)	FWGE	< 0.01	0.01	mg/L
Zinc (Zn)	FWGE	0.032	0.002	mg/L
***ICP Total**				
Aluminum (Al)	FWGE	0.94	0.06	mg/L
Antimony (Sb)	FWGE	< 0.06	0.06	mg/L
Arsenic (As)	FWGE	< 0.06	0.06	mg/L
Barium (Ba)	FWGE	0.002	0.001	mg/L
Berylium (Be)	FWGE	< 0.001	0.001	mg/L
Boron (B)	FWGE	0.03	0.01	mg/L
Cadmium (Cd)	FWGE	< 0.006	0.006	mg/L
Calcium (Ca)	FWGE	3.7	0.1	mg/L
Chromium (Cr)	FWGE	< 0.006	0.006	mg/L
Cobalt (Co)	FWGE	0.008	0.006	mg/L
Copper (Cu)	FWGE	1.09	0.02	mg/L

TEST DESCRIPTION	MATRIX	RESULT	MDL	UNITS
Iron (Fe)	FWGE	0.13	0.05	mg/L
Lead (Pb)	FWGE	< 0.06	0.06	mg/L
Magnesium (Mg)	FWGE	0.6	0.1	mg/L
Manganese (Mn)	FWGE	0.071	0.001	mg/L
Molybdenum (Mo)	FWGE	< 0.01	0.01	mg/L
Nickel (Ni)	FWGE	< 0.02	0.02	mg/L
Phosphorus (P)	FWGE	< 0.1	0.1	mg/L
Potassium (K)	FWGE	0.5	0.1	mg/L
Selenium (Se)	FWGE	< 0.06	0.06	mg/L
Silicon (Si)	FWGE	1.84	0.06	mg/L
Silver (Ag)	FWGE	< 0.01	0.01	mg/L
Sodium (Na)	FWGE	0.4	0.1	mg/L
Strontium (Sr)	FWGE	0.012	0.001	mg/L
Sulfur (S)	FWGE	5.60	0.06	mg/L
Tin (Sn)	FWGE	< 0.06	0.06	mg/L
Titanium (Ti)	FWGE	0.002	0.002	mg/L
Vanadium (V)	FWGE	< 0.01	0.01	mg/L
Zinc (Zn)	FWGE	0.032	0.002	mg/L
***ICPMS Dissolved.**				
Aluminum (Al)	FWGE	960	0.2	ug/L
Antimony (Sb)	FWGE	0.232	0.005	ug/L
Arsenic (As)	FWGE	5.6	0.1	ug/L
Barium (Ba)	FWGE	1.59	0.02	ug/L
Berylium (Be)	FWGE	0.030	0.002	ug/L
Bismuth (Bi)	FWGE	< 0.02	0.02	ug/L
Cadmium (Cd)	FWGE	0.18	0.01	ug/L
Chromium (Cr)	FWGE	< 0.2	0.2	ug/L
Cobalt (Co)	FWGE	6.57	0.005	ug/L
Copper (Cu)	FWGE	1050	0.05	ug/L
Lead (Pb)	FWGE	0.39	0.01	ug/L
Lithium (Li)	FWGE	0.78	0.05	ug/L
Manganese (Mn)	FWGE	61.1	0.005	ug/L
Molybdenum (Mo)	FWGE	0.07	0.05	ug/L
Nickel (Ni)	FWGE	3.57	0.05	ug/L
Selenium (Se)	FWGE	< 0.2	0.2	ug/L
Silver (Ag)	FWGE	0.08	0.02	ug/L
Strontium (Sr)	FWGE	9.96	0.005	ug/L
Thallium (Tl)	FWGE	0.010	0.002	ug/L
Tin (Sn)	FWGE	0.02	0.01	ug/L
Uranium (U)	FWGE	0.004	0.002	ug/L
Vanadium (V)	FWGE	< 0.05	0.05	ug/L
Zinc (Zn)	FWGE	26.1	0.1	ug/L
***ICPMS Total.**				
Aluminum (Al)	FWGE	962	0.2	ug/L
Antimony (Sb)	FWGE	0.208	0.005	ug/L
Arsenic (As)	FWGE	10.1	0.1	ug/L
Barium (Ba)	FWGE	1.67	0.02	ug/L
Berylium (Be)	FWGE	0.029	0.002	ug/L
Bismuth (Bi)	FWGE	< 0.02	0.02	ug/L
Cadmium (Cd)	FWGE	0.13	0.01	ug/L
Chromium (Cr)	FWGE	< 0.2	0.2	ug/L
Cobalt (Co)	FWGE	6.55	0.005	ug/L

TEST DESCRIPTION	MATRIX	RESULT	MDL	UNITS
Copper (Cu)	FWGE	1090	0.05	ug/L
Lead (Pb)	FWGE	0.06	0.01	ug/L
Lithium (Li)	FWGE	0.80	0.05	ug/L
Manganese (Mn)	FWGE	60.6	0.005	ug/L
Molybdenum (Mo)	FWGE	< 0.05	0.05	ug/L
Nickel (Ni)	FWGE	3.60	0.05	ug/L
Selenium (Se)	FWGE	< 0.2	0.2	ug/L
Silver (Ag)	FWGE	0.03	0.02	ug/L
Strontium (Sr)	FWGE	10.3	0.005	ug/L
Thallium (Tl)	FWGE	0.007	0.002	ug/L
Tin (Sn)	FWGE	0.68	0.01	ug/L
Uranium (U)	FWGE	0.004	0.002	ug/L
Vanadium (V)	FWGE	< 0.05	0.05	ug/L
Zinc (Zn)	FWGE	16.1	0.1	ug/L

Order No: 159278 - SEEP 14
Start Date: 7/9/2007 12:00:00AM

General

TEST DESCRIPTION	MATRIX	RESULT	MDL	UNITS
***Acidity total&pH4.5**				
Acidity to pH 4.5	FWGE	18	1	mg CaCO3 / L
Acidity, Total	FWGE	60	1	mg CaCO3 / L
***AlkalinityTot-pH4.5**				
Alkalinity to pH 4.5	FWGE	< 0.5	0.5	mg CaCO3 / L
***ICA (Cl F SO4)**				
Chloride (Cl)	FWGE	0.5	0.1	mg/L
Fluoride (F)	FWGE	0.10	0.01	mg/L
Sulphate (SO4)	FWGE	389	10	mg/L
Analysis performed after recommended hold time.				
***ICA (NO2 NO3 Br)**				
Bromide (Br)	FWGE	< 0.05	0.05	mg/L
Nitrogen, Nitrate as N	FWGE	0.022	0.002	mg/L
Nitrogen, Nitrite as N	FWGE	< 0.005	0.005	mg/L
***pH**				
pH	FWGE	3.53	0.01	pH Units
***Residue: Filterable**				
Solids, Total Dissolved (FR)	FWGE	280	10	mg/L
***SpecificConductance**				
Conductivity	FWGE	325	2	uS/cm

Metals

TEST DESCRIPTION	MATRIX	RESULT	MDL	UNITS
***ICP Dissolved**				
Aluminum (Al)	FWGE	4.94	0.05	mg/L
Antimony (Sb)	FWGE	< 0.05	0.05	mg/L
Arsenic (As)	FWGE	< 0.05	0.05	mg/L
Barium (Ba)	FWGE	0.001	0.001	mg/L

TEST DESCRIPTION	MATRIX	RESULT	MDL	UNITS
Berylium (Be)	FWGE	< 0.001	0.001	mg/L
Boron (B)	FWGE	0.01	0.01	mg/L
Cadmium (Cd)	FWGE	< 0.005	0.005	mg/L
Calcium (Ca)	FWGE	19.4	0.1	mg/L
Chromium (Cr)	FWGE	< 0.005	0.005	mg/L
Cobalt (Co)	FWGE	0.048	0.005	mg/L
Copper (Cu)	FWGE	11.8	0.005	mg/L
Iron (Fe)	FWGE	1.62	0.005	mg/L
Lead (Pb)	FWGE	< 0.05	0.05	mg/L
Magnesium (Mg)	FWGE	4.3	0.1	mg/L
Manganese (Mn)	FWGE	0.549	0.001	mg/L
Molybdenum (Mo)	FWGE	< 0.01	0.01	mg/L
Nickel (Ni)	FWGE	0.03	0.02	mg/L
Phosphorus (P)	FWGE	< 0.1	0.1	mg/L
Potassium (K)	FWGE	0.8	0.1	mg/L
Selenium (Se)	FWGE	< 0.05	0.05	mg/L
Silicon (Si)	FWGE	6.84	0.05	mg/L
Silver (Ag)	FWGE	< 0.01	0.01	mg/L
Sodium (Na)	FWGE	0.8	0.1	mg/L
Strontium (Sr)	FWGE	0.032	0.001	mg/L
Sulfur (S)	FWGE	42	0.05	mg/L
Tin (Sn)	FWGE	< 0.05	0.05	mg/L
Titanium (Ti)	FWGE	< 0.002	0.002	mg/L
Vanadium (V)	FWGE	< 0.01	0.01	mg/L
Zinc (Zn)	FWGE	0.161	0.002	mg/L
***ICP Total**				
Aluminum (Al)	FWGE	5.01	0.06	mg/L
159278 + 159280 were originally dumped from run# 17823				
Antimony (Sb)	FWGE	< 0.06	0.06	mg/L
159278 + 159280 were originally dumped from run# 17823				
Arsenic (As)	FWGE	< 0.06	0.06	mg/L
159278 + 159280 were originally dumped from run# 17823				
Barium (Ba)	FWGE	0.002	0.001	mg/L
159278 + 159280 were originally dumped from run# 17823				
Berylium (Be)	FWGE	< 0.001	0.001	mg/L
159278 + 159280 were originally dumped from run# 17823				
Boron (B)	FWGE	0.03	0.01	mg/L
159278 + 159280 were originally dumped from run# 17823				
Cadmium (Cd)	FWGE	< 0.006	0.006	mg/L
159278 + 159280 were originally dumped from run# 17823				
Calcium (Ca)	FWGE	22.1	0.1	mg/L
159278 + 159280 were originally dumped from run# 17823				
Chromium (Cr)	FWGE	< 0.006	0.006	mg/L
159278 + 159280 were originally dumped from run# 17823				
Cobalt (Co)	FWGE	0.052	0.006	mg/L
159278 + 159280 were originally dumped from run# 17823				
Copper (Cu)	FWGE	12.4	0.02	mg/L
159278 + 159280 were originally dumped from run# 17823				
Iron (Fe)	FWGE	1.69	0.05	mg/L

TEST DESCRIPTION	MATRIX	RESULT	MDL	UNITS
159278 + 159280 were originally dumped from run# 17823				
Lead (Pb)	FWGE	< 0.06	0.06	mg/L
159278 + 159280 were originally dumped from run# 17823				
Magnesium (Mg)	FWGE	4.4	0.1	mg/L
159278 + 159280 were originally dumped from run# 17823				
Manganese (Mn)	FWGE	0.588	0.001	mg/L
159278 + 159280 were originally dumped from run# 17823				
Molybdenum (Mo)	FWGE	< 0.01	0.01	mg/L
159278 + 159280 were originally dumped from run# 17823				
Nickel (Ni)	FWGE	0.03	0.02	mg/L
159278 + 159280 were originally dumped from run# 17823				
Phosphorus (P)	FWGE	< 0.1	0.1	mg/L
159278 + 159280 were originally dumped from run# 17823				
Potassium (K)	FWGE	0.8	0.1	mg/L
159278 + 159280 were originally dumped from run# 17823				
Selenium (Se)	FWGE	< 0.06	0.06	mg/L
159278 + 159280 were originally dumped from run# 17823				
Silicon (Si)	FWGE	7.29	0.06	mg/L
159278 + 159280 were originally dumped from run# 17823				
Silver (Ag)	FWGE	0.02	0.01	mg/L
159278 + 159280 were originally dumped from run# 17823				
Sodium (Na)	FWGE	0.8	0.1	mg/L
159278 + 159280 were originally dumped from run# 17823				
Strontium (Sr)	FWGE	0.038	0.001	mg/L
159278 + 159280 were originally dumped from run# 17823				
Sulfur (S)	FWGE	43.2	0.06	mg/L
159278 + 159280 were originally dumped from run# 17823				
Tin (Sn)	FWGE	< 0.06	0.06	mg/L
159278 + 159280 were originally dumped from run# 17823				
Titanium (Ti)	FWGE	0.002	0.002	mg/L
159278 + 159280 were originally dumped from run# 17823				
Vanadium (V)	FWGE	< 0.01	0.01	mg/L
159278 + 159280 were originally dumped from run# 17823				
Zinc (Zn)	FWGE	0.167	0.002	mg/L
159278 + 159280 were originally dumped from run# 17823				
***ICPMS Dissolved.**				
Aluminum (Al)	FWGE	4940	0.2	ug/L
Antimony (Sb)	FWGE	0.041	0.005	ug/L
Arsenic (As)	FWGE	1.0	0.1	ug/L
Barium (Ba)	FWGE	1.38	0.02	ug/L
Berylium (Be)	FWGE	0.234	0.002	ug/L
Bismuth (Bi)	FWGE	< 0.02	0.02	ug/L
Cadmium (Cd)	FWGE	1.11	0.01	ug/L
Chromium (Cr)	FWGE	0.5	0.2	ug/L
Cobalt (Co)	FWGE	40.2	0.005	ug/L
Copper (Cu)	FWGE	11800	0.05	ug/L
Lead (Pb)	FWGE	0.07	0.01	ug/L

TEST DESCRIPTION	MATRIX	RESULT	MDL	UNITS
Lithium (Li)	FWGE	3.22	0.05	ug/L
Manganese (Mn)	FWGE	549	0.005	ug/L
Molybdenum (Mo)	FWGE	< 0.05	0.05	ug/L
Nickel (Ni)	FWGE	22	0.05	ug/L
Selenium (Se)	FWGE	< 0.2	0.2	ug/L
Silver (Ag)	FWGE	0.42	0.02	ug/L
Strontium (Sr)	FWGE	31.7	0.005	ug/L
Thallium (Tl)	FWGE	0.087	0.002	ug/L
Tin (Sn)	FWGE	0.01	0.01	ug/L
Uranium (U)	FWGE	0.228	0.002	ug/L
Vanadium (V)	FWGE	< 0.05	0.05	ug/L
Zinc (Zn)	FWGE	140	0.1	ug/L
***ICPMS Total.**				
Aluminum (Al)	FWGE	5010	0.2	ug/L
Antimony (Sb)	FWGE	0.040	0.005	ug/L
Arsenic (As)	FWGE	0.9	0.1	ug/L
Barium (Ba)	FWGE	1.37	0.02	ug/L
Berylium (Be)	FWGE	0.205	0.002	ug/L
Bismuth (Bi)	FWGE	< 0.02	0.02	ug/L
Cadmium (Cd)	FWGE	0.92	0.01	ug/L
Chromium (Cr)	FWGE	0.6	0.2	ug/L
Cobalt (Co)	FWGE	38.4	0.005	ug/L
Copper (Cu)	FWGE	12400	0.05	ug/L
Lead (Pb)	FWGE	0.07	0.01	ug/L
Lithium (Li)	FWGE	3.09	0.05	ug/L
Manganese (Mn)	FWGE	588	0.005	ug/L
Molybdenum (Mo)	FWGE	0.05	0.05	ug/L
Nickel (Ni)	FWGE	20.8	0.05	ug/L
Selenium (Se)	FWGE	< 0.2	0.2	ug/L
Silver (Ag)	FWGE	0.44	0.02	ug/L
Strontium (Sr)	FWGE	32.3	0.005	ug/L
Thallium (Tl)	FWGE	0.079	0.002	ug/L
Tin (Sn)	FWGE	0.86	0.01	ug/L
Uranium (U)	FWGE	0.218	0.002	ug/L
Vanadium (V)	FWGE	< 0.05	0.05	ug/L
Zinc (Zn)	FWGE	98.3	0.1	ug/L

Order No: 159279 - SEEP 15
Start Date: 7/9/2007 12:00:00AM

General

TEST DESCRIPTION	MATRIX	RESULT	MDL	UNITS
***Acidity total&pH4.5**				
Acidity to pH 4.5	FWGE	< 1	1	mg CaCO3 / L
Acidity, Total	FWGE	3	1	mg CaCO3 / L
***AlkalinityTot-pH4.5**				
Alkalinity to pH 4.5	FWGE	11.5	0.5	mg CaCO3 / L
Alkalinity, Total	FWGE	1.0	0.5	mg CaCO3 / L

TEST DESCRIPTION	MATRIX	RESULT	MDL	UNITS
***ICA (Cl F SO4)**				
Chloride (Cl)	FWGE	0.6	0.1	mg/L
Fluoride (F)	FWGE	0.05	0.01	mg/L
Sulphate (SO4)	FWGE	33	1	mg/L
***ICA (NO2 NO3 Br)**				
Bromide (Br)	FWGE	< 0.05	0.05	mg/L
Nitrogen, Nitrate as N	FWGE	0.011	0.002	mg/L
Nitrogen, Nitrite as N	FWGE	0.017	0.005	mg/L
***pH**				
pH	FWGE	6.79	0.01	pH Units
***Residue: Filterable**				
Solids, Total Dissolved (FR)	FWGE	105	10	mg/L
***SpecificConductance**				
Conductivity	FWGE	94	2	uS/cm
Metals				
***ICP Dissolved**				
Aluminum (Al)	FWGE	0.06	0.05	mg/L
Antimony (Sb)	FWGE	< 0.05	0.05	mg/L
Arsenic (As)	FWGE	< 0.05	0.05	mg/L
Barium (Ba)	FWGE	0.001	0.001	mg/L
Berylium (Be)	FWGE	< 0.001	0.001	mg/L
Boron (B)	FWGE	0.01	0.01	mg/L
Cadmium (Cd)	FWGE	< 0.005	0.005	mg/L
Calcium (Ca)	FWGE	12.0	0.1	mg/L
Chromium (Cr)	FWGE	< 0.005	0.005	mg/L
Cobalt (Co)	FWGE	0.006	0.005	mg/L
Copper (Cu)	FWGE	0.847	0.005	mg/L
Iron (Fe)	FWGE	0.038	0.005	mg/L
Lead (Pb)	FWGE	< 0.05	0.05	mg/L
Magnesium (Mg)	FWGE	3.4	0.1	mg/L
Manganese (Mn)	FWGE	0.189	0.001	mg/L
Molybdenum (Mo)	FWGE	< 0.01	0.01	mg/L
Nickel (Ni)	FWGE	< 0.02	0.02	mg/L
Phosphorus (P)	FWGE	< 0.1	0.1	mg/L
Potassium (K)	FWGE	0.5	0.1	mg/L
Selenium (Se)	FWGE	< 0.05	0.05	mg/L
Silicon (Si)	FWGE	1.49	0.05	mg/L
Silver (Ag)	FWGE	< 0.01	0.01	mg/L
Sodium (Na)	FWGE	0.4	0.1	mg/L
Strontium (Sr)	FWGE	0.017	0.001	mg/L
Sulfur (S)	FWGE	11.1	0.05	mg/L
Tin (Sn)	FWGE	< 0.05	0.05	mg/L
Titanium (Ti)	FWGE	< 0.002	0.002	mg/L
Vanadium (V)	FWGE	< 0.01	0.01	mg/L
Zinc (Zn)	FWGE	0.033	0.002	mg/L
***ICP Total**				
Aluminum (Al)	FWGE	0.17	0.06	mg/L
Antimony (Sb)	FWGE	< 0.06	0.06	mg/L
Arsenic (As)	FWGE	< 0.06	0.06	mg/L
Barium (Ba)	FWGE	0.002	0.001	mg/L

TEST DESCRIPTION	MATRIX	RESULT	MDL	UNITS
Berylium (Be)	FWGE	< 0.001	0.001	mg/L
Boron (B)	FWGE	0.03	0.01	mg/L
Cadmium (Cd)	FWGE	< 0.006	0.006	mg/L
Calcium (Ca)	FWGE	13.7	0.1	mg/L
Chromium (Cr)	FWGE	< 0.006	0.006	mg/L
Cobalt (Co)	FWGE	< 0.006	0.006	mg/L
Copper (Cu)	FWGE	0.93	0.02	mg/L
Iron (Fe)	FWGE	0.30	0.05	mg/L
Lead (Pb)	FWGE	< 0.06	0.06	mg/L
Magnesium (Mg)	FWGE	3.5	0.1	mg/L
Manganese (Mn)	FWGE	0.204	0.001	mg/L
Molybdenum (Mo)	FWGE	< 0.01	0.01	mg/L
Nickel (Ni)	FWGE	< 0.02	0.02	mg/L
Phosphorus (P)	FWGE	< 0.1	0.1	mg/L
Potassium (K)	FWGE	0.5	0.1	mg/L
Selenium (Se)	FWGE	< 0.06	0.06	mg/L
Silicon (Si)	FWGE	1.67	0.06	mg/L
Silver (Ag)	FWGE	< 0.01	0.01	mg/L
Sodium (Na)	FWGE	0.4	0.1	mg/L
Strontium (Sr)	FWGE	0.021	0.001	mg/L
Sulfur (S)	FWGE	10.9	0.06	mg/L
Tin (Sn)	FWGE	< 0.06	0.06	mg/L
Titanium (Ti)	FWGE	< 0.002	0.002	mg/L
Vanadium (V)	FWGE	< 0.01	0.01	mg/L
Zinc (Zn)	FWGE	0.034	0.002	mg/L
***ICPMS Dissolved.**				
Aluminum (Al)	FWGE	59.0	0.2	ug/L
Antimony (Sb)	FWGE	1.69	0.005	ug/L
Arsenic (As)	FWGE	6.4	0.1	ug/L
Barium (Ba)	FWGE	1.26	0.02	ug/L
Berylium (Be)	FWGE	0.022	0.002	ug/L
Bismuth (Bi)	FWGE	< 0.02	0.02	ug/L
Cadmium (Cd)	FWGE	0.16	0.01	ug/L
Chromium (Cr)	FWGE	< 0.2	0.2	ug/L
Cobalt (Co)	FWGE	5.42	0.005	ug/L
Copper (Cu)	FWGE	847	0.05	ug/L
Lead (Pb)	FWGE	< 0.01	0.01	ug/L
Lithium (Li)	FWGE	0.91	0.05	ug/L
Manganese (Mn)	FWGE	178	0.005	ug/L
Molybdenum (Mo)	FWGE	0.25	0.05	ug/L
Nickel (Ni)	FWGE	5.30	0.05	ug/L
Selenium (Se)	FWGE	< 0.2	0.2	ug/L
Silver (Ag)	FWGE	0.03	0.02	ug/L
Strontium (Sr)	FWGE	17.1	0.005	ug/L
Thallium (Tl)	FWGE	0.051	0.002	ug/L
Tin (Sn)	FWGE	< 0.01	0.01	ug/L
Uranium (U)	FWGE	< 0.002	0.002	ug/L
Vanadium (V)	FWGE	< 0.05	0.05	ug/L
Zinc (Zn)	FWGE	25.3	0.1	ug/L
***ICPMS Total.**				
Aluminum (Al)	FWGE	150	0.2	ug/L
Antimony (Sb)	FWGE	1.6	0.005	ug/L

TEST DESCRIPTION	MATRIX	RESULT	MDL	UNITS
Arsenic (As)	FWGE	26.1	0.1	ug/L
Barium (Ba)	FWGE	1.29	0.02	ug/L
Berylium (Be)	FWGE	0.018	0.002	ug/L
Bismuth (Bi)	FWGE	< 0.02	0.02	ug/L
Cadmium (Cd)	FWGE	0.14	0.01	ug/L
Chromium (Cr)	FWGE	< 0.2	0.2	ug/L
Cobalt (Co)	FWGE	5.28	0.005	ug/L
Copper (Cu)	FWGE	930	0.05	ug/L
Lead (Pb)	FWGE	0.08	0.01	ug/L
Lithium (Li)	FWGE	0.86	0.05	ug/L
Manganese (Mn)	FWGE	173	0.005	ug/L
Molybdenum (Mo)	FWGE	0.30	0.05	ug/L
Nickel (Ni)	FWGE	5.85	0.05	ug/L
Selenium (Se)	FWGE	< 0.2	0.2	ug/L
Silver (Ag)	FWGE	0.07	0.02	ug/L
Strontium (Sr)	FWGE	17.2	0.005	ug/L
Thallium (Tl)	FWGE	0.048	0.002	ug/L
Tin (Sn)	FWGE	0.90	0.01	ug/L
Uranium (U)	FWGE	0.004	0.002	ug/L
Vanadium (V)	FWGE	< 0.05	0.05	ug/L
Zinc (Zn)	FWGE	18.0	0.1	ug/L

Order No: 159280 - SEEP 18
Start Date: 7/9/2007 12:00:00AM

General

TEST DESCRIPTION	MATRIX	RESULT	MDL	UNITS
***Acidity total&pH4.5**				
Acidity to pH 4.5	FWGE	19	1	mg CaCO3 / L
Acidity, Total	FWGE	60	1	mg CaCO3 / L
***AlkalinityTot-pH4.5**				
Alkalinity to pH 4.5	FWGE	< 0.5	0.5	mg CaCO3 / L
***ICA (Cl F SO4)**				
Chloride (Cl)	FWGE	0.7	0.1	mg/L
Fluoride (F)	FWGE	0.32	0.01	mg/L
Sulphate (SO4)	FWGE	301	10	mg/L
Analysis performed after recommended hold time.				
***ICA (NO2 NO3 Br)**				
Bromide (Br)	FWGE	< 0.05	0.05	mg/L
Nitrogen, Nitrate as N	FWGE	0.022	0.002	mg/L
Nitrogen, Nitrite as N	FWGE	< 0.005	0.005	mg/L
***pH**				
pH	FWGE	3.54	0.01	pH Units
***Residue: Filterable**				
Solids, Total Dissolved (FR)	FWGE	273	10	mg/L
***SpecificConductance**				
Conductivity	FWGE	331	2	uS/cm

TEST DESCRIPTION	MATRIX	RESULT	MDL	UNITS
Metals				
***ICP Dissolved**				
Aluminum (Al)	FWGE	5.00	0.05	mg/L
Antimony (Sb)	FWGE	< 0.05	0.05	mg/L
Arsenic (As)	FWGE	< 0.05	0.05	mg/L
Barium (Ba)	FWGE	0.002	0.001	mg/L
Berylium (Be)	FWGE	< 0.001	0.001	mg/L
Boron (B)	FWGE	< 0.01	0.01	mg/L
Cadmium (Cd)	FWGE	< 0.005	0.005	mg/L
Calcium (Ca)	FWGE	19.4	0.1	mg/L
Chromium (Cr)	FWGE	< 0.005	0.005	mg/L
Cobalt (Co)	FWGE	0.048	0.005	mg/L
Copper (Cu)	FWGE	12.1	0.005	mg/L
Iron (Fe)	FWGE	1.63	0.005	mg/L
Lead (Pb)	FWGE	< 0.05	0.05	mg/L
Magnesium (Mg)	FWGE	4.4	0.1	mg/L
Manganese (Mn)	FWGE	0.553	0.001	mg/L
Molybdenum (Mo)	FWGE	< 0.01	0.01	mg/L
Nickel (Ni)	FWGE	0.03	0.02	mg/L
Phosphorus (P)	FWGE	< 0.1	0.1	mg/L
Potassium (K)	FWGE	0.8	0.1	mg/L
Selenium (Se)	FWGE	< 0.05	0.05	mg/L
Silicon (Si)	FWGE	6.92	0.05	mg/L
Silver (Ag)	FWGE	< 0.01	0.01	mg/L
Sodium (Na)	FWGE	0.8	0.1	mg/L
Strontium (Sr)	FWGE	0.034	0.001	mg/L
Sulfur (S)	FWGE	42.8	0.05	mg/L
Tin (Sn)	FWGE	< 0.05	0.05	mg/L
Titanium (Ti)	FWGE	< 0.002	0.002	mg/L
Vanadium (V)	FWGE	< 0.01	0.01	mg/L
Zinc (Zn)	FWGE	0.161	0.002	mg/L
***ICP Total**				
Aluminum (Al)	FWGE	4.95	0.06	mg/L
159278 + 159280 were originally dumped from run# 17823				
Antimony (Sb)	FWGE	< 0.06	0.06	mg/L
159278 + 159280 were originally dumped from run# 17823				
Arsenic (As)	FWGE	< 0.06	0.06	mg/L
159278 + 159280 were originally dumped from run# 17823				
Barium (Ba)	FWGE	0.002	0.001	mg/L
159278 + 159280 were originally dumped from run# 17823				
Berylium (Be)	FWGE	< 0.001	0.001	mg/L
159278 + 159280 were originally dumped from run# 17823				
Boron (B)	FWGE	0.03	0.01	mg/L
159278 + 159280 were originally dumped from run# 17823				
Cadmium (Cd)	FWGE	< 0.006	0.006	mg/L
159278 + 159280 were originally dumped from run# 17823				
Calcium (Ca)	FWGE	21.7	0.1	mg/L
159278 + 159280 were originally dumped from run# 17823				
Chromium (Cr)	FWGE	< 0.006	0.006	mg/L

TEST DESCRIPTION	MATRIX	RESULT	MDL	UNITS
159278 + 159280 were originally dumped from run# 17823				
Cobalt (Co)	FWGE	0.051	0.006	mg/L
159278 + 159280 were originally dumped from run# 17823				
Copper (Cu)	FWGE	12.3	0.02	mg/L
159278 + 159280 were originally dumped from run# 17823				
Iron (Fe)	FWGE	1.66	0.05	mg/L
159278 + 159280 were originally dumped from run# 17823				
Lead (Pb)	FWGE	< 0.06	0.06	mg/L
159278 + 159280 were originally dumped from run# 17823				
Magnesium (Mg)	FWGE	4.4	0.1	mg/L
159278 + 159280 were originally dumped from run# 17823				
Manganese (Mn)	FWGE	0.586	0.001	mg/L
159278 + 159280 were originally dumped from run# 17823				
Molybdenum (Mo)	FWGE	< 0.01	0.01	mg/L
159278 + 159280 were originally dumped from run# 17823				
Nickel (Ni)	FWGE	0.03	0.02	mg/L
159278 + 159280 were originally dumped from run# 17823				
Phosphorus (P)	FWGE	< 0.1	0.1	mg/L
159278 + 159280 were originally dumped from run# 17823				
Potassium (K)	FWGE	0.8	0.1	mg/L
159278 + 159280 were originally dumped from run# 17823				
Selenium (Se)	FWGE	< 0.06	0.06	mg/L
159278 + 159280 were originally dumped from run# 17823				
Silicon (Si)	FWGE	7.04	0.06	mg/L
159278 + 159280 were originally dumped from run# 17823				
Silver (Ag)	FWGE	< 0.01	0.01	mg/L
159278 + 159280 were originally dumped from run# 17823				
Sodium (Na)	FWGE	0.8	0.1	mg/L
159278 + 159280 were originally dumped from run# 17823				
Strontium (Sr)	FWGE	0.037	0.001	mg/L
159278 + 159280 were originally dumped from run# 17823				
Sulfur (S)	FWGE	42.4	0.06	mg/L
159278 + 159280 were originally dumped from run# 17823				
Tin (Sn)	FWGE	< 0.06	0.06	mg/L
159278 + 159280 were originally dumped from run# 17823				
Titanium (Ti)	FWGE	0.002	0.002	mg/L
159278 + 159280 were originally dumped from run# 17823				
Vanadium (V)	FWGE	< 0.01	0.01	mg/L
159278 + 159280 were originally dumped from run# 17823				
Zinc (Zn)	FWGE	0.163	0.002	mg/L
159278 + 159280 were originally dumped from run# 17823				
***ICPMS Dissolved.**				
Aluminum (Al)	FWGE	5000	0.2	ug/L
Antimony (Sb)	FWGE	0.039	0.005	ug/L
Arsenic (As)	FWGE	1.0	0.1	ug/L
Barium (Ba)	FWGE	1.40	0.02	ug/L

TEST DESCRIPTION	MATRIX	RESULT	MDL	UNITS
Berylium (Be)	FWGE	0.244	0.002	ug/L
Bismuth (Bi)	FWGE	< 0.02	0.02	ug/L
Cadmium (Cd)	FWGE	1.12	0.01	ug/L
Chromium (Cr)	FWGE	0.5	0.2	ug/L
Cobalt (Co)	FWGE	40.4	0.005	ug/L
Copper (Cu)	FWGE	12100	0.05	ug/L
Lead (Pb)	FWGE	0.05	0.01	ug/L
Lithium (Li)	FWGE	3.22	0.05	ug/L
Manganese (Mn)	FWGE	553	0.005	ug/L
Molybdenum (Mo)	FWGE	< 0.05	0.05	ug/L
Nickel (Ni)	FWGE	22.1	0.05	ug/L
Selenium (Se)	FWGE	< 0.2	0.2	ug/L
Silver (Ag)	FWGE	0.42	0.02	ug/L
Strontium (Sr)	FWGE	31.8	0.005	ug/L
Thallium (Tl)	FWGE	0.087	0.002	ug/L
Tin (Sn)	FWGE	< 0.01	0.01	ug/L
Uranium (U)	FWGE	0.230	0.002	ug/L
Vanadium (V)	FWGE	< 0.05	0.05	ug/L
Zinc (Zn)	FWGE	141	0.1	ug/L
***ICPMS Total.**				
Aluminum (Al)	FWGE	4950	0.2	ug/L
Antimony (Sb)	FWGE	0.040	0.005	ug/L
Arsenic (As)	FWGE	1.0	0.1	ug/L
Barium (Ba)	FWGE	1.36	0.02	ug/L
Berylium (Be)	FWGE	0.189	0.002	ug/L
Bismuth (Bi)	FWGE	< 0.02	0.02	ug/L
Cadmium (Cd)	FWGE	0.95	0.01	ug/L
Chromium (Cr)	FWGE	0.6	0.2	ug/L
Cobalt (Co)	FWGE	39.3	0.005	ug/L
Copper (Cu)	FWGE	12300	0.05	ug/L
Lead (Pb)	FWGE	0.11	0.01	ug/L
Lithium (Li)	FWGE	3.09	0.05	ug/L
Manganese (Mn)	FWGE	586	0.005	ug/L
Molybdenum (Mo)	FWGE	< 0.05	0.05	ug/L
Nickel (Ni)	FWGE	21.3	0.05	ug/L
Selenium (Se)	FWGE	< 0.2	0.2	ug/L
Silver (Ag)	FWGE	0.45	0.02	ug/L
Strontium (Sr)	FWGE	32.5	0.005	ug/L
Thallium (Tl)	FWGE	0.080	0.002	ug/L
Tin (Sn)	FWGE	0.51	0.01	ug/L
Uranium (U)	FWGE	0.228	0.002	ug/L
Vanadium (V)	FWGE	< 0.05	0.05	ug/L
Zinc (Zn)	FWGE	101	0.1	ug/L

Order No: 159281 - SEEP 19
Start Date: 7/9/2007 12:00:00AM

General

TEST DESCRIPTION	MATRIX	RESULT	MDL	UNITS
***Acidity total&pH4.5**				
Acidity to pH 4.5	FWGE	< 1	1	mg CaCO3 / L
Acidity, Total	FWGE	2	1	mg CaCO3 / L
***AlkalinityTot-pH4.5**				
Alkalinity to pH 4.5	FWGE	12.5	0.5	mg CaCO3 / L
***ICA (Cl F SO4)**				
Chloride (Cl)	FWGE	0.3	0.1	mg/L
Fluoride (F)	FWGE	0.07	0.01	mg/L
Sulphate (SO4)	FWGE	38	1	mg/L
***ICA (NO2 NO3 Br)**				
Bromide (Br)	FWGE	0.08	0.05	mg/L
Nitrogen, Nitrate as N	FWGE	0.008	0.002	mg/L
Nitrogen, Nitrite as N	FWGE	0.016	0.005	mg/L
***pH**				
pH	FWGE	7.36	0.01	pH Units
***Residue: Filterable**				
Solids, Total Dissolved (FR)	FWGE	110	10	mg/L
***SpecificConductance**				
Conductivity	FWGE	108	2	uS/cm
Metals				
***ICP Dissolved**				
Aluminum (Al)	FWGE	< 0.05	0.05	mg/L
Antimony (Sb)	FWGE	< 0.05	0.05	mg/L
Arsenic (As)	FWGE	< 0.05	0.05	mg/L
Barium (Ba)	FWGE	0.002	0.001	mg/L
Berylium (Be)	FWGE	< 0.001	0.001	mg/L
Boron (B)	FWGE	< 0.01	0.01	mg/L
Cadmium (Cd)	FWGE	< 0.005	0.005	mg/L
Calcium (Ca)	FWGE	16.0	0.1	mg/L
Chromium (Cr)	FWGE	< 0.005	0.005	mg/L
Cobalt (Co)	FWGE	0.008	0.005	mg/L
Copper (Cu)	FWGE	0.777	0.005	mg/L
Iron (Fe)	FWGE	< 0.005	0.005	mg/L
Lead (Pb)	FWGE	< 0.05	0.05	mg/L
Magnesium (Mg)	FWGE	3.3	0.1	mg/L
Manganese (Mn)	FWGE	0.118	0.001	mg/L
Molybdenum (Mo)	FWGE	< 0.01	0.01	mg/L
Nickel (Ni)	FWGE	< 0.02	0.02	mg/L
Phosphorus (P)	FWGE	< 0.1	0.1	mg/L
Potassium (K)	FWGE	0.8	0.1	mg/L
Selenium (Se)	FWGE	< 0.05	0.05	mg/L
Silicon (Si)	FWGE	2.79	0.05	mg/L
Silver (Ag)	FWGE	< 0.01	0.01	mg/L
Sodium (Na)	FWGE	0.5	0.1	mg/L
Strontium (Sr)	FWGE	0.040	0.001	mg/L
Sulfur (S)	FWGE	13.4	0.05	mg/L
Tin (Sn)	FWGE	< 0.05	0.05	mg/L
Titanium (Ti)	FWGE	< 0.002	0.002	mg/L
Vanadium (V)	FWGE	< 0.01	0.01	mg/L
Zinc (Zn)	FWGE	0.052	0.002	mg/L

TEST DESCRIPTION	MATRIX	RESULT	MDL	UNITS
***ICP Total**				
Aluminum (Al)	FWGE	0.24	0.06	mg/L
Antimony (Sb)	FWGE	< 0.06	0.06	mg/L
Arsenic (As)	FWGE	< 0.06	0.06	mg/L
Barium (Ba)	FWGE	0.003	0.001	mg/L
Berylium (Be)	FWGE	< 0.001	0.001	mg/L
Boron (B)	FWGE	0.03	0.01	mg/L
Cadmium (Cd)	FWGE	< 0.006	0.006	mg/L
Calcium (Ca)	FWGE	17.2	0.1	mg/L
Chromium (Cr)	FWGE	< 0.006	0.006	mg/L
Cobalt (Co)	FWGE	0.008	0.006	mg/L
Copper (Cu)	FWGE	1.06	0.02	mg/L
Iron (Fe)	FWGE	< 0.05	0.05	mg/L
Lead (Pb)	FWGE	< 0.06	0.06	mg/L
Magnesium (Mg)	FWGE	3.2	0.1	mg/L
Manganese (Mn)	FWGE	0.122	0.001	mg/L
Molybdenum (Mo)	FWGE	< 0.01	0.01	mg/L
Nickel (Ni)	FWGE	< 0.02	0.02	mg/L
Phosphorus (P)	FWGE	< 0.1	0.1	mg/L
Potassium (K)	FWGE	0.8	0.1	mg/L
Selenium (Se)	FWGE	< 0.06	0.06	mg/L
Silicon (Si)	FWGE	2.83	0.06	mg/L
Silver (Ag)	FWGE	< 0.01	0.01	mg/L
Sodium (Na)	FWGE	0.5	0.1	mg/L
Strontium (Sr)	FWGE	0.045	0.001	mg/L
Sulfur (S)	FWGE	12.6	0.06	mg/L
Tin (Sn)	FWGE	< 0.06	0.06	mg/L
Titanium (Ti)	FWGE	< 0.002	0.002	mg/L
Vanadium (V)	FWGE	< 0.01	0.01	mg/L
Zinc (Zn)	FWGE	0.052	0.002	mg/L
***ICPMS Dissolved.**				
Aluminum (Al)	FWGE	20.9	0.2	ug/L
Antimony (Sb)	FWGE	6.21	0.005	ug/L
Arsenic (As)	FWGE	9.6	0.1	ug/L
Barium (Ba)	FWGE	2.25	0.02	ug/L
Berylium (Be)	FWGE	0.017	0.002	ug/L
Bismuth (Bi)	FWGE	< 0.02	0.02	ug/L
Cadmium (Cd)	FWGE	0.30	0.01	ug/L
Chromium (Cr)	FWGE	< 0.2	0.2	ug/L
Cobalt (Co)	FWGE	6.91	0.005	ug/L
Copper (Cu)	FWGE	777	0.05	ug/L
Lead (Pb)	FWGE	< 0.01	0.01	ug/L
Lithium (Li)	FWGE	1.98	0.05	ug/L
Manganese (Mn)	FWGE	108	0.005	ug/L
Molybdenum (Mo)	FWGE	5.33	0.05	ug/L
Nickel (Ni)	FWGE	4.59	0.05	ug/L
Selenium (Se)	FWGE	0.3	0.2	ug/L
Silver (Ag)	FWGE	0.03	0.02	ug/L
Strontium (Sr)	FWGE	37.7	0.005	ug/L
Thallium (Tl)	FWGE	0.080	0.002	ug/L
Tin (Sn)	FWGE	< 0.01	0.01	ug/L
Uranium (U)	FWGE	0.002	0.002	ug/L

TEST DESCRIPTION	MATRIX	RESULT	MDL	UNITS
Vanadium (V)	FWGE	< 0.05	0.05	ug/L
Zinc (Zn)	FWGE	39.6	0.1	ug/L
***ICPMS Total.**				
Aluminum (Al)	FWGE	224	0.2	ug/L
Antimony (Sb)	FWGE	5.88	0.005	ug/L
Arsenic (As)	FWGE	43.5	0.1	ug/L
Barium (Ba)	FWGE	2.26	0.02	ug/L
Berylium (Be)	FWGE	0.020	0.002	ug/L
Bismuth (Bi)	FWGE	< 0.02	0.02	ug/L
Cadmium (Cd)	FWGE	0.27	0.01	ug/L
Chromium (Cr)	FWGE	< 0.2	0.2	ug/L
Cobalt (Co)	FWGE	6.88	0.005	ug/L
Copper (Cu)	FWGE	1060	0.05	ug/L
Lead (Pb)	FWGE	0.05	0.01	ug/L
Lithium (Li)	FWGE	1.99	0.05	ug/L
Manganese (Mn)	FWGE	103	0.005	ug/L
Molybdenum (Mo)	FWGE	5.39	0.05	ug/L
Nickel (Ni)	FWGE	4.61	0.05	ug/L
Selenium (Se)	FWGE	0.2	0.2	ug/L
Silver (Ag)	FWGE	0.06	0.02	ug/L
Strontium (Sr)	FWGE	39.4	0.005	ug/L
Thallium (Tl)	FWGE	0.073	0.002	ug/L
Tin (Sn)	FWGE	0.51	0.01	ug/L
Uranium (U)	FWGE	0.046	0.002	ug/L
Vanadium (V)	FWGE	< 0.05	0.05	ug/L
Zinc (Zn)	FWGE	28.8	0.1	ug/L

Order No: 159282 - DIV 8
Start Date: 7/9/2007 12:00:00AM

General

TEST DESCRIPTION	MATRIX	RESULT	MDL	UNITS
***Acidity total&pH4.5**				
Acidity to pH 4.5	FWGE	< 1	1	mg CaCO3 / L
Acidity, Total	FWGE	1	1	mg CaCO3 / L
***AlkalinityTot-pH4.5**				
Alkalinity, Total	FWGE	1.9	0.5	mg CaCO3 / L
***ICA (Cl F SO4)**				
Chloride (Cl)	FWGE	0.2	0.1	mg/L
Fluoride (F)	FWGE	< 0.01	0.01	mg/L
Sulphate (SO4)	FWGE	2.9	0.5	mg/L
***ICA (NO2 NO3 Br)**				
Bromide (Br)	FWGE	< 0.05	0.05	mg/L
Nitrogen, Nitrate as N	FWGE	< 0.002	0.002	mg/L
Nitrogen, Nitrite as N	FWGE	< 0.005	0.005	mg/L
***pH**				
pH	FWGE	6.58	0.01	pH Units

TEST DESCRIPTION	MATRIX	RESULT	MDL	UNITS
***Residue: Filterable**				
Solids, Total Dissolved (FR)	FWGE	38	10	mg/L
***SpecificConductance**				
Conductivity	FWGE	11	2	uS/cm

Metals

TEST DESCRIPTION	MATRIX	RESULT	MDL	UNITS
***ICP Dissolved**				
Aluminum (Al)	FWGE	< 0.05	0.05	mg/L
Antimony (Sb)	FWGE	< 0.05	0.05	mg/L
Arsenic (As)	FWGE	< 0.05	0.05	mg/L
Barium (Ba)	FWGE	< 0.001	0.001	mg/L
Berylium (Be)	FWGE	< 0.001	0.001	mg/L
Boron (B)	FWGE	< 0.01	0.01	mg/L
Cadmium (Cd)	FWGE	< 0.005	0.005	mg/L
Calcium (Ca)	FWGE	1.5	0.1	mg/L
Chromium (Cr)	FWGE	< 0.005	0.005	mg/L
Cobalt (Co)	FWGE	< 0.005	0.005	mg/L
Copper (Cu)	FWGE	0.011	0.005	mg/L
Iron (Fe)	FWGE	0.019	0.005	mg/L
Lead (Pb)	FWGE	< 0.05	0.05	mg/L
Magnesium (Mg)	FWGE	0.2	0.1	mg/L
Manganese (Mn)	FWGE	0.012	0.001	mg/L
Molybdenum (Mo)	FWGE	< 0.01	0.01	mg/L
Nickel (Ni)	FWGE	< 0.02	0.02	mg/L
Phosphorus (P)	FWGE	< 0.1	0.1	mg/L
Potassium (K)	FWGE	0.2	0.1	mg/L
Selenium (Se)	FWGE	< 0.05	0.05	mg/L
Silicon (Si)	FWGE	1.45	0.05	mg/L
Silver (Ag)	FWGE	< 0.01	0.01	mg/L
Sodium (Na)	FWGE	0.4	0.1	mg/L
Strontium (Sr)	FWGE	0.006	0.001	mg/L
Sulfur (S)	FWGE	1.05	0.05	mg/L
Tin (Sn)	FWGE	< 0.05	0.05	mg/L
Titanium (Ti)	FWGE	< 0.002	0.002	mg/L
Vanadium (V)	FWGE	< 0.01	0.01	mg/L
Zinc (Zn)	FWGE	0.005	0.002	mg/L
***ICP Total**				
Aluminum (Al)	FWGE	0.14	0.06	mg/L
Antimony (Sb)	FWGE	< 0.06	0.06	mg/L
Arsenic (As)	FWGE	< 0.06	0.06	mg/L
Barium (Ba)	FWGE	0.001	0.001	mg/L
Berylium (Be)	FWGE	< 0.001	0.001	mg/L
Boron (B)	FWGE	0.03	0.01	mg/L
Cadmium (Cd)	FWGE	< 0.006	0.006	mg/L
Calcium (Ca)	FWGE	1.6	0.1	mg/L
Chromium (Cr)	FWGE	< 0.006	0.006	mg/L
Cobalt (Co)	FWGE	< 0.006	0.006	mg/L
Copper (Cu)	FWGE	< 0.02	0.02	mg/L
Iron (Fe)	FWGE	0.12	0.05	mg/L
Lead (Pb)	FWGE	< 0.06	0.06	mg/L
Magnesium (Mg)	FWGE	0.2	0.1	mg/L
Manganese (Mn)	FWGE	0.013	0.001	mg/L

TEST DESCRIPTION	MATRIX	RESULT	MDL	UNITS
Molybdenum (Mo)	FWGE	< 0.01	0.01	mg/L
Nickel (Ni)	FWGE	< 0.02	0.02	mg/L
Phosphorus (P)	FWGE	< 0.1	0.1	mg/L
Potassium (K)	FWGE	0.2	0.1	mg/L
Selenium (Se)	FWGE	< 0.06	0.06	mg/L
Silicon (Si)	FWGE	1.57	0.06	mg/L
Silver (Ag)	FWGE	< 0.01	0.01	mg/L
Sodium (Na)	FWGE	0.4	0.1	mg/L
Strontium (Sr)	FWGE	0.007	0.001	mg/L
Sulfur (S)	FWGE	1.01	0.06	mg/L
Tin (Sn)	FWGE	< 0.06	0.06	mg/L
Titanium (Ti)	FWGE	0.004	0.002	mg/L
Vanadium (V)	FWGE	< 0.01	0.01	mg/L
Zinc (Zn)	FWGE	0.005	0.002	mg/L
***ICPMS Dissolved.**				
Aluminum (Al)	FWGE	43.1	0.2	ug/L
Antimony (Sb)	FWGE	0.788	0.005	ug/L
Arsenic (As)	FWGE	21.7	0.1	ug/L
Barium (Ba)	FWGE	0.35	0.02	ug/L
Berylium (Be)	FWGE	< 0.002	0.002	ug/L
Bismuth (Bi)	FWGE	< 0.02	0.02	ug/L
Cadmium (Cd)	FWGE	< 0.01	0.01	ug/L
Chromium (Cr)	FWGE	< 0.2	0.2	ug/L
Cobalt (Co)	FWGE	0.343	0.005	ug/L
Copper (Cu)	FWGE	9.03	0.05	ug/L
Lead (Pb)	FWGE	< 0.01	0.01	ug/L
Lithium (Li)	FWGE	0.19	0.05	ug/L
Manganese (Mn)	FWGE	10.2	0.005	ug/L
Molybdenum (Mo)	FWGE	0.10	0.05	ug/L
Nickel (Ni)	FWGE	0.42	0.05	ug/L
Selenium (Se)	FWGE	< 0.2	0.2	ug/L
Silver (Ag)	FWGE	< 0.02	0.02	ug/L
Strontium (Sr)	FWGE	5.62	0.005	ug/L
Thallium (Tl)	FWGE	0.006	0.002	ug/L
Tin (Sn)	FWGE	0.04	0.01	ug/L
Uranium (U)	FWGE	< 0.002	0.002	ug/L
Vanadium (V)	FWGE	< 0.05	0.05	ug/L
Zinc (Zn)	FWGE	3.0	0.1	ug/L
***ICPMS Total.**				
Aluminum (Al)	FWGE	118	0.2	ug/L
Antimony (Sb)	FWGE	0.771	0.005	ug/L
Arsenic (As)	FWGE	30.4	0.1	ug/L
Barium (Ba)	FWGE	0.62	0.02	ug/L
Berylium (Be)	FWGE	0.002	0.002	ug/L
Bismuth (Bi)	FWGE	< 0.02	0.02	ug/L
Cadmium (Cd)	FWGE	< 0.01	0.01	ug/L
Chromium (Cr)	FWGE	0.6	0.2	ug/L
Cobalt (Co)	FWGE	0.403	0.005	ug/L
Copper (Cu)	FWGE	11.9	0.05	ug/L
Lead (Pb)	FWGE	0.07	0.01	ug/L
Lithium (Li)	FWGE	0.23	0.05	ug/L
Manganese (Mn)	FWGE	11.3	0.005	ug/L

TEST DESCRIPTION	MATRIX	RESULT	MDL	UNITS
Molybdenum (Mo)	FWGE	0.11	0.05	ug/L
Nickel (Ni)	FWGE	1.79	0.05	ug/L
Selenium (Se)	FWGE	< 0.2	0.2	ug/L
Silver (Ag)	FWGE	0.06	0.02	ug/L
Strontium (Sr)	FWGE	6.09	0.005	ug/L
Thallium (Tl)	FWGE	0.004	0.002	ug/L
Tin (Sn)	FWGE	0.96	0.01	ug/L
Uranium (U)	FWGE	0.002	0.002	ug/L
Vanadium (V)	FWGE	0.13	0.05	ug/L
Zinc (Zn)	FWGE	1.5	0.1	ug/L

Order No: 159283 - DIV 13
Start Date: 7/9/2007 12:00:00AM

General

TEST DESCRIPTION	MATRIX	RESULT	MDL	UNITS
***Acidity total&pH4.5**				
Acidity to pH 4.5	FWGE	< 1	1	mg CaCO3 / L
Acidity, Total	FWGE	2	1	mg CaCO3 / L
***AlkalinityTot-pH4.5**				
Alkalinity to pH 4.5	FWGE	0.8	0.5	mg CaCO3 / L
Alkalinity, Total	FWGE	0.8	0.5	mg CaCO3 / L
***ICA (Cl F SO4)**				
Chloride (Cl)	FWGE	0.1	0.1	mg/L
Fluoride (F)	FWGE	< 0.01	0.01	mg/L
Sulphate (SO4)	FWGE	4.2	0.5	mg/L
***ICA (NO2 NO3 Br)**				
Bromide (Br)	FWGE	< 0.05	0.05	mg/L
Nitrogen, Nitrate as N	FWGE	< 0.002	0.002	mg/L
Nitrogen, Nitrite as N	FWGE	< 0.005	0.005	mg/L
***pH**				
pH	FWGE	5.87	0.01	pH Units
***Residue: Filterable**				
Solids, Total Dissolved (FR)	FWGE	25	10	mg/L
***SpecificConductance**				
Conductivity	FWGE	13	2	uS/cm

Metals

TEST DESCRIPTION	MATRIX	RESULT	MDL	UNITS
***ICP Dissolved**				
Aluminum (Al)	FWGE	0.10	0.05	mg/L
Antimony (Sb)	FWGE	< 0.05	0.05	mg/L
Arsenic (As)	FWGE	< 0.05	0.05	mg/L
Barium (Ba)	FWGE	0.002	0.001	mg/L
Berylium (Be)	FWGE	< 0.001	0.001	mg/L
Boron (B)	FWGE	< 0.01	0.01	mg/L
Cadmium (Cd)	FWGE	< 0.005	0.005	mg/L
Calcium (Ca)	FWGE	1.7	0.1	mg/L
Chromium (Cr)	FWGE	< 0.005	0.005	mg/L

TEST DESCRIPTION	MATRIX	RESULT	MDL	UNITS
Cobalt (Co)	FWGE	< 0.005	0.005	mg/L
Copper (Cu)	FWGE	0.278	0.005	mg/L
Iron (Fe)	FWGE	0.021	0.005	mg/L
Lead (Pb)	FWGE	< 0.05	0.05	mg/L
Magnesium (Mg)	FWGE	0.1	0.1	mg/L
Manganese (Mn)	FWGE	0.018	0.001	mg/L
Molybdenum (Mo)	FWGE	< 0.01	0.01	mg/L
Nickel (Ni)	FWGE	< 0.02	0.02	mg/L
Phosphorus (P)	FWGE	< 0.1	0.1	mg/L
Potassium (K)	FWGE	0.2	0.1	mg/L
Selenium (Se)	FWGE	< 0.05	0.05	mg/L
Silicon (Si)	FWGE	0.91	0.05	mg/L
Silver (Ag)	FWGE	< 0.01	0.01	mg/L
Sodium (Na)	FWGE	0.2	0.1	mg/L
Strontium (Sr)	FWGE	0.005	0.001	mg/L
Sulfur (S)	FWGE	1.58	0.05	mg/L
Tin (Sn)	FWGE	< 0.05	0.05	mg/L
Titanium (Ti)	FWGE	< 0.002	0.002	mg/L
Vanadium (V)	FWGE	< 0.01	0.01	mg/L
Zinc (Zn)	FWGE	0.011	0.002	mg/L
***ICP Total**				
Aluminum (Al)	FWGE	0.13	0.06	mg/L
Antimony (Sb)	FWGE	< 0.06	0.06	mg/L
Arsenic (As)	FWGE	< 0.06	0.06	mg/L
Barium (Ba)	FWGE	0.003	0.001	mg/L
Berylium (Be)	FWGE	< 0.001	0.001	mg/L
Boron (B)	FWGE	0.03	0.01	mg/L
Cadmium (Cd)	FWGE	< 0.006	0.006	mg/L
Calcium (Ca)	FWGE	1.9	0.1	mg/L
Chromium (Cr)	FWGE	< 0.006	0.006	mg/L
Cobalt (Co)	FWGE	< 0.006	0.006	mg/L
Copper (Cu)	FWGE	0.30	0.02	mg/L
Iron (Fe)	FWGE	0.21	0.05	mg/L
Lead (Pb)	FWGE	< 0.06	0.06	mg/L
Magnesium (Mg)	FWGE	0.1	0.1	mg/L
Manganese (Mn)	FWGE	0.020	0.001	mg/L
Molybdenum (Mo)	FWGE	< 0.01	0.01	mg/L
Nickel (Ni)	FWGE	< 0.02	0.02	mg/L
Phosphorus (P)	FWGE	< 0.1	0.1	mg/L
Potassium (K)	FWGE	0.2	0.1	mg/L
Selenium (Se)	FWGE	< 0.06	0.06	mg/L
Silicon (Si)	FWGE	1.04	0.06	mg/L
Silver (Ag)	FWGE	0.02	0.01	mg/L
Sodium (Na)	FWGE	0.2	0.1	mg/L
Strontium (Sr)	FWGE	0.006	0.001	mg/L
Sulfur (S)	FWGE	1.52	0.06	mg/L
Tin (Sn)	FWGE	< 0.06	0.06	mg/L
Titanium (Ti)	FWGE	0.004	0.002	mg/L
Vanadium (V)	FWGE	< 0.01	0.01	mg/L
Zinc (Zn)	FWGE	0.011	0.002	mg/L
***ICPMS Dissolved.**				
Aluminum (Al)	FWGE	104	0.2	ug/L

TEST DESCRIPTION	MATRIX	RESULT	MDL	UNITS
Antimony (Sb)	FWGE	0.093	0.005	ug/L
Arsenic (As)	FWGE	0.5	0.1	ug/L
Barium (Ba)	FWGE	2.24	0.02	ug/L
Berylium (Be)	FWGE	0.007	0.002	ug/L
Bismuth (Bi)	FWGE	< 0.02	0.02	ug/L
Cadmium (Cd)	FWGE	0.05	0.01	ug/L
Chromium (Cr)	FWGE	< 0.2	0.2	ug/L
Cobalt (Co)	FWGE	1.64	0.005	ug/L
Copper (Cu)	FWGE	236	0.05	ug/L
Lead (Pb)	FWGE	0.02	0.01	ug/L
Lithium (Li)	FWGE	0.20	0.05	ug/L
Manganese (Mn)	FWGE	16.1	0.005	ug/L
Molybdenum (Mo)	FWGE	0.29	0.05	ug/L
Nickel (Ni)	FWGE	2.13	0.05	ug/L
Selenium (Se)	FWGE	< 0.2	0.2	ug/L
Silver (Ag)	FWGE	0.03	0.02	ug/L
Strontium (Sr)	FWGE	4.87	0.005	ug/L
Thallium (Tl)	FWGE	0.004	0.002	ug/L
Tin (Sn)	FWGE	< 0.01	0.01	ug/L
Uranium (U)	FWGE	0.004	0.002	ug/L
Vanadium (V)	FWGE	< 0.05	0.05	ug/L
Zinc (Zn)	FWGE	8.1	0.1	ug/L
***ICPMS Total.**				
Aluminum (Al)	FWGE	108	0.2	ug/L
Antimony (Sb)	FWGE	0.090	0.005	ug/L
Arsenic (As)	FWGE	0.5	0.1	ug/L
Barium (Ba)	FWGE	2.29	0.02	ug/L
Berylium (Be)	FWGE	0.005	0.002	ug/L
Bismuth (Bi)	FWGE	< 0.02	0.02	ug/L
Cadmium (Cd)	FWGE	0.04	0.01	ug/L
Chromium (Cr)	FWGE	< 0.2	0.2	ug/L
Cobalt (Co)	FWGE	1.63	0.005	ug/L
Copper (Cu)	FWGE	222	0.05	ug/L
Lead (Pb)	FWGE	0.04	0.01	ug/L
Lithium (Li)	FWGE	0.22	0.05	ug/L
Manganese (Mn)	FWGE	15.8	0.005	ug/L
Molybdenum (Mo)	FWGE	0.29	0.05	ug/L
Nickel (Ni)	FWGE	2.12	0.05	ug/L
Selenium (Se)	FWGE	< 0.2	0.2	ug/L
Silver (Ag)	FWGE	0.05	0.02	ug/L
Strontium (Sr)	FWGE	5.17	0.005	ug/L
Thallium (Tl)	FWGE	0.003	0.002	ug/L
Tin (Sn)	FWGE	0.57	0.01	ug/L
Uranium (U)	FWGE	0.005	0.002	ug/L
Vanadium (V)	FWGE	< 0.05	0.05	ug/L
Zinc (Zn)	FWGE	5.0	0.1	ug/L

Order No: 159284 - DITCH 11
Start Date: 7/9/2007 12:00:00AM

TEST DESCRIPTION	MATRIX	RESULT	MDL	UNITS
General				
***Acidity total&pH4.5**				
Acidity to pH 4.5	FWGE	< 1	1	mg CaCO3 / L
Acidity, Total	FWGE	2	1	mg CaCO3 / L
***AlkalinityTot-pH4.5**				
Alkalinity, Total	FWGE	10.6	0.5	mg CaCO3 / L
***ICA (Cl F SO4)**				
Chloride (Cl)	FWGE	0.2	0.1	mg/L
Fluoride (F)	FWGE	0.05	0.01	mg/L
Sulphate (SO4)	FWGE	42	1	mg/L
***ICA (NO2 NO3 Br)**				
Bromide (Br)	FWGE	< 0.05	0.05	mg/L
Nitrogen, Nitrate as N	FWGE	0.014	0.002	mg/L
Nitrogen, Nitrite as N	FWGE	0.006	0.005	mg/L
***pH**				
pH	FWGE	7.28	0.01	pH Units
***Residue: Filterable**				
Solids, Total Dissolved (FR)	FWGE	78	10	mg/L
***SpecificConductance**				
Conductivity	FWGE	116	2	uS/cm
Metals				
***ICP Dissolved**				
Aluminum (Al)	FWGE	< 0.05	0.05	mg/L
Antimony (Sb)	FWGE	< 0.05	0.05	mg/L
Arsenic (As)	FWGE	< 0.05	0.05	mg/L
Barium (Ba)	FWGE	0.005	0.001	mg/L
Berylium (Be)	FWGE	< 0.001	0.001	mg/L
Boron (B)	FWGE	< 0.01	0.01	mg/L
Cadmium (Cd)	FWGE	< 0.005	0.005	mg/L
Calcium (Ca)	FWGE	17.6	0.1	mg/L
Chromium (Cr)	FWGE	< 0.005	0.005	mg/L
Cobalt (Co)	FWGE	0.013	0.005	mg/L
Copper (Cu)	FWGE	0.564	0.005	mg/L
Iron (Fe)	FWGE	< 0.005	0.005	mg/L
Lead (Pb)	FWGE	< 0.05	0.05	mg/L
Magnesium (Mg)	FWGE	2.6	0.1	mg/L
Manganese (Mn)	FWGE	0.266	0.001	mg/L
Molybdenum (Mo)	FWGE	< 0.01	0.01	mg/L
Nickel (Ni)	FWGE	< 0.02	0.02	mg/L
Phosphorus (P)	FWGE	< 0.1	0.1	mg/L
Potassium (K)	FWGE	0.7	0.1	mg/L
Selenium (Se)	FWGE	< 0.05	0.05	mg/L
Silicon (Si)	FWGE	2.32	0.05	mg/L
Silver (Ag)	FWGE	< 0.01	0.01	mg/L
Sodium (Na)	FWGE	0.5	0.1	mg/L
Strontium (Sr)	FWGE	0.035	0.001	mg/L

TEST DESCRIPTION	MATRIX	RESULT	MDL	UNITS
Sulfur (S)	FWGE	15	0.05	mg/L
Tin (Sn)	FWGE	< 0.05	0.05	mg/L
Titanium (Ti)	FWGE	< 0.002	0.002	mg/L
Vanadium (V)	FWGE	< 0.01	0.01	mg/L
Zinc (Zn)	FWGE	0.058	0.002	mg/L
***ICP Total**				
Aluminum (Al)	FWGE	0.28	0.06	mg/L
Antimony (Sb)	FWGE	< 0.06	0.06	mg/L
Arsenic (As)	FWGE	0.09	0.06	mg/L
Barium (Ba)	FWGE	0.007	0.001	mg/L
Berylium (Be)	FWGE	< 0.001	0.001	mg/L
Boron (B)	FWGE	0.03	0.01	mg/L
Cadmium (Cd)	FWGE	< 0.006	0.006	mg/L
Calcium (Ca)	FWGE	19.2	0.1	mg/L
Chromium (Cr)	FWGE	< 0.006	0.006	mg/L
Cobalt (Co)	FWGE	0.013	0.006	mg/L
Copper (Cu)	FWGE	1.46	0.02	mg/L
Iron (Fe)	FWGE	1.99	0.05	mg/L
Lead (Pb)	FWGE	< 0.06	0.06	mg/L
Magnesium (Mg)	FWGE	2.6	0.1	mg/L
Manganese (Mn)	FWGE	0.278	0.001	mg/L
Molybdenum (Mo)	FWGE	< 0.01	0.01	mg/L
Nickel (Ni)	FWGE	< 0.02	0.02	mg/L
Phosphorus (P)	FWGE	< 0.1	0.1	mg/L
Potassium (K)	FWGE	0.7	0.1	mg/L
Selenium (Se)	FWGE	< 0.06	0.06	mg/L
Silicon (Si)	FWGE	2.54	0.06	mg/L
Silver (Ag)	FWGE	0.01	0.01	mg/L
Sodium (Na)	FWGE	0.5	0.1	mg/L
Strontium (Sr)	FWGE	0.039	0.001	mg/L
Sulfur (S)	FWGE	14.4	0.06	mg/L
Tin (Sn)	FWGE	< 0.06	0.06	mg/L
Titanium (Ti)	FWGE	0.003	0.002	mg/L
Vanadium (V)	FWGE	< 0.01	0.01	mg/L
Zinc (Zn)	FWGE	0.061	0.002	mg/L
***ICPMS Dissolved.**				
Aluminum (Al)	FWGE	12.5	0.2	ug/L
Antimony (Sb)	FWGE	0.142	0.005	ug/L
Arsenic (As)	FWGE	18.3	0.1	ug/L
Barium (Ba)	FWGE	5.05	0.02	ug/L
Berylium (Be)	FWGE	0.006	0.002	ug/L
Bismuth (Bi)	FWGE	< 0.02	0.02	ug/L
Cadmium (Cd)	FWGE	0.36	0.01	ug/L
Chromium (Cr)	FWGE	< 0.2	0.2	ug/L
Cobalt (Co)	FWGE	11.4	0.005	ug/L
Copper (Cu)	FWGE	564	0.05	ug/L
Lead (Pb)	FWGE	0.02	0.01	ug/L
Lithium (Li)	FWGE	1.54	0.05	ug/L
Manganese (Mn)	FWGE	249	0.005	ug/L
Molybdenum (Mo)	FWGE	0.93	0.05	ug/L
Nickel (Ni)	FWGE	8.75	0.05	ug/L
Selenium (Se)	FWGE	< 0.2	0.2	ug/L

TEST DESCRIPTION	MATRIX	RESULT	MDL	UNITS
Silver (Ag)	FWGE	0.04	0.02	ug/L
Strontium (Sr)	FWGE	33.3	0.005	ug/L
Thallium (Tl)	FWGE	0.061	0.002	ug/L
Tin (Sn)	FWGE	< 0.01	0.01	ug/L
Uranium (U)	FWGE	< 0.002	0.002	ug/L
Vanadium (V)	FWGE	< 0.05	0.05	ug/L
Zinc (Zn)	FWGE	44.8	0.1	ug/L
***ICPMS Total.**				
Aluminum (Al)	FWGE	265	0.2	ug/L
Antimony (Sb)	FWGE	0.189	0.005	ug/L
Arsenic (As)	FWGE	78.3	0.1	ug/L
Barium (Ba)	FWGE	5.14	0.02	ug/L
Berylium (Be)	FWGE	0.014	0.002	ug/L
Bismuth (Bi)	FWGE	< 0.02	0.02	ug/L
Cadmium (Cd)	FWGE	0.31	0.01	ug/L
Chromium (Cr)	FWGE	0.3	0.2	ug/L
Cobalt (Co)	FWGE	11.2	0.005	ug/L
Copper (Cu)	FWGE	1460	0.05	ug/L
Lead (Pb)	FWGE	0.06	0.01	ug/L
Lithium (Li)	FWGE	1.58	0.05	ug/L
Manganese (Mn)	FWGE	245	0.005	ug/L
Molybdenum (Mo)	FWGE	1.07	0.05	ug/L
Nickel (Ni)	FWGE	10.4	0.05	ug/L
Selenium (Se)	FWGE	< 0.2	0.2	ug/L
Silver (Ag)	FWGE	0.09	0.02	ug/L
Strontium (Sr)	FWGE	35.2	0.005	ug/L
Thallium (Tl)	FWGE	0.057	0.002	ug/L
Tin (Sn)	FWGE	0.81	0.01	ug/L
Uranium (U)	FWGE	0.019	0.002	ug/L
Vanadium (V)	FWGE	< 0.05	0.05	ug/L
Zinc (Zn)	FWGE	32.9	0.1	ug/L

Order No: 159285 - WEIR 1
Start Date: 7/9/2007 12:00:00AM

General

TEST DESCRIPTION	MATRIX	RESULT	MDL	UNITS
***Acidity total&pH4.5**				
Acidity to pH 4.5	FWGE	36	1	mg CaCO3 / L
Acidity, Total	FWGE	143	1	mg CaCO3 / L
***AlkalinityTot-pH4.5**				
Alkalinity to pH 4.5	FWGE	< 0.5	0.5	mg CaCO3 / L
***ICA (Cl F SO4)**				
Chloride (Cl)	FWGE	2.3	0.1	mg/L
Fluoride (F)	FWGE	0.05	0.01	mg/L
Sulphate (SO4)	FWGE	1010	30	mg/L

Analysis performed after recommended hold time.

***ICA (NO2 NO3 Br)**

TEST DESCRIPTION	MATRIX	RESULT	MDL	UNITS
Bromide (Br)	FWGE	0.22	0.05	mg/L
Nitrogen, Nitrate as N	FWGE	0.115	0.002	mg/L
Nitrogen, Nitrite as N	FWGE	< 0.005	0.005	mg/L
***pH**				
pH	FWGE	3.52	0.01	pH Units
***Residue: Filterable**				
Solids, Total Dissolved (FR)	FWGE	940	10	mg/L
***SpecificConductance**				
Conductivity	FWGE	965	2	uS/cm
Metals				
***ICP Dissolved**				
Aluminum (Al)	FWGE	21	0.05	mg/L
Antimony (Sb)	FWGE	< 0.05	0.05	mg/L
Arsenic (As)	FWGE	< 0.05	0.05	mg/L
Barium (Ba)	FWGE	0.009	0.001	mg/L
Berylium (Be)	FWGE	< 0.001	0.001	mg/L
Boron (B)	FWGE	< 0.01	0.01	mg/L
Cadmium (Cd)	FWGE	< 0.005	0.005	mg/L
Calcium (Ca)	FWGE	135	0.1	mg/L
Chromium (Cr)	FWGE	< 0.005	0.005	mg/L
Cobalt (Co)	FWGE	0.167	0.005	mg/L
Copper (Cu)	FWGE	10.3	0.005	mg/L
Iron (Fe)	FWGE	2.59	0.005	mg/L
Iron (Fe)	FWGE	2.52	0.005	mg/L
Lead (Pb)	FWGE	< 0.05	0.05	mg/L
Magnesium (Mg)	FWGE	17.2	0.1	mg/L
Manganese (Mn)	FWGE	2.52	0.001	mg/L
Manganese (Mn)	FWGE	2.57	0.001	mg/L
Molybdenum (Mo)	FWGE	< 0.01	0.01	mg/L
Nickel (Ni)	FWGE	0.14	0.02	mg/L
Phosphorus (P)	FWGE	< 0.1	0.1	mg/L
Potassium (K)	FWGE	3.2	0.1	mg/L
Selenium (Se)	FWGE	< 0.05	0.05	mg/L
Silicon (Si)	FWGE	13.1	0.05	mg/L
Silicon (Si)	FWGE	12.2	0.05	mg/L
Silver (Ag)	FWGE	< 0.01	0.01	mg/L
Sodium (Na)	FWGE	2.9	0.1	mg/L
Strontium (Sr)	FWGE	0.239	0.001	mg/L
Sulfur (S)	FWGE	178	0.05	mg/L
Tin (Sn)	FWGE	< 0.05	0.05	mg/L
Titanium (Ti)	FWGE	< 0.002	0.002	mg/L
Vanadium (V)	FWGE	< 0.01	0.01	mg/L
Zinc (Zn)	FWGE	0.591	0.002	mg/L
***ICP Total**				
Aluminum (Al)	FWGE	17.3	0.06	mg/L
Antimony (Sb)	FWGE	< 0.06	0.06	mg/L
Arsenic (As)	FWGE	< 0.06	0.06	mg/L
Barium (Ba)	FWGE	0.010	0.001	mg/L
Berylium (Be)	FWGE	< 0.001	0.001	mg/L
Boron (B)	FWGE	0.03	0.01	mg/L

TEST DESCRIPTION	MATRIX	RESULT	MDL	UNITS
Cadmium (Cd)	FWGE	< 0.006	0.006	mg/L
Calcium (Ca)	FWGE	112	0.1	mg/L
Chromium (Cr)	FWGE	< 0.006	0.006	mg/L
Cobalt (Co)	FWGE	0.162	0.006	mg/L
Copper (Cu)	FWGE	8.49	0.02	mg/L
Iron (Fe)	FWGE	2.42	0.05	mg/L
Iron (Fe)	FWGE	2.27	0.05	mg/L
Lead (Pb)	FWGE	< 0.06	0.06	mg/L
Magnesium (Mg)	FWGE	15.7	0.1	mg/L
Manganese (Mn)	FWGE	2.42	0.001	mg/L
Manganese (Mn)	FWGE	2.36	0.001	mg/L
Molybdenum (Mo)	FWGE	< 0.01	0.01	mg/L
Nickel (Ni)	FWGE	0.12	0.02	mg/L
Phosphorus (P)	FWGE	< 0.1	0.1	mg/L
Potassium (K)	FWGE	3.3	0.1	mg/L
Selenium (Se)	FWGE	< 0.06	0.06	mg/L
Silicon (Si)	FWGE	12.9	0.06	mg/L
Silicon (Si)	FWGE	11.6	0.06	mg/L
Silver (Ag)	FWGE	0.01	0.01	mg/L
Sodium (Na)	FWGE	2.8	0.1	mg/L
Strontium (Sr)	FWGE	0.272	0.001	mg/L
Sulfur (S)	FWGE	180	0.06	mg/L
Tin (Sn)	FWGE	< 0.06	0.06	mg/L
Titanium (Ti)	FWGE	< 0.002	0.002	mg/L
Vanadium (V)	FWGE	< 0.01	0.01	mg/L
Zinc (Zn)	FWGE	0.583	0.002	mg/L
***ICPMS Dissolved.**				
Aluminum (Al)	FWGE	18082	0.2	ug/L
Antimony (Sb)	FWGE	0.024	0.005	ug/L
Arsenic (As)	FWGE	0.4	0.1	ug/L
Barium (Ba)	FWGE	8.36	0.02	ug/L
Berylium (Be)	FWGE	0.426	0.002	ug/L
Bismuth (Bi)	FWGE	< 0.02	0.02	ug/L
Cadmium (Cd)	FWGE	2.92	0.01	ug/L
Chromium (Cr)	FWGE	0.5	0.2	ug/L
Cobalt (Co)	FWGE	148	0.005	ug/L
Copper (Cu)	FWGE	10500	0.05	ug/L
Lead (Pb)	FWGE	0.26	0.01	ug/L
Lithium (Li)	FWGE	8.91	0.05	ug/L
Manganese (Mn)	FWGE	2320	0.005	ug/L
Molybdenum (Mo)	FWGE	< 0.05	0.05	ug/L
Nickel (Ni)	FWGE	96.5	0.05	ug/L
Selenium (Se)	FWGE	0.6	0.2	ug/L
Silver (Ag)	FWGE	0.20	0.02	ug/L
Strontium (Sr)	FWGE	256	0.005	ug/L
Thallium (Tl)	FWGE	0.049	0.002	ug/L
Tin (Sn)	FWGE	< 0.01	0.01	ug/L
Uranium (U)	FWGE	0.135	0.002	ug/L
Vanadium (V)	FWGE	< 0.05	0.05	ug/L
Zinc (Zn)	FWGE	591	0.1	ug/L
***ICPMS Total.**				
Aluminum (Al)	FWGE	20200	0.2	ug/L

TEST DESCRIPTION	MATRIX	RESULT	MDL	UNITS
Antimony (Sb)	FWGE	0.025	0.005	ug/L
Arsenic (As)	FWGE	0.5	0.1	ug/L
Barium (Ba)	FWGE	8.21	0.02	ug/L
Berylium (Be)	FWGE	0.399	0.002	ug/L
Bismuth (Bi)	FWGE	< 0.02	0.02	ug/L
Cadmium (Cd)	FWGE	2.57	0.01	ug/L
Chromium (Cr)	FWGE	0.5	0.2	ug/L
Cobalt (Co)	FWGE	146	0.005	ug/L
Copper (Cu)	FWGE	10100	0.05	ug/L
Lead (Pb)	FWGE	0.23	0.01	ug/L
Lithium (Li)	FWGE	9.24	0.05	ug/L
Manganese (Mn)	FWGE	2360	0.005	ug/L
Molybdenum (Mo)	FWGE	< 0.05	0.05	ug/L
Nickel (Ni)	FWGE	94.5	0.05	ug/L
Selenium (Se)	FWGE	0.5	0.2	ug/L
Silver (Ag)	FWGE	0.20	0.02	ug/L
Strontium (Sr)	FWGE	268	0.005	ug/L
Thallium (Tl)	FWGE	0.037	0.002	ug/L
Tin (Sn)	FWGE	0.49	0.01	ug/L
Uranium (U)	FWGE	0.131	0.002	ug/L
Vanadium (V)	FWGE	< 0.05	0.05	ug/L
Zinc (Zn)	FWGE	583	0.1	ug/L

Order No: 159286 - WEIR 2
Start Date: 7/9/2007 12:00:00AM

General

TEST DESCRIPTION	MATRIX	RESULT	MDL	UNITS
***Acidity total&pH4.5**				
Acidity to pH 4.5	FWGE	3	1	mg CaCO3 / L
Acidity, Total	FWGE	26	1	mg CaCO3 / L
***AlkalinityTot-pH4.5**				
Alkalinity to pH 4.5	FWGE	< 0.5	0.5	mg CaCO3 / L
***ICA (Cl F SO4)**				
Chloride (Cl)	FWGE	0.5	0.1	mg/L
Fluoride (F)	FWGE	< 0.01	0.01	mg/L
Sulphate (SO4)	FWGE	127	5	mg/L
***ICA (NO2 NO3 Br)**				
Bromide (Br)	FWGE	< 0.05	0.05	mg/L
Nitrogen, Nitrate as N	FWGE	0.021	0.002	mg/L
Nitrogen, Nitrite as N	FWGE	< 0.005	0.005	mg/L
***pH**				
pH	FWGE	4.29	0.01	pH Units
***Residue: Filterable**				
Solids, Total Dissolved (FR)	FWGE	189	10	mg/L
***SpecificConductance**				
Conductivity	FWGE	197	2	uS/cm

TEST DESCRIPTION	MATRIX	RESULT	MDL	UNITS
Metals				
***ICP Dissolved**				
Aluminum (Al)	FWGE	2.71	0.05	mg/L
Antimony (Sb)	FWGE	< 0.05	0.05	mg/L
Arsenic (As)	FWGE	< 0.05	0.05	mg/L
Barium (Ba)	FWGE	0.004	0.001	mg/L
Berylium (Be)	FWGE	< 0.001	0.001	mg/L
Boron (B)	FWGE	< 0.01	0.01	mg/L
Cadmium (Cd)	FWGE	< 0.005	0.005	mg/L
Calcium (Ca)	FWGE	18	0.1	mg/L
Chromium (Cr)	FWGE	< 0.005	0.005	mg/L
Cobalt (Co)	FWGE	0.031	0.005	mg/L
Copper (Cu)	FWGE	4.3	0.005	mg/L
Iron (Fe)	FWGE	0.332	0.005	mg/L
Lead (Pb)	FWGE	< 0.05	0.05	mg/L
Magnesium (Mg)	FWGE	3.0	0.1	mg/L
Manganese (Mn)	FWGE	0.488	0.001	mg/L
Molybdenum (Mo)	FWGE	< 0.01	0.01	mg/L
Nickel (Ni)	FWGE	< 0.02	0.02	mg/L
Phosphorus (P)	FWGE	< 0.1	0.1	mg/L
Potassium (K)	FWGE	0.7	0.1	mg/L
Selenium (Se)	FWGE	< 0.05	0.05	mg/L
Silicon (Si)	FWGE	3.76	0.05	mg/L
Silver (Ag)	FWGE	< 0.01	0.01	mg/L
Sodium (Na)	FWGE	0.6	0.1	mg/L
Strontium (Sr)	FWGE	0.033	0.001	mg/L
Sulfur (S)	FWGE	26.3	0.05	mg/L
Tin (Sn)	FWGE	< 0.05	0.05	mg/L
Titanium (Ti)	FWGE	< 0.002	0.002	mg/L
Vanadium (V)	FWGE	< 0.01	0.01	mg/L
Zinc (Zn)	FWGE	0.108	0.002	mg/L
***ICP Total**				
Aluminum (Al)	FWGE	2.50	0.06	mg/L
Antimony (Sb)	FWGE	< 0.06	0.06	mg/L
Arsenic (As)	FWGE	< 0.06	0.06	mg/L
Barium (Ba)	FWGE	0.004	0.001	mg/L
Berylium (Be)	FWGE	< 0.001	0.001	mg/L
Boron (B)	FWGE	0.03	0.01	mg/L
Cadmium (Cd)	FWGE	< 0.006	0.006	mg/L
Calcium (Ca)	FWGE	18.3	0.1	mg/L
Chromium (Cr)	FWGE	< 0.006	0.006	mg/L
Cobalt (Co)	FWGE	0.032	0.006	mg/L
Copper (Cu)	FWGE	4.12	0.02	mg/L
Iron (Fe)	FWGE	0.33	0.05	mg/L
Lead (Pb)	FWGE	< 0.06	0.06	mg/L
Magnesium (Mg)	FWGE	2.8	0.1	mg/L
Manganese (Mn)	FWGE	0.483	0.001	mg/L
Molybdenum (Mo)	FWGE	< 0.01	0.01	mg/L
Nickel (Ni)	FWGE	< 0.02	0.02	mg/L
Phosphorus (P)	FWGE	< 0.1	0.1	mg/L
Potassium (K)	FWGE	0.7	0.1	mg/L

TEST DESCRIPTION	MATRIX	RESULT	MDL	UNITS
Selenium (Se)	FWGE	< 0.06	0.06	mg/L
Silicon (Si)	FWGE	3.69	0.06	mg/L
Silver (Ag)	FWGE	< 0.01	0.01	mg/L
Sodium (Na)	FWGE	0.6	0.1	mg/L
Strontium (Sr)	FWGE	0.035	0.001	mg/L
Sulfur (S)	FWGE	25.6	0.06	mg/L
Tin (Sn)	FWGE	< 0.06	0.06	mg/L
Titanium (Ti)	FWGE	< 0.002	0.002	mg/L
Vanadium (V)	FWGE	< 0.01	0.01	mg/L
Zinc (Zn)	FWGE	0.104	0.002	mg/L
***ICPMS Dissolved.**				
Aluminum (Al)	FWGE	2710	0.2	ug/L
Antimony (Sb)	FWGE	0.037	0.005	ug/L
Arsenic (As)	FWGE	1.1	0.1	ug/L
Barium (Ba)	FWGE	3.53	0.02	ug/L
Berylium (Be)	FWGE	0.102	0.002	ug/L
Bismuth (Bi)	FWGE	< 0.02	0.02	ug/L
Cadmium (Cd)	FWGE	0.67	0.01	ug/L
Chromium (Cr)	FWGE	< 0.2	0.2	ug/L
Cobalt (Co)	FWGE	27.7	0.005	ug/L
Copper (Cu)	FWGE	4300	0.05	ug/L
Lead (Pb)	FWGE	0.12	0.01	ug/L
Lithium (Li)	FWGE	1.90	0.05	ug/L
Manganese (Mn)	FWGE	488	0.005	ug/L
Molybdenum (Mo)	FWGE	0.05	0.05	ug/L
Nickel (Ni)	FWGE	14.8	0.05	ug/L
Selenium (Se)	FWGE	< 0.2	0.2	ug/L
Silver (Ag)	FWGE	0.04	0.02	ug/L
Strontium (Sr)	FWGE	33.2	0.005	ug/L
Thallium (Tl)	FWGE	0.038	0.002	ug/L
Tin (Sn)	FWGE	< 0.01	0.01	ug/L
Uranium (U)	FWGE	0.061	0.002	ug/L
Vanadium (V)	FWGE	< 0.05	0.05	ug/L
Zinc (Zn)	FWGE	94.0	0.1	ug/L
***ICPMS Total.**				
Aluminum (Al)	FWGE	2731	0.2	ug/L
Antimony (Sb)	FWGE	0.045	0.005	ug/L
Arsenic (As)	FWGE	1.2	0.1	ug/L
Barium (Ba)	FWGE	3.97	0.02	ug/L
Berylium (Be)	FWGE	0.084	0.002	ug/L
Bismuth (Bi)	FWGE	< 0.02	0.02	ug/L
Cadmium (Cd)	FWGE	0.57	0.01	ug/L
Chromium (Cr)	FWGE	< 0.2	0.2	ug/L
Cobalt (Co)	FWGE	27.5	0.005	ug/L
Copper (Cu)	FWGE	4120	0.05	ug/L
Lead (Pb)	FWGE	0.27	0.01	ug/L
Lithium (Li)	FWGE	2.06	0.05	ug/L
Manganese (Mn)	FWGE	483	0.005	ug/L
Molybdenum (Mo)	FWGE	0.06	0.05	ug/L
Nickel (Ni)	FWGE	14.8	0.05	ug/L
Selenium (Se)	FWGE	< 0.2	0.2	ug/L
Silver (Ag)	FWGE	0.09	0.02	ug/L

TEST DESCRIPTION	MATRIX	RESULT	MDL	UNITS
Strontium (Sr)	FWGE	36.4	0.005	ug/L
Thallium (Tl)	FWGE	0.034	0.002	ug/L
Tin (Sn)	FWGE	0.66	0.01	ug/L
Uranium (U)	FWGE	0.058	0.002	ug/L
Vanadium (V)	FWGE	< 0.05	0.05	ug/L
Zinc (Zn)	FWGE	69.0	0.1	ug/L

QC Information:

ANALYTE	ALIQ#	EXPECTED	RESULT	% REC	DIL'N	MDL	QC TYPE

*Acidity total&pH4.5 UNITS: mg CaCO3 / L MATRIX: FWGE

ANALYTE	ALIQ#	EXPECTED	RESULT	% REC	DIL'N	MDL	QC TYPE
Acidity to pH 4.5	159499-1	< MDL	< 1		1	1	BLE
Acidity to pH 4.5	159502-1	19	19	101.5	1	1	REP
Acidity to pH 4.5	159503-1	3	3	103.5	1	1	REP
Acidity, Total	159499-1	< MDL	< 1		1	1	BLE
Acidity, Total	159500-1	25	27	107.3	1	1	REF
Acidity, Total	159501-1	50	51	102.4	1	1	REF
Acidity, Total	159502-1	60	60	99.7	1	1	REP
Acidity, Total	159503-1	27	27	101.7	1	1	REP

*AlkalinityTot-pH4.5 UNITS: mg CaCO3 / L MATRIX: FWGE

ANALYTE	ALIQ#	EXPECTED	RESULT	% REC	DIL'N	MDL	QC TYPE
Alkalinity to pH 4.5	159788-1	50	54.1	108.2	1	0.5	REF
Alkalinity to pH 4.5	162718-1	50	51.9	103.8	1	0.5	REF
Alkalinity to pH 4.5	162757-1	39.5	40.4	102.4	1	0.5	REP
Alkalinity, Total	159787-1	< MDL	< 0.5		1	0.5	BLE
Alkalinity, Total	162716-1	< MDL	< 0.5		1	0.5	BLE
Alkalinity, Total	159793-1		< 0.5		1	0.5	REP

*ICA (Cl F SO4) UNITS: mg/L MATRIX: FWGE

ANALYTE	ALIQ#	EXPECTED	RESULT	% REC	DIL'N	MDL	QC TYPE
Chloride (Cl)	159674-1	< MDL	0.1		1	0.1	BLE
Chloride (Cl)	161118-1	< MDL	< 0.1		1	0.1	BLE
Chloride (Cl)	163226-1	< MDL	< 0.1		1	0.1	BLE
Chloride (Cl)	163227-1	< MDL	< 0.1		1	0.1	BLE
Chloride (Cl)	159675-1	1.72	1.7	100.7	1	0.1	REF
Chloride (Cl)	161120-1	1.72	1.8	102.4	1	0.1	REF
Chloride (Cl)	163228-1	1.72	1.7	98.8	1	0.1	REF
Chloride (Cl)	159679-1	0.2	0.2	88.4	1	0.1	REP
Chloride (Cl)	159681-1	0.4	0.4	100.9	1	0.1	REP
Chloride (Cl)	161124-1	3.2	3.3	101.7	1	0.1	REP
Chloride (Cl)	163233-1		< 0.1		1	0.1	REP
Fluoride (F)	159674-1	< MDL	< 0.01		1	0.01	BLE
Fluoride (F)	161118-1	< MDL	< 0.01		1	0.01	BLE
Fluoride (F)	163226-1	< MDL	< 0.01		1	0.01	BLE
Fluoride (F)	163227-1	< MDL	< 0.01		1	0.01	BLE
Fluoride (F)	159675-1	0.20	0.19	97.0	1	0.01	REF
Fluoride (F)	161120-1	0.20	0.19	94.5	1	0.01	REF
Fluoride (F)	163228-1	0.20	0.18	91.5	1	0.01	REF
Fluoride (F)	159679-1	0.02	0.02	111.6	1	0.01	REP
Fluoride (F)	159681-1	0.02	0.02	101.1	1	0.01	REP
Fluoride (F)	161124-1	0.09	0.09	104.8	1	0.01	REP
Fluoride (F)	163233-1		< 0.01		1	0.01	REP
Sulphate (SO4)	159674-1	< MDL	< 0.5		1	0.5	BLE
Sulphate (SO4)	161118-1	< MDL	< 0.5		1	0.5	BLE
Sulphate (SO4)	163226-1	< MDL	< 0.5		1	0.5	BLE
Sulphate (SO4)	163227-1	< MDL	< 0.5		1	0.5	BLE
Sulphate (SO4)	159677-1	11.62	11.5	98.6	1	0.5	REF
Sulphate (SO4)	161122-1	11.62	11.6	99.9	1	0.5	REF

QC Information:

ANALYTE	ALIQ#	EXPECTED	RESULT	% REC	DIL'N	MDL	QC TYPE
Sulphate (SO4)	163235-1	11.62	11.4	97.9	1	0.5	REF
Sulphate (SO4)	159679-1	173	165	95.3	10	5	REP
Sulphate (SO4)	159681-1	6.5	6.5	99.9	1	0.5	REP
Sulphate (SO4)	161124-1	45	45	100.0	2	1	REP
Sulphate (SO4)	163233-1		< 0.5		1	0.5	REP

***ICA (NO2 NO3 Br) UNITS:** mg/L **MATRIX:** FWGE

ANALYTE	ALIQ#	EXPECTED	RESULT	% REC	DIL'N	MDL	QC TYPE
Bromide (Br)	159680-1		< 0.05		1	0.05	REP
Bromide (Br)	159682-1		< 0.05		1	0.05	REP
Nitrogen, Nitrate as N	159676-1	0.262	0.253	96.4	1	0.002	REF
Nitrogen, Nitrate as N	159680-1	0.009	0.010	115.9	1	0.002	REP
Nitrogen, Nitrate as N	159682-1	0.047	0.049	104.9	1	0.002	REP
Nitrogen, Nitrite as N	159678-1	3.74	3.53	94.2	1	0.005	REF
Nitrogen, Nitrite as N	159680-1	0.006	0.005	84.1	1	0.005	REP
Nitrogen, Nitrite as N	159682-1	0.006	0.007	112.9	1	0.005	REP

***ICP Dissolved UNITS:** mg/L **MATRIX:** FWGE

ANALYTE	ALIQ#	EXPECTED	RESULT	% REC	DIL'N	MDL	QC TYPE
Aluminum (Al)	160402-1	< MDL	< 0.05		1	0.05	BLE
Aluminum (Al)	161307-1	< MDL	< 0.05		1	0.05	BLE
Aluminum (Al)	160404-1	0.915	0.92	101.0	1	0.05	REF
Aluminum (Al)	161310-1	0.915	0.87	95.0	1	0.05	REF
Aluminum (Al)	160409-1	2.43	2.36	97.2	1	0.05	REP
Aluminum (Al)	160410-1		< 0.05		1	0.05	REP
Aluminum (Al)	160411-1	0.06	0.06	100.8	1	0.05	REP
Aluminum (Al)	160412-1		< 0.05		1	0.05	REP
Aluminum (Al)	161315-1		< 0.05		1	0.05	REP
Aluminum (Al)	161318-1		< 0.05		1	0.05	REP
Antimony (Sb)	160402-1	< MDL	< 0.05		1	0.05	BLE
Antimony (Sb)	161307-1	< MDL	< 0.05		1	0.05	BLE
Antimony (Sb)	160404-1	0.808	0.89	110.7	1	0.05	REF
Antimony (Sb)	161310-1	0.808	0.78	96.7	1	0.05	REF
Antimony (Sb)	160409-1		< 0.05		1	0.05	REP
Antimony (Sb)	160410-1		< 0.05		1	0.05	REP
Antimony (Sb)	160411-1		< 0.05		1	0.05	REP
Antimony (Sb)	160412-1		< 0.05		1	0.05	REP
Antimony (Sb)	161315-1	0.14	0.14	101.3	1	0.05	REP
Antimony (Sb)	161318-1		< 0.05		1	0.05	REP
Arsenic (As)	160402-1	< MDL	< 0.05		1	0.05	BLE
Arsenic (As)	161307-1	< MDL	< 0.05		1	0.05	BLE
Arsenic (As)	160404-1	0.275	0.27	98.8	1	0.05	REF
Arsenic (As)	161310-1	0.275	0.24	87.0	1	0.05	REF
Arsenic (As)	160409-1		< 0.05		1	0.05	REP
Arsenic (As)	160410-1		< 0.05		1	0.05	REP
Arsenic (As)	160411-1		< 0.05		1	0.05	REP
Arsenic (As)	160412-1		< 0.05		1	0.05	REP
Arsenic (As)	161315-1		< 0.05		1	0.05	REP
Arsenic (As)	161318-1		< 0.05		1	0.05	REP
Barium (Ba)	160402-1	< MDL	0.005		1	0.001	BLE
Barium (Ba)	161307-1	< MDL	< 0.001		1	0.001	BLE

QC Information:

ANALYTE	ALIQ#	EXPECTED	RESULT	% REC	DIL'N	MDL	QC TYPE
Barium (Ba)	160404-1	1.210	1.35	111.7	1	0.001	REF
Barium (Ba)	161310-1	1.210	1.15	95.1	1	0.001	REF
Barium (Ba)	160409-1	0.003	0.003	92.8	1	0.001	REP
Barium (Ba)	160410-1	0.022	0.023	102.8	1	0.001	REP
Barium (Ba)	160411-1	<0.001	0.001	106.2	1	0.001	REP
Barium (Ba)	160412-1	0.011	0.011	103.5	1	0.001	REP
Barium (Ba)	161315-1	0.028	0.028	101.0	1	0.001	REP
Barium (Ba)	161318-1		< 0.001		1	0.001	REP
Berylium (Be)	160402-1	< MDL	< 0.001		1	0.001	BLE
Berylium (Be)	161307-1	< MDL	< 0.001		1	0.001	BLE
Berylium (Be)	160404-1	0.569	0.645	113.3	1	0.001	REF
Berylium (Be)	161310-1	0.569	0.588	103.3	1	0.001	REF
Berylium (Be)	160409-1		< 0.001		1	0.001	REP
Berylium (Be)	160410-1		< 0.001		1	0.001	REP
Berylium (Be)	160411-1		< 0.001		1	0.001	REP
Berylium (Be)	160412-1		< 0.001		1	0.001	REP
Berylium (Be)	161315-1		< 0.001		1	0.001	REP
Berylium (Be)	161318-1		< 0.001		1	0.001	REP
Boron (B)	160402-1	< MDL	0.01		1	0.01	BLE
Boron (B)	161307-1	< MDL	< 0.01		1	0.01	BLE
Boron (B)	160404-1	0.888	1.00	112.2	1	0.01	REF
Boron (B)	161310-1	0.888	0.88	98.9	1	0.01	REF
Boron (B)	160409-1		< 0.01		1	0.01	REP
Boron (B)	160410-1	0.02	0.02	81.9	1	0.01	REP
Boron (B)	160411-1		< 0.01		1	0.01	REP
Boron (B)	160412-1	0.06	0.06	99.9	1	0.01	REP
Boron (B)	161315-1	0.06	0.06	98.4	1	0.01	REP
Boron (B)	161318-1		< 0.01		1	0.01	REP
Cadmium (Cd)	160402-1	< MDL	< 0.005		1	0.005	BLE
Cadmium (Cd)	161307-1	< MDL	< 0.005		1	0.005	BLE
Cadmium (Cd)	160404-1	0.137	0.148	107.7	1	0.005	REF
Cadmium (Cd)	161310-1	0.137	0.132	96.3	1	0.005	REF
Cadmium (Cd)	160409-1		< 0.005		1	0.005	REP
Cadmium (Cd)	160410-1		< 0.005		1	0.005	REP
Cadmium (Cd)	160411-1		< 0.005		1	0.005	REP
Cadmium (Cd)	160412-1		< 0.005		1	0.005	REP
Cadmium (Cd)	161315-1		< 0.005		1	0.005	REP
Cadmium (Cd)	161318-1		< 0.005		1	0.005	REP
Calcium (Ca)	160402-1	< MDL	< 0.1		1	0.1	BLE
Calcium (Ca)	161307-1	< MDL	< 0.1		1	0.1	BLE
Calcium (Ca)	160406-1	90.6	95.5	105.4	1	0.1	REF
Calcium (Ca)	161312-1	90.6	86.9	96.0	1	0.1	REF
Calcium (Ca)	160409-1	16.3	15.4	94.4	1	0.1	REP
Calcium (Ca)	160410-1	141	154	109.6	1	0.1	REP
Calcium (Ca)	160411-1	12.0	12.2	101.4	1	0.1	REP
Calcium (Ca)	160412-1	35.1	36.3	103.3	1	0.1	REP
Calcium (Ca)	161315-1	117	114	97.6	1	0.1	REP
Calcium (Ca)	161318-1		< 0.1		1	0.1	REP
Chromium (Cr)	160402-1	< MDL	< 0.005		1	0.005	BLE
Chromium (Cr)	161307-1	< MDL	< 0.005		1	0.005	BLE
Chromium (Cr)	160404-1	0.215	0.230	107.0	1	0.005	REF
Chromium (Cr)	161310-1	0.215	0.212	98.6	1	0.005	REF

QC Information:

ANALYTE	ALIQ#	EXPECTED	RESULT	% REC	DIL'N	MDL	QC TYPE
Chromium (Cr)	160409-1		< 0.005		1	0.005	REP
Chromium (Cr)	160410-1		< 0.005		1	0.005	REP
Chromium (Cr)	160411-1		< 0.005		1	0.005	REP
Chromium (Cr)	160412-1		< 0.005		1	0.005	REP
Chromium (Cr)	161315-1		< 0.005		1	0.005	REP
Chromium (Cr)	161318-1		< 0.005		1	0.005	REP
Cobalt (Co)	160402-1	< MDL	< 0.005		1	0.005	BLE
Cobalt (Co)	161307-1	< MDL	< 0.005		1	0.005	BLE
Cobalt (Co)	160404-1	0.419	0.440	105.1	1	0.005	REF
Cobalt (Co)	161310-1	0.419	0.396	94.4	1	0.005	REF
Cobalt (Co)	160409-1	0.024	0.024	98.9	1	0.005	REP
Cobalt (Co)	160410-1	0.041	0.042	101.8	1	0.005	REP
Cobalt (Co)	160411-1	0.006	0.006	97.3	1	0.005	REP
Cobalt (Co)	160412-1		< 0.005		1	0.005	REP
Cobalt (Co)	161315-1		< 0.005		1	0.005	REP
Cobalt (Co)	161318-1		< 0.005		1	0.005	REP
Copper (Cu)	160402-1	< MDL	< 0.005		1	0.005	BLE
Copper (Cu)	161307-1	< MDL	< 0.005		1	0.005	BLE
Copper (Cu)	160404-1	0.484	0.527	108.9	1	0.005	REF
Copper (Cu)	161310-1	0.484	0.459	94.9	1	0.005	REF
Copper (Cu)	160409-1	2.95	2.85	96.5	1	0.005	REP
Copper (Cu)	160410-1	1.13	1.23	108.6	1	0.005	REP
Copper (Cu)	160411-1	0.847	0.870	102.7	1	0.005	REP
Copper (Cu)	160412-1		< 0.005		1	0.005	REP
Copper (Cu)	161315-1		< 0.005		1	0.005	REP
Copper (Cu)	161318-1		< 0.005		1	0.005	REP
Iron (Fe)	160402-1	< MDL	< 0.005		1	0.005	BLE
Iron (Fe)	161307-1	< MDL	< 0.005		1	0.005	BLE
Iron (Fe)	160404-1	0.680	0.773	113.6	1	0.005	REF
Iron (Fe)	161310-1	0.680	0.710	104.4	1	0.005	REF
Iron (Fe)	160409-1	0.277	0.272	98.0	1	0.005	REP
Iron (Fe)	160410-1	5.70	5.85	102.6	1	0.005	REP
Iron (Fe)	160411-1	0.038	0.038	100.5	1	0.005	REP
Iron (Fe)	160412-1		< 0.005		1	0.005	REP
Iron (Fe)	161315-1	0.064	0.063	98.3	1	0.005	REP
Iron (Fe)	161318-1		< 0.005		1	0.005	REP
Lead (Pb)	160402-1	< MDL	< 0.05		1	0.05	BLE
Lead (Pb)	161307-1	< MDL	< 0.05		1	0.05	BLE
Lead (Pb)	160404-1	1.140	1.20	105.4	1	0.05	REF
Lead (Pb)	161310-1	1.140	1.07	94.1	1	0.05	REF
Lead (Pb)	160409-1		< 0.05		1	0.05	REP
Lead (Pb)	160410-1		< 0.05		1	0.05	REP
Lead (Pb)	160411-1		< 0.05		1	0.05	REP
Lead (Pb)	160412-1		< 0.05		1	0.05	REP
Lead (Pb)	161315-1		< 0.05		1	0.05	REP
Lead (Pb)	161318-1		< 0.05		1	0.05	REP
Magnesium (Mg)	160402-1	< MDL	< 0.1		1	0.1	BLE
Magnesium (Mg)	161307-1	< MDL	< 0.1		1	0.1	BLE
Magnesium (Mg)	160406-1	25.7	27.6	107.3	1	0.1	REF
Magnesium (Mg)	161312-1	25.7	24.6	95.8	1	0.1	REF
Magnesium (Mg)	160409-1	2.4	2.3	96.5	1	0.1	REP
Magnesium (Mg)	160410-1	10.2	10.9	107.3	1	0.1	REP

QC Information:

ANALYTE	ALIQ#	EXPECTED	RESULT	% REC	DIL'N	MDL	QC TYPE
Magnesium (Mg)	160411-1	3.3	3.4	101.7	1	0.1	REP
Magnesium (Mg)	160412-1	3.1	3.1	101.4	1	0.1	REP
Magnesium (Mg)	161315-1	132	133	100.6	1	0.1	REP
Magnesium (Mg)	161318-1		< 0.1		1	0.1	REP
Manganese (Mn)	160402-1	< MDL	< 0.001		1	0.001	BLE
Manganese (Mn)	161307-1	< MDL	< 0.001		1	0.001	BLE
Manganese (Mn)	160404-1	0.644	0.721	111.9	1	0.001	REF
Manganese (Mn)	161310-1	0.644	0.651	101.0	1	0.001	REF
Manganese (Mn)	160409-1	0.380	0.371	97.7	1	0.001	REP
Manganese (Mn)	160410-1	1.41	1.45	102.8	1	0.001	REP
Manganese (Mn)	160411-1	0.189	0.191	101.2	1	0.001	REP
Manganese (Mn)	160412-1		< 0.001		1	0.001	REP
Manganese (Mn)	161315-1	0.303	0.300	98.9	1	0.001	REP
Manganese (Mn)	161318-1		< 0.001		1	0.001	REP
Molybdenum (Mo)	160402-1	< MDL	< 0.01		1	0.01	BLE
Molybdenum (Mo)	161307-1	< MDL	< 0.01		1	0.01	BLE
Molybdenum (Mo)	160404-1	0.510	0.55	108.3	1	0.01	REF
Molybdenum (Mo)	161310-1	0.510	0.49	95.7	1	0.01	REF
Molybdenum (Mo)	160409-1		< 0.01		1	0.01	REP
Molybdenum (Mo)	160410-1		< 0.01		1	0.01	REP
Molybdenum (Mo)	160411-1		< 0.01		1	0.01	REP
Molybdenum (Mo)	160412-1		< 0.01		1	0.01	REP
Molybdenum (Mo)	161315-1		< 0.01		1	0.01	REP
Molybdenum (Mo)	161318-1		< 0.01		1	0.01	REP
Nickel (Ni)	160402-1	< MDL	< 0.02		1	0.02	BLE
Nickel (Ni)	161307-1	< MDL	< 0.02		1	0.02	BLE
Nickel (Ni)	160404-1	0.942	0.94	99.5	1	0.02	REF
Nickel (Ni)	161310-1	0.942	0.85	89.9	1	0.02	REF
Nickel (Ni)	160409-1		< 0.02		1	0.02	REP
Nickel (Ni)	160410-1	0.05	0.05	108.8	1	0.02	REP
Nickel (Ni)	160411-1		< 0.02		1	0.02	REP
Nickel (Ni)	160412-1		< 0.02		1	0.02	REP
Nickel (Ni)	161315-1		< 0.02		1	0.02	REP
Nickel (Ni)	161318-1		< 0.02		1	0.02	REP
Phosphorus (P)	160402-1	< MDL	< 0.1		1	0.1	BLE
Phosphorus (P)	161307-1	< MDL	< 0.1		1	0.1	BLE
Phosphorus (P)	160409-1		< 0.1		1	0.1	REP
Phosphorus (P)	160410-1		< 0.1		1	0.1	REP
Phosphorus (P)	160411-1		< 0.1		1	0.1	REP
Phosphorus (P)	160412-1		< 0.1		1	0.1	REP
Phosphorus (P)	161315-1	0.6	0.7	112.8	1	0.1	REP
Phosphorus (P)	161318-1		< 0.1		1	0.1	REP
Potassium (K)	160402-1	< MDL	< 0.1		1	0.1	BLE
Potassium (K)	161307-1	< MDL	< 0.1		1	0.1	BLE
Potassium (K)	160406-1	4.0	4.3	106.7	1	0.1	REF
Potassium (K)	161312-1	4.0	3.8	95.7	1	0.1	REF
Potassium (K)	160409-1	0.5	0.5	95.0	1	0.1	REP
Potassium (K)	160410-1	3.0	3.1	103.5	1	0.1	REP
Potassium (K)	160411-1	0.5	0.5	98.7	1	0.1	REP
Potassium (K)	160412-1	3.7	3.8	103.4	1	0.1	REP
Potassium (K)	161315-1	7.7	7.7	100.5	1	0.1	REP
Potassium (K)	161318-1		< 0.1		1	0.1	REP

QC Information:

ANALYTE	ALIQ#	EXPECTED	RESULT	% REC	DIL'N	MDL	QC TYPE
Selenium (Se)	160402-1	< MDL	< 0.05		1	0.05	BLE
Selenium (Se)	161307-1	< MDL	< 0.05		1	0.05	BLE
Selenium (Se)	160404-1	0.674	0.74	109.2	1	0.05	REF
Selenium (Se)	161310-1	0.674	0.66	97.5	1	0.05	REF
Selenium (Se)	160409-1		< 0.05		1	0.05	REP
Selenium (Se)	160410-1		< 0.05		1	0.05	REP
Selenium (Se)	160411-1		< 0.05		1	0.05	REP
Selenium (Se)	160412-1		< 0.05		1	0.05	REP
Selenium (Se)	161315-1		< 0.05		1	0.05	REP
Selenium (Se)	161318-1		< 0.05		1	0.05	REP
Silicon (Si)	160402-1	< MDL	< 0.05		1	0.05	BLE
Silicon (Si)	161307-1	< MDL	< 0.05		1	0.05	BLE
Silicon (Si)	160406-1	1.16	1.31	113.1	1	0.05	REF
Silicon (Si)	161312-1	1.16	1.08	92.9	1	0.05	REF
Silicon (Si)	160409-1	3.25	3.20	98.3	1	0.05	REP
Silicon (Si)	160410-1	8.23	8.78	106.6	1	0.05	REP
Silicon (Si)	160411-1	1.49	1.53	102.3	1	0.05	REP
Silicon (Si)	160412-1	13.5	13.6	101.0	1	0.05	REP
Silicon (Si)	161315-1	9.9	10.2	102.6	1	0.05	REP
Silicon (Si)	161318-1		< 0.05		1	0.05	REP
Silver (Ag)	160402-1	< MDL	< 0.01		1	0.01	BLE
Silver (Ag)	161307-1	< MDL	< 0.01		1	0.01	BLE
Silver (Ag)	160404-1	0.484	0.48	99.0	1	0.01	REF
Silver (Ag)	161310-1	0.484	0.49	101.1	1	0.01	REF
Silver (Ag)	160409-1		< 0.01		1	0.01	REP
Silver (Ag)	160410-1		< 0.01		1	0.01	REP
Silver (Ag)	160411-1		< 0.01		1	0.01	REP
Silver (Ag)	160412-1		< 0.01		1	0.01	REP
Silver (Ag)	161315-1	0.02	0.02	102.2	1	0.01	REP
Silver (Ag)	161318-1		< 0.01		1	0.01	REP
Sodium (Na)	160402-1	< MDL	< 0.1		1	0.1	BLE
Sodium (Na)	161307-1	< MDL	< 0.1		1	0.1	BLE
Sodium (Na)	160406-1	48.6	53.9	110.9	1	0.1	REF
Sodium (Na)	161312-1	48.6	47.4	97.5	1	0.1	REF
Sodium (Na)	160409-1	0.6	0.6	92.8	1	0.1	REP
Sodium (Na)	160410-1	2.6	2.6	100.9	1	0.1	REP
Sodium (Na)	160411-1	0.4	0.4	100.6	1	0.1	REP
Sodium (Na)	160412-1	42.0	42.4	100.9	1	0.1	REP
Sodium (Na)	161315-1	410	410	100.0	1	0.1	REP
Sodium (Na)	161318-1		< 0.1		1	0.1	REP
Strontium (Sr)	160402-1	< MDL	< 0.001		1	0.001	BLE
Strontium (Sr)	161307-1	< MDL	< 0.001		1	0.001	BLE
Strontium (Sr)	160404-1	0.126	0.144	114.0	1	0.001	REF
Strontium (Sr)	161310-1	0.126	0.122	96.7	1	0.001	REF
Strontium (Sr)	160409-1	0.032	0.030	93.1	1	0.001	REP
Strontium (Sr)	160410-1	0.308	0.315	102.2	1	0.001	REP
Strontium (Sr)	160411-1	0.018	0.018	101.8	1	0.001	REP
Strontium (Sr)	160412-1	0.264	0.268	101.4	1	0.001	REP
Strontium (Sr)	161315-1	2.03	2.04	100.6	1	0.001	REP
Strontium (Sr)	161318-1		< 0.001		1	0.001	REP
Sulfur (S)	160402-1	< MDL	< 0.05		1	0.05	BLE
Sulfur (S)	161307-1	< MDL	< 0.05		1	0.05	BLE

QC Information:

ANALYTE	ALIQ#	EXPECTED	RESULT	% REC	DIL'N	MDL	QC TYPE
Sulfur (S)	160406-1	36.7	39.9	108.6	1	0.05	REF
Sulfur (S)	161312-1	36.7	35.2	95.8	1	0.05	REF
Sulfur (S)	160409-1	23.4	23.3	99.5	1	0.05	REP
Sulfur (S)	160410-1	118	119	101.3	1	0.05	REP
Sulfur (S)	160411-1	11.1	11.1	99.7	1	0.05	REP
Sulfur (S)	160412-1	2.94	2.90	98.5	1	0.05	REP
Sulfur (S)	161315-1	336	348	103.5	1	0.05	REP
Sulfur (S)	161318-1		< 0.05		1	0.05	REP
Tin (Sn)	160402-1	< MDL	< 0.05		1	0.05	BLE
Tin (Sn)	161307-1	< MDL	< 0.05		1	0.05	BLE
Tin (Sn)	160409-1		< 0.05		1	0.05	REP
Tin (Sn)	160410-1		< 0.05		1	0.05	REP
Tin (Sn)	160411-1		< 0.05		1	0.05	REP
Tin (Sn)	160412-1		< 0.05		1	0.05	REP
Tin (Sn)	161315-1		0.05		1	0.05	REP
Tin (Sn)	161318-1		< 0.05		1	0.05	REP
Titanium (Ti)	160402-1	< MDL	< 0.002		1	0.002	BLE
Titanium (Ti)	161307-1	< MDL	< 0.002		1	0.002	BLE
Titanium (Ti)	160409-1		< 0.002		1	0.002	REP
Titanium (Ti)	160410-1		< 0.002		1	0.002	REP
Titanium (Ti)	160411-1		< 0.002		1	0.002	REP
Titanium (Ti)	160412-1		< 0.002		1	0.002	REP
Titanium (Ti)	161315-1		< 0.002		1	0.002	REP
Titanium (Ti)	161318-1		< 0.002		1	0.002	REP
Vanadium (V)	160402-1	< MDL	< 0.01		1	0.01	BLE
Vanadium (V)	161307-1	< MDL	< 0.01		1	0.01	BLE
Vanadium (V)	160404-1	0.850	0.92	108.4	1	0.01	REF
Vanadium (V)	161310-1	0.850	0.83	98.2	1	0.01	REF
Vanadium (V)	160409-1		< 0.01		1	0.01	REP
Vanadium (V)	160410-1		< 0.01		1	0.01	REP
Vanadium (V)	160411-1		< 0.01		1	0.01	REP
Vanadium (V)	160412-1		< 0.01		1	0.01	REP
Vanadium (V)	161315-1		< 0.01		1	0.01	REP
Vanadium (V)	161318-1		< 0.01		1	0.01	REP
Zinc (Zn)	160402-1	< MDL	< 0.002		1	0.002	BLE
Zinc (Zn)	161307-1	< MDL	< 0.002		1	0.002	BLE
Zinc (Zn)	160404-1	1.200	1.37	113.8	1	0.002	REF
Zinc (Zn)	161310-1	1.200	1.19	98.9	1	0.002	REF
Zinc (Zn)	160409-1	0.091	0.086	94.2	1	0.002	REP
Zinc (Zn)	160410-1	0.165	0.165	100.1	1	0.002	REP
Zinc (Zn)	160411-1	0.033	0.034	102.7	1	0.002	REP
Zinc (Zn)	160412-1	0.015	0.014	94.6	1	0.002	REP
Zinc (Zn)	161315-1	0.022	0.021	97.5	1	0.002	REP
Zinc (Zn)	161318-1		< 0.002		1	0.002	REP

***ICP Total UNITS:** mg/L **MATRIX:** FWGE

ANALYTE	ALIQ#	EXPECTED	RESULT	% REC	DIL'N	MDL	QC TYPE
Aluminum (Al)	160340-1	< MDL	< 0.06		1	0.06	BLL
Aluminum (Al)	160792-1	< MDL	< 0.06		1	0.06	BLL
Aluminum (Al)	161175-1	< MDL	< 0.06		1	0.06	BLL
Aluminum (Al)	164003-1	< MDL	< 0.06		1	0.06	BLL
Aluminum (Al)	160341-1	0.915	0.90	98.1	1	0.06	REF

QC Information:

ANALYTE	ALIQ#	EXPECTED	RESULT	% REC	DIL'N	MDL	QC TYPE
Aluminum (Al)	160787-1	0.915	0.88	95.9	1	0.06	REF
Aluminum (Al)	161176-1	0.915	0.87	94.7	1	0.06	REF
Aluminum (Al)	164004-1	0.371	0.37	99.3	1	0.06	REF
Aluminum (Al)	160344-1	0.17	0.15	88.1	1	0.06	REP
Aluminum (Al)	160345-1	4.90	4.94	100.7	1	0.06	REP
Aluminum (Al)	160347-1	1.15	1.07	92.8	1	0.06	REP
Aluminum (Al)	160789-1		< 0.06		1	0.06	REP
Aluminum (Al)	160790-1		< 0.06		1	0.06	REP
Aluminum (Al)	160791-1	3.07	2.89	94.1	1	0.06	REP
Aluminum (Al)	164007-1		< 0.06		1	0.06	REP
Aluminum (Al)	164008-1	0.08	0.08	97.8	1	0.06	REP
Aluminum (Al)	164009-1	1.17	1.13	96.9	1	0.06	REP
Aluminum (Al)	164010-1		< 0.06		1	0.06	REP
Aluminum (Al)	164011-1		< 0.06		1	0.06	REP
Aluminum (Al)	164012-1	60.1	64.1	106.7	1	0.06	REP
Antimony (Sb)	160340-1	< MDL	< 0.06		1	0.06	BLL
Antimony (Sb)	160792-1	< MDL	< 0.06		1	0.06	BLL
Antimony (Sb)	161175-1	< MDL	< 0.06		1	0.06	BLL
Antimony (Sb)	164003-1	< MDL	< 0.06		1	0.06	BLL
Antimony (Sb)	160341-1	0.808	0.81	100.0	1	0.06	REF
Antimony (Sb)	160787-1	0.808	0.83	102.7	1	0.06	REF
Antimony (Sb)	161176-1	0.808	0.81	99.9	1	0.06	REF
Antimony (Sb)	164004-1	0.114	0.12	106.6	1	0.06	REF
Antimony (Sb)	160344-1		< 0.06		1	0.06	REP
Antimony (Sb)	160345-1		< 0.06		1	0.06	REP
Antimony (Sb)	160347-1	0.25	0.23	93.1	1	0.06	REP
Antimony (Sb)	160789-1		< 0.06		1	0.06	REP
Antimony (Sb)	160790-1		< 0.06		1	0.06	REP
Antimony (Sb)	160791-1		< 0.06		1	0.06	REP
Antimony (Sb)	164007-1		< 0.06		1	0.06	REP
Antimony (Sb)	164008-1		< 0.06		1	0.06	REP
Antimony (Sb)	164009-1		< 0.06		1	0.06	REP
Antimony (Sb)	164010-1		< 0.06		1	0.06	REP
Antimony (Sb)	164011-1		< 0.06		1	0.06	REP
Antimony (Sb)	164012-1		< 0.06		1	0.06	REP
Arsenic (As)	160340-1	< MDL	< 0.06		1	0.06	BLL
Arsenic (As)	160792-1	< MDL	< 0.06		1	0.06	BLL
Arsenic (As)	161175-1	< MDL	< 0.06		1	0.06	BLL
Arsenic (As)	164003-1	< MDL	< 0.06		1	0.06	BLL
Arsenic (As)	160341-1	0.275	0.27	96.5	1	0.06	REF
Arsenic (As)	160787-1	0.275	0.29	104.4	1	0.06	REF
Arsenic (As)	161176-1	0.275	0.27	99.6	1	0.06	REF
Arsenic (As)	164004-1	0.175	0.19	108.3	1	0.06	REF
Arsenic (As)	160344-1		< 0.06		1	0.06	REP
Arsenic (As)	160345-1		< 0.06		1	0.06	REP
Arsenic (As)	160347-1	0.34	0.29	85.6	1	0.06	REP
Arsenic (As)	160789-1		< 0.06		1	0.06	REP
Arsenic (As)	160790-1		< 0.06		1	0.06	REP
Arsenic (As)	160791-1		< 0.06		1	0.06	REP
Arsenic (As)	164007-1		< 0.06		1	0.06	REP
Arsenic (As)	164008-1		< 0.06		1	0.06	REP
Arsenic (As)	164009-1	0.06	0.06	94.9	1	0.06	REP

QC Information:

ANALYTE	ALIQ#	EXPECTED	RESULT	% REC	DIL'N	MDL	QC TYPE
Arsenic (As)	164010-1		< 0.06		1	0.06	REP
Arsenic (As)	164011-1		< 0.06		1	0.06	REP
Arsenic (As)	164012-1		< 0.06		1	0.06	REP
Barium (Ba)	160340-1	< MDL	< 0.001		1	0.001	BLL
Barium (Ba)	160792-1	< MDL	< 0.001		1	0.001	BLL
Barium (Ba)	161175-1	< MDL	< 0.001		1	0.001	BLL
Barium (Ba)	164003-1	< MDL	< 0.001		1	0.001	BLL
Barium (Ba)	160341-1	1.210	1.23	101.3	1	0.001	REF
Barium (Ba)	160787-1	1.210	1.29	107.0	1	0.001	REF
Barium (Ba)	161176-1	1.210	1.19	97.9	1	0.001	REF
Barium (Ba)	164004-1	1.370	1.43	104.5	1	0.001	REF
Barium (Ba)	160344-1	0.002	0.002	96.0	1	0.001	REP
Barium (Ba)	160345-1	0.054	0.054	99.8	1	0.001	REP
Barium (Ba)	160347-1	0.065	0.065	100.1	1	0.001	REP
Barium (Ba)	160789-1	0.016	0.016	98.3	1	0.001	REP
Barium (Ba)	160790-1	0.041	0.040	97.1	1	0.001	REP
Barium (Ba)	160791-1	0.096	0.098	101.9	1	0.001	REP
Barium (Ba)	164007-1	0.055	0.054	98.0	1	0.001	REP
Barium (Ba)	164008-1	0.083	0.086	103.1	1	0.001	REP
Barium (Ba)	164009-1	0.067	0.067	99.5	1	0.001	REP
Barium (Ba)	164010-1		< 0.001		1	0.001	REP
Barium (Ba)	164011-1	0.007	0.007	99.9	1	0.001	REP
Barium (Ba)	164012-1	0.253	0.250	98.8	1	0.001	REP
Berylium (Be)	160340-1	< MDL	< 0.001		1	0.001	BLL
Berylium (Be)	160792-1	< MDL	< 0.001		1	0.001	BLL
Berylium (Be)	161175-1	< MDL	< 0.001		1	0.001	BLL
Berylium (Be)	164003-1	< MDL	< 0.001		1	0.001	BLL
Berylium (Be)	160341-1	0.569	0.585	102.8	1	0.001	REF
Berylium (Be)	160787-1	0.569	0.622	109.3	1	0.001	REF
Berylium (Be)	161176-1	0.569	0.575	101.0	1	0.001	REF
Berylium (Be)	164004-1	0.443	0.458	103.3	1	0.001	REF
Berylium (Be)	160344-1		< 0.001		1	0.001	REP
Berylium (Be)	160345-1		< 0.001		1	0.001	REP
Berylium (Be)	160347-1		< 0.001		1	0.001	REP
Berylium (Be)	160789-1		< 0.001		1	0.001	REP
Berylium (Be)	160790-1		< 0.001		1	0.001	REP
Berylium (Be)	160791-1		< 0.001		1	0.001	REP
Berylium (Be)	164007-1		< 0.001		1	0.001	REP
Berylium (Be)	164008-1		< 0.001		1	0.001	REP
Berylium (Be)	164009-1		< 0.001		1	0.001	REP
Berylium (Be)	164010-1		< 0.001		1	0.001	REP
Berylium (Be)	164011-1		< 0.001		1	0.001	REP
Berylium (Be)	164012-1	0.007	0.007	103.1	1	0.001	REP
Boron (B)	160340-1	< MDL	< 0.01		1	0.01	BLL
Boron (B)	160792-1	< MDL	0.02		1	0.01	BLL
Boron (B)	161175-1	< MDL	< 0.01		1	0.01	BLL
Boron (B)	164003-1	< MDL	< 0.01		1	0.01	BLL
Boron (B)	160341-1	0.888	0.93	104.2	1	0.01	REF
Boron (B)	160787-1	0.888	0.99	111.0	1	0.01	REF
Boron (B)	161176-1	0.888	0.92	103.3	1	0.01	REF
Boron (B)	164004-1	0.818	0.73	89.1	1	0.01	REF
Boron (B)	160344-1	0.03	0.03	93.6	1	0.01	REP

QC Information:

ANALYTE	ALIQ#	EXPECTED	RESULT	% REC	DIL'N	MDL	QC TYPE
Boron (B)	160345-1	0.01	0.01	94.4	1	0.01	REP
Boron (B)	160347-1	0.02	0.02	86.4	1	0.01	REP
Boron (B)	160789-1	0.04	0.05	136.4	1	0.01	REP
Boron (B)	160790-1	0.03	0.02	63.5	1	0.01	REP
Boron (B)	160791-1	0.02	0.02	90.5	1	0.01	REP
Boron (B)	164007-1		< 0.01		1	0.01	REP
Boron (B)	164008-1		< 0.01		1	0.01	REP
Boron (B)	164009-1		< 0.01		1	0.01	REP
Boron (B)	164010-1		< 0.01		1	0.01	REP
Boron (B)	164011-1		< 0.01		1	0.01	REP
Boron (B)	164012-1		< 0.01		1	0.01	REP
Cadmium (Cd)	160340-1	< MDL	< 0.006		1	0.006	BLL
Cadmium (Cd)	160792-1	< MDL	< 0.006		1	0.006	BLL
Cadmium (Cd)	161175-1	< MDL	< 0.006		1	0.006	BLL
Cadmium (Cd)	164003-1	< MDL	< 0.006		1	0.006	BLL
Cadmium (Cd)	160341-1	0.137	0.137	100.0	1	0.006	REF
Cadmium (Cd)	160787-1	0.137	0.145	105.5	1	0.006	REF
Cadmium (Cd)	161176-1	0.137	0.135	98.3	1	0.006	REF
Cadmium (Cd)	164004-1	0.0491	0.051	104.7	1	0.006	REF
Cadmium (Cd)	160344-1		< 0.006		1	0.006	REP
Cadmium (Cd)	160345-1		< 0.006		1	0.006	REP
Cadmium (Cd)	160347-1	0.183	0.155	84.5	1	0.006	REP
Cadmium (Cd)	160789-1		< 0.006		1	0.006	REP
Cadmium (Cd)	160790-1		< 0.006		1	0.006	REP
Cadmium (Cd)	160791-1		< 0.006		1	0.006	REP
Cadmium (Cd)	164007-1		< 0.006		1	0.006	REP
Cadmium (Cd)	164008-1		< 0.006		1	0.006	REP
Cadmium (Cd)	164009-1	0.065	0.059	90.8	1	0.006	REP
Cadmium (Cd)	164010-1		< 0.006		1	0.006	REP
Cadmium (Cd)	164011-1		< 0.006		1	0.006	REP
Cadmium (Cd)	164012-1		< 0.006		1	0.006	REP
Calcium (Ca)	160340-1	< MDL	< 0.1		1	0.1	BLL
Calcium (Ca)	160792-1	< MDL	< 0.1		1	0.1	BLL
Calcium (Ca)	161175-1	< MDL	< 0.1		1	0.1	BLL
Calcium (Ca)	164003-1	< MDL	< 0.1		1	0.1	BLL
Calcium (Ca)	160342-1	90.6	92.0	101.5	1	0.1	REF
Calcium (Ca)	160788-1	90.6	93.2	102.8	1	0.1	REF
Calcium (Ca)	161177-1	90.6	88.4	97.6	1	0.1	REF
Calcium (Ca)	164005-1	90.6	92.5	102.1	1	0.1	REF
Calcium (Ca)	160344-1	13.7	13.8	101.0	1	0.1	REP
Calcium (Ca)	160345-1	5.8	5.8	100.9	1	0.1	REP
Calcium (Ca)	160347-1	1.8	1.8	101.9	1	0.1	REP
Calcium (Ca)	160789-1	89.2	84.6	94.8	1	0.1	REP
Calcium (Ca)	160790-1	115	107	92.9	1	0.1	REP
Calcium (Ca)	160791-1	328	321	97.8	1	0.1	REP
Calcium (Ca)	164007-1	39.7	38.5	97.0	1	0.1	REP
Calcium (Ca)	164008-1	67.5	69.4	102.9	1	0.1	REP
Calcium (Ca)	164009-1	1.0	1.0	99.6	1	0.1	REP
Calcium (Ca)	164010-1		< 0.1		1	0.1	REP
Calcium (Ca)	164011-1	10.2	10.2	99.6	1	0.1	REP
Calcium (Ca)	164012-1	39.8	41.3	103.8	1	0.1	REP
Chromium (Cr)	160340-1	< MDL	< 0.006		1	0.006	BLL

QC Information:

ANALYTE	ALIQ#	EXPECTED	RESULT	% REC	DIL'N	MDL	QC TYPE
Chromium (Cr)	160792-1	< MDL	< 0.006		1	0.006	BLL
Chromium (Cr)	161175-1	< MDL	< 0.006		1	0.006	BLL
Chromium (Cr)	164003-1	< MDL	< 0.006		1	0.006	BLL
Chromium (Cr)	160341-1	0.215	0.216	100.5	1	0.006	REF
Chromium (Cr)	160787-1	0.215	0.228	105.8	1	0.006	REF
Chromium (Cr)	161176-1	0.215	0.217	100.7	1	0.006	REF
Chromium (Cr)	164004-1	0.116	0.114	98.4	1	0.006	REF
Chromium (Cr)	160344-1		< 0.006		1	0.006	REP
Chromium (Cr)	160345-1		< 0.006		1	0.006	REP
Chromium (Cr)	160347-1		< 0.006		1	0.006	REP
Chromium (Cr)	160789-1		< 0.006		1	0.006	REP
Chromium (Cr)	160790-1		< 0.006		1	0.006	REP
Chromium (Cr)	160791-1		< 0.006		1	0.006	REP
Chromium (Cr)	164007-1		< 0.006		1	0.006	REP
Chromium (Cr)	164008-1		< 0.006		1	0.006	REP
Chromium (Cr)	164009-1		< 0.006		1	0.006	REP
Chromium (Cr)	164010-1		< 0.006		1	0.006	REP
Chromium (Cr)	164011-1		< 0.006		1	0.006	REP
Chromium (Cr)	164012-1	0.018	0.020	109.8	1	0.006	REP
Cobalt (Co)	160340-1	< MDL	< 0.006		1	0.006	BLL
Cobalt (Co)	160792-1	< MDL	< 0.006		1	0.006	BLL
Cobalt (Co)	161175-1	< MDL	< 0.006		1	0.006	BLL
Cobalt (Co)	164003-1	< MDL	< 0.006		1	0.006	BLL
Cobalt (Co)	160341-1	0.419	0.407	97.1	1	0.006	REF
Cobalt (Co)	160787-1	0.419	0.429	102.4	1	0.006	REF
Cobalt (Co)	161176-1	0.419	0.405	96.6	1	0.006	REF
Cobalt (Co)	164004-1	0.316	0.322	102.0	1	0.006	REF
Cobalt (Co)	160344-1		< 0.006		1	0.006	REP
Cobalt (Co)	160345-1		< 0.006		1	0.006	REP
Cobalt (Co)	160347-1		< 0.006		1	0.006	REP
Cobalt (Co)	160789-1		< 0.006		1	0.006	REP
Cobalt (Co)	160790-1		< 0.006		1	0.006	REP
Cobalt (Co)	160791-1		< 0.006		1	0.006	REP
Cobalt (Co)	164007-1		< 0.006		1	0.006	REP
Cobalt (Co)	164008-1		< 0.006		1	0.006	REP
Cobalt (Co)	164009-1	<0.006	0.006	100.8	1	0.006	REP
Cobalt (Co)	164010-1		< 0.006		1	0.006	REP
Cobalt (Co)	164011-1		< 0.006		1	0.006	REP
Cobalt (Co)	164012-1	0.045	0.047	103.4	1	0.006	REP
Copper (Cu)	160340-1	< MDL	< 0.02		1	0.02	BLL
Copper (Cu)	160792-1	< MDL	< 0.02		1	0.02	BLL
Copper (Cu)	161175-1	< MDL	< 0.02		1	0.02	BLL
Copper (Cu)	164003-1	< MDL	< 0.02		1	0.02	BLL
Copper (Cu)	160341-1	0.484	0.50	102.5	1	0.02	REF
Copper (Cu)	160787-1	0.484	0.49	101.9	1	0.02	REF
Copper (Cu)	161176-1	0.484	0.48	98.9	1	0.02	REF
Copper (Cu)	164004-1	0.318	0.34	106.8	1	0.02	REF
Copper (Cu)	160344-1	0.93	0.93	99.9	1	0.02	REP
Copper (Cu)	160345-1		< 0.02		1	0.02	REP
Copper (Cu)	160347-1	35.6	43.8	123.0	10	0.06	REP
Copper (Cu)	160789-1		< 0.02		1	0.02	REP
Copper (Cu)	160790-1		< 0.02		1	0.02	REP

QC Information:

ANALYTE	ALIQ#	EXPECTED	RESULT	% REC	DIL'N	MDL	QC TYPE
Copper (Cu)	160791-1		< 0.02		1	0.02	REP
Copper (Cu)	164007-1		< 0.02		1	0.02	REP
Copper (Cu)	164008-1		< 0.02		1	0.02	REP
Copper (Cu)	164009-1	28	26	91.6	1	0.006	REP
Copper (Cu)	164010-1	0.053	0.056	105.2	1	0.006	REP
Copper (Cu)	164011-1		< 0.02		1	0.02	REP
Copper (Cu)	164012-1	0.05	0.05	103.9	1	0.02	REP
Iron (Fe)	160340-1	< MDL	< 0.05		1	0.05	BLL
Iron (Fe)	160792-1	< MDL	< 0.05		1	0.05	BLL
Iron (Fe)	161175-1	< MDL	< 0.05		1	0.05	BLL
Iron (Fe)	164003-1	< MDL	< 0.05		1	0.05	BLL
Iron (Fe)	160341-1	0.680	0.73	107.3	1	0.05	REF
Iron (Fe)	160787-1	0.680	0.74	108.7	1	0.05	REF
Iron (Fe)	161176-1	0.680	0.71	104.6	1	0.05	REF
Iron (Fe)	164004-1	2.560	2.84	110.7	1	0.05	REF
Iron (Fe)	160344-1	0.30	0.30	98.6	1	0.05	REP
Iron (Fe)	160345-1	5.32	5.39	101.3	1	0.05	REP
Iron (Fe)	160347-1	25.7	21.3	82.9	1	0.006	REP
Iron (Fe)	160789-1		< 0.05		1	0.05	REP
Iron (Fe)	160790-1	0.49	0.48	97.3	1	0.05	REP
Iron (Fe)	160791-1	3.44	3.22	93.7	1	0.05	REP
Iron (Fe)	164007-1	0.30	0.29	96.3	1	0.05	REP
Iron (Fe)	164008-1	0.21	0.23	111.4	1	0.05	REP
Iron (Fe)	164009-1	18.5	16.9	91.3	1	0.006	REP
Iron (Fe)	164010-1	0.009	0.009	95.0	1	0.006	REP
Iron (Fe)	164011-1		< 0.05		1	0.05	REP
Iron (Fe)	164012-1	109	112	102.8	1	0.05	REP
Lead (Pb)	160340-1	< MDL	< 0.06		1	0.06	BLL
Lead (Pb)	160792-1	< MDL	< 0.06		1	0.06	BLL
Lead (Pb)	161175-1	< MDL	< 0.06		1	0.06	BLL
Lead (Pb)	164003-1	< MDL	< 0.06		1	0.06	BLL
Lead (Pb)	160341-1	1.140	1.12	98.2	1	0.06	REF
Lead (Pb)	160787-1	1.140	1.16	101.3	1	0.06	REF
Lead (Pb)	161176-1	1.140	1.12	98.2	1	0.06	REF
Lead (Pb)	164004-1	2.150	2.12	98.6	1	0.06	REF
Lead (Pb)	160344-1		< 0.06		1	0.06	REP
Lead (Pb)	160345-1		< 0.06		1	0.06	REP
Lead (Pb)	160347-1	46.5	52.5	112.9	10	0.6	REP
Lead (Pb)	160789-1		< 0.06		1	0.06	REP
Lead (Pb)	160790-1		< 0.06		1	0.06	REP
Lead (Pb)	160791-1		< 0.06		1	0.06	REP
Lead (Pb)	164007-1		< 0.06		1	0.06	REP
Lead (Pb)	164008-1		< 0.06		1	0.06	REP
Lead (Pb)	164009-1	1.75	1.73	98.7	1	0.06	REP
Lead (Pb)	164010-1		< 0.06		1	0.06	REP
Lead (Pb)	164011-1		< 0.06		1	0.06	REP
Lead (Pb)	164012-1	0.07	0.07	102.8	1	0.06	REP
Magnesium (Mg)	160340-1	< MDL	< 0.1		1	0.1	BLL
Magnesium (Mg)	160792-1	< MDL	< 0.1		1	0.1	BLL
Magnesium (Mg)	161175-1	< MDL	< 0.1		1	0.1	BLL
Magnesium (Mg)	164003-1	< MDL	< 0.1		1	0.1	BLL
Magnesium (Mg)	160342-1	25.7	26.1	101.4	1	0.1	REF

QC Information:

ANALYTE	ALIQ#	EXPECTED	RESULT	% REC	DIL'N	MDL	QC TYPE
Magnesium (Mg)	160788-1	25.7	26.6	103.7	1	0.1	REF
Magnesium (Mg)	161177-1	25.7	24.7	96.1	1	0.1	REF
Magnesium (Mg)	164005-1	25.7	26.5	103.2	1	0.1	REF
Magnesium (Mg)	160344-1	3.5	3.5	100.1	1	0.1	REP
Magnesium (Mg)	160345-1	1.9	1.9	100.9	1	0.1	REP
Magnesium (Mg)	160347-1	0.5	0.5	96.9	1	0.1	REP
Magnesium (Mg)	160789-1	31.2	31.0	99.3	1	0.1	REP
Magnesium (Mg)	160790-1	23.1	22.2	96.2	1	0.1	REP
Magnesium (Mg)	160791-1	44.6	46.7	104.8	1	0.1	REP
Magnesium (Mg)	164007-1	6.8	6.6	96.8	1	0.1	REP
Magnesium (Mg)	164008-1	30.3	31.1	102.7	1	0.1	REP
Magnesium (Mg)	164009-1	0.3	0.3	97.8	1	0.1	REP
Magnesium (Mg)	164010-1		< 0.1		1	0.1	REP
Magnesium (Mg)	164011-1	1.4	1.4	100.4	1	0.1	REP
Magnesium (Mg)	164012-1	34.1	34.3	100.5	1	0.1	REP
Manganese (Mn)	160340-1	< MDL	< 0.001		1	0.001	BLL
Manganese (Mn)	160792-1	< MDL	< 0.001		1	0.001	BLL
Manganese (Mn)	161175-1	< MDL	< 0.001		1	0.001	BLL
Manganese (Mn)	164003-1	< MDL	< 0.001		1	0.001	BLL
Manganese (Mn)	160341-1	0.644	0.663	102.9	1	0.001	REF
Manganese (Mn)	160787-1	0.644	0.703	109.2	1	0.001	REF
Manganese (Mn)	161176-1	0.644	0.658	102.2	1	0.001	REF
Manganese (Mn)	164004-1	1.340	1.4	104.3	1	0.001	REF
Manganese (Mn)	160344-1	0.204	0.201	98.5	1	0.001	REP
Manganese (Mn)	160345-1	0.086	0.087	101.6	1	0.001	REP
Manganese (Mn)	160347-1	0.913	0.913	100.0	1	0.001	REP
Manganese (Mn)	160789-1	0.001	0.001	94.5	1	0.001	REP
Manganese (Mn)	160790-1	0.324	0.318	98.1	1	0.001	REP
Manganese (Mn)	160791-1	0.359	0.350	97.4	1	0.001	REP
Manganese (Mn)	164007-1	0.040	0.038	95.9	1	0.001	REP
Manganese (Mn)	164008-1	0.020	0.021	103.1	1	0.001	REP
Manganese (Mn)	164009-1	0.042	0.041	97.8	1	0.001	REP
Manganese (Mn)	164010-1		< 0.001		1	0.001	REP
Manganese (Mn)	164011-1		< 0.001		1	0.001	REP
Manganese (Mn)	164012-1	2.42	2.46	101.8	1	0.001	REP
Molybdenum (Mo)	160340-1	< MDL	< 0.01		1	0.01	BLL
Molybdenum (Mo)	160792-1	< MDL	< 0.01		1	0.01	BLL
Molybdenum (Mo)	161175-1	< MDL	< 0.01		1	0.01	BLL
Molybdenum (Mo)	164003-1	< MDL	< 0.01		1	0.01	BLL
Molybdenum (Mo)	160341-1	0.510	0.51	99.8	1	0.01	REF
Molybdenum (Mo)	160787-1	0.510	0.53	103.2	1	0.01	REF
Molybdenum (Mo)	161176-1	0.510	0.51	100.6	1	0.01	REF
Molybdenum (Mo)	164004-1	0.291	0.29	100.4	1	0.01	REF
Molybdenum (Mo)	160344-1		< 0.01		1	0.01	REP
Molybdenum (Mo)	160345-1		< 0.01		1	0.01	REP
Molybdenum (Mo)	160347-1	0.09	0.07	74.3	1	0.01	REP
Molybdenum (Mo)	160789-1		< 0.01		1	0.01	REP
Molybdenum (Mo)	160790-1		< 0.01		1	0.01	REP
Molybdenum (Mo)	160791-1		< 0.01		1	0.01	REP
Molybdenum (Mo)	164007-1		< 0.01		1	0.01	REP
Molybdenum (Mo)	164008-1		< 0.01		1	0.01	REP
Molybdenum (Mo)	164009-1	0.03	0.03	90.3	1	0.01	REP

QC Information:

ANALYTE	ALIQ#	EXPECTED	RESULT	% REC	DIL'N	MDL	QC TYPE
Molybdenum (Mo)	164010-1		< 0.01		1	0.01	REP
Molybdenum (Mo)	164011-1		< 0.01		1	0.01	REP
Molybdenum (Mo)	164012-1		< 0.01		1	0.01	REP
Nickel (Ni)	160340-1	< MDL	< 0.02		1	0.02	BLL
Nickel (Ni)	160792-1	< MDL	< 0.02		1	0.02	BLL
Nickel (Ni)	161175-1	< MDL	< 0.02		1	0.02	BLL
Nickel (Ni)	164003-1	< MDL	< 0.02		1	0.02	BLL
Nickel (Ni)	160341-1	0.942	0.90	95.4	1	0.02	REF
Nickel (Ni)	160787-1	0.942	0.92	98.1	1	0.02	REF
Nickel (Ni)	161176-1	0.942	0.89	94.6	1	0.02	REF
Nickel (Ni)	164004-1	0.669	0.70	103.9	1	0.02	REF
Nickel (Ni)	160344-1		< 0.02		1	0.02	REP
Nickel (Ni)	160345-1		< 0.02		1	0.02	REP
Nickel (Ni)	160347-1		< 0.02		1	0.02	REP
Nickel (Ni)	160789-1		< 0.02		1	0.02	REP
Nickel (Ni)	160790-1		< 0.02		1	0.02	REP
Nickel (Ni)	160791-1		< 0.02		1	0.02	REP
Nickel (Ni)	164007-1		< 0.02		1	0.02	REP
Nickel (Ni)	164008-1		< 0.02		1	0.02	REP
Nickel (Ni)	164009-1		< 0.02		1	0.02	REP
Nickel (Ni)	164010-1		< 0.02		1	0.02	REP
Nickel (Ni)	164011-1		< 0.02		1	0.02	REP
Nickel (Ni)	164012-1	0.05	0.05	100.6	1	0.02	REP
Phosphorus (P)	160340-1	< MDL	< 0.1		1	0.1	BLL
Phosphorus (P)	160792-1	< MDL	< 0.1		1	0.1	BLL
Phosphorus (P)	161175-1	< MDL	< 0.1		1	0.1	BLL
Phosphorus (P)	164003-1	< MDL	< 0.1		1	0.1	BLL
Phosphorus (P)	160344-1		< 0.1		1	0.1	REP
Phosphorus (P)	160345-1		< 0.1		1	0.1	REP
Phosphorus (P)	160347-1		< 0.1		1	0.1	REP
Phosphorus (P)	160789-1		< 0.1		1	0.1	REP
Phosphorus (P)	160790-1		< 0.1		1	0.1	REP
Phosphorus (P)	160791-1		< 0.1		1	0.1	REP
Phosphorus (P)	164007-1	0.6	0.6	98.0	1	0.1	REP
Phosphorus (P)	164008-1	0.9	1.0	106.7	1	0.1	REP
Phosphorus (P)	164009-1		< 0.1		1	0.1	REP
Phosphorus (P)	164010-1		< 0.1		1	0.1	REP
Phosphorus (P)	164011-1	0.2	0.2	103.6	1	0.1	REP
Phosphorus (P)	164012-1	4.4	4.4	100.1	1	0.1	REP
Potassium (K)	160340-1	< MDL	< 0.1		1	0.1	BLL
Potassium (K)	160792-1	< MDL	< 0.1		1	0.1	BLL
Potassium (K)	161175-1	< MDL	< 0.1		1	0.1	BLL
Potassium (K)	164003-1	< MDL	< 0.1		1	0.1	BLL
Potassium (K)	160342-1	4.0	4.0	100.8	1	0.1	REF
Potassium (K)	160788-1	4.0	4.2	105.3	1	0.1	REF
Potassium (K)	161177-1	4.0	3.9	96.8	1	0.1	REF
Potassium (K)	164005-1	4.0	4.1	103.3	1	0.1	REF
Potassium (K)	160344-1	0.5	0.5	96.6	1	0.1	REP
Potassium (K)	160345-1	0.9	0.9	101.8	1	0.1	REP
Potassium (K)	160347-1	0.8	0.8	95.5	1	0.1	REP
Potassium (K)	160789-1	0.5	0.5	91.3	1	0.1	REP
Potassium (K)	160790-1	0.3	0.3	92.6	1	0.1	REP

QC Information:

ANALYTE	ALIQ#	EXPECTED	RESULT	% REC	DIL'N	MDL	QC TYPE
Potassium (K)	160791-1	1.0	1.0	103.0	1	0.1	REP
Potassium (K)	164007-1	3.0	3.0	98.4	1	0.1	REP
Potassium (K)	164008-1	1.0	1.0	100.4	1	0.1	REP
Potassium (K)	164009-1	0.6	0.6	98.6	1	0.1	REP
Potassium (K)	164010-1		< 0.1		1	0.1	REP
Potassium (K)	164011-1	0.5	0.5	96.1	1	0.1	REP
Potassium (K)	164012-1	6.2	6.4	103.9	1	0.1	REP
Selenium (Se)	160340-1	< MDL	< 0.06		1	0.06	BLL
Selenium (Se)	160792-1	< MDL	< 0.06		1	0.06	BLL
Selenium (Se)	161175-1	< MDL	< 0.06		1	0.06	BLL
Selenium (Se)	164003-1	< MDL	< 0.06		1	0.06	BLL
Selenium (Se)	160341-1	0.674	0.66	98.4	1	0.06	REF
Selenium (Se)	160787-1	0.674	0.69	102.3	1	0.06	REF
Selenium (Se)	161176-1	0.674	0.66	97.2	1	0.06	REF
Selenium (Se)	164004-1	1.450	1.44	99.4	1	0.06	REF
Selenium (Se)	160344-1		< 0.06		1	0.06	REP
Selenium (Se)	160345-1		< 0.06		1	0.06	REP
Selenium (Se)	160347-1		< 0.06		1	0.06	REP
Selenium (Se)	160789-1		< 0.06		1	0.06	REP
Selenium (Se)	160790-1		< 0.06		1	0.06	REP
Selenium (Se)	160791-1		< 0.06		1	0.06	REP
Selenium (Se)	164007-1		< 0.06		1	0.06	REP
Selenium (Se)	164008-1		< 0.06		1	0.06	REP
Selenium (Se)	164009-1		< 0.06		1	0.06	REP
Selenium (Se)	164010-1		< 0.06		1	0.06	REP
Selenium (Se)	164011-1		< 0.06		1	0.06	REP
Selenium (Se)	164012-1		< 0.06		1	0.06	REP
Silicon (Si)	160340-1	< MDL	< 0.06		1	0.06	BLL
Silicon (Si)	160792-1	< MDL	< 0.06		1	0.06	BLL
Silicon (Si)	161175-1	< MDL	< 0.06		1	0.06	BLL
Silicon (Si)	164003-1	< MDL	< 0.06		1	0.06	BLL
Silicon (Si)	160342-1	1.16	1.14	97.9	1	0.06	REF
Silicon (Si)	160788-1	1.16	1.19	102.4	1	0.06	REF
Silicon (Si)	161177-1	1.16	1.18	101.6	1	0.06	REF
Silicon (Si)	164005-1	1.16	1.17	100.5	1	0.06	REF
Silicon (Si)	160344-1	1.67	1.62	96.9	1	0.06	REP
Silicon (Si)	160345-1	12.5	12.5	99.9	1	0.06	REP
Silicon (Si)	160347-1	2.73	2.49	91.2	1	0.06	REP
Silicon (Si)	160789-1	2.73	2.64	96.7	1	0.06	REP
Silicon (Si)	160790-1	4.46	4.25	95.3	1	0.06	REP
Silicon (Si)	160791-1	7.35	7.04	95.8	1	0.06	REP
Silicon (Si)	164007-1	4.54	4.36	95.9	1	0.06	REP
Silicon (Si)	164008-1	4.28	4.42	103.2	1	0.06	REP
Silicon (Si)	164009-1	2.35	2.26	96.1	1	0.06	REP
Silicon (Si)	164010-1		< 0.06		1	0.06	REP
Silicon (Si)	164011-1	4.20	4.20	100.1	1	0.06	REP
Silicon (Si)	164012-1	44.8	44.2	98.6	1	0.06	REP
Silver (Ag)	160340-1	< MDL	< 0.01		1	0.01	BLL
Silver (Ag)	160792-1	< MDL	< 0.01		1	0.01	BLL
Silver (Ag)	161175-1	< MDL	< 0.01		1	0.01	BLL
Silver (Ag)	164003-1	< MDL	< 0.01		1	0.01	BLL
Silver (Ag)	160341-1	0.484	0.60	123.9	1	0.01	REF

QC Information:

ANALYTE	ALIQ#	EXPECTED	RESULT	% REC	DIL'N	MDL	QC TYPE
Silver (Ag)	160787-1	0.484	0.88	182.6	1	0.01	REF
Silver (Ag)	161176-1	0.484	0.65	134.2	1	0.01	REF
Silver (Ag)	160344-1		0.01		1	0.01	REP
Silver (Ag)	160345-1		< 0.01		1	0.01	REP
Silver (Ag)	160347-1	0.44	0.39	87.8	1	0.01	REP
Silver (Ag)	160789-1		< 0.01		1	0.01	REP
Silver (Ag)	160790-1		< 0.01		1	0.01	REP
Silver (Ag)	160791-1		< 0.01		1	0.01	REP
Silver (Ag)	164007-1		< 0.01		1	0.01	REP
Silver (Ag)	164008-1		< 0.01		1	0.01	REP
Silver (Ag)	164009-1	0.03	0.03	90.6	1	0.01	REP
Silver (Ag)	164010-1		< 0.01		1	0.01	REP
Silver (Ag)	164011-1		< 0.01		1	0.01	REP
Silver (Ag)	164012-1		< 0.01		1	0.01	REP
Sodium (Na)	160340-1	< MDL	< 0.1		1	0.1	BLL
Sodium (Na)	160792-1	< MDL	< 0.1		1	0.1	BLL
Sodium (Na)	161175-1	< MDL	< 0.1		1	0.1	BLL
Sodium (Na)	164003-1	< MDL	< 0.1		1	0.1	BLL
Sodium (Na)	160342-1	48.6	51.3	105.6	1	0.1	REF
Sodium (Na)	160788-1	48.6	53.8	110.8	1	0.1	REF
Sodium (Na)	161177-1	48.6	47.8	98.4	1	0.1	REF
Sodium (Na)	164005-1	48.6	50.1	103.1	1	0.1	REF
Sodium (Na)	160344-1	0.4	0.4	102.1	1	0.1	REP
Sodium (Na)	160345-1	2.7	2.6	94.8	1	0.1	REP
Sodium (Na)	160347-1	0.8	0.8	101.9	1	0.1	REP
Sodium (Na)	160789-1	2.0	2.0	97.6	1	0.1	REP
Sodium (Na)	160790-1	1.6	1.5	95.0	1	0.1	REP
Sodium (Na)	160791-1	2.2	2.3	104.0	1	0.1	REP
Sodium (Na)	164007-1	15.9	15.7	98.4	1	0.1	REP
Sodium (Na)	164008-1	4.0	4.1	103.0	1	0.1	REP
Sodium (Na)	164009-1	0.4	0.4	97.1	1	0.1	REP
Sodium (Na)	164010-1		< 0.1		1	0.1	REP
Sodium (Na)	164011-1	1.4	1.4	100.4	1	0.1	REP
Sodium (Na)	164012-1	18.0	18.6	103.1	1	0.1	REP
Strontium (Sr)	160340-1	< MDL	< 0.001		1	0.001	BLL
Strontium (Sr)	160792-1	< MDL	< 0.001		1	0.001	BLL
Strontium (Sr)	161175-1	< MDL	< 0.001		1	0.001	BLL
Strontium (Sr)	164003-1	< MDL	< 0.001		1	0.001	BLL
Strontium (Sr)	160341-1	0.126	0.13	103.2	1	0.001	REF
Strontium (Sr)	160787-1	0.126	0.136	107.6	1	0.001	REF
Strontium (Sr)	161176-1	0.126	0.125	99.0	1	0.001	REF
Strontium (Sr)	164004-1	0.156	0.168	107.4	1	0.001	REF
Strontium (Sr)	160344-1	0.021	0.021	100.7	1	0.001	REP
Strontium (Sr)	160345-1	0.047	0.047	100.8	1	0.001	REP
Strontium (Sr)	160347-1	0.014	0.014	99.2	1	0.001	REP
Strontium (Sr)	160789-1	0.415	0.406	97.9	1	0.001	REP
Strontium (Sr)	160790-1	0.229	0.222	97.0	1	0.001	REP
Strontium (Sr)	160791-1	0.609	0.633	104.0	1	0.001	REP
Strontium (Sr)	164007-1	0.511	0.506	99.0	1	0.001	REP
Strontium (Sr)	164008-1	0.317	0.327	103.0	1	0.001	REP
Strontium (Sr)	164009-1	0.011	0.011	99.3	1	0.001	REP
Strontium (Sr)	164010-1		< 0.001		1	0.001	REP

QC Information:

ANALYTE	ALIQ#	EXPECTED	RESULT	% REC	DIL'N	MDL	QC TYPE
Strontium (Sr)	164011-1	0.043	0.043	99.8	1	0.001	REP
Strontium (Sr)	164012-1	0.289	0.304	105.0	1	0.001	REP
Sulfur (S)	160340-1	< MDL	< 0.06		1	0.06	BLL
Sulfur (S)	160792-1	< MDL	< 0.06		1	0.06	BLL
Sulfur (S)	161175-1	< MDL	< 0.06		1	0.06	BLL
Sulfur (S)	164003-1	< MDL	< 0.06		1	0.06	BLL
Sulfur (S)	160342-1	36.7	36.8	100.3	1	0.06	REF
Sulfur (S)	160788-1	36.7	37.8	103.1	1	0.06	REF
Sulfur (S)	161177-1	36.7	36.1	98.3	1	0.06	REF
Sulfur (S)	164005-1	36.7	37.6	102.5	1	0.06	REF
Sulfur (S)	160344-1	10.9	10.9	100.5	1	0.06	REP
Sulfur (S)	160345-1	0.55	0.54	98.7	1	0.06	REP
Sulfur (S)	160347-1	44.2	42.7	96.6	1	0.06	REP
Sulfur (S)	160789-1	55.8	54.8	98.2	1	0.06	REP
Sulfur (S)	160790-1	79.7	81.8	102.6	1	0.06	REP
Sulfur (S)	160791-1	288	289	100.3	1	0.06	REP
Sulfur (S)	164007-1	51.6	49.4	95.8	1	0.06	REP
Sulfur (S)	164008-1	18.4	18.9	102.5	1	0.06	REP
Sulfur (S)	164009-1	22.2	21.5	96.7	1	0.06	REP
Sulfur (S)	164010-1		< 0.06		1	0.06	REP
Sulfur (S)	164011-1	3.70	3.68	99.4	1	0.06	REP
Sulfur (S)	164012-1	3.11	3.07	98.6	1	0.06	REP
Tin (Sn)	160340-1	< MDL	< 0.06		1	0.06	BLL
Tin (Sn)	160792-1	< MDL	< 0.06		1	0.06	BLL
Tin (Sn)	161175-1	< MDL	< 0.06		1	0.06	BLL
Tin (Sn)	164003-1	< MDL	< 0.06		1	0.06	BLL
Tin (Sn)	164004-1	1.240	1.25	100.8	1	0.06	REF
Tin (Sn)	160344-1		< 0.06		1	0.06	REP
Tin (Sn)	160345-1		< 0.06		1	0.06	REP
Tin (Sn)	160347-1		< 0.06		1	0.06	REP
Tin (Sn)	160789-1	0.06	< 0.06		1	0.06	REP
Tin (Sn)	160790-1	0.07	< 0.06		1	0.06	REP
Tin (Sn)	160791-1	0.06	< 0.06		1	0.06	REP
Tin (Sn)	164007-1		< 0.06		1	0.06	REP
Tin (Sn)	164008-1		0.06		1	0.06	REP
Tin (Sn)	164009-1		< 0.06		1	0.06	REP
Tin (Sn)	164010-1		< 0.06		1	0.06	REP
Tin (Sn)	164011-1		< 0.06		1	0.06	REP
Tin (Sn)	164012-1		< 0.06		1	0.06	REP
Titanium (Ti)	160340-1	< MDL	< 0.002		1	0.002	BLL
Titanium (Ti)	160792-1	< MDL	< 0.002		1	0.002	BLL
Titanium (Ti)	161175-1	< MDL	< 0.002		1	0.002	BLL
Titanium (Ti)	164003-1	< MDL	< 0.002		1	0.002	BLL
Titanium (Ti)	164004-1	0.147	0.161	109.8	1	0.002	REF
Titanium (Ti)	160344-1		< 0.002		1	0.002	REP
Titanium (Ti)	160345-1	0.123	0.127	103.3	1	0.002	REP
Titanium (Ti)	160347-1	0.038	0.036	95.9	1	0.002	REP
Titanium (Ti)	160789-1		< 0.002		1	0.002	REP
Titanium (Ti)	160790-1	0.002	< 0.002		1	0.002	REP
Titanium (Ti)	160791-1	0.088	0.081	91.8	1	0.002	REP
Titanium (Ti)	164007-1		< 0.002		1	0.002	REP
Titanium (Ti)	164009-1	0.063	0.063	100.0	1	0.002	REP

QC Information:

ANALYTE	ALIQ#	EXPECTED	RESULT	% REC	DIL'N	MDL	QC TYPE
Titanium (Ti)	164010-1		< 0.002		1	0.002	REP
Titanium (Ti)	164011-1		< 0.002		1	0.002	REP
Titanium (Ti)	164012-1	4.08	4.37	107.0	1	0.002	REP
Vanadium (V)	160340-1	< MDL	< 0.01		1	0.01	BLL
Vanadium (V)	160792-1	< MDL	< 0.01		1	0.01	BLL
Vanadium (V)	161175-1	< MDL	< 0.01		1	0.01	BLL
Vanadium (V)	164003-1	< MDL	< 0.01		1	0.01	BLL
Vanadium (V)	160341-1	0.850	0.84	99.4	1	0.01	REF
Vanadium (V)	160787-1	0.850	0.90	106.4	1	0.01	REF
Vanadium (V)	161176-1	0.850	0.85	99.6	1	0.01	REF
Vanadium (V)	164004-1	0.374	0.39	103.1	1	0.01	REF
Vanadium (V)	160344-1		< 0.01		1	0.01	REP
Vanadium (V)	160345-1	0.02	0.02	104.1	1	0.01	REP
Vanadium (V)	160347-1	<0.01	0.01	100.2	1	0.01	REP
Vanadium (V)	160789-1		< 0.01		1	0.01	REP
Vanadium (V)	160790-1		< 0.01		1	0.01	REP
Vanadium (V)	160791-1		< 0.01		1	0.01	REP
Vanadium (V)	164007-1		< 0.01		1	0.01	REP
Vanadium (V)	164008-1		< 0.01		1	0.01	REP
Vanadium (V)	164009-1	0.02	0.02	98.0	1	0.01	REP
Vanadium (V)	164010-1		< 0.01		1	0.01	REP
Vanadium (V)	164011-1		< 0.01		1	0.01	REP
Vanadium (V)	164012-1	0.17	0.18	106.7	1	0.01	REP
Zinc (Zn)	160340-1	< MDL	< 0.002		1	0.002	BLL
Zinc (Zn)	160792-1	< MDL	< 0.002		1	0.002	BLL
Zinc (Zn)	161175-1	< MDL	< 0.002		1	0.002	BLL
Zinc (Zn)	164003-1	< MDL	< 0.002		1	0.002	BLL
Zinc (Zn)	160341-1	1.200	1.25	103.9	1	0.002	REF
Zinc (Zn)	160787-1	1.200	1.23	102.7	1	0.002	REF
Zinc (Zn)	161176-1	1.200	1.19	99.5	1	0.002	REF
Zinc (Zn)	164004-1	1.360	1.37	100.7	1	0.002	REF
Zinc (Zn)	160344-1	0.034	0.036	106.5	1	0.002	REP
Zinc (Zn)	160345-1	0.017	0.017	101.1	1	0.002	REP
Zinc (Zn)	160347-1	54.4	63.4	116.5	10	0.02	REP
Zinc (Zn)	160789-1	0.668	0.668	99.9	1	0.002	REP
Zinc (Zn)	160790-1	0.174	0.174	100.0	1	0.002	REP
Zinc (Zn)	160791-1	2.0	2.1	104.8	1	0.002	REP
Zinc (Zn)	164007-1	0.030	0.029	97.1	1	0.002	REP
Zinc (Zn)	164008-1	0.012	0.014	121.5	1	0.002	REP
Zinc (Zn)	164009-1	11.2	10.2	91.0	1	0.002	REP
Zinc (Zn)	164010-1		< 0.002		1	0.002	REP
Zinc (Zn)	164011-1	0.002	0.002	93.1	1	0.002	REP
Zinc (Zn)	164012-1	0.254	0.262	103.2	1	0.002	REP

***ICPMS Dissolved. UNITS:** ug/L **MATRIX:** FWGE

ANALYTE	ALIQ#	EXPECTED	RESULT	% REC	DIL'N	MDL	QC TYPE
Aluminum (Al)	161683-1	< MDL	< 0.2		1	0.2	BLL
Aluminum (Al)	162458-1	< MDL	< 0.2		1	0.2	BLL
Aluminum (Al)	163106-1	< MDL	< 0.2		1	0.2	BLL
Aluminum (Al)	161685-1	708	731	103.3	1	0.2	REF
Aluminum (Al)	161687-1	58.4	58.0	99.2	1	0.2	REF
Aluminum (Al)	162460-1	708	733	103.5	1	0.2	REF

QC Information:

ANALYTE	ALIQ#	EXPECTED	RESULT	% REC	DIL'N	MDL	QC TYPE
Aluminum (Al)	162461-1	58.4	58.3	99.9	1	0.2	REF
Aluminum (Al)	163108-1	708	778	109.9	1	0.2	REF
Aluminum (Al)	163110-1	58.4	60.1	102.9	1	0.2	REF
Aluminum (Al)	161691-1	5.6	5.6	100.5	1	0.2	REP
Aluminum (Al)	162464-1	2.0	2.0	99.5	1	0.2	REP
Aluminum (Al)	162465-1	1.0	0.9	92.4	1	0.2	REP
Aluminum (Al)	162466-1	9.5	9.5	99.5	1	0.2	REP
Aluminum (Al)	163112-1	13.8	12.8	93.0	1	0.2	REP
Aluminum (Al)	163113-1	110	109	99.5	1	0.2	REP
Antimony (Sb)	161683-1	< MDL	< 0.005		1	0.005	BLL
Antimony (Sb)	162458-1	< MDL	< 0.005		1	0.005	BLL
Antimony (Sb)	163106-1	< MDL	0.010		1	0.005	BLL
Antimony (Sb)	161685-1		19.4		1	0.005	REF
Antimony (Sb)	161687-1		32.6		1	0.005	REF
Antimony (Sb)	162460-1		20		1	0.005	REF
Antimony (Sb)	162461-1	32.0	33.5	104.6	1	0.005	REF
Antimony (Sb)	163108-1	19.8	20.1	101.7	1	0.005	REF
Antimony (Sb)	163110-1	32.0	33.6	105.0	1	0.005	REF
Antimony (Sb)	159265-1	0.245	0.242	99.0	1	0.005	REP
Antimony (Sb)	159300-1		< 0.005		1	0.005	REP
Antimony (Sb)	160330-1		< 0.005		1	0.005	REP
Antimony (Sb)	160475-1	0.150	0.149	99.6	1	0.005	REP
Antimony (Sb)	161612-1	0.301	0.273	90.7	1	0.005	REP
Antimony (Sb)	161691-1	0.244	0.241	98.6	1	0.005	REP
Antimony (Sb)	161845-1	0.196	0.195	99.4	1	0.005	REP
Antimony (Sb)	162464-1		< 0.005		1	0.005	REP
Antimony (Sb)	162465-1		< 0.005		1	0.005	REP
Antimony (Sb)	162466-1	0.150	0.148	98.9	1	0.005	REP
Antimony (Sb)	163112-1	0.301	0.278	92.3	1	0.005	REP
Antimony (Sb)	163113-1	0.196	0.201	102.5	1	0.005	REP
Arsenic (As)	161683-1	< MDL	< 0.1		1	0.1	BLL
Arsenic (As)	162458-1	< MDL	< 0.1		1	0.1	BLL
Arsenic (As)	163106-1	< MDL	< 0.1		1	0.1	BLL
Arsenic (As)	161685-1	35.6	33.0	92.8	1	0.1	REF
Arsenic (As)	161687-1	33.6	33.2	98.9	1	0.1	REF
Arsenic (As)	162460-1	35.6	34.0	95.5	1	0.1	REF
Arsenic (As)	162461-1	33.6	34.3	102.2	1	0.1	REF
Arsenic (As)	163108-1	35.6	34.2	96.0	1	0.1	REF
Arsenic (As)	163110-1	33.6	34.2	101.7	1	0.1	REF
Arsenic (As)	161691-1	2.7	2.7	100.8	1	0.1	REP
Arsenic (As)	162464-1		< 0.1		1	0.1	REP
Arsenic (As)	162465-1	1.3	1.2	91.7	1	0.1	REP
Arsenic (As)	162466-1	0.8	0.8	104.3	1	0.1	REP
Arsenic (As)	163112-1	3.9	3.6	93.3	1	0.1	REP
Arsenic (As)	163113-1	0.4	0.4	105.3	1	0.1	REP
Barium (Ba)	161683-1	< MDL	< 0.02		1	0.02	BLL
Barium (Ba)	162458-1	< MDL	< 0.02		1	0.02	BLL
Barium (Ba)	163106-1	< MDL	< 0.02		1	0.02	BLL
Barium (Ba)	161685-1	1600	1562	97.6	1	0.02	REF
Barium (Ba)	161687-1		60.3		1	0.02	REF
Barium (Ba)	162460-1	1600	1628	101.8	1	0.02	REF
Barium (Ba)	162461-1	63.4	63.3	99.9	1	0.02	REF

QC Information:

ANALYTE	ALIQ#	EXPECTED	RESULT	% REC	DIL'N	MDL	QC TYPE
Barium (Ba)	163108-1	1600	1697	106.0	1	0.02	REF
Barium (Ba)	163110-1	63.4	63.6	100.3	1	0.02	REF
Barium (Ba)	159265-1	0.51	0.51	99.8	1	0.02	REP
Barium (Ba)	159300-1		< 0.02		1	0.02	REP
Barium (Ba)	160330-1	0.19	0.20	104.8	1	0.02	REP
Barium (Ba)	160475-1	87	86	99.3	1	0.02	REP
Barium (Ba)	161612-1	4.11	3.72	90.5	1	0.02	REP
Barium (Ba)	161691-1	0.51	0.50	97.7	1	0.02	REP
Barium (Ba)	161845-1	95.1	95.2	100.1	1	0.02	REP
Barium (Ba)	162464-1		< 0.02		1	0.02	REP
Barium (Ba)	162465-1	0.19	0.19	99.9	1	0.02	REP
Barium (Ba)	162466-1	86.6	86.2	99.5	1	0.02	REP
Barium (Ba)	163112-1	4.12	3.79	92.0	1	0.02	REP
Barium (Ba)	163113-1	95.1	94.5	99.4	1	0.02	REP
Berylium (Be)	161683-1	< MDL	< 0.002		1	0.002	BLL
Berylium (Be)	162458-1	< MDL	< 0.002		1	0.002	BLL
Berylium (Be)	163106-1	< MDL	< 0.002		1	0.002	BLL
Berylium (Be)	161685-1	7.16	7.63	106.5	1	0.002	REF
Berylium (Be)	161687-1	36.4	37.7	103.6	1	0.002	REF
Berylium (Be)	162460-1	7.16	8.24	115.1	1	0.002	REF
Berylium (Be)	162461-1	36.4	42.2	115.9	1	0.002	REF
Berylium (Be)	163108-1	7.16	8.02	112.1	1	0.002	REF
Berylium (Be)	163110-1	36.4	39.7	109.0	1	0.002	REF
Berylium (Be)	161691-1		< 0.002		1	0.002	REP
Berylium (Be)	162464-1		< 0.002		1	0.002	REP
Berylium (Be)	162465-1		< 0.002		1	0.002	REP
Berylium (Be)	162466-1		< 0.002		1	0.002	REP
Berylium (Be)	163112-1		< 0.002		1	0.002	REP
Berylium (Be)	163113-1	0.028	0.030	108.0	1	0.002	REP
Bismuth (Bi)	161683-1	< MDL	< 0.02		1	0.02	BLL
Bismuth (Bi)	162458-1	< MDL	< 0.02		1	0.02	BLL
Bismuth (Bi)	163106-1	< MDL	< 0.02		1	0.02	BLL
Bismuth (Bi)	161687-1	25	28.2	112.9	1	0.02	REF
Bismuth (Bi)	162461-1	25	26.5	106.0	1	0.02	REF
Bismuth (Bi)	163110-1	25	28.2	112.7	1	0.02	REF
Bismuth (Bi)	161691-1		< 0.02		1	0.02	REP
Bismuth (Bi)	162464-1		< 0.02		1	0.02	REP
Bismuth (Bi)	162465-1		< 0.02		1	0.02	REP
Bismuth (Bi)	162466-1		< 0.02		1	0.02	REP
Bismuth (Bi)	163112-1		< 0.02		1	0.02	REP
Bismuth (Bi)	163113-1		< 0.02		1	0.02	REP
Cadmium (Cd)	161683-1	< MDL	< 0.01		1	0.01	BLL
Cadmium (Cd)	162458-1	< MDL	< 0.01		1	0.01	BLL
Cadmium (Cd)	163106-1	< MDL	< 0.01		1	0.01	BLL
Cadmium (Cd)	161685-1		32.3		1	0.01	REF
Cadmium (Cd)	161687-1		59.4		1	0.01	REF
Cadmium (Cd)	162460-1	34.3	33	96.2	1	0.01	REF
Cadmium (Cd)	162461-1	59.3	60.5	102.0	1	0.01	REF
Cadmium (Cd)	163108-1	34.3	33.6	98.0	1	0.01	REF
Cadmium (Cd)	163110-1	59.3	60.8	102.5	1	0.01	REF
Cadmium (Cd)	159265-1	0.02	0.02	122.1	1	0.01	REP
Cadmium (Cd)	159300-1		< 0.01		1	0.01	REP

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ANALYTE	ALIQ#	EXPECTED	RESULT	% REC	DIL'N	MDL	QC TYPE
Cadmium (Cd)	160330-1		< 0.01		1	0.01	REP
Cadmium (Cd)	160475-1	0.05	0.05	98.7	1	0.01	REP
Cadmium (Cd)	161612-1	0.01	0.01	93.9	1	0.01	REP
Cadmium (Cd)	161691-1	0.02	0.02	121.7	1	0.01	REP
Cadmium (Cd)	161845-1	0.62	0.61	98.0	1	0.01	REP
Cadmium (Cd)	162464-1		< 0.01		1	0.01	REP
Cadmium (Cd)	162465-1		< 0.01		1	0.01	REP
Cadmium (Cd)	162466-1	0.05	0.05	97.7	1	0.01	REP
Cadmium (Cd)	163112-1		< 0.01		1	0.01	REP
Cadmium (Cd)	163113-1	0.62	0.59	94.8	1	0.01	REP
Chromium (Cr)	161683-1	< MDL	< 0.2		1	0.2	BLL
Chromium (Cr)	162458-1	< MDL	< 0.2		1	0.2	BLL
Chromium (Cr)	163106-1	< MDL	< 0.2		1	0.2	BLL
Chromium (Cr)	161685-1		86.4		1	0.2	REF
Chromium (Cr)	161687-1		66.1		1	0.2	REF
Chromium (Cr)	162460-1	90.5	87.7	96.9	1	0.2	REF
Chromium (Cr)	162461-1	68.6	66.6	97.2	1	0.2	REF
Chromium (Cr)	163108-1	90.5	88.0	97.2	1	0.2	REF
Chromium (Cr)	163110-1	68.6	66.9	97.5	1	0.2	REF
Chromium (Cr)	159265-1		< 0.2		1	0.2	REP
Chromium (Cr)	159300-1		< 0.2		1	0.2	REP
Chromium (Cr)	160330-1	0.6	0.6	102.5	1	0.2	REP
Chromium (Cr)	160475-1	0.6	0.6	98.9	1	0.2	REP
Chromium (Cr)	161612-1		< 0.2		1	0.2	REP
Chromium (Cr)	161691-1		< 0.2		1	0.2	REP
Chromium (Cr)	161845-1	0.5	0.6	109.2	1	0.2	REP
Chromium (Cr)	162464-1		< 0.2		1	0.2	REP
Chromium (Cr)	162465-1	0.7	0.6	92.0	1	0.2	REP
Chromium (Cr)	162466-1	0.6	0.6	94.0	1	0.2	REP
Chromium (Cr)	163112-1	0.4	0.3	67.3	1	0.2	REP
Chromium (Cr)	163113-1	0.5	0.5	97.5	1	0.2	REP
Cobalt (Co)	161683-1	< MDL	< 0.005		1	0.005	BLL
Cobalt (Co)	162458-1	< MDL	< 0.005		1	0.005	BLL
Cobalt (Co)	163106-1	< MDL	< 0.005		1	0.005	BLL
Cobalt (Co)	161687-1	62.9	59.3	94.2	1	0.005	REF
Cobalt (Co)	162461-1	62.9	61	96.9	1	0.005	REF
Cobalt (Co)	163110-1	62.9	60.7	96.6	1	0.005	REF
Cobalt (Co)	161691-1	0.311	0.317	101.9	1	0.005	REP
Cobalt (Co)	162464-1		< 0.005		1	0.005	REP
Cobalt (Co)	162465-1	0.018	0.017	96.0	1	0.005	REP
Cobalt (Co)	162466-1	0.060	0.060	100.6	1	0.005	REP
Cobalt (Co)	163112-1	0.024	0.022	91.9	1	0.005	REP
Cobalt (Co)	163113-1	1.37	1.36	99.6	1	0.005	REP
Copper (Cu)	161683-1	< MDL	< 0.05		1	0.05	BLL
Copper (Cu)	162458-1	< MDL	< 0.05		1	0.05	BLL
Copper (Cu)	163106-1	< MDL	0.22		1	0.05	BLL
Copper (Cu)	161685-1	877	840	95.7	1	0.05	REF
Copper (Cu)	161687-1	69.2	66.1	95.5	1	0.05	REF
Copper (Cu)	162460-1	877	859	98.0	1	0.05	REF
Copper (Cu)	162461-1	69.2	66.7	96.4	1	0.05	REF
Copper (Cu)	163108-1	877	895	102.1	1	0.05	REF
Copper (Cu)	163110-1	69.2	66.3	95.8	1	0.05	REF

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ANALYTE	ALIQ#	EXPECTED	RESULT	% REC	DIL'N	MDL	QC TYPE
Copper (Cu)	159265-1	10.3	10.2	99.0	1	0.05	REP
Copper (Cu)	159300-1	0.11	0.08	73.8	1	0.05	REP
Copper (Cu)	160330-1	2.99	3.13	104.6	1	0.05	REP
Copper (Cu)	160475-1	2.85	2.91	102.2	1	0.05	REP
Copper (Cu)	161612-1	0.72	0.42	58.4	1	0.05	REP
Copper (Cu)	161691-1	10.3	10.1	98.4	1	0.05	REP
Copper (Cu)	161845-1	1.69	1.85	109.3	1	0.05	REP
Copper (Cu)	162464-1	0.11	0.08	69.7	1	0.05	REP
Copper (Cu)	162465-1	3.0	12.6	419.2	1	0.05	REP
Copper (Cu)	162466-1	2.84	2.76	97.0	1	0.05	REP
Copper (Cu)	163112-1	0.72	0.40	55.5	1	0.05	REP
Copper (Cu)	163113-1	1.70	1.70	100.0	1	0.05	REP
Lead (Pb)	161683-1	< MDL	< 0.01		1	0.01	BLL
Lead (Pb)	162458-1	< MDL	< 0.01		1	0.01	BLL
Lead (Pb)	163106-1	< MDL	< 0.01		1	0.01	BLL
Lead (Pb)	161685-1	74.6	71	95.2	1	0.01	REF
Lead (Pb)	161687-1	64.4	61.1	94.8	1	0.01	REF
Lead (Pb)	162460-1	74.6	67.2	90.1	1	0.01	REF
Lead (Pb)	162461-1	64.4	56.6	88.0	1	0.01	REF
Lead (Pb)	163108-1	74.6	73.2	98.2	1	0.01	REF
Lead (Pb)	163110-1	64.4	63	97.9	1	0.01	REF
Lead (Pb)	161691-1	0.08	0.08	102.5	1	0.01	REP
Lead (Pb)	162464-1		< 0.01		1	0.01	REP
Lead (Pb)	162465-1	0.33	0.32	97.5	1	0.01	REP
Lead (Pb)	162466-1	0.06	0.06	100.8	1	0.01	REP
Lead (Pb)	163112-1	0.03	0.03	86.0	1	0.01	REP
Lead (Pb)	163113-1	0.03	0.03	111.7	1	0.01	REP
Lithium (Li)	161683-1	< MDL	< 0.05		1	0.05	BLL
Lithium (Li)	162458-1	< MDL	< 0.05		1	0.05	BLL
Lithium (Li)	163106-1	< MDL	< 0.05		1	0.05	BLL
Lithium (Li)	161687-1	34.3	36.4	106.1	1	0.05	REF
Lithium (Li)	162461-1	34.3	41	119.6	1	0.05	REF
Lithium (Li)	163110-1	34.3	36.8	107.2	1	0.05	REF
Lithium (Li)	161691-1	1.03	1.08	104.8	1	0.05	REP
Lithium (Li)	162464-1		< 0.05		1	0.05	REP
Lithium (Li)	162465-1		< 0.05		1	0.05	REP
Lithium (Li)	162466-1	4.06	4.01	98.8	1	0.05	REP
Lithium (Li)	163112-1	0.23	0.21	91.4	1	0.05	REP
Lithium (Li)	163113-1	2.85	2.84	99.7	1	0.05	REP
Manganese (Mn)	161683-1	< MDL	< 0.005		1	0.005	BLL
Manganese (Mn)	162458-1	< MDL	< 0.005		1	0.005	BLL
Manganese (Mn)	163106-1	< MDL	0.006		1	0.005	BLL
Manganese (Mn)	161685-1	192	190	99.1	1	0.005	REF
Manganese (Mn)	161687-1	74.8	71.4	95.5	1	0.005	REF
Manganese (Mn)	162460-1	192	197	102.8	1	0.005	REF
Manganese (Mn)	162461-1	74.8	73.9	98.8	1	0.005	REF
Manganese (Mn)	163108-1	192	208	108.3	1	0.005	REF
Manganese (Mn)	163110-1	74.8	74.8	100.0	1	0.005	REF
Manganese (Mn)	161691-1	23.4	23.5	100.4	1	0.005	REP
Manganese (Mn)	162464-1		< 0.005		1	0.005	REP
Manganese (Mn)	162465-1	0.176	0.176	99.9	1	0.005	REP
Manganese (Mn)	162466-1	1.94	1.93	99.3	1	0.005	REP

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ANALYTE	ALIQ#	EXPECTED	RESULT	% REC	DIL'N	MDL	QC TYPE
Manganese (Mn)	163112-1	0.918	0.851	92.7	1	0.005	REP
Manganese (Mn)	163113-1	53.6	53.6	99.9	1	0.005	REP
Molybdenum (Mo)	161683-1	< MDL	< 0.05		1	0.05	BLL
Molybdenum (Mo)	162458-1	< MDL	< 0.05		1	0.05	BLL
Molybdenum (Mo)	163106-1	< MDL	< 0.05		1	0.05	BLL
Molybdenum (Mo)	161685-1	99.9	93	93.1	1	0.05	REF
Molybdenum (Mo)	161687-1	72.7	71	97.7	1	0.05	REF
Molybdenum (Mo)	162460-1	99.9	93.1	93.2	1	0.05	REF
Molybdenum (Mo)	162461-1	72.7	70.8	97.3	1	0.05	REF
Molybdenum (Mo)	163108-1	99.9	96.8	96.8	1	0.05	REF
Molybdenum (Mo)	163110-1	72.7	73	100.4	1	0.05	REF
Molybdenum (Mo)	161691-1	0.06	0.07	111.2	1	0.05	REP
Molybdenum (Mo)	162464-1		< 0.05		1	0.05	REP
Molybdenum (Mo)	162465-1		< 0.05		1	0.05	REP
Molybdenum (Mo)	162466-1	0.94	0.95	101.3	1	0.05	REP
Molybdenum (Mo)	163112-1	0.23	0.22	95.4	1	0.05	REP
Molybdenum (Mo)	163113-1	1.23	1.22	99.3	1	0.05	REP
Nickel (Ni)	161683-1	< MDL	< 0.05		1	0.05	BLL
Nickel (Ni)	162458-1	< MDL	< 0.05		1	0.05	BLL
Nickel (Ni)	163106-1	< MDL	< 0.05		1	0.05	BLL
Nickel (Ni)	161685-1	42.9	40.5	94.4	1	0.05	REF
Nickel (Ni)	161687-1	58.7	56.2	95.8	1	0.05	REF
Nickel (Ni)	162460-1	42.9	41.2	96.0	1	0.05	REF
Nickel (Ni)	162461-1	58.7	56.5	96.3	1	0.05	REF
Nickel (Ni)	163108-1	42.9	41.4	96.4	1	0.05	REF
Nickel (Ni)	163110-1	58.7	56.1	95.6	1	0.05	REF
Nickel (Ni)	161691-1	1.61	1.73	107.7	1	0.05	REP
Nickel (Ni)	162464-1		< 0.05		1	0.05	REP
Nickel (Ni)	162465-1	0.35	0.34	97.5	1	0.05	REP
Nickel (Ni)	162466-1	2.49	2.83	113.8	1	0.05	REP
Nickel (Ni)	163112-1	0.65	0.55	84.4	1	0.05	REP
Nickel (Ni)	163113-1	16.6	16.6	100.2	1	0.05	REP
Selenium (Se)	161683-1	< MDL	< 0.2		1	0.2	BLL
Selenium (Se)	162458-1	< MDL	< 0.2		1	0.2	BLL
Selenium (Se)	163106-1	< MDL	< 0.2		1	0.2	BLL
Selenium (Se)	161685-1	66.8	67.4	100.9	1	0.2	REF
Selenium (Se)	161687-1	37.2	38.3	103.0	1	0.2	REF
Selenium (Se)	162460-1	66.8	70.5	105.5	1	0.2	REF
Selenium (Se)	162461-1	37.2	40.6	109.2	1	0.2	REF
Selenium (Se)	163108-1	66.8	69.7	104.3	1	0.2	REF
Selenium (Se)	163110-1	37.2	39.9	107.2	1	0.2	REF
Selenium (Se)	161691-1		< 0.2		1	0.2	REP
Selenium (Se)	162464-1		< 0.2		1	0.2	REP
Selenium (Se)	162465-1	3.9	3.6	91.2	1	0.2	REP
Selenium (Se)	162466-1	1.2	1.3	104.6	1	0.2	REP
Selenium (Se)	163112-1		< 0.2		1	0.2	REP
Selenium (Se)	163113-1	1.2	1.3	106.0	1	0.2	REP
Silver (Ag)	161683-1	< MDL	< 0.02		1	0.02	BLL
Silver (Ag)	162458-1	< MDL	< 0.02		1	0.02	BLL
Silver (Ag)	163106-1	< MDL	< 0.02		1	0.02	BLL
Silver (Ag)	161685-1	95.2	91.5	96.1	1	0.02	REF
Silver (Ag)	162460-1	95.2	90.5	95.0	1	0.02	REF

QC Information:

ANALYTE	ALIQ#	EXPECTED	RESULT	% REC	DIL'N	MDL	QC TYPE
Silver (Ag)	163108-1	95.2	93.3	98.0	1	0.02	REF
Silver (Ag)	161691-1	<0.02	0.02	108.4	1	0.02	REP
Silver (Ag)	162464-1		< 0.02		1	0.02	REP
Silver (Ag)	162465-1		< 0.02		1	0.02	REP
Silver (Ag)	162466-1		< 0.02		1	0.02	REP
Silver (Ag)	163112-1		< 0.02		1	0.02	REP
Silver (Ag)	163113-1		< 0.02		1	0.02	REP
Strontium (Sr)	161683-1	< MDL	< 0.005		1	0.005	BLL
Strontium (Sr)	162458-1	< MDL	< 0.005		1	0.005	BLL
Strontium (Sr)	163106-1	< MDL	< 0.005		1	0.005	BLL
Strontium (Sr)	161687-1	67.7	66.5	98.2	1	0.005	REF
Strontium (Sr)	162461-1	67.7	71.8	106.0	1	0.005	REF
Strontium (Sr)	163110-1	67.7	71.5	105.7	1	0.005	REF
Strontium (Sr)	161691-1	22.8	23.3	102.4	1	0.005	REP
Strontium (Sr)	162464-1	0.055	0.030	54.2	1	0.005	REP
Strontium (Sr)	162465-1	22.6	22.6	99.8	1	0.005	REP
Strontium (Sr)	162466-1	225	224	99.3	1	0.005	REP
Strontium (Sr)	163112-1	54.1	50.3	92.9	1	0.005	REP
Strontium (Sr)	163113-1	122	121	99.4	1	0.005	REP
Thallium (Tl)	161683-1	< MDL	0.004		1	0.002	BLL
Thallium (Tl)	162458-1	< MDL	0.005		1	0.002	BLL
Thallium (Tl)	163106-1	< MDL	0.002		1	0.002	BLL
Thallium (Tl)	161685-1	7.98	7.48	93.8	1	0.002	REF
Thallium (Tl)	161687-1	36.9	34.6	93.8	1	0.002	REF
Thallium (Tl)	162460-1	7.98	7.1	89.0	1	0.002	REF
Thallium (Tl)	162461-1	36.9	32.3	87.6	1	0.002	REF
Thallium (Tl)	163108-1	7.98	7.94	99.5	1	0.002	REF
Thallium (Tl)	163110-1	36.9	36.7	99.6	1	0.002	REF
Thallium (Tl)	161691-1	0.028	0.023	81.6	1	0.002	REP
Thallium (Tl)	162464-1	0.049	0.004	8.2	1	0.002	REP
Thallium (Tl)	162465-1	0.184	0.176	95.9	1	0.002	REP
Thallium (Tl)	162466-1		< 0.002		1	0.002	REP
Thallium (Tl)	163112-1		< 0.002		1	0.002	REP
Thallium (Tl)	163113-1	0.005	0.005	99.3	1	0.002	REP
Tin (Sn)	161683-1	< MDL	< 0.01		1	0.01	BLL
Tin (Sn)	162458-1	< MDL	0.02		1	0.01	BLL
Tin (Sn)	163106-1	< MDL	0.02		1	0.01	BLL
Tin (Sn)	161687-1	59.6	59.5	99.9	1	0.01	REF
Tin (Sn)	162461-1	59.6	61.3	102.8	1	0.01	REF
Tin (Sn)	163110-1	59.6	60.6	101.7	1	0.01	REF
Tin (Sn)	161691-1		< 0.01		1	0.01	REP
Tin (Sn)	162464-1	0.01	0.01	76.0	1	0.01	REP
Tin (Sn)	162465-1		0.05		1	0.01	REP
Tin (Sn)	162466-1		< 0.01		1	0.01	REP
Tin (Sn)	163112-1		< 0.01		1	0.01	REP
Tin (Sn)	163113-1		< 0.01		1	0.01	REP
Uranium (U)	161683-1	< MDL	< 0.002		1	0.002	BLL
Uranium (U)	162458-1	< MDL	< 0.002		1	0.002	BLL
Uranium (U)	163106-1	< MDL	< 0.002		1	0.002	BLL
Uranium (U)	161687-1	35.7	32.4	90.6	1	0.002	REF
Uranium (U)	162461-1	35.7	32.6	91.3	1	0.002	REF
Uranium (U)	163110-1	35.7	34.6	96.9	1	0.002	REF

QC Information:

ANALYTE	ALIQ#	EXPECTED	RESULT	% REC	DIL'N	MDL	QC TYPE
Uranium (U)	161691-1		< 0.002		1	0.002	REP
Uranium (U)	162464-1		< 0.002		1	0.002	REP
Uranium (U)	162465-1		< 0.002		1	0.002	REP
Uranium (U)	162466-1	2.21	2.21	100.0	1	0.002	REP
Uranium (U)	163112-1	0.002	0.002	84.9	1	0.002	REP
Uranium (U)	163113-1	0.878	0.872	99.3	1	0.002	REP
Vanadium (V)	161683-1	< MDL	< 0.05		1	0.05	BLL
Vanadium (V)	162458-1	< MDL	< 0.05		1	0.05	BLL
Vanadium (V)	163106-1	< MDL	< 0.05		1	0.05	BLL
Vanadium (V)	161685-1	439	443	100.8	1	0.05	REF
Vanadium (V)	161687-1	71.0	70.5	99.3	1	0.05	REF
Vanadium (V)	162460-1	439	452	102.9	1	0.05	REF
Vanadium (V)	162461-1	71.0	71.5	100.7	1	0.05	REF
Vanadium (V)	163108-1	439	475	108.1	1	0.05	REF
Vanadium (V)	163110-1	71.0	72.3	101.9	1	0.05	REF
Vanadium (V)	161691-1	0.06	0.06	93.0	1	0.05	REP
Vanadium (V)	162464-1		< 0.05		1	0.05	REP
Vanadium (V)	162465-1	0.08	0.07	91.9	1	0.05	REP
Vanadium (V)	162466-1	0.06	0.06	98.7	1	0.05	REP
Vanadium (V)	163112-1	0.20	0.15	74.1	1	0.05	REP
Vanadium (V)	163113-1	0.07	0.07	99.7	1	0.05	REP
Zinc (Zn)	161683-1	< MDL	0.1		1	0.1	BLL
Zinc (Zn)	162458-1	< MDL	< 0.1		1	0.1	BLL
Zinc (Zn)	163106-1	< MDL	0.2		1	0.1	BLL
Zinc (Zn)	161685-1		669		1	0.1	REF
Zinc (Zn)	161687-1		71.7		1	0.1	REF
Zinc (Zn)	162460-1	671	689	102.6	1	0.1	REF
Zinc (Zn)	162461-1	71.3	74.5	104.4	1	0.1	REF
Zinc (Zn)	163108-1	671	699	104.2	1	0.1	REF
Zinc (Zn)	163110-1	71.3	75.5	105.9	1	0.1	REF
Zinc (Zn)	159265-1	8.8	8.9	101.0	1	0.1	REP
Zinc (Zn)	159300-1	0.5	0.5	100.5	1	0.1	REP
Zinc (Zn)	160330-1	2.7	2.7	100.0	1	0.1	REP
Zinc (Zn)	160475-1	8.1	7.9	97.6	1	0.1	REP
Zinc (Zn)	161612-1	0.8	0.9	108.6	1	0.1	REP
Zinc (Zn)	161691-1	8.8	9.0	102.3	1	0.1	REP
Zinc (Zn)	161845-1	64.1	63.7	99.4	1	0.1	REP
Zinc (Zn)	162464-1	0.4	0.4	98.7	1	0.1	REP
Zinc (Zn)	162465-1	2.7	4.9	181.1	1	0.1	REP
Zinc (Zn)	162466-1	8.1	6.2	76.3	1	0.1	REP
Zinc (Zn)	163112-1	0.8	0.7	86.2	1	0.1	REP
Zinc (Zn)	163113-1	64.2	62.1	96.8	1	0.1	REP

***ICPMS Total. UNITS:** ug/L **MATRIX:** FWGE

ANALYTE	ALIQ#	EXPECTED	RESULT	% REC	DIL'N	MDL	QC TYPE
Aluminum (Al)	161684-1	< MDL	< 0.2		1	0.2	BLL
Aluminum (Al)	162459-1	< MDL	< 0.2		1	0.2	BLL
Aluminum (Al)	163107-1	< MDL	< 0.2		1	0.2	BLL
Aluminum (Al)	161686-1	708	740	104.5	1	0.2	REF
Aluminum (Al)	161688-1	58.4	58.4	100.0	1	0.2	REF
Aluminum (Al)	162462-1	708	740	104.5	1	0.2	REF
Aluminum (Al)	162463-1	58.4	58.5	100.1	1	0.2	REF

QC Information:

ANALYTE	ALIQ#	EXPECTED	RESULT	% REC	DIL'N	MDL	QC TYPE
Aluminum (Al)	163109-1	708	781	110.3	1	0.2	REF
Aluminum (Al)	163111-1	58.4	61.2	104.8	1	0.2	REF
Aluminum (Al)	161693-1	129	122	94.6	1	0.2	REP
Aluminum (Al)	161702-1	36.1	37.6	104.1	1	0.2	REP
Antimony (Sb)	161684-1	< MDL	< 0.005		1	0.005	BLL
Antimony (Sb)	162459-1	< MDL	< 0.005		1	0.005	BLL
Antimony (Sb)	161686-1		19.6		1	0.005	REF
Antimony (Sb)	161688-1		32.5		1	0.005	REF
Antimony (Sb)	162462-1	19.8	19.9	100.7	1	0.005	REF
Antimony (Sb)	162463-1	32.0	33.3	104.1	1	0.005	REF
Antimony (Sb)	159270-1	0.579	0.597	103.0	1	0.005	REP
Antimony (Sb)	159794-1	0.099	0.103	104.2	1	0.005	REP
Antimony (Sb)	161693-1	0.580	0.585	100.9	1	0.005	REP
Antimony (Sb)	161702-1	0.099	0.100	101.0	1	0.005	REP
Arsenic (As)	161684-1	< MDL	< 0.1		1	0.1	BLL
Arsenic (As)	162459-1	< MDL	< 0.1		1	0.1	BLL
Arsenic (As)	161686-1	35.6	33.3	93.5	1	0.1	REF
Arsenic (As)	161688-1	33.6	33.5	99.8	1	0.1	REF
Arsenic (As)	162462-1	35.6	34.0	95.6	1	0.1	REF
Arsenic (As)	162463-1	33.6	34.2	101.8	1	0.1	REF
Arsenic (As)	161693-1	6.3	6.3	100.7	1	0.1	REP
Arsenic (As)	161702-1	0.8	0.8	104.3	1	0.1	REP
Barium (Ba)	161684-1	< MDL	< 0.02		1	0.02	BLL
Barium (Ba)	162459-1	< MDL	< 0.02		1	0.02	BLL
Barium (Ba)	161686-1	1600	1565	97.8	1	0.02	REF
Barium (Ba)	161688-1		59.7		1	0.02	REF
Barium (Ba)	162462-1	1600	1639	102.5	1	0.02	REF
Barium (Ba)	162463-1	63.4	63.2	99.7	1	0.02	REF
Barium (Ba)	159270-1	0.77	0.78	100.7	1	0.02	REP
Barium (Ba)	159794-1	15.5	16.2	104.3	1	0.02	REP
Barium (Ba)	161693-1	0.78	0.79	101.3	1	0.02	REP
Barium (Ba)	161702-1	15.5	16.3	104.9	1	0.02	REP
Berylium (Be)	161684-1	< MDL	< 0.002		1	0.002	BLL
Berylium (Be)	162459-1	< MDL	< 0.002		1	0.002	BLL
Berylium (Be)	161686-1	7.16	7.62	106.4	1	0.002	REF
Berylium (Be)	161688-1	36.4	38.6	105.9	1	0.002	REF
Berylium (Be)	162462-1	7.16	8.34	116.5	1	0.002	REF
Berylium (Be)	162463-1	36.4	42.1	115.7	1	0.002	REF
Berylium (Be)	161693-1	0.011	0.012	105.3	1	0.002	REP
Berylium (Be)	161702-1		< 0.002		1	0.002	REP
Bismuth (Bi)	161684-1	< MDL	< 0.02		1	0.02	BLL
Bismuth (Bi)	162459-1	< MDL	< 0.02		1	0.02	BLL
Bismuth (Bi)	161688-1	25	28.4	113.6	1	0.02	REF
Bismuth (Bi)	162463-1	25	26.3	105.3	1	0.02	REF
Bismuth (Bi)	161693-1		< 0.02		1	0.02	REP
Bismuth (Bi)	161702-1		< 0.02		1	0.02	REP
Cadmium (Cd)	161686-1		32.8		1	0.01	REF
Cadmium (Cd)	162462-1	34.3	33.1	96.6	1	0.01	REF
Cadmium (Cd)	159270-1	0.03	0.03	93.1	1	0.01	REP
Cadmium (Cd)	159794-1		< 0.01		1	0.01	REP
Cadmium (Cd)	161693-1	0.03	0.03	101.8	1	0.01	REP
Cadmium (Cd)	161702-1		< 0.01		1	0.01	REP

QC Information:

ANALYTE	ALIQ#	EXPECTED	RESULT	% REC	DIL'N	MDL	QC TYPE
Chromium (Cr)	161684-1	< MDL	< 0.2		1	0.2	BLL
Chromium (Cr)	162459-1	< MDL	< 0.2		1	0.2	BLL
Chromium (Cr)	161686-1		87.3		1	0.2	REF
Chromium (Cr)	161688-1		66.5		1	0.2	REF
Chromium (Cr)	162462-1	90.5	87.8	97.0	1	0.2	REF
Chromium (Cr)	162463-1	68.6	66.3	96.6	1	0.2	REF
Chromium (Cr)	159270-1		< 0.2		1	0.2	REP
Chromium (Cr)	159794-1		0.7		1	0.2	REP
Chromium (Cr)	161693-1		< 0.2		1	0.2	REP
Chromium (Cr)	161702-1		< 0.2		1	0.2	REP
Cobalt (Co)	161684-1	< MDL	< 0.005		1	0.005	BLL
Cobalt (Co)	162459-1	< MDL	< 0.005		1	0.005	BLL
Cobalt (Co)	161688-1	62.9	59.8	95.0	1	0.005	REF
Cobalt (Co)	162463-1	62.9	60.6	96.4	1	0.005	REF
Cobalt (Co)	161693-1	1.27	1.28	100.8	1	0.005	REP
Cobalt (Co)	161702-1	0.153	0.161	105.0	1	0.005	REP
Copper (Cu)	161684-1	< MDL	< 0.05		1	0.05	BLL
Copper (Cu)	162459-1	< MDL	< 0.05		1	0.05	BLL
Copper (Cu)	163107-1	< MDL	0.11		1	0.05	BLL
Copper (Cu)	161686-1	877	855	97.5	1	0.05	REF
Copper (Cu)	161688-1		66.3		1	0.05	REF
Copper (Cu)	162462-1	877	865	98.7	1	0.05	REF
Copper (Cu)	162463-1	69.2	66.1	95.5	1	0.05	REF
Copper (Cu)	163109-1	877	893	101.8	1	0.05	REF
Copper (Cu)	163111-1	69.2	66.9	96.6	1	0.05	REF
Copper (Cu)	159270-1	109	112	102.3	1	0.05	REP
Copper (Cu)	159794-1	1.81	1.71	94.7	1	0.05	REP
Copper (Cu)	161693-1	110	112	102.3	1	0.05	REP
Copper (Cu)	161702-1	1.81	1.79	98.8	1	0.05	REP
Lead (Pb)	161684-1	< MDL	< 0.01		1	0.01	BLL
Lead (Pb)	162459-1	< MDL	< 0.01		1	0.01	BLL
Lead (Pb)	163107-1	< MDL	< 0.01		1	0.01	BLL
Lead (Pb)	161686-1	74.6	70.5	94.6	1	0.01	REF
Lead (Pb)	161688-1	64.4	61.3	95.1	1	0.01	REF
Lead (Pb)	162462-1	74.6	66.5	89.2	1	0.01	REF
Lead (Pb)	162463-1	64.4	56.4	87.5	1	0.01	REF
Lead (Pb)	163109-1	74.6	72.3	96.8	1	0.01	REF
Lead (Pb)	163111-1	64.4	62.6	97.2	1	0.01	REF
Lead (Pb)	161693-1	0.10	0.10	104.5	1	0.01	REP
Lead (Pb)	161702-1	0.29	0.31	108.3	1	0.01	REP
Lithium (Li)	161684-1	< MDL	< 0.05		1	0.05	BLL
Lithium (Li)	162459-1	< MDL	< 0.05		1	0.05	BLL
Lithium (Li)	161688-1	34.3	37.8	110.3	1	0.05	REF
Lithium (Li)	162463-1	34.3	41.3	120.4	1	0.05	REF
Lithium (Li)	161693-1	0.25	0.26	105.2	1	0.05	REP
Lithium (Li)	161702-1	0.77	0.80	103.7	1	0.05	REP
Manganese (Mn)	161684-1	< MDL	< 0.005		1	0.005	BLL
Manganese (Mn)	162459-1	< MDL	< 0.005		1	0.005	BLL
Manganese (Mn)	161686-1	192	192	100.2	1	0.005	REF
Manganese (Mn)	161688-1	74.8	71.8	96.0	1	0.005	REF
Manganese (Mn)	162462-1	192	200	104.0	1	0.005	REF
Manganese (Mn)	162463-1	74.8	73.8	98.6	1	0.005	REF

QC Information:

ANALYTE	ALIQ#	EXPECTED	RESULT	% REC	DIL'N	MDL	QC TYPE
Manganese (Mn)	161693-1	32.6	33.2	101.7	1	0.005	REP
Manganese (Mn)	161702-1	51.8	53.8	103.8	1	0.005	REP
Molybdenum (Mo)	161684-1	< MDL	< 0.05		1	0.05	BLL
Molybdenum (Mo)	162459-1	< MDL	< 0.05		1	0.05	BLL
Molybdenum (Mo)	161686-1	99.9	93.8	93.9	1	0.05	REF
Molybdenum (Mo)	161688-1	72.7	70.9	97.5	1	0.05	REF
Molybdenum (Mo)	162462-1	99.9	92.8	92.9	1	0.05	REF
Molybdenum (Mo)	162463-1	72.7	70.1	96.4	1	0.05	REF
Molybdenum (Mo)	161693-1	0.06	0.05	88.3	1	0.05	REP
Molybdenum (Mo)	161702-1	0.27	0.28	103.5	1	0.05	REP
Nickel (Ni)	161684-1	< MDL	< 0.05		1	0.05	BLL
Nickel (Ni)	162459-1	< MDL	< 0.05		1	0.05	BLL
Nickel (Ni)	161686-1	42.9	41.1	95.7	1	0.05	REF
Nickel (Ni)	161688-1	58.7	56.3	96.0	1	0.05	REF
Nickel (Ni)	162462-1	42.9	41.2	96.1	1	0.05	REF
Nickel (Ni)	162463-1	58.7	56.3	96.0	1	0.05	REF
Nickel (Ni)	161693-1	1.82	1.91	104.9	1	0.05	REP
Nickel (Ni)	161702-1	1.15	1.02	88.5	1	0.05	REP
Selenium (Se)	161684-1	< MDL	< 0.2		1	0.2	BLL
Selenium (Se)	162459-1	< MDL	< 0.2		1	0.2	BLL
Selenium (Se)	161686-1	66.8	68.0	101.7	1	0.2	REF
Selenium (Se)	161688-1	37.2	38.6	103.8	1	0.2	REF
Selenium (Se)	162462-1	66.8	70.1	104.9	1	0.2	REF
Selenium (Se)	162463-1	37.2	40.6	109.1	1	0.2	REF
Selenium (Se)	161693-1		< 0.2		1	0.2	REP
Selenium (Se)	161702-1	0.5	0.5	96.0	1	0.2	REP
Silver (Ag)	161684-1	< MDL	< 0.02		1	0.02	BLL
Silver (Ag)	162459-1	< MDL	< 0.02		1	0.02	BLL
Silver (Ag)	161686-1	95.2	92.8	97.5	1	0.02	REF
Silver (Ag)	162462-1	95.2	90	94.5	1	0.02	REF
Silver (Ag)	161693-1	0.13	0.13	97.3	1	0.02	REP
Silver (Ag)	161702-1		< 0.02		1	0.02	REP
Strontium (Sr)	161684-1	< MDL	< 0.005		1	0.005	BLL
Strontium (Sr)	162459-1	< MDL	< 0.005		1	0.005	BLL
Strontium (Sr)	161688-1	67.7	67.3	99.4	1	0.005	REF
Strontium (Sr)	162463-1	67.7	71.7	105.9	1	0.005	REF
Strontium (Sr)	161693-1	3.61	3.64	100.8	1	0.005	REP
Strontium (Sr)	161702-1	155	161	104.0	1	0.005	REP
Thallium (Tl)	161684-1	< MDL	< 0.002		1	0.002	BLL
Thallium (Tl)	162459-1	< MDL	0.002		1	0.002	BLL
Thallium (Tl)	161686-1	7.98	7.45	93.4	1	0.002	REF
Thallium (Tl)	161688-1	36.9	34.8	94.2	1	0.002	REF
Thallium (Tl)	162462-1	7.98	7.06	88.5	1	0.002	REF
Thallium (Tl)	162463-1	36.9	32.2	87.2	1	0.002	REF
Thallium (Tl)	161693-1	0.013	0.012	93.6	1	0.002	REP
Thallium (Tl)	161702-1	0.524	0.560	106.9	1	0.002	REP
Tin (Sn)	161684-1	< MDL	< 0.01		1	0.01	BLL
Tin (Sn)	162459-1	< MDL	< 0.01		1	0.01	BLL
Tin (Sn)	161688-1	59.6	59.5	99.8	1	0.01	REF
Tin (Sn)	162463-1	59.6	61	102.3	1	0.01	REF
Tin (Sn)	161693-1	0.17	0.83	480.7	1	0.01	REP
Tin (Sn)	161702-1	0.50	0.42	83.3	1	0.01	REP

QC Information:

ANALYTE	ALIQ#	EXPECTED	RESULT	% REC	DIL'N	MDL	QC TYPE
Uranium (U)	161684-1	< MDL	< 0.002		1	0.002	BLL
Uranium (U)	162459-1	< MDL	< 0.002		1	0.002	BLL
Uranium (U)	161688-1	35.7	32.4	90.8	1	0.002	REF
Uranium (U)	162463-1	35.7	32.4	90.7	1	0.002	REF
Uranium (U)	161693-1		< 0.002		1	0.002	REP
Uranium (U)	161702-1	0.026	0.027	104.8	1	0.002	REP
Vanadium (V)	161684-1	< MDL	< 0.05		1	0.05	BLL
Vanadium (V)	162459-1	< MDL	< 0.05		1	0.05	BLL
Vanadium (V)	161686-1	439	451	102.6	1	0.05	REF
Vanadium (V)	161688-1	71.0	71	100.0	1	0.05	REF
Vanadium (V)	162462-1	439	456	104.0	1	0.05	REF
Vanadium (V)	162463-1	71.0	71.1	100.1	1	0.05	REF
Vanadium (V)	161693-1	0.06	0.05	85.0	1	0.05	REP
Vanadium (V)	161702-1	0.61	0.64	105.1	1	0.05	REP
Zinc (Zn)	161684-1	< MDL	0.1		1	0.1	BLL
Zinc (Zn)	162459-1	< MDL	< 0.1		1	0.1	BLL
Zinc (Zn)	163107-1	< MDL	0.6		1	0.1	BLL
Zinc (Zn)	161686-1		692		1	0.1	REF
Zinc (Zn)	161688-1		72.2		1	0.1	REF
Zinc (Zn)	162462-1	671	689	102.7	1	0.1	REF
Zinc (Zn)	162463-1	71.3	74.4	104.4	1	0.1	REF
Zinc (Zn)	163109-1	671	699	104.2	1	0.1	REF
Zinc (Zn)	163111-1	71.3	75.6	106.0	1	0.1	REF
Zinc (Zn)	159270-1	6.4	6.3	99.1	1	0.1	REP
Zinc (Zn)	159794-1	3.0	4.2	138.3	1	0.1	REP
Zinc (Zn)	161693-1	6.3	6.3	100.0	1	0.1	REP
Zinc (Zn)	161702-1	3.1	3.2	103.6	1	0.1	REP

***pH UNITS:** pH Units **MATRIX:** FWGE

ANALYTE	ALIQ#	EXPECTED	RESULT	% REC	DIL'N	MDL	QC TYPE
pH	162714-1	5.68	5.61		1	0.01	BLE
pH	159790-1	4.0	4.01	100.3	1	0.01	REF
pH	162719-1	4.0	3.96	99.0	1	0.01	REF
pH	159791-1	4.29	4.15	96.7	1	0.01	REP
pH	162756-1	7.92	7.91	99.9	1	0.01	REP

***Residue: Filterable UNITS:** mg/L **MATRIX:** FWGE

ANALYTE	ALIQ#	EXPECTED	RESULT	% REC	DIL'N	MDL	QC TYPE
Solids, Total Dissolved (FR)	159809-1	< MDL	< 10		1	10	BLE
Solids, Total Dissolved (FR)	159810-1	< MDL	13		1	10	BLE
Solids, Total Dissolved (FR)	159811-1	< MDL	< 10		1	10	BLE
Solids, Total Dissolved (FR)	160291-1	< MDL	< 10		1	10	BLE
Solids, Total Dissolved (FR)	161629-1	< MDL	< 10		1	10	BLE
Solids, Total Dissolved (FR)	159825-1	892	918	102.9	1	10	REF
Solids, Total Dissolved (FR)	159826-1	892	848	95.1	1	10	REF
Solids, Total Dissolved (FR)	159827-1	892	883	99.0	1	10	REF
Solids, Total Dissolved (FR)	160292-1	892	910	102.0	1	10	REF
Solids, Total Dissolved (FR)	161631-1	892	944	105.9	1	10	REF
Solids, Total Dissolved (FR)	159815-1	290	342	118.0	1	10	REP
Solids, Total Dissolved (FR)	159816-1		< 10		1	10	REP
Solids, Total Dissolved (FR)	160293-1	514	465	90.5	1	10	REP

QC Information:

ANALYTE	ALIQ#	EXPECTED	RESULT	% REC	DIL'N	MDL	QC TYPE
Solids, Total Dissolved (FR)	161630-1	377	370	98.1	1	10	REP

***SpecificConductance UNITS:** uS/cm **MATRIX:** FWGE

ANALYTE	ALIQ#	EXPECTED	RESULT	% REC	DIL'N	MDL	QC TYPE
Conductivity	159786-1	< MDL	< 2		1	2	BLE
Conductivity	162715-1	< MDL	< 2		1	2	BLE
Conductivity	159789-1	100	97	97.0	1	2	REF
Conductivity	162717-1	14.9	17	112.1	1	2	REF
Conductivity	159792-1	197	197	100.2	1	2	REP
Conductivity	162758-1	390	392	100.4	1	2	REP

Note: **All QC information is batch associated. Duplicate analysis are not necessarily those of this report. Percent recovery for duplicate analysis represents the percent recovery of REP2 as compared to REP1 of a sample duplicate.**

BLE - Blank, Equipment
BLL - Blank, Method
BLX - Blank, Extraction
REA - Replicate Spike, Known Addition
REF - Reference Material
REG - Regular Sample
RRF - Replicate Reference Material
REK - Replicate, Spike
REP - Replicate, Regular
RTS - Replicate Test Sample
SPA - Spike, Known Addition
SPK - Spike
TST - Test Sample 1=Present 2=Absent
MDL - Method Detection Limit

Environment Canada   Environnement Canada

Billing Estimate

------- Not an Invoice Do not Pay -------

PESC FOLDER # :

Invoice:

Location:

TEST DESCRIPTION	MATRIX	QTY	UNITPRICE	PENALTY	SURCHARGE	NETPRICE

Charges

Total Charged To:

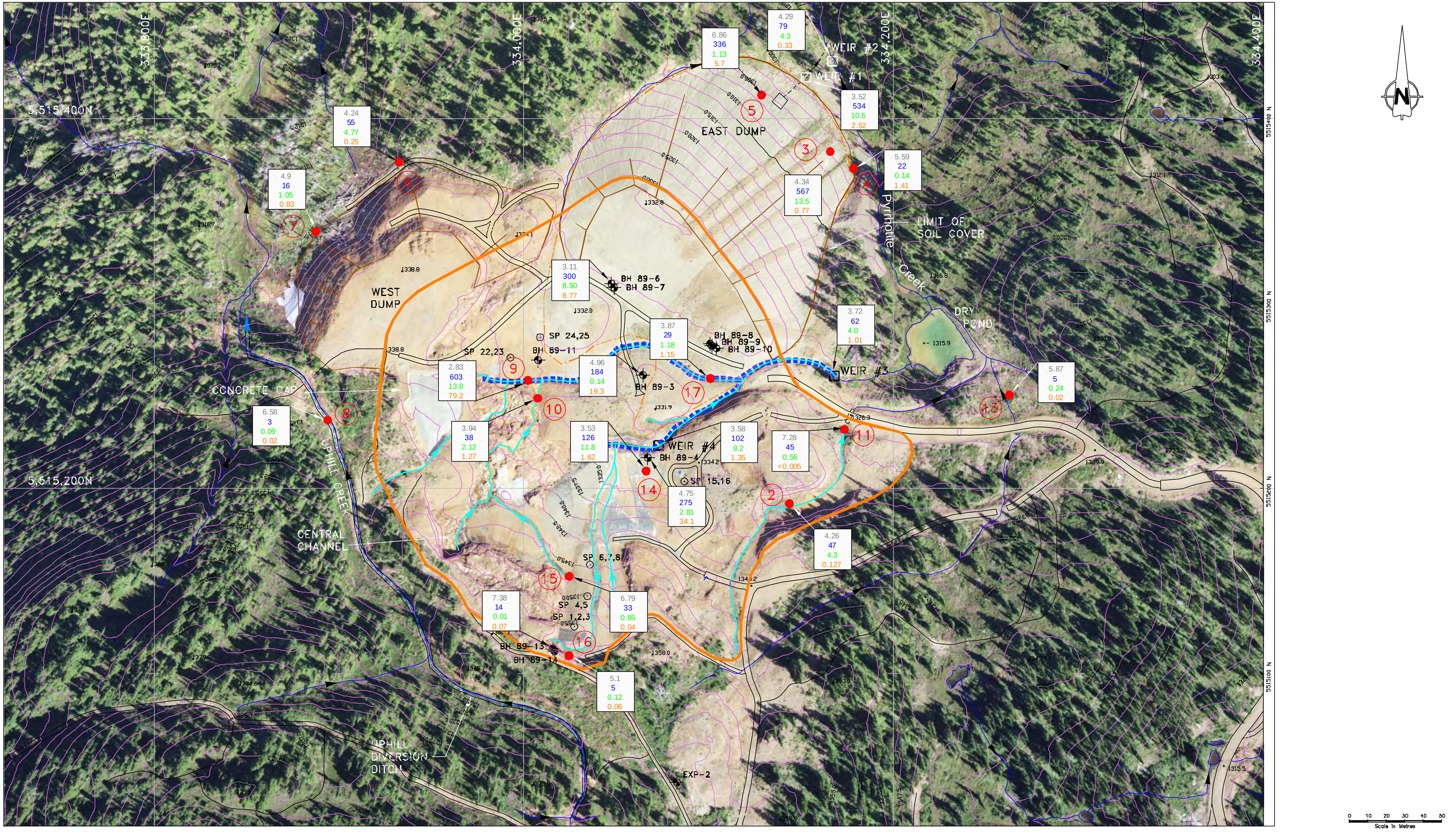
Penalty - A charge that removed from the price due to a test performed after a certian penalty time.
Surcharge - A service charge that is applied when tests are performed by a contract Lab.

Attachment 3.2
Water Chemistry Data – Compiled Data
July 9, 2007

	MDL	Units	BR 1200	SEEP 2	SEEP 3	SEEP 4	SEEP 5	SEEP 6	SEEP 7	DIV 8	SEEP 9	SEEP 10	DITCH 11	DIV 13	SEEP 14	SEEP 15	SEEP 16	SEEP 17	SEEP 18	SEEP 19	Weir 1	Weir 2	Weir 3	Weir 4	Well 89-13	Well 89-3	Well 89-4	Well 89-7
Field Parameters																												
pH			4.38	6.25	4.26	5.15	6.07	4.14	4.88	5.78	2.81	3.88	5.97	5.93	3.67	5.78	4.83	3.86	3.67	6.08	5.84	3.82	3.72	3.6	6.81	5.15	3.12	5.89
Eh		mV	555	178	437	396	417	435	172	100	544	405	162	#N/A	#N/A	162	377	449	#N/A	#N/A	424	450	370	785	475	530	835	480
EC		uS/cm	80	136	949	60	673	136	44	12	1741	118	124	14	378	96	17	107	378	114	1009	215	200	762	77	#N/A	812	362
T		°C	11.4	8.5	4.1	7.6	11.5	12.5	2.7	10.5	21.5	19.1	18.1	16.7	7.2	2.6	14.4	16.6	7.2	17.1	3.5	9.4	15.9	8.7	7	7.7	7.8	6.4
General																												
***Acidity total&pH4.5**																												
Acidity to pH 4.5	1	mg CaCO3 / L	2	< 1	14	< 1	< 1	1	< 1	< 1	222	4	< 1	< 1	18	< 1	< 1	6	19	< 1	36	3	9	15	< 1	< 1	< 1	70
Acidity, Total	1	mg CaCO3 / L	21	11	162	5	4	33	7	1	385	17	2	2	60	3	3	16	60	2	143	26	30	50	2	32	82	137
***AlkalinityTot-pH4.5**																												
Alkalinity to pH 4.5	0.5	mg CaCO3 / L	< 0.5	< 0.5	< 0.5	0.8	16.4	< 0.5	< 0.5	1.9	< 0.5	< 0.5	10.6	0.8	< 0.5	11.5	< 0.5	< 0.5	< 0.5	12.5	< 0.5	< 0.5	< 0.5	< 0.5	30	< 0.5	< 0.5	< 0.5
***ICA (Cl F SO4)**													0.8		1.0										< 0.5			
Chloride (Cl)	0.1	mg/L	< 0.1	0.3	2.4	0.2	0.3	0.8	0.3	0.2	2.6	0.3	0.2	0.1	0.5	0.6	0.3	0.2	0.7	0.3	2.3	0.5	0.3	0.3	0.5	0.3	0.6	2.8
Fluoride (F)	0.01	mg/L	< 0.01	0.04	0.04	< 0.01	0.08	< 0.01	< 0.01	< 0.01	0.36	0.03	0.05	< 0.01	0.10	0.05	0.01	0.01	0.32	0.07	0.05	< 0.01	0.05	0.09	0.03	0.08	< 0.01	< 0.01
Sulphate (SO4)	3	mg/L	64	101	994	23	339	136	37	2.9	648	99	42	4.2	389	33	10.9	103	301	38	1010	127	90	155	12.5	210	345	366
***ICA (NO2 NO3 Br)**																												
Bromide (Br)	0.05	mg/L	< 0.05	< 0.05	0.13	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.08	0.22	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Nitrogen, Nitrate as N	0.002	mg/L	0.016	0.017	0.179	0.011	0.017	0.024	0.024	< 0.002	0.002	0.004	0.014	< 0.002	0.022	0.011	0.006	0.008	0.022	0.008	0.115	0.021	0.012	0.020	0.015	0.028	0.003	0.021
Nitrogen, Nitrite as N	0.005	mg/L	< 0.005	< 0.005	< 0.005	< 0.005	0.008	< 0.005	0.018	< 0.005	< 0.005	0.008	0.006	< 0.005	< 0.005	0.017	0.007	0.006	< 0.005	0.016	< 0.005	< 0.005	< 0.005	0.006	0.006	< 0.005	< 0.005	< 0.005
***pH**																												
pH	0.01	pH Units	4.26	4.26	4.34	5.59	6.86	4.24	4.90	6.58	2.83	3.94	7.28	5.87	3.53	6.79	5.10	3.87	3.54	7.36	3.52	4.29	3.72	3.58	7.38	4.96	4.75	3.11
***Residue: Filterable**																												
Solids, Total Dissolved (FR)	10	mg/L	139	505	923	324	647	457	96	38	1350	78	78	25	280	105	< 10	50	273	110	940	189	127	226	55	290	520	518
***SpecificConductance**																												
Conductivity	2	uS/cm	161	123	926	57	653	122	42	11	1262	118	116	13	325	94	14	95	331	108	965	197	184	287	88	422	509	771
Metals																												
***ICP Dissolved**																												
Aluminum (Al)	0.05	mg/L	2.43	0.68	25.8	0.17	< 0.05	4.46	0.92	< 0.05	17.2	0.86	< 0.05	0.10	4.94	0.06	0.09	0.70	5.00	< 0.05	21	2.71	2.05	3.67	< 0.05	0.08	3.20	11.6
Antimony (Sb)	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Arsenic (As)	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.12	< 0.05
Barium (Ba)	0.001	mg/L	0.004	0.006	0.013	0.003	0.022	0.004	0.002	< 0.001	0.009	0.002	0.005	0.002	0.001	0.001	< 0.001	0.001	0.002	0.002	0.009	0.004	0.002	0.002	< 0.001	0.004	0.002	0.003
Beryllium (Be)	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Boron (B)	0.01	mg/L	< 0.01	0.05	0.03	0.02	0.02	0.01	0.01	< 0.01	0.05	0.06	< 0.01	< 0.01	0.01	0.01	0.07	0.10	< 0.01	< 0.01	< 0.01	< 0.01	0.02	0.01	0.01	< 0.01	0.02	0.01
Cadmium (Cd)	0.005	mg/L	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Calcium (Ca)	0.1	mg/L	16.3	10.3	122	5.9	112	6.2	3.3	1.5	59.9	8.4	17.6	1.7	19.4	12.0	1.0	6.1	19.4	16.0	135	18	10.9	15.5	13.5	52.1	69.1	60.8
Chromium (Cr)	0.005	mg/L	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Cobalt (Co)	0.005	mg/L	0.025	0.020	0.232	< 0.005	0.041	0.024	0.007	< 0.005	0.237	0.010	0.013	< 0.005	0.048	0.006	< 0.005	0.008	0.048	0.008	0.167	0.031	0.021	0.040	< 0.005	0.048	0.084	0.077
Copper (Cu)	0.005	mg/L	2.58	4.33	13.5	0.169	1.13	4.77	1.05	0.011	13.8	2.12	0.564	0.278	11.8	0.847	0.138	1.18	12.1	0.777	10.3	4.3	3.98	8.2	0.011	0.156	2.81	9.81
Iron (Fe)	0.005	mg/L	0.278	0.127	0.77	1.41	5.7	0.247	0.831	0.019	79.2	1.27	< 0.005	0.021	1.62	0.038	0.057	1.15	1.63	< 0.005	2.52	0.332	1.01	1.35	0.074	19.3	34.1	8.77
																					2.59							
Lead (Pb)	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Magnesium (Mg)	0.1	mg/L	2.4	2.2	22.0	1.0	10.2	1.2	0.6	0.2	16.7	0.9	2.6	0.1	4.3	3.4	0.2	0.6	4.4	3.3	17.2	3.0	2.0	3.8	2.6	6.1	9.7	5.9
Manganese (Mn)	0.001	mg/L	0.38	0.272	3.47	0.233	1.3	0.169	0.068	0.012	1.54	0.121	0.266	0.018	0.549	0.189	0.039	0.089	0.553	0.118	2.52	0.488	0.237	0.423	0.025	1.65	1.87	0.719
																					2.57							
Molybdenum (Mo)	0.01	mg/L	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Nickel (Ni)	0.02	mg/L	< 0.02	< 0.02	0.14	< 0.02	0.04	< 0.02	< 0.02	< 0.02	0.04	< 0.02	< 0.02	< 0.02	0.03	< 0.02	< 0.02	< 0.02	0.03	< 0.02	0.14	< 0.02	< 0.02	0.02	< 0.02	0.04	0.06	0.05
Phosphorus (P)	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Potassium (K)	0.1	mg/L	0.5	0.7	3.1	0.4	3.0	0.9	0.4	0.2	1.3	0.4	0.7	0.2	0.8	0.5	0.2	0.3	0.8	0.8	3.2	0.7	4.0	0.8	0.7	1.2	1.4	1.3
Selenium (Se)	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Silicon (Si)	0.05	mg/L	3.25	2.48	11.3	1.32	6.91	2.69	1.72	1.45	28.3	1.84	2.32	0.91	6.84	1.49	1.12	1.44	6.92	2.79	13.1	3.76	3.37	6.09	2.56	9.31	12.2	14.6
																					12.2							
Silver (Ag)	0.01	mg/L	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Sodium (Na)	0.1	mg/L	0.6	0.4	3.7	0.4	2.6	0.6	0.4	0.4	3.9	0.3	0.5	0.2	0.8	0.4	0.4	0.2	0.8	0.5	2.9	0.6	0.8	0.8	0.7	2.1	2.1	1.6
Strontium (Sr)	0.001	mg/L	0.032	0.023	0.237	0.019	0.279	0.025	0.010	0.006	0.149	0.015	0.035	0.005	0.032	0.017	0.004	0.011	0.034	0.040	0.239	0.033	0.019	0.029	0.024	0.084	0.120	0.102
Sulfur (S)	0.05	mg/L	21.9	15.8	189	7.44	112	18.4	5.35	1.05	201	12.8	15	1.58	42	11.1	1.50	9.67	42.8	13.4	178	26.3	20.6	34.1	4.79	61.3	91.6	100
Tin (Sn)	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Titanium (Ti)	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	0.003	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Vanadium (V)	0.01	mg/L	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Zinc (Zn)	0.002	mg/L	0.091	0.094	0.657	0.014	0.165	0.089	0.032	0.005	0.685	0.051	0.058	0.011	0.161	0.033	0.013	0.039	0.161	0.052	0.591	0.108	0.084	0.127	0.018	0.205	0.314	0.309

	MDL	Units	BR 1200	SEEP 2	SEEP 3	SEEP 4	SEEP 5	SEEP 6	SEEP 7	DIV 8	SEEP 9	SEEP 10	DITCH 11	DIV 13	SEEP 14	SEEP 15	SEEP 16	SEEP 17	SEEP 18	SEEP 19	Weir 1	Weir 2	Weir 3	Weir 4	Well 89-13	Well 89-3	Well 89-4	Well 89-7
***ICP Total**																												
Aluminum (Al)	0.06	mg/L	2.36	0.87	26.6	0.22	1.22	4.84	0.94	0.14	18.8	0.95	0.28	0.13	5.01	0.17	0.18	0.68	4.95	0.24	17.3	2.50	1.96	3.6	2.80	16	35.1	11.4
Antimony (Sb)	0.06	mg/L	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06
Arsenic (As)	0.06	mg/L	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	0.12	0.09	< 0.06	< 0.06	< 0.06	< 0.06	0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	0.14	0.45	1.80	< 0.06
Barium (Ba)	0.001	mg/L	0.004	0.006	0.012	0.004	0.021	0.005	0.002	0.001	0.010	0.002	0.007	0.003	0.002	0.002	0.001	0.001	0.002	0.003	0.010	0.004	0.002	0.001	0.011	0.046	0.009	0.004
Berylium (Be)	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Boron (B)	0.01	mg/L	< 0.01	< 0.01	0.01	< 0.01	< 0.01	< 0.01	0.03	0.03	0.02	0.02	0.03	0.03	0.03	0.03	0.02	< 0.01	0.03	0.03	0.03	0.03	0.02	< 0.01	0.02	< 0.01	0.02	0.02
Cadmium (Cd)	0.006	mg/L	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	0.024	< 0.006
Calcium (Ca)	0.1	mg/L	16.0	10.8	132	7.0	120	7.2	3.7	1.6	61.6	8.1	19.2	1.9	22.1	13.7	1.1	5.7	21.7	17.2	112	18.3	10.1	15.7	12.8	52.9	68.3	56.1
Chromium (Cr)	0.006	mg/L	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	0.026	0.007	< 0.006
Cobalt (Co)	0.006	mg/L	0.024	0.019	0.239	< 0.006	0.039	0.027	0.008	< 0.006	0.243	0.010	0.013	< 0.006	0.052	< 0.006	< 0.006	0.008	0.051	0.008	0.162	0.032	0.020	0.039	< 0.006	0.058	0.090	0.079
Copper (Cu)	0.02	mg/L	2.66	4.62	13.7	0.16	1.48	5.36	1.09	< 0.02	15.2	2.05	1.46	0.30	12.4	0.93	0.14	1.26	12.3	1.06	8.49	4.12	4.36	8.31	0.17	1.64	3.33	9.49
Iron (Fe)	0.05	mg/L	0.35	1.57	1.24	1.49	6.28	0.27	0.13	0.12	81.7	2.18	1.99	0.21	1.69	0.30	0.17	2.46	1.66	< 0.05	2.27	0.33	1.76	1.29	7.05	36.4	37.3	14.9
																					2.42							
Lead (Pb)	0.06	mg/L	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06
Magnesium (Mg)	0.1	mg/L	2.2	2.0	19.0	0.9	9.2	1.3	0.6	0.2	15.8	0.9	2.6	0.1	4.4	3.5	0.2	0.6	4.4	3.2	15.7	2.8	1.8	3.5	3.1	9.2	10.0	5.7
Manganese (Mn)	0.001	mg/L	0.375	0.291	3.57	0.248	1.41	0.186	0.071	0.013	1.53	0.120	0.278	0.020	0.588	0.204	0.039	0.083	0.586	0.122	2.42	0.483	0.231	0.448	0.142	1.77	1.94	0.734
																					2.36							
Molybdenum (Mo)	0.01	mg/L	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Nickel (Ni)	0.02	mg/L	< 0.02	< 0.02	0.14	< 0.02	0.04	< 0.02	< 0.02	< 0.02	0.04	< 0.02	< 0.02	< 0.02	0.03	< 0.02	< 0.02	< 0.02	0.03	< 0.02	0.12	< 0.02	< 0.02	0.02	< 0.02	0.05	0.07	0.05
Phosphorus (P)	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Potassium (K)	0.1	mg/L	0.5	0.7	3.3	0.4	2.7	1.0	0.5	0.2	1.3	0.4	0.7	0.2	0.8	0.5	0.2	0.3	0.8	0.8	3.3	0.7	0.4	0.6	1.8	2.8	1.3	1.2
Selenium (Se)	0.06	mg/L	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06
Silicon (Si)	0.06	mg/L	3.25	2.31	11.7	1.21	7.49	2.77	1.84	1.57	30.6	2.03	2.54	1.04	7.29	1.67	1.19	1.28	7.04	2.83	12.9	3.69	3.46	5.85	6.83	34.9	25.2	15.4
																					11.6							
Silver (Ag)	0.01	mg/L	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.01	0.02	0.02	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Sodium (Na)	0.1	mg/L	0.6	0.4	3.3	0.4	2.4	0.7	0.4	0.4	3.5	0.3	0.5	0.2	0.8	0.4	0.4	0.2	0.8	0.5	2.8	0.6	0.4	0.7	0.8	3.6	2.3	1.6
Strontium (Sr)	0.001	mg/L	0.031	0.022	0.260	0.018	0.301	0.029	0.012	0.007	0.141	0.015	0.039	0.006	0.038	0.021	0.005	0.010	0.037	0.045	0.272	0.035	0.018	0.028	0.027	0.114	0.129	0.106
Sulfur (S)	0.06	mg/L	21.6	16.1	189	7.52	112	18.8	5.60	1.01	206	12.8	14.4	1.52	43.2	10.9	1.48	9.89	42.4	12.6	180	25.6	20.3	33.4	4.81	63.4	94.8	103
Tin (Sn)	0.06	mg/L	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06
Titanium (Ti)	0.002	mg/L	0.003	0.005	0.003	0.002	< 0.002	< 0.002	0.002	0.004	0.006	0.007	0.003	0.004	0.002	< 0.002	< 0.002	< 0.002	0.002	< 0.002	< 0.002	< 0.002	0.003	< 0.002	0.114	0.792	0.049	0.013
Vanadium (V)	0.01	mg/L	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.04	< 0.01	< 0.01
Zinc (Zn)	0.002	mg/L	0.085	0.087	0.723	0.012	0.162	0.097	0.032	0.005	0.725	0.044	0.061	0.011	0.167	0.034	0.008	0.035	0.163	0.052	0.583	0.104	0.074	0.121	0.028	0.301	0.330	0.292
																							0.071					
***ICPMS Dissolved.**																												
Aluminum (Al)	0.2	ug/L	2430	680	25800	162	18.7	4460	960	43.1	17200	860	12.5	104	4940	59.0	92.5	700	5000	20.9	18082	2710	2050	3670	5.6	75.4	3200	10488
Antimony (Sb)	0.005	ug/L	0.047	0.019	0.044	0.034	0.212	0.037	0.232	0.788	0.036	0.085	0.142	0.093	0.041	1.69	0.588	0.036	0.039	6.21	0.024	0.037	0.500	0.117	0.244	0.159	1.3	0.042
Arsenic (As)	0.1	ug/L	0.6	0.1	0.6	1.6	26.7	1.4	5.6	21.7	4.3	44.9	18.3	0.5	1.0	6.4	4.4	10.5	1.0	9.6	0.4	1.1	3.1	1.2	2.7	12.5	130	3.0
Barium (Ba)	0.02	ug/L	3.31	5.13	11	2.38	20.3	4.02	1.59	0.35	8.06	1.43	5.05	2.24	1.38	1.26	0.63	1.05	1.40	2.25	8.36	3.53	1.65	2.13	0.51	3.64	2.35	2.78
Berylium (Be)	0.002	ug/L	0.080	0.062	0.565	0.006	0.044	0.141	0.030	< 0.002	0.664	0.036	0.006	0.007	0.234	0.022	0.010	0.027	0.244	0.017	0.426	0.102	0.091	0.154	< 0.002	0.029	0.187	0.316
Bismuth (Bi)	0.02	ug/L	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Cadmium (Cd)	0.01	ug/L	0.49	0.65	3.70	0.03	0.70	0.53	0.18	< 0.01	3.45	0.33	0.36	0.05	1.11	0.16	0.04	0.23	1.12	0.30	2.92	0.67	0.58	0.93	0.02	0.16	1.98	1.88
Chromium (Cr)	0.2	ug/L	< 0.2	< 0.2	0.4	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	2.5	< 0.2	< 0.2	< 0.2	0.5	< 0.2	< 0.2	< 0.2	0.5	< 0.2	0.5	< 0.2	0.3	0.5	< 0.2	< 0.2	0.6	1.2
Cobalt (Co)	0.005	ug/L	24.8	17.6	210	3.36	35.1	20.4	6.57	0.343	191	9.28	11.4	1.64	40.2	5.42	1.26	7.43	40.4	6.91	148	27.7	19	36.7	0.311	47.6	76.1	67.4
Copper (Cu)	0.05	ug/L	2580	4330	13500	138	1130	4770	1050	9.03	13800	2120	564	236	11800	847	121	1180	12100	777	10500	4300	3980	8200	10.3	135	2810	8563
Lead (Pb)	0.01	ug/L	0.09	0.06	0.10	0.04	< 0.01	0.23	0.39	< 0.01	0.48	0.15	0.02	0.02	0.07	< 0.01	0.02	0.12	0.05	< 0.01	0.26	0.12	1.60	0.20	0.07	0.58	0.27	21.3
Lithium (Li)	0.05	ug/L	1.37	1.22	8.86	0.30	3.32	1.97	0.78	0.19	25.2	0.92	1.54	0.20	3.22	0.91	0.17	0.74	3.22	1.98	8.91	1.90	19	2.73	1.03	2.76	4.91	7.49
Manganese (Mn)	0.005	ug/L	361	261	3470	221	1300	154	61.1	10.2	1540	106	249	16.1	549	178	33.1	80	553	108	2320	488	218	418	23.4	1650	1870	678
Molybdenum (Mo)	0.05	ug/L	< 0.05	< 0.05	0.20	< 0.05	0.69	< 0.05	0.07	0.10	0.05	< 0.05	0.93	0.29	< 0.05	0.25	0.05	< 0.05	< 0.05	5.33	< 0.05	0.05	0.10	< 0.05	0.06	0.05	0.09	< 0.05
Nickel (Ni)	0.05	ug/L	15.7	14	111	1.25	36.9	9.25	3.57	0.42	28.4	2.44	8.75	2.13	22	5.30	1.74	1.87	22.1	4.59	96.5	14.8	11.2	20.7	1.61	35	52.7	43.3
Selenium (Se)	0.2	ug/L	< 0.2	< 0.2	0.9	< 0.2	0.3	< 0.2	< 0.2	< 0.2	0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	0.3	0.6	< 0.2	< 0.2	0.2	< 0.2	< 0.2	< 0.2	0.3
Silver (Ag)	0.02	ug/L	< 0.02	0.18	0.12	< 0.02	< 0.02	< 0.02	0.08	< 0.02	0.55	0.16	0.04	0.03	0.42	0.03	0.10	0.14	0.42	0.03	0.20	0.04	0.07	0.37	0.02	< 0.02	< 0.02	0.63
Strontium (Sr)	0.005	ug/L	30.6	19.9	258	15.6	284	24	9.96	5.62	133	12.7	33.3	4.87	31.7	17.1	3.38	9.76	31.8	37.7	256	33.2	18.4	28.1	22.7	87.7	123	105
Thallium (Tl)	0.002	ug/L	0.037	0.111	0.079	0.004	0.026	0.012	0.010	0.006	0.072	0.010	0.061	0.004	0.087	0.051	0.014	0.005	0.087	0.080	0.049	0.038	0.215	0.093	0.029	0.031	0.170	0.034
Tin (Sn)	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.04	0.02	0.04	< 0.01	< 0.01	< 0.01	< 0.01	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Uranium (U)	0.002	ug/L	0.037	0.063	0.162	< 0.002	0.014	0.011	0.004	< 0.002	0.566	0.031	< 0.002	0.004	0.228	< 0.002	< 0.002	0.026	0.230	0.002	0.135	0.061	0.103	0.202	< 0.002	0.003	0.172	0.241
Vanadium (V)	0.05	ug/L	< 0.05	< 0.05	0.09	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.07	< 0.05	0.26	0.14
Zinc (Zn)	0.1	ug/L	72.4	74.2	657	7.1	101	77.8	26.1	3.0	685	39.5	44.8	8.1	140	25.3	8.3	30.0	141	39.6	591	94.0	82.7	121	8.8	157	244	247
***ICPMS Total.**																												
Aluminum (Al)	0.2	ug/L	2360	870	26600	202	1220	4840	962	118	18800	950	265	108	5010	150	129	680	4950	224	20200	2731	1960	3600	2800	16000	35100	11400
Antimony (Sb)	0.005	ug/L	0.046	0.048	0.054	0.044	0.211	0.035	0.208	0.771	0.058	0.106	0.189	0.090	0.040	1.6	0.579	0.067	0.040	5.88	0.025	0.045	0.086	0.084	2.79	4.72	5.6	0.225
Arsenic (As)	0.1	ug/L	0.6	2.2	0.7	1.5	62.5	1.2	10.1	30.4	7.0	94.1	78.3	0.5	0.9	26.1	6.3	55.1	1.0	43.5	0.5	1.2	21.0	1.2	146	450	1800	61.7
Barium (Ba)	0.02	ug/L	3.44	5.64	10.8	2.30	19.5	4.05	1.67	0.62	8.19	1.49	5.14	2.29	1.37	1.29	0.78	1.04	1.36	2.26	8.21	3.97	1.25	1.29	10.7	33	6.33	3.69
Berylium (Be)	0.002	ug/L	0.067	0.070	0.572	0.011	0.075	0.114	0.029	0.002	0.644	0.037	0.014	0.005	0.205	0.018	0.011	0.026	0.189	0.020	0.399	0.084	0.079	0.160	0.049	0.147	0.390	0.294
Bismuth (Bi)	0.02	ug/L	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	0.22	0.40	0.05	0.11
Cadmium (Cd)	0.01	ug/L	0.42	0.58	3.40	0.03	0.64	0.46	0.13	< 0.01	3.14	0.30	0.31	0.04	0.92	0.14	0.03	0.19	0.95	0.27	2.57	0.57	0.41	0.77	0.06	0.25	1.92	1.66
Chromium (Cr)	0.2	ug/L	0.2	< 0.2	0.3	< 0.2	0.2	< 0.2	< 0.2	0.6	2.6	0.3	0.3	< 0.2	0.6	< 0.2	0.2	< 0.2	0.6	< 0.2	0.5	< 0.2	0.3	0.6	2.7	16.1	4.6	1.4
Cobalt (Co)	0.005	ug/L	21.9	17	203	3.1	33.7	21	6.55	0.403	182	9.07	11.2	1.63	38.4	5.28	1.27	6.93	39.3	6.88	146	27.5	17.1	34.2	3.07	40.4	62.8	64.7
Copper (Cu)	0.05	ug/L	2660	4620	13700	124	1480	5360	1090	11.9	15200	2050	1460	222	12400	930	109	1260	12300	1060	10100	4120	4360	8310	144	1640	3330	8777
Lead (Pb)	0.01	ug/L	0.14	0.13	3.52	0.10	0.71	0.26	0.06	0.07	0.52	0.23	0.06	0.04	0.07	0.08	0.09	0.16	0.11	0.05	0.23	0.27	0.13	0.12	5.47	24.5	0.71	23.2
Lithium (Li)	0.05	ug/L	1.69	1.49	9.89	0.37	4.13	2.04	0.80	0.23	25.4	1.02	1.58	0.22	3.09	0.86	0.24	0.88	3.09	1.99	9.24	2.06	1.58	3.23	2.57	7.91	5.11	8.07
Manganese (Mn)	0.005	ug/L	375	255	3570	201	1410	159	60.6	11.3	1530	105	245	15.8	588	173	32.6	73.7	586	103	2360	483	200	448	132	1770	1940	734
Molybdenum (Mo)	0.05	ug/L	0.06	0.05	0.41	< 0.05	0.69	< 0.05	< 0.05	0.11	0.07	0.07	1.07	0.29	0.05	0.30	0.06	0.06	< 0.05	5.39	< 0.05	0.06	< 0.05	< 0.05	1.68	1.54	0.55	0.09
Nickel (Ni)	0.05	ug/L	14.2	14.8	106	1.31	36.1	9.52	3.60	1.79	26.9	2.49	10.4	2.12	20.8	5.85	1.82	6.33	21.3	4.61	94.5	14.8	9.06	19	3.06	36.4	43.6	40.8
Selenium (Se)	0.2	ug/L	0.3	< 0.2	0.8	< 0.2	0.3	< 0.2	< 0.2	< 0.2	0.3	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	0.2	0.5	< 0.2	< 0.2	< 0.2	0.2	0.4	0.2	0.3
Silver (Ag)	0.02	ug/L	0.07	0.25	0.18	0.03	0.07	0.02	0.03	0.06	0.60	0.42	0.09	0.05	0.44	0.07	0.13	0.32	0.45	0.06	0.20	0.09	0.36	0.40	3.41	1.16	0.45	1.98
Strontium (Sr)	0.005	ug/L	29.7	21.2	266	15.7	301	25.4	10.3	6.09	130	13.2	35.2	5.17	32.3	17.2	3.61	10	32.5	39.4	268	36.4	16.1	28.6	28.2	119	122	106
Thallium (Tl)	0.002	ug/L	0.021	0.104	0.062	0.003	0.018	0.009	0.007	0.004	0.038	0.009	0.057	0.003	0.079	0.048	0.013	0.004	0.080	0.073	0.037	0.034	0.039	0.069	0.070	0.049	0.161	0.024
Tin (Sn)	0.01	ug/L	0.85	0.66	0.01	0.33	1.19	0.47	0.68	0.96	0.06	1.16	0.81	0.57	0.86	0.90	0.17	0.19	0.51	0.51	0.49	0.66	0.40	0.56	0.57	0.66	0.36	0.11
Uranium (U)	0.002	ug/L	0.037	0.071	0.161	0.002	0.041	0.011	0.004	0.002	0.558	0.035	0.019	0.005	0.218	0.004	< 0.002	0.026	0.228	0.046	0.131	0.058	0.092	0.189	0.028	0.164	0.856	0.240
Vanadium (V)	0.05	ug/L	0.05	0.10	< 0.05	< 0.05	0.06	< 0.05	< 0.05	0.13	0.06	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.06	0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.08	< 0.05	6.68	28.2	3.02	0.60
Zinc (Zn)	0.1	ug/L	52.5	55.8	723	5.0	86.9	56.6	16.1	1.5	725	28.9	32.9	5.0	98.3	18.0	6.3	21.0	101	28.8	583	69.0	44.0	84.6	17.7	199	199	190

Attachment 4
Summary of Water Chemistry Data
July 9, 2007



LEGEND

WEIR #2	V-NOTCH WEIRS
	SURFACE DIVERSIONS
7	SEEP SAMPLE
BH 89-11	MONITORING WELLS
SP 24,25	STANDPIPE PIEZOMETERS
	PROPOSED COVER OUTLINE
	EXISTING SHOTCRETE LINED SEEPAGE COLLECTION CHANNEL
	EXISTING SEEPAGE DRAINAGE

pH
SO_4 (mg/L)
Cu-D (mg/L)
Fe-D (mg/L)

RESULTS FROM SRK WATER QUALITY SAMPLING

NOTE: SULPHATE ESTIMATED FROM SULPHUR DETERMINED BY ICP.

SRK Consulting
Engineers and Scientists
Vancouver B.C.

SRK JOB NO.: 1CT001.001–700
FILE NAME: 1CT001001–700–12.dwg

Tsolum River Partnership

Mt. Washington Remediation

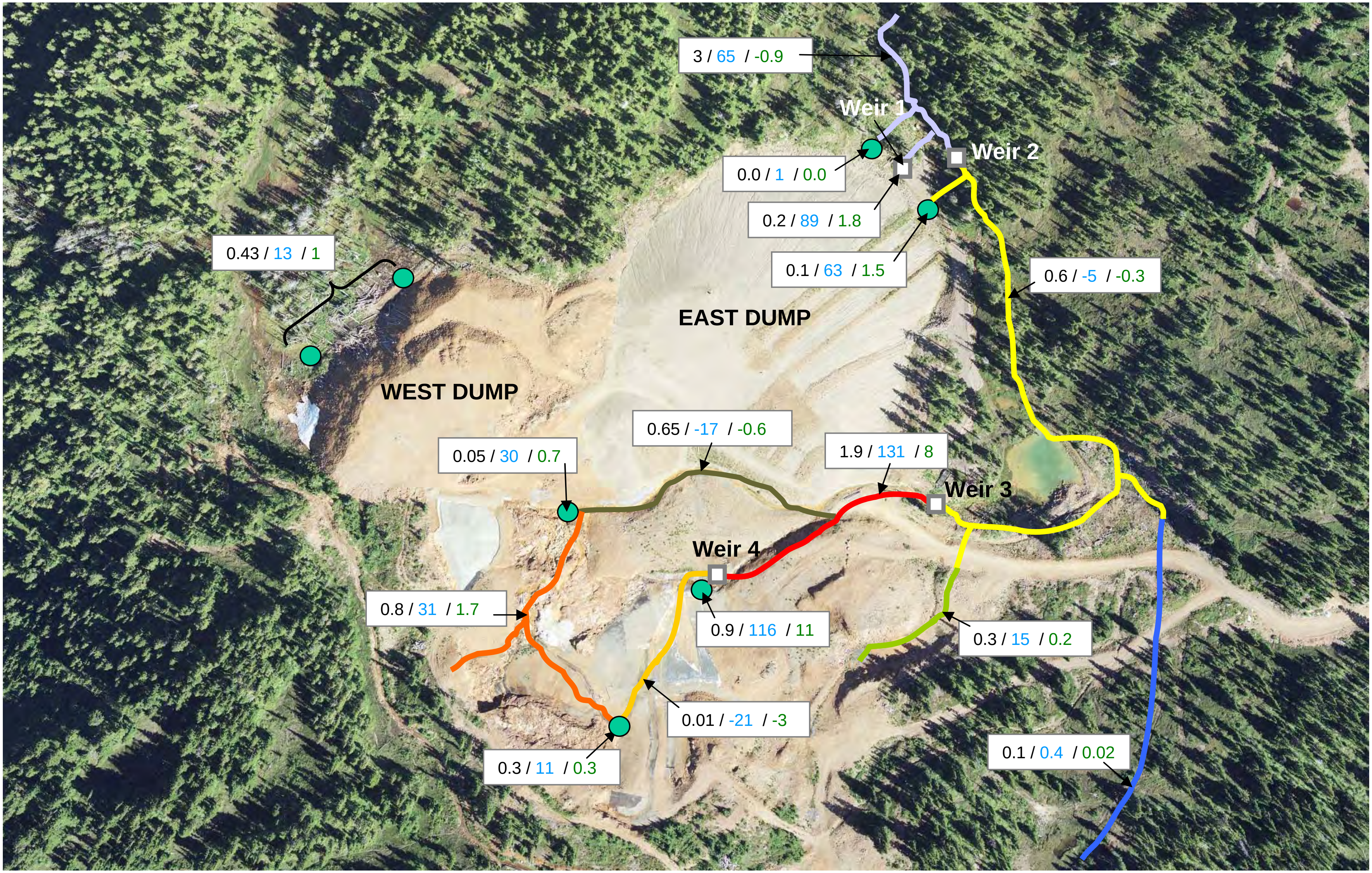
Detailed Design

Summary of Water Geochemistry Data July 9, 2007

DATE:	APPROVED:	FIGURE:
Nov. 07	PMH	Attachment 4

J:\01_SITES\MtWashington\!ACAD\Remediation Final Design\1CT001001-700-12.dwg

Attachment 5
Loading Interpretation
July 9, 2007



KEY

Seep Sample Location

Flow (L/s)/ SO_4 (mg/s) / Cu (mg/s)

SRK Consulting Engineers and Scientists VANCOUVER	Tsolum River Partnership	Detailed Design **Loading Interpretation** **July 9, 2007**		
Job No: 1CT001.001 Filename: Figure 7.7_AlignmPyrrhCr_20071121.ppt	Mt. Washington Remediation	Date: November 2007	Approved:	Attachment **5**

Appendix C
Review of Options

SRK Consulting (Canada) Inc.
Suite 2200 – 1066 West Hastings Street
Vancouver, B.C. V6E 3X2
Canada

vancouver@srk.com
www.srk.com

Tel: 604.681.4196
Fax: 604.687.5532

Memo

To:	File (Appendix C)	**Date:**	November 26, 2007
cc:		**From:**	Peter Healey and Pat Bryan
Subject:	Review of Remediation Options	**Project #:**	1CT001.001

1 Introduction

In review of the options for this project, SRK has adopted a "top-down" approach for analyzing and selecting the preferred remediation method. "Top-down" is a term used in the software industry to describe a software development process whereby the end objectives direct every step of development. It can be contrasted with the "bottom up" approach whereby a number of initiatives (or scientific investigations) are started in the hope that they will somehow add up to the desired final product (or closure decision). In mine closure work, the ingredients necessary to initiate the top-down approach are a concise definition of the scope of the project and a compilation of all available information.

In the first step of the "top-down" approach, a one day workshop was held to identify possible remediation methods for the Mt Washington mine site. The format of the workshop was a group brainstorming session to identify all options. This was done to ensure that all possible remediation methods were under consideration. The work shop started with a common understanding of the project objectives. Remediation methods were then discussed and example options were developed. Each option was assessed by the group and preferred option or combination of options was agree to.

2 Options Identified in November Workshop

The November workshop concluded with a preferred method and a number of contingencies as shown on Figure C-1. However, in order to evaluate these methods, it was agreed that additional information would need to be obtained and further analysis would need to be carried out in order to demonstrate the practicality and effectiveness of the methods selected. One of the key options that the workshop group felt was worth pursuing was the concept of a flow equalization reservoir located at Pyrrhotite Lake. The provision of an equalization reservoir at Pyrrhotite Lake has the potential of reducing the higher concentrations experienced in the Tsolum River. It was hoped that the reservoir would achieve this by storing a portion of the contaminated runoff from the mine during spring freshet for subsequent release during the remainder of the year. It was anticipated that the bulk of the releases from storage would be made during the fall and winter months, when dilution flows are relatively large in the receiving environment. The summer months typically experience the lowest flows of the year and therefore offer only limited capacity to receive releases from the reservoir (i.e., it wouldn't take much of a release from the reservoir during the summer to cause unacceptably high concentrations in the river).

In addition to the flow equalization concept, the workshop participants concluded that several contingency methods would also be assessed. These would include a possible upgrade of the existing surface diversion ditch upstream of the pit, the placement of some reasonable cover or combination of covers over the entire area of the pit and batch lime treatment with an in-line mixer located upstream of the Pyrrhotite Lake. Although the Spectacle Lake wetland was considered a short term solution, it was felt that it would function as a contingency polishing pond.

3 Detailed Options Analysis

3.1 Water Quality

The copper concentrations in Tsolum River exhibit a distinct seasonal character. They are consistently high during the spring freshet, low during the summer baseflow period and quite variable during the fall and winter. Averaged over long periods of time (i.e., a week or more), the copper concentrations in the fall and winter tend to be lower than during the spring freshet.

Figures C-2 and C-3 show the water quality data collected in the Tsolum River 500 m downstream of Murex Creek. The data show a substantial improvement over time in the copper concentrations in the Tsolum River. It is interesting to note that copper concentrations were significantly less during the 2003 freshet than previous years and that this improvement preceded the rerouting of Pyrrhotite Creek through the wetlands.

Figures C-4 and C-5 show the water quality data collected at Branch 1200. These data also indicate a significant improvement in water quality from the site since the remediation work was completed in 1992. The decreasing trend in concentrations after 2003 suggests the recent observed improvements in water quality in Tsolum River are not entirely attributable to rerouting of Pyrrhotite Creek through the wetlands.

3.2 Mass Balance Model

A mass balance model was developed to investigate the potential effectiveness of the various mitigation options identified during the November workshop. The model was set up to simulate copper concentrations at two key points within the upper Tsolum River catchment, namely: i) the outlet of the proposed equalization reservoir at Pyrrhotite Lake; and ii) Tsolum River just downstream of Murex Creek (See Figure C-6). The main inputs to the model were two historical records of flow and associated copper loading. The first record characterized the inflows from Pyrrhotite Creek to the equalization reservoir. The other represented the flow and copper loading generated by the remainder of the upper Tsolum River catchment, defined as the incremental area between Pyrrhotite Lake and a point on Tsolum River some 500 m downstream of Murex Creek.

The first step in developing the model was to select a suitable simulation period. This period had to satisfy the following three criteria: i) water quality sampling was frequent at both Branch 1200 and the Tsolum River below Murex Creek; ii) the records of flow at these two sites were complete, or nearly so; and, iii) the data represented a reasonably stationary condition (i.e., no detectable trend in copper concentration due to mitigation measures at the mine). After scrutinizing the flow and water quality records at the two sites, the two-year period from March 2001 to February 2003 was adopted for the modelling period. Over this period, the copper concentration determinations were numerous at both sites. The flow record for the Tsolum River (WSC Station 08HB089) was complete and the flow record for Branch 126 only contained a short gap of missing data. The selected time frame met the third criterion because it represented a condition after the benefits of the initial mine remediation were realized (first detectable in the mid 1990's) but before rerouting of Pyrrhotite Creek through the Spectacle Lake wetland in the fall of 2003.

Operation of the model required continuous records of flow and copper concentration and, therefore, estimates had to be made for missing data. The process of making these estimates is known as "patching". Two methods were adopted for patching the water quality records. For short gaps, missing data were patched using linear interpolation. For long gaps (i.e., more than five consecutive days), correlations between copper concentration and coincidental flow rate were used. In the case of the Tsolum River, the correlation was made between copper concentrations in the Tsolum River and coincidental flows in Pyrrhotite Creek. The premise of this particular correlation was variations in flow from the mine should explain a significant amount of the variations in copper concentrations in the Tsolum River based on the fact that the mine is the single largest source of copper loading within the Tsolum River catchment. Long gaps in the water quality record of Pyrrhotite Creek were patched using correlations between concentration and flow at Branch 1200. To capture seasonal differences in the correlation, a number of relationships were developed covering periods as short as a month to as long as a full season. The gap in the Pyrrhotite Creek flow record was infilled using a correlation between the coincidental flows at Branch 126 and at Piggott Creek (WSC Station 08HD030). Owing to similarities in elevational characteristics of their catchments, these two streamflow gauging stations experience flows that are highly correlated. As indicated earlier, no patching of the Tsolum River flow record was required. Figures C-7 and C-8 present the patched daily flow and copper concentration records for the Tsolum River and Pyrrhotite Creek, respectively, for the two-year period from March 2001 to February 2003. Symbols (filled squares) identify measured copper concentrations while solid lines show periods where concentrations were estimated. The green line on Figure C-8 indicates the portion of the Pyrrhotite Creek flow record that had to be patched.

Upon completion of the data patching, the next step was to program the model in an Excel spreadsheet. The model incorporated the following features and assumptions:

- The model was operated on a monthly time step to avoid the complications of simulating transit time and attenuation as releases from the proposed equalization pond make their way down through the system of streams and wetlands to the Tsolum River.

- A monthly record of inflows to the equalization pond was estimated by scaling the observed flows at Branch 1200 according to the ratio of catchment areas at the equalization pond and at Branch 126 (0.85 km^2 / 0.27 km^2). To account for orographic effects on catchment yield, the resulting flows were then reduced by 5%.

- The inflow of copper loading to the equalization pond was assumed to be exactly the same as measured at Branch 126 (i.e., no allowance was made for any additional loading generated by the incremental catchment between Branch 1200 and Pyrrhotite Lake).

- The flows generated by the rest of the upper Tsolum River catchment were determined by subtracting the estimated inflows at the equalization pond from the observed flows at WSC Station 08HB089.

- The copper concentrations of the flows from the rest of the upper Tsolum River catchment were assumed to be constant at 0.0035 mg/L, based on background concentrations measured at Tsolum River above Murex Creek and at Murex Creek above Pyrrhotite Creek. The adopted background concentration is half the 30-day average objective for the Tsolum River.

- Owing to their greater availability, determinations of total copper concentration (i.e., dissolved plus particulate) were used to estimate dissolved concentrations at Branch 126 and at the monitoring site in Tsolum River below Murex Creek. An examination of water quality samples where both dissolved and total determinations were made suggests that the use of total metal determinations only overestimates the dissolved copper loading by a small proportion (< 15%).

- An algorithm was added to account for natural sinks that act in the Tsolum River catchment to reduce copper concentrations as water flows from the mine to the Tsolum River. The natural sinks (precipitation and absorption) were assumed to operate only during spring and summer, based on a comparison of the observed loadings at Branch 1200 and at the monitoring site in Tsolum River. Furthermore, the effectiveness of the sinks was assumed to decrease as flow from the mine site increases. The character of the relationship between load reduction and flow rates was estimated through model calibration. The natural sink was estimated to remove up to 90% of the load released from the mine during the lowest flow period of the summer. During flows typical of the freshet, the natural sink was estimated to remove roughly half of the load that originally exits the mine development.

- An algorithm was added to simulate effectiveness of additional mitigation that could be implemented at the minesite (such as construction of additional covers or implementation of water treatment). Any new mitigation was assumed to cause a constant reduction in copper loading from the mine year-round (e.g., if the associated model parameter was set to 60%, then each of the simulated months would experience a 60% reduction in loading from the mine, be it during a wet fall month or a dry summer month).

- A routine was incorporated into the model to simulate the operation of the equalization reservoir. This routine was designed to allow for controlled release from the reservoir's outlet works and uncontrolled releases over a spillway. To simulate the copper concentrations of the reservoir outflows, the reservoir was assumed to act like a perfect mix tank.

Early in the development of the model, it was discovered that an equalization reservoir on its own could not achieve the 30-day average objective of 0.007 mg/L in the Tsolum River. The flow-weighted average copper concentration in the Tsolum River below Murex Creek is approximately 0.013 mg/L, or almost double the objective. The flow-weighted concentration represents the best long-term concentration that could be achieved with the equalization pond if it acted alone. Accordingly, all results from the model presented in this report include additional mitigation measures at the mine site proper.

A range of five scenarios were simulated with the mass balance model. The first scenario examined a situation in which the equalization reservoir was constructed and the required load reduction at the mine site was minimized. In other words, the total loading from the mine was reduced just enough so that the flow-weighted average copper concentration in the Tsolum River would equal the objective of 0.007 mg/L. The equalization reservoir would then be relied on to modify the hydrograph of Pyrrhotite Creek so that it more closely resembled the seasonal pattern of flow in Tsolum River. Figures C-9 and C-10 graphically illustrate the output from the model. Figure C-9 estimates what the water quality would have been in the Tsolum River if the conditions for Scenario 1 had existed over the period March 2001 to February 2003. The top plot shows monthly copper loading in kg while the bottom plot presents the monthly average copper concentration in mg/L. For comparison, the historical copper loadings and concentrations for the same period are superimposed on these two plots (which represent present-day conditions, but without the added benefit of the wetland). As can be seen in the bottom plot, the simulated concentration is constant throughout the simulation period. To achieve this, the reservoir would have had to operate with almost perfect flow pacing. In other words, just enough water would be released from the reservoir to ensure that the concentration of 0.007 mg/L is just met in the Tsolum River. The data required to implement this scenario would be extensive indeed, with a minimal daily sampling of concentrations in the Tsolum River and in the reservoir. Also, the flows into the reservoir and in the Tsolum River would have to be measured on a continuous basis and be available in near real-time. The valve on the outlet works would probably have to be adjusted on a daily basis, particularly during periods of high flow. At a lower level of management, the reservoir would still be effective, but the concentrations would fluctuate about the objective level.

Figure C-10 comprises four plots that illustrate the four main water balance components of the reservoir: inflow, controlled release, spill and storage. An examination of these four plots reveals how the reservoir would behave in meeting the conditions of Scenario 1. During spring freshet, controlled releases from the reservoir would be constrained, thus forcing a portion of the incoming flows to be stored in the reservoir. These stored waters would then be carried over the full summer, when dilution flows are low, to be subsequently released during the fall and winter months. With this mode of operation, the flows in Pyrrhotite Creek below the reservoir would approximately match the flow pattern in the Tsolum River. Over the two-year simulation period, the reservoir would have required a live storage of about 500,000 m^3. In this simulation the storage was made large enough to prevent uncontrolled releases of water over the spillway.

Scenario 2 is the same as the first scenario, except diversion ditches would be constructed in the catchment of Pyrrhotite Lake, thus reducing the inflows to the equalization reservoir. The diversions would reduce the size of the catchment by about 0.19 km^2. Figure C-11 presents the resulting water balance of the reservoir. The requirement for live storage would be reduced slightly to about 425,000 m^3.

Scenario 3 is another variation of the first scenario. A pipeline would be constructed to convey the mine water to Pyrrhotite Lake. To reduce the size of catchment controlled by the reservoir, a diversion channel would intercept the flows of Pyrrhotite Creek near the inlet of the Pyrrhotite Lake and divert these flows to a point downstream of the lake. The headworks of the pipeline would be constructed in Pyrrhotite Creek just below the East Dump. The coupled effect of the pipeline and diversion would be to reduce the catchment of the reservoir by about 0.6 km^2. With this scenario, the capacity of the reservoir could be reduced to about 200,000 m^3 (see Figure C-12).

Scenario 4 examines a case in which no equalization reservoir is provided, but mitigation at the mine site reduces loading enough to prevent the 30-day average objective of 0.007 mg/L from being exceeded in the Tsolum River. To achieve this, the loading from the mine would have to be reduced by some 90%. Figure C-13 shows the predicted water quality in the Tsolum River under this scenario. The monthly average concentration reaches 0.007 mg/L on a few occasions, but otherwise lies below the objective level.

The final scenario also excludes the use of an equalization pond. Improvements in water quality are achieved by treating drainage at the outlet of Pyrrhotite Lake to a copper concentration of 0.05 mg/L. Figure C-14 shows the resulting water quality in the Tsolum River. To be conservative, no allowance was made for the removal of copper by the natural sink. If this sink was simulated, then the concentrations would remain below the objective over the full two-year simulation period.

3.3 Flow Equalization Reservoir

The preferred method that came out of the workshop was the construction of a flow equalization reservoir in the vicinity of Pyrrhotite Lake. Aerial photos of Pyrrhotite Lake are shown on Figure C-15.

In order to evaluate this option, SRK developed preliminary engineering designs for the reservoir embankment (see Figure C-16). Available storage in Pyrrhotite Lake was based on information provided by Environment Canada (Attachment C-1, Pyrrhotite Lake Volume, Environment Canada). It was estimated that with an assumed load reduction at the mine site of 60 percent, the reservoir storage would have to be about 500,000 m^3 to achieve the required water quality objective for dissolved copper in the Tsolum. Using available topographic maps provided by Timberwest, the embankment would have a crest elevation of 1058m with an average dam height of 9m (see Figure C-17). A typical dam section is shown on Figure C-18. A storage capacity curve for a number of different configurations is presented in Figure C-19.

To optimize the embankment design, SRK evaluated several different configurations including the construction of surface water diversions around Pyrrhotite Lake, together with the piping of contaminated seepage from the pit to the flow equalization reservoir at Pyrrhotite Lake. Both of these alternatives reduced the storage requirements and consequently the height of the embankment. Typical details of the liner installation are provided in Figure C-19.

Table C-1 in Attachment C-2 (Cost Estimate Tables) presents a summary of the design parameters and the capital (direct and indirect) and operating cost for the Flow Equalization option.

3.4 Covers

3.4.1 General

SRK has evaluated a number of alternative cover options for potential ARD remediation measures in the North Pit. The estimated area of the North Pit is 38,000 m^2. A plan showing the extent of the North Pit cover is provided in Figure C-20. The following sections present an overview of each of the cover options.

3.4.2 Low Permeability Soil Cover

A low permeability soil cover would consist of 1 m thick compacted till similar to the cover placed over the East Dump in 1988. The original borrow area for the East Dump cover is located approximately 5 km from the mine site. The till in this borrow area is not considered ideal for a cover over the pit because of the low percentage of fines and the available material at the borrow area has not been determined at this stage of the study.

However, for the purposes of this option evaluation study, the cost estimate for till supply assumes that till could be obtained from a site, a similar distance away.

The unit costs used to prepare the comparative cost estimate were based on the BC Blue Book 2005-2006. The projected unit cost to load, haul, dump and place is estimated to be $27.78 per cubic metre. A summary of the direct and indirect cost estimates to place a soil/till cover is provided in Table C-2 of Attachment C-2. The approximate total capital cost for the soil/till cover is $2 million. A summary of the benefits and disadvantages of the cover option are provided on Table C-3 in Attachment C-2.

3.4.3 Bituminous Liner

The next cover option considered for the North bit was a geosynthetic bituminous liner as shown in Figure C-20. The liner would be similar to the asphalt impregnated geotextile installed in 1992. The natural ground would require subgrade preparation and regrading in places to a minimum 3H:1V slopes. Subgrade preparation would include removal of the large boulders and any low spots would be filled in. The subgrade would also need to be re-contoured to form a continuous smooth surface. The finished subgrade surface would require compacted prior to liner deployment. Details of the bituminous liner are provided in Figure C-21. The NP2 type bituminous liner has a unit cost of \$18.50 per m^2 with an estimated 10% for waste and overlap. The installation procedures and specifications would be provided by the contractor during detail design. It was assumed for the purposes of this study that a 0.3 m soil cover would be placed over the liner. As shown on Table C-2, the total capital cost for this option was estimated to be about \$1.44 million. A summary of the benefits and disadvantages of this cover option are provided on Table C-3.

3.4.4 Concrete Cap

The concrete cap option is expected to require extensive engineering work for both design and quality control during construction. The subgrade preparation will require re-sloping to a minimum 3H:1V, clearing all boulders and debris, and re-contoured.

The subgrade will need to be compacted to minimize settlement. The cap would be a minimum 50 mm thick. The concrete is expected to be premixed and transport to site. The unit cost for the concrete is estimated at \$210 per cubic metre. As shown on Table C-2, the total capital cost for this option was estimated to be about \$2 million excluding the forms, subgrade and finishing work. A summary of the benefits and disadvantages of this cover option are provided on Table C-3.

3.4.5 Geosynthetic Clay Liner

An alternative to the bituminous liner cover is a geosynthetics clay liner (GCL) cover. The installation of a GCL is similar to the bituminous liner but would require more quality control and engineering. The GCL would need a bedding layer of 50 mm minus material. A bentonite powder would be spread along panel seams as sealant. It is suggested that the GCL would require a cover to provide confining pressure and UV protection. As shown on Table C-2, the total capital cost for this option was estimated to be about \$1.85 million. A summary of the benefits and disadvantages of this cover option are provided on Table C-3.

3.4.6 Surface Diversions

Surface diversions have been considered for all the options evaluated in this study. The uphill diversion as shown on Figure C-22 was assumed to be in place for all of the mass loading model runs. Surface water channels would be constructed on the surface of the proposed pit cover to direct clean water away from the pit surface. As previously discussed in Section 3.3, surface water diversions were also factored into the different scenarios for the flow equalization reservoir. A plan showing the approximate location of these diversions is shown in Figure C-23. Typical details of the diversions are shown on Figure C-24.

Table C-4 provides a summary of the capital and operating costs for the surface diversion options.

3.5 Pipelines

Two pipeline options were evaluated in this study. The first pipeline was included as an option under Method Option 3 (See Table C-9). The concept would involve collecting the runoff from partially covered pit area and directing the flow in a HDPE 200 mm diameter pipeline to the

Pyrrhotite Lake Flow Equalization Reservoir (FER). As shown on Table C-1, this option reduced the dam height of the FER from 9 m to 4.5 m and the required storage capacity from 500,000 m^3 to 200,000 m^3. A plan of the alignment of the pipeline is shown on Figure C-25.

The second HDPE pipeline would be part of the Method Option 4, which would convey seepage from the underdrain beneath the full pit cover to Pyrrhotite Creek for lime treatment. It is assumed the pipeline diameter would be no greater than 100 mm.

Capital cost for the installation of the pipelines are shown on Table C-5.

3.6 Water Treatment

Although it is believed that the cover will in time effectively reduce the copper loading from the mine area by 90% and hence meet the water quality objective in the Tsolum River, water treatment would likely be required in an interim period until the cover achieves its optimum effectiveness.

The purpose of this section to provide an overview of a proposed chemical water treatment system and to provide a preliminary estimate of the lime and power requirements, an estimate of the sludge generation and design issues that would need to addressed in Phase II.

There are a number of mechanical devices available that can be used to either dose dry lime or lime slurry to the flow in Pyrrhotite Creek. One such device is the “Aqua-Fix” system. It relies on a water wheel which drives a lime dosing mechanism to deliver lime to the flow at rate proportional to the flow in the stream. The system is available at different sizes, with hopper capacities of up to 75 tonnes.

It is assumed that such a system could be installed in Pyrrhotite Creek at either Branch 1200 or at Pyrrhotite Lake. For the purposes of this study the following assumptions were made:

- Average flow of 18.9 L/s (Branch 126);
- Average copper 3 mg/L;
- Acidity:Copper ratio of 8-12;
- Average acidity 40 mg $CaCO_3$ eq./L; and
- Peak flow of 150 L/s for one month.

The annual hydrated lime demand ($Ca(OH)_2$) is expected to be between 25 tonnes depending on the utilization that can be achieved. The treated water would be allowed to flow to Pyrrhotite Lake where most of the precipitates that would be formed would be expected to settle out and accumulate. Additional polishing could be expected if the Pyrrhotite Creek diversion through Spectacle Lake is maintained.

A typical hydrated lime applications system would normally require a silo for dry storage and a slurry tank to mix and store the lime slurry. This system would require agitation equipment and a recirculation loop. Alternatively, the slurry could be delivered to the site and hence, eliminate the need for a silo. Another option is to apply the lime directly, which would eliminate the need for a slurry tank or agitator. In summary, and without any further analyses at this stage, it is believed that the power requirement would be minimal (less than 10hp) and a small generator would surfice.

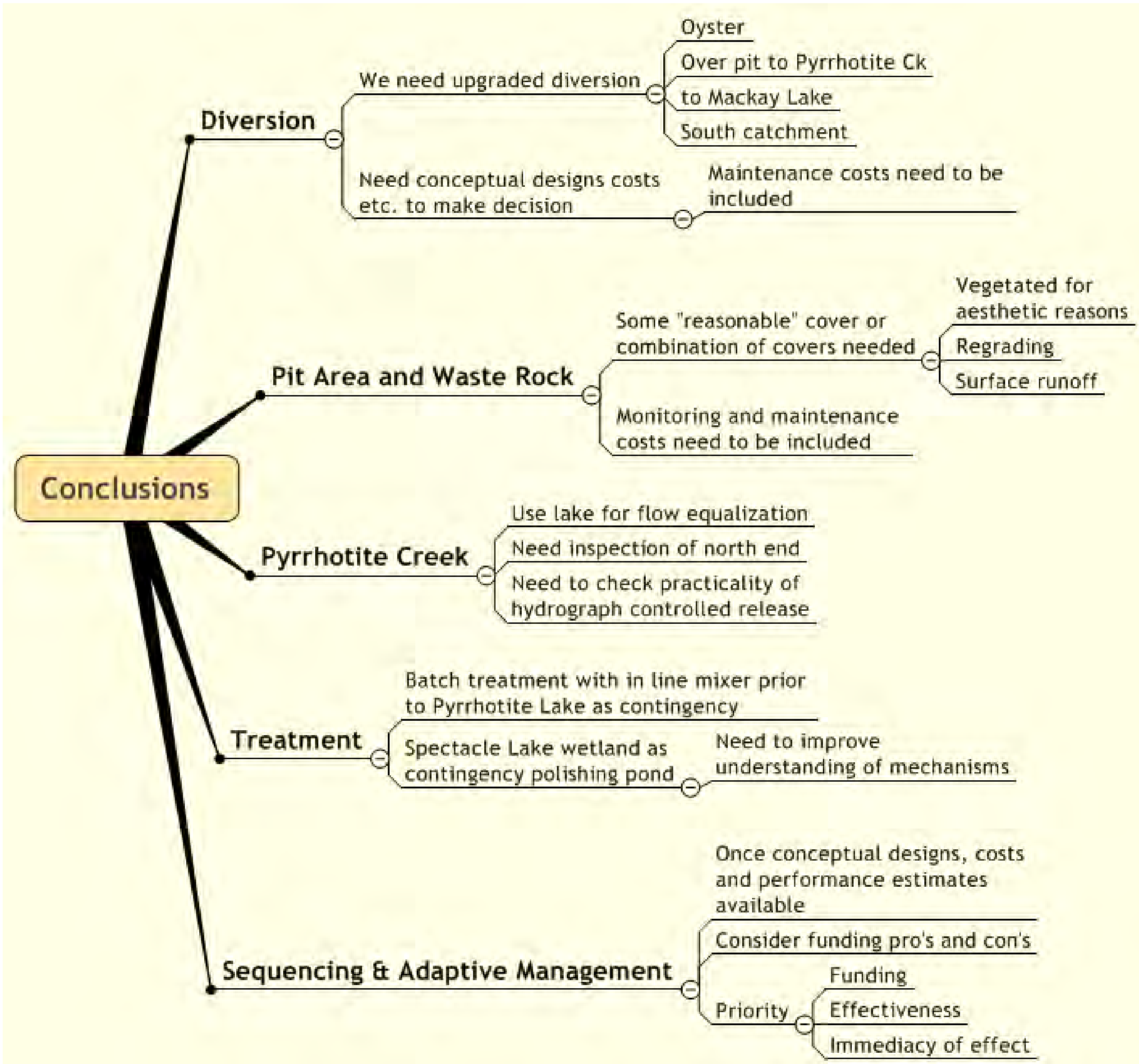
It is estimated that based on a lime consumption of 25 tonnes a year, and assuming 3 percent solids by weight, the system would generate about 2000 m^3 of sludge every year.

Based on this preliminary overview of a treatment system, the following conclusions were reached:

- Treatment system is relatively simple;
- Hydrated lime in bulk delivery;
- Silo and dry application;
- Local power, if necessary;
- Capital cost around $75,000-$200,000;
- Lime cost of $15,000 per year;
- Settling time requires that Pyrrhotite Lake is part of system;
- Sludge storage is key;
- Sludge volumes could be higher than estimated; and
- Possible issues
  - The treatment process could overtax attenuation capacity; and
  - sludge removal may be required.

Water treatment should only be implemented in combination with source control at the mine.

Figures



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Tsolum River Partnership

Workshop Conclusions

Job No: 1CT001.000

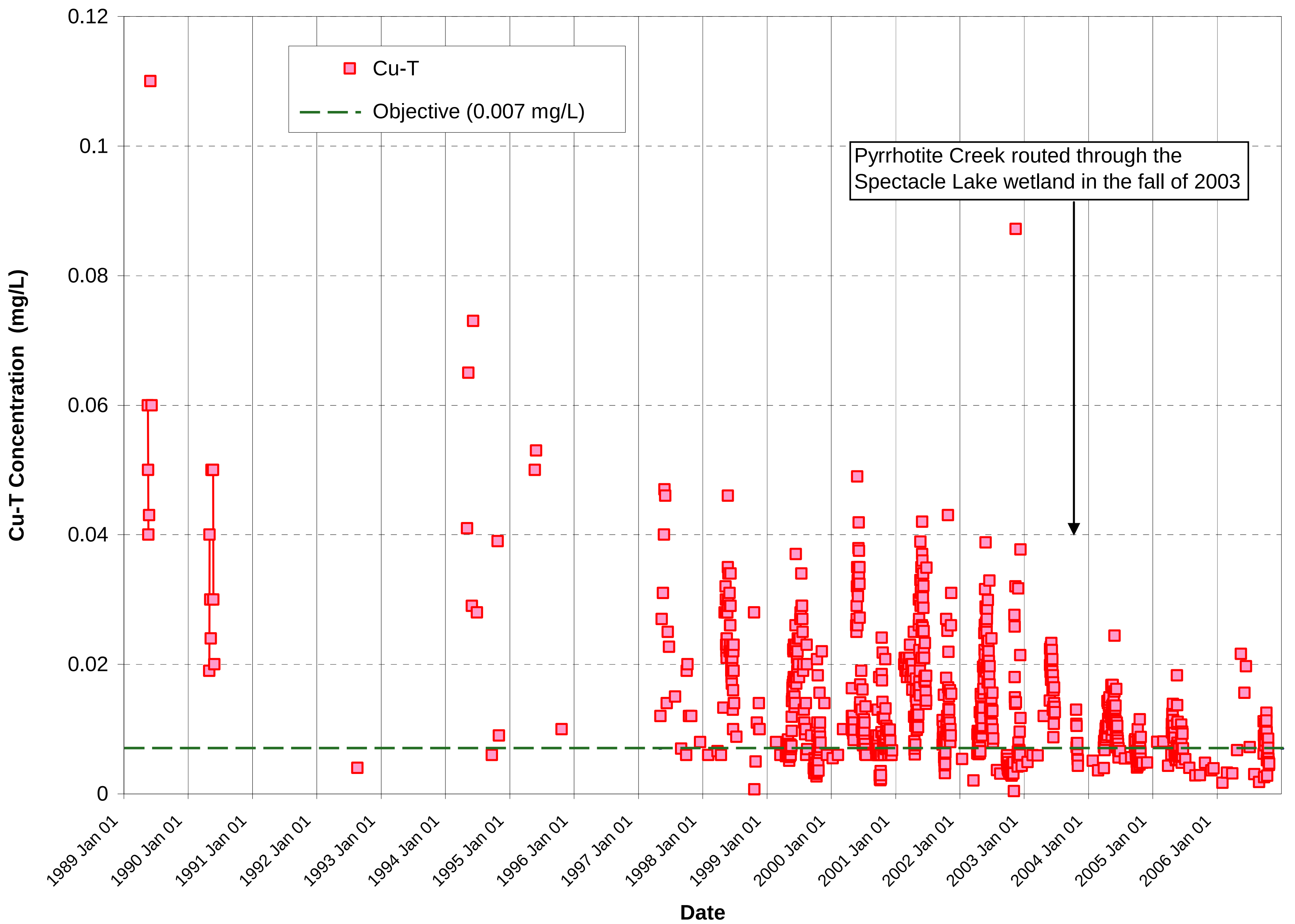
Filename: Figure 3-9_16-20-Branch126-TsolumRiver_20070220.ppt

Mt. Washington Remediation
Detailed Design

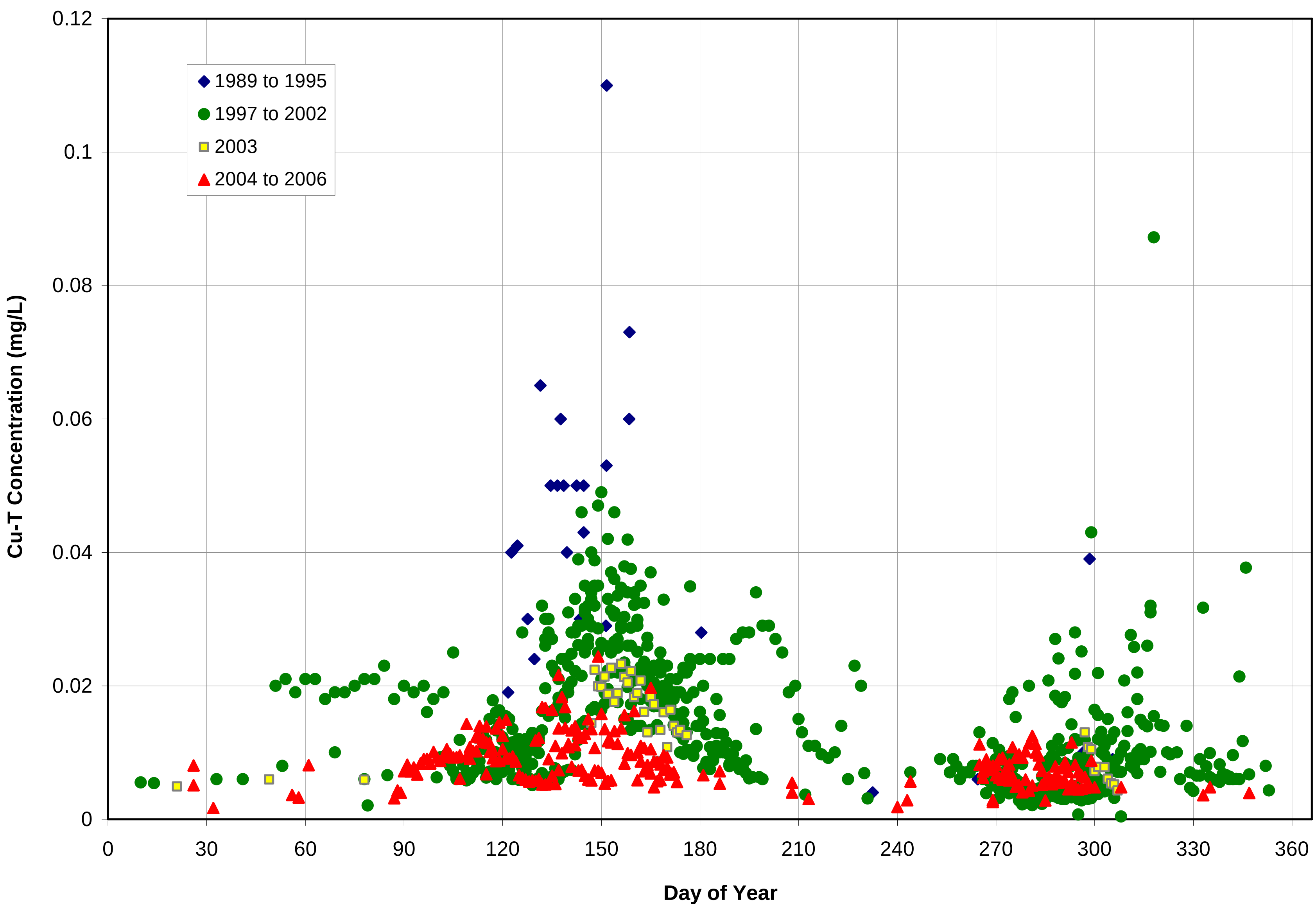
Date: Nov. 2007

Approved:

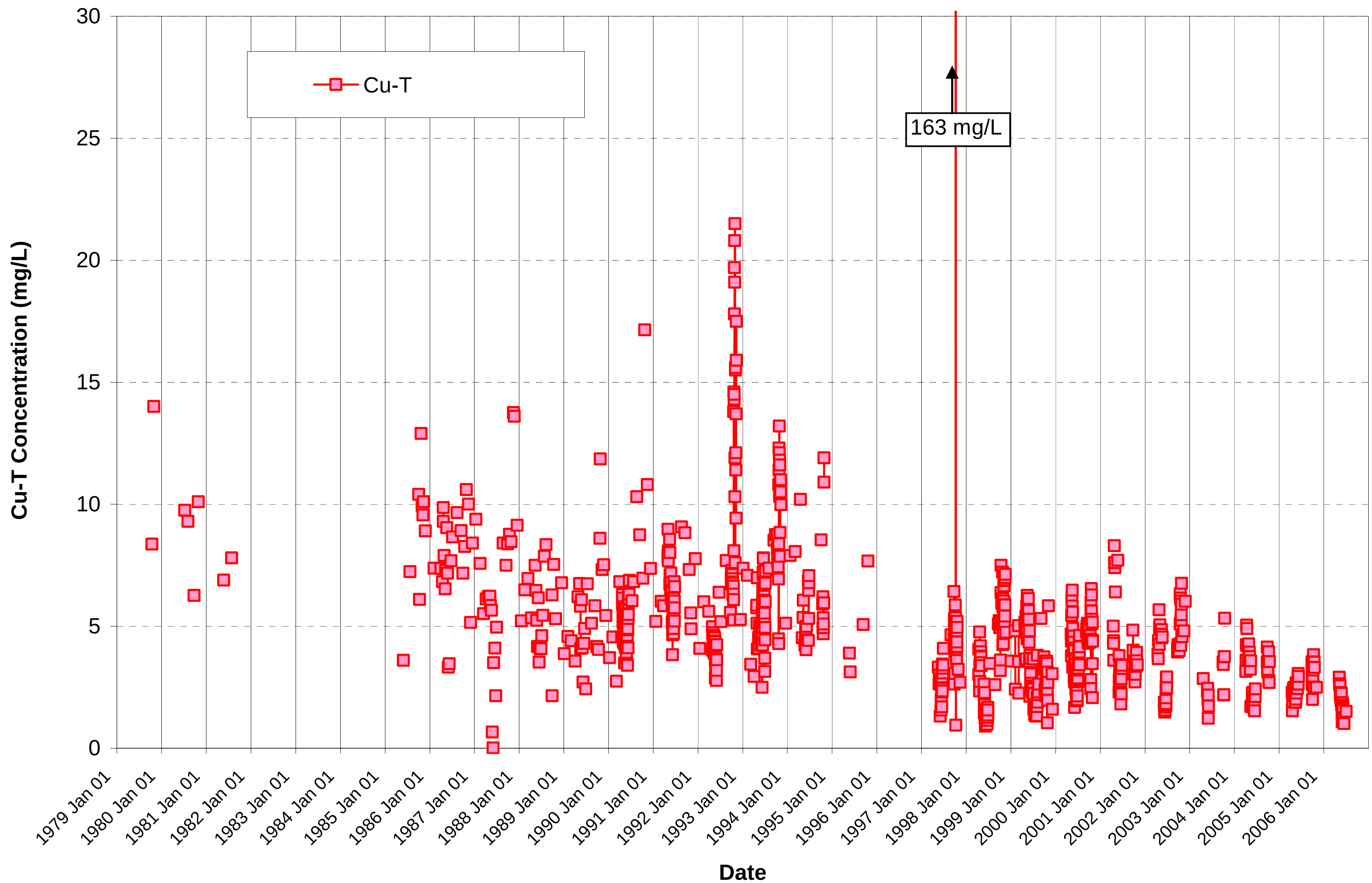
Figure: **C-1**



SRK Consulting Engineers and Scientists VANCOUVER	**Tsolum River Partnership**	**Historical Water Quality (Total Cu vs. Time) Tsolum River below Murex Creek**		
Job No: 1CT001.000 Filename: Figure 3-9_16-20-Branch126-TsolumRiver_20070220.ppt	Mt. Washington Remediation Detailed Design	Date: Nov. 2007	Approved:	Figure: **C-2**



SRK Consulting Engineers and Scientists VANCOUVER	Tsolum River Partnership	**Historical Water Quality (Total Cu vs. Day of Year) Tsolum River below Murex Creek**		
Job No: 1CT001.000 Filename: Figure 3-9_16-20-Branch126-TsolumRiver_20070220.ppt	Mt. Washington Remediation Detailed Design	Date: Nov. 2007	Approved:	Figure: **C-3**



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Tsolum River Partnership

Historical Water Quality (Total Cu vs. Time) Branch 1200

Job No: 1CT001.000

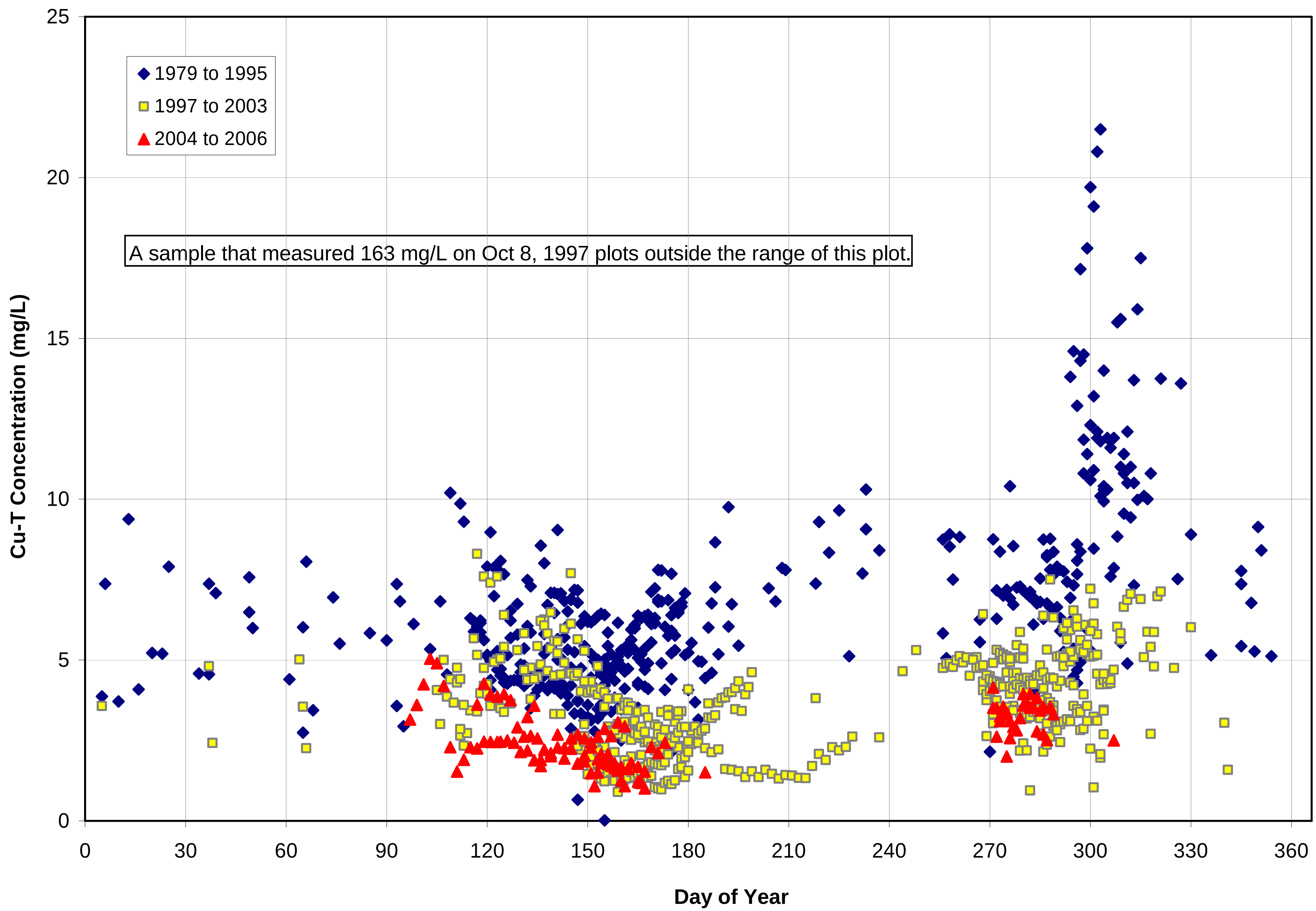
Filename: Figure 3-9_16-20-Branch126-TsolumRiver_20070220.ppt

Mt. Washington Remediation Detailed Design

Date: Nov. 2007

Approved:

Figure: **C-4**



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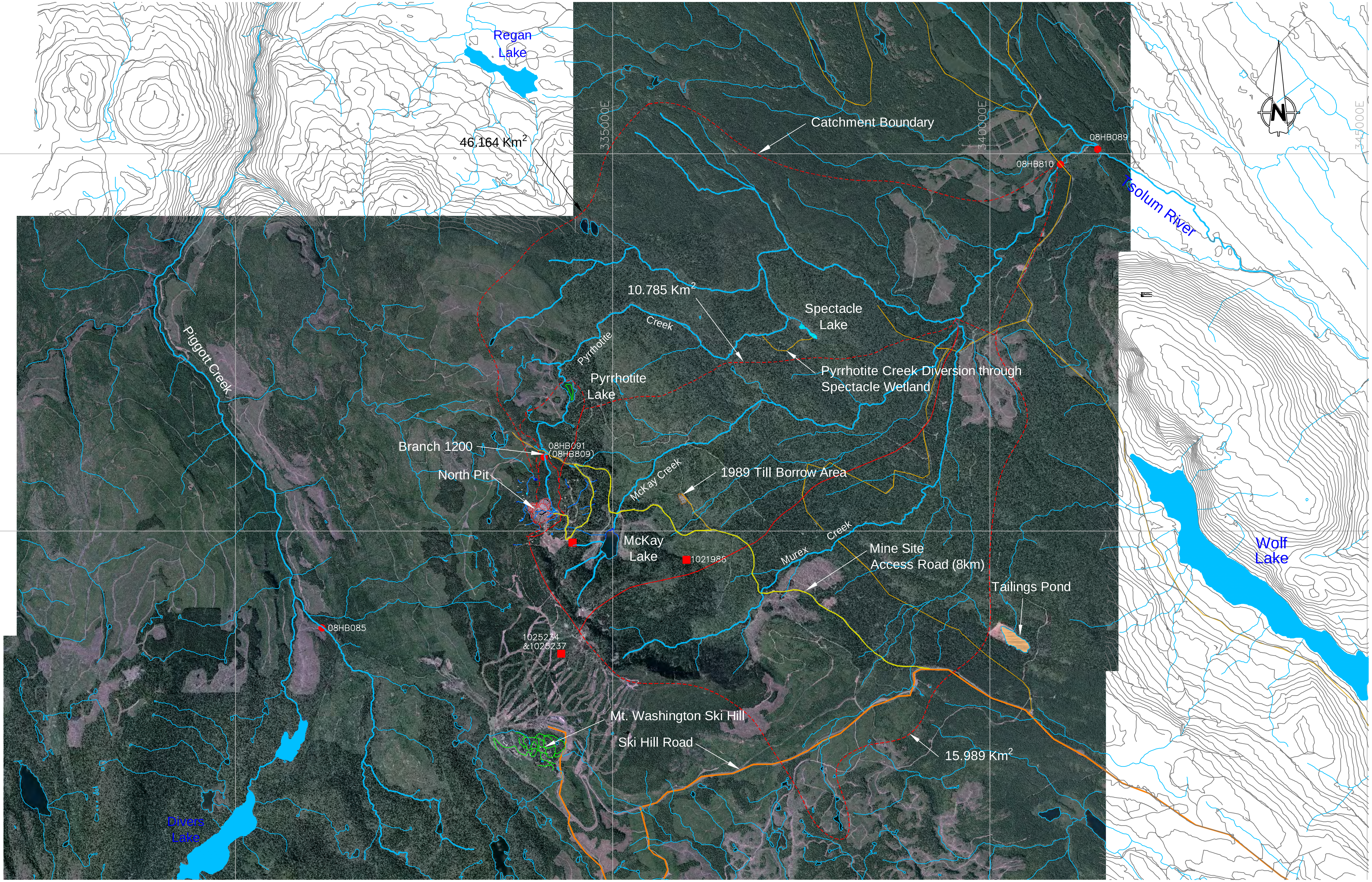
Job No: 1CT001.000	**Tsolum River Partnership**	**Historical Water Quality (Total Cu vs. Day of Year) Branch 1200**
Filename: Figure 3-9_16-20-Branch126-TsolumRiver_20070220.ppt	Mt. Washington Remediation Detailed Design	Date: Nov. 2007 / Approved: / Figure: **C-5**

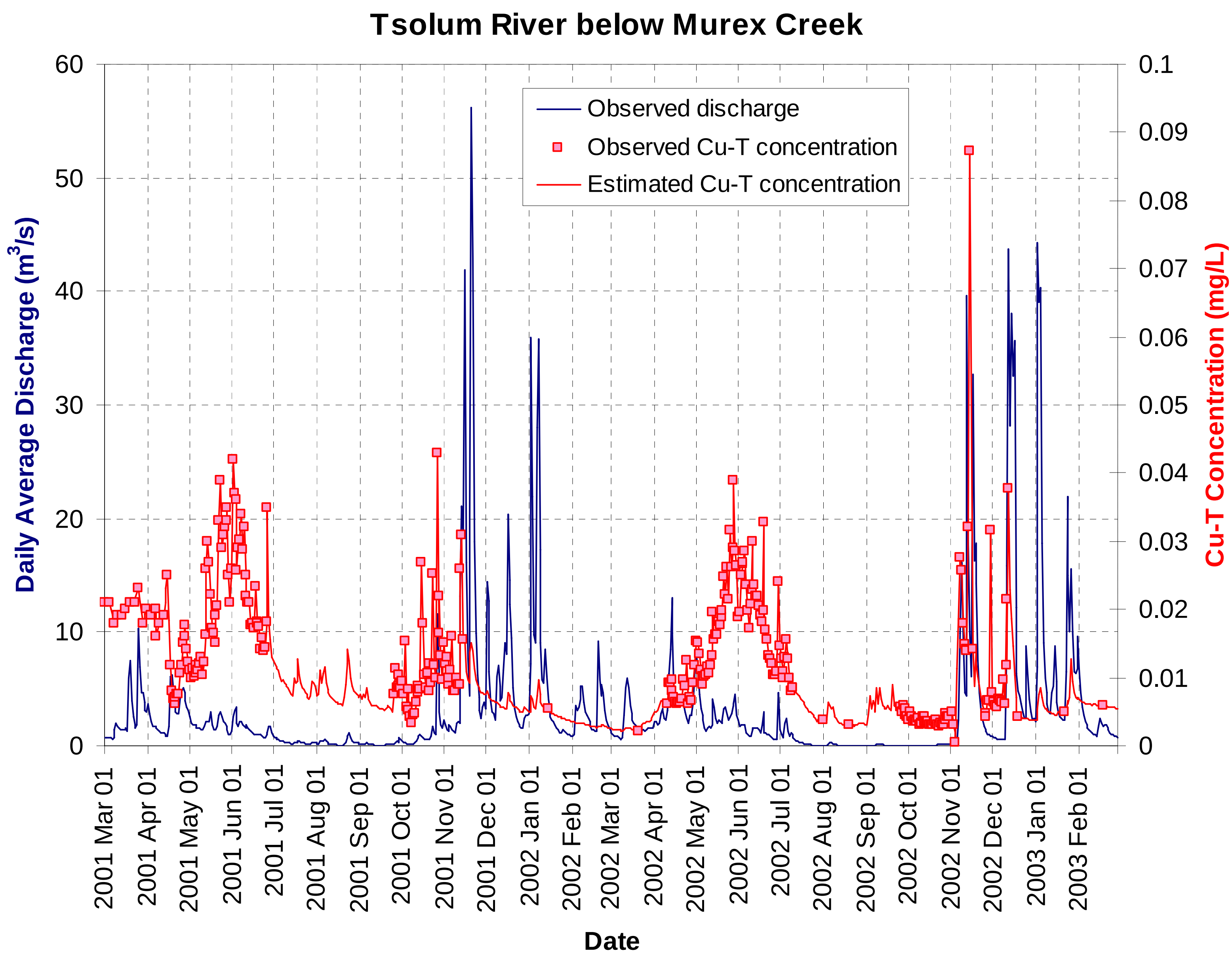


0 300 600 900 1200 1500

Scale in Metres

SRK Consulting Engineers and Scientists Vancouver B.C.	**Tsolum River Partnership**	Detailed Design
SRK JOB NO.: 1CT001.001-700 FILE NAME: 1CT001001-700-1.dwg	Mt. Washington Remediation	Catchment Areas and General Location Map
		DATE: Nov. 07 / APPROVED: PMH / FIGURE: C-6

J:\01_SITES\MtWashington\!ACAD\Remediation Final Design\1CT001001-700-1.dwg



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Tsolum River Partnership

Tsolum River Patched Data

Job No: 1CT001.000

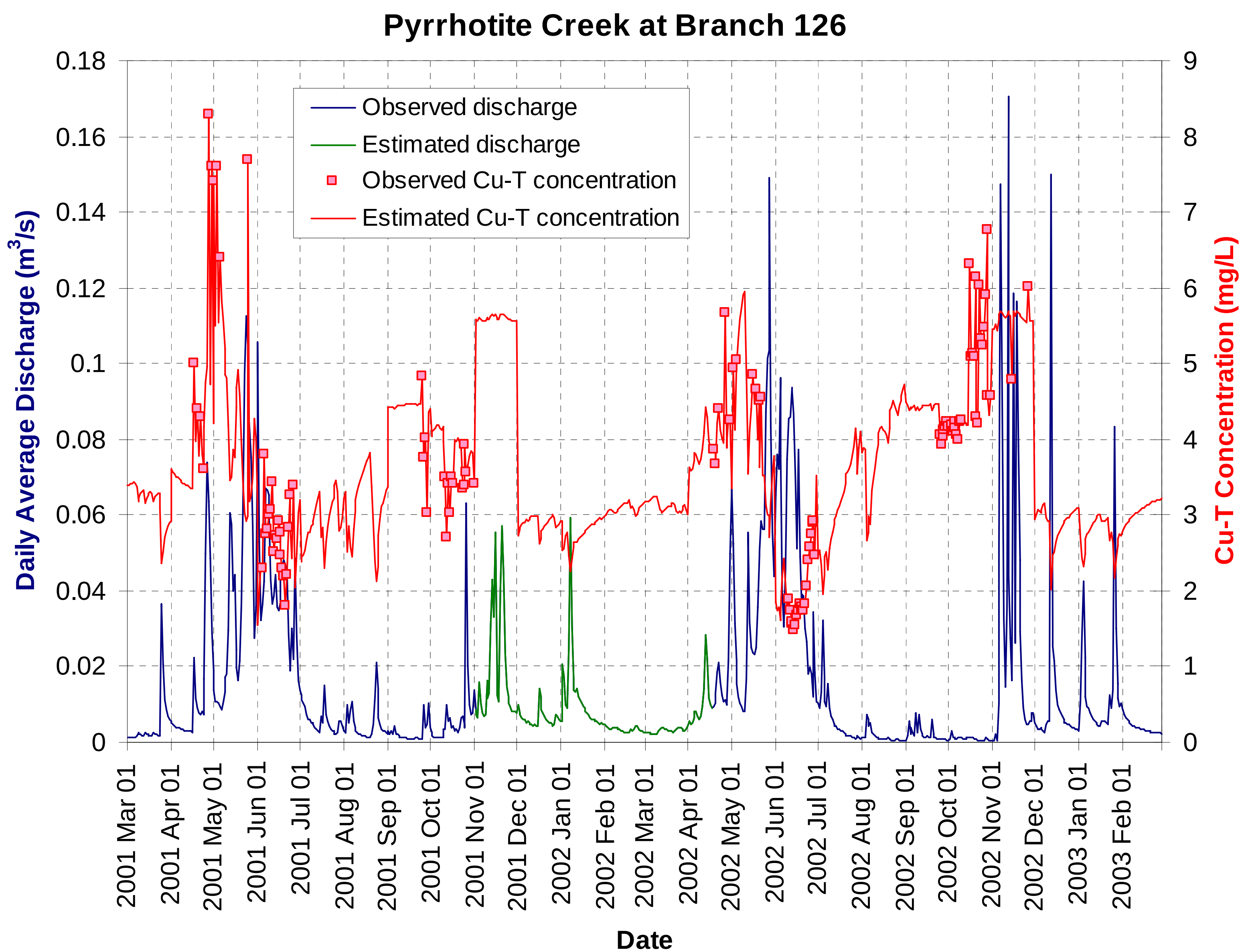
Filename: Figure 3-9_16-20-Branch126-TsolumRiver_20070220.ppt

Mt. Washington Remediation Detailed Design

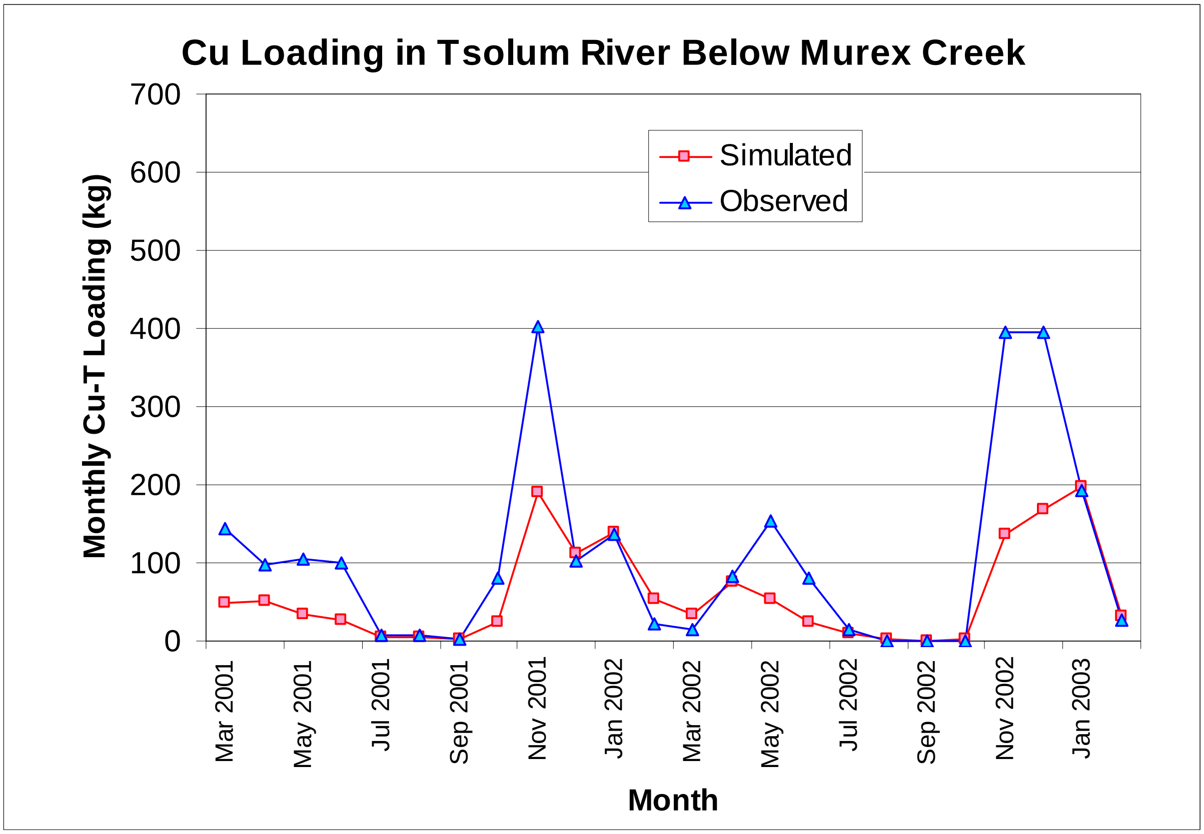
Date: Nov. 2007

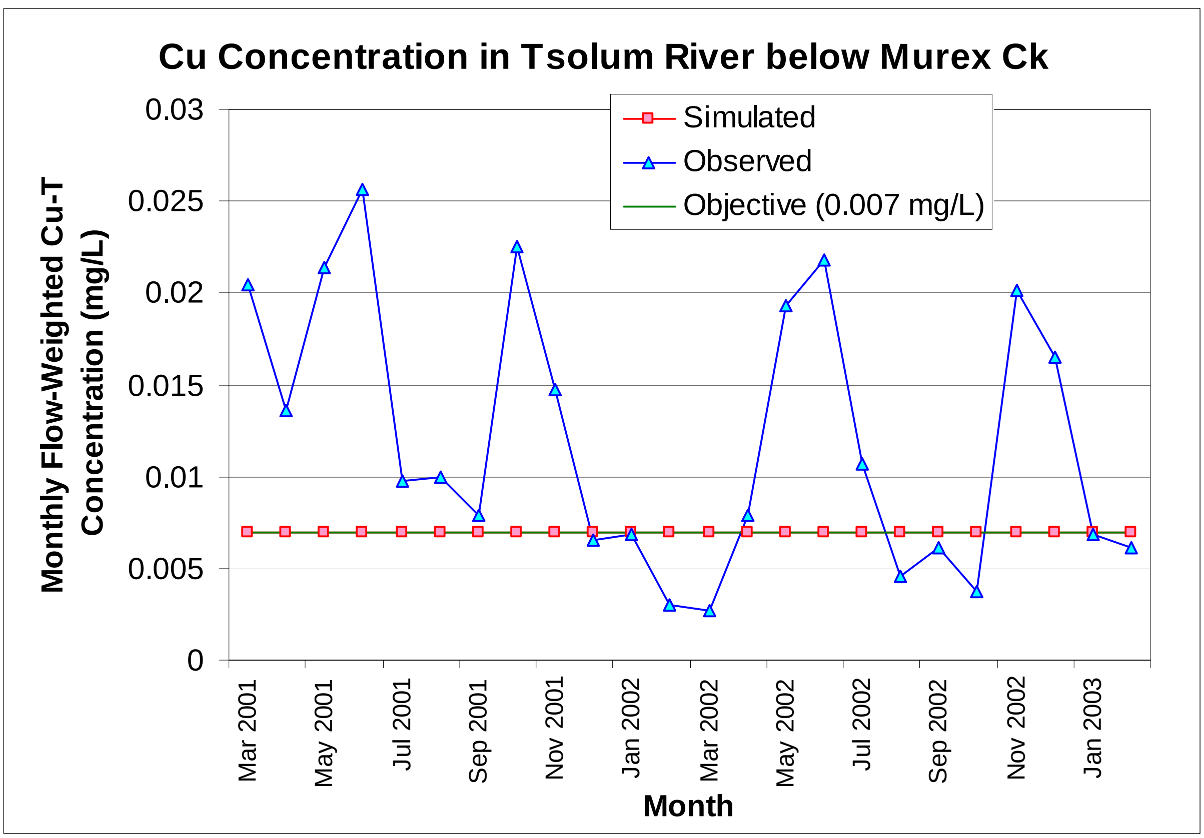
Approved:

Figure: **C-7**

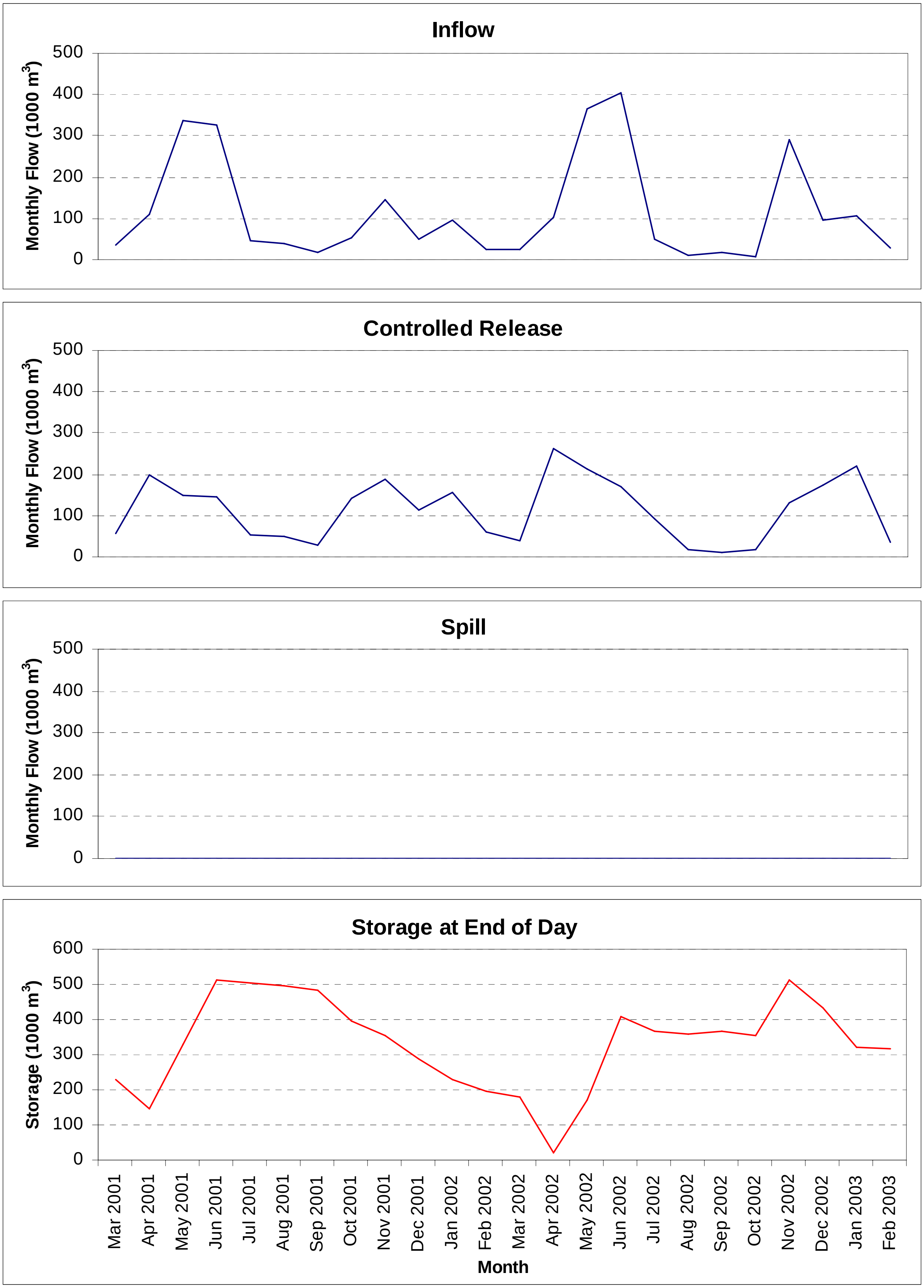


SRK Consulting Engineers and Scientists VANCOUVER	Tsolum River Partnership	Pyrrhotite Creek at Branch 1200 Patched Data		
Job No: 1CT001.000 Filename: Figure 3-9_16-20-Branch126-TsolumRiver_20070220.ppt	Mt. Washington Remediation Detailed Design	Date: Nov. 2007	Approved:	Figure: C-8





SRK Consulting Engineers and Scientists VANCOUVER	**Tsolum River Partnership**	**Scenario 1** **60% Load Reduction at Mine and Equalization Reservoir**
Job No: 1CT001.000 Filename: Figure 1_Location.ppt	Mt. Washington Remediation Detailed Design	Date: Nov. 2007 | Approved: | Figure: **C-9**



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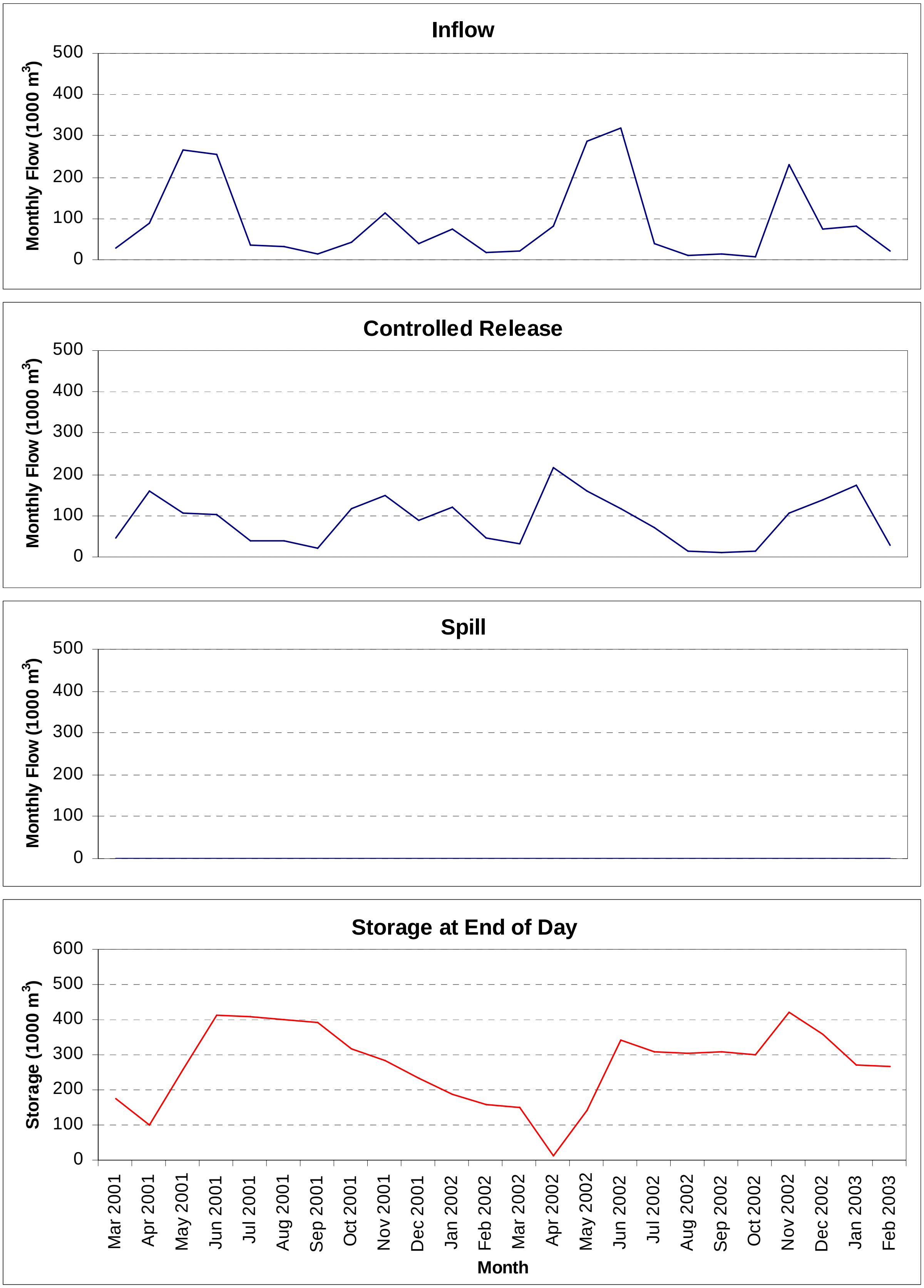
Scenario 1
Equalization Reservoir
Water Balance

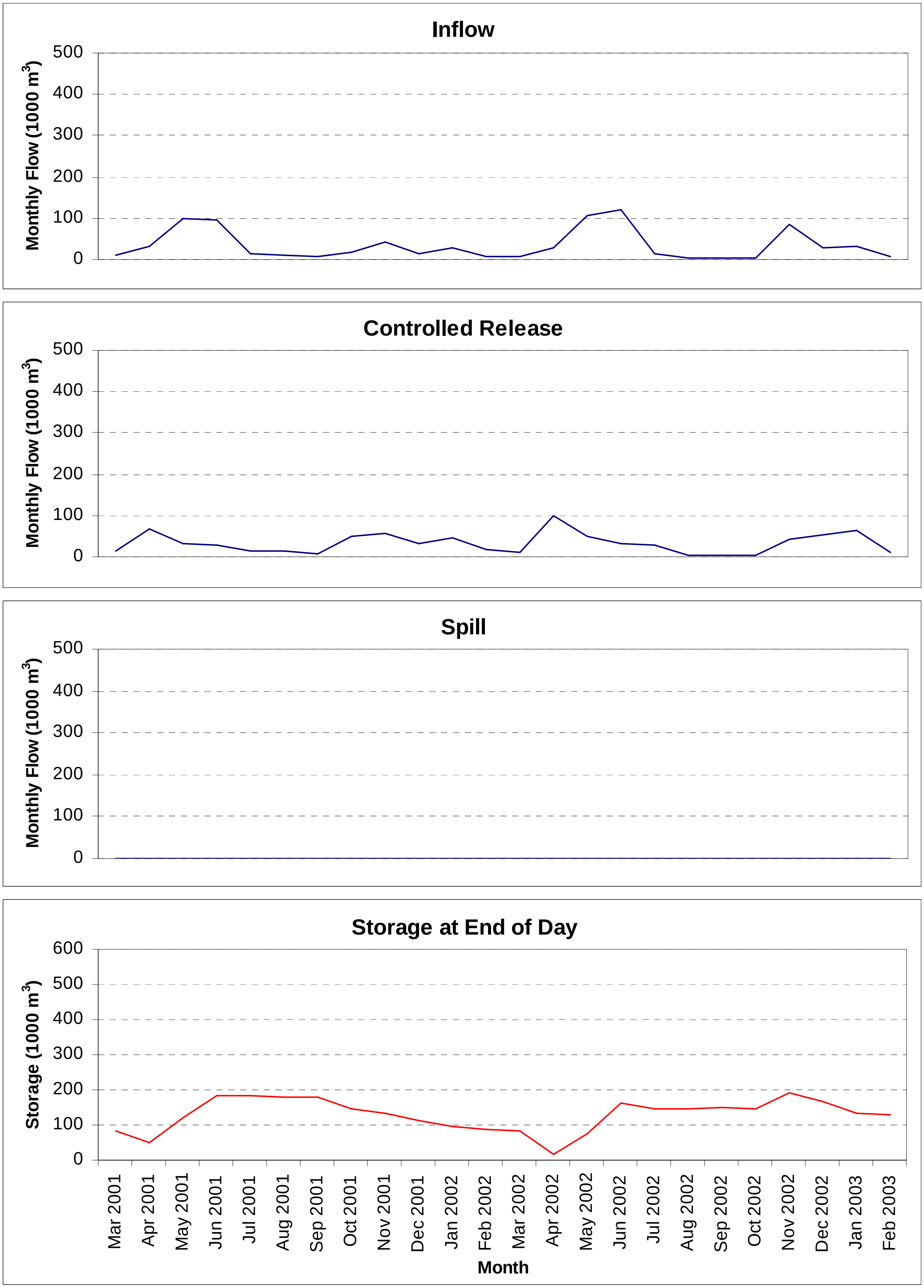
Job No: 1CT001.000
Filename: Figure 1_Location.ppt

Mt. Washington Remediation
Detailed Design

Date: Nov. 2007
Approved:
Figure: **C-10**



SRK Consulting Engineers and Scientists VANCOUVER	**Tsolum River Partnership**	**Scenario 2 Same as Scenario 1 Except Diversions Constructed in Catchment of Pyrrhotite Lake**
Job No: 1CT001.000 Filename: Figure 1_Location.ppt	Mt. Washington Remediation Detailed Design	Date: Nov. 2007 / Approved: / Figure: **C-11**



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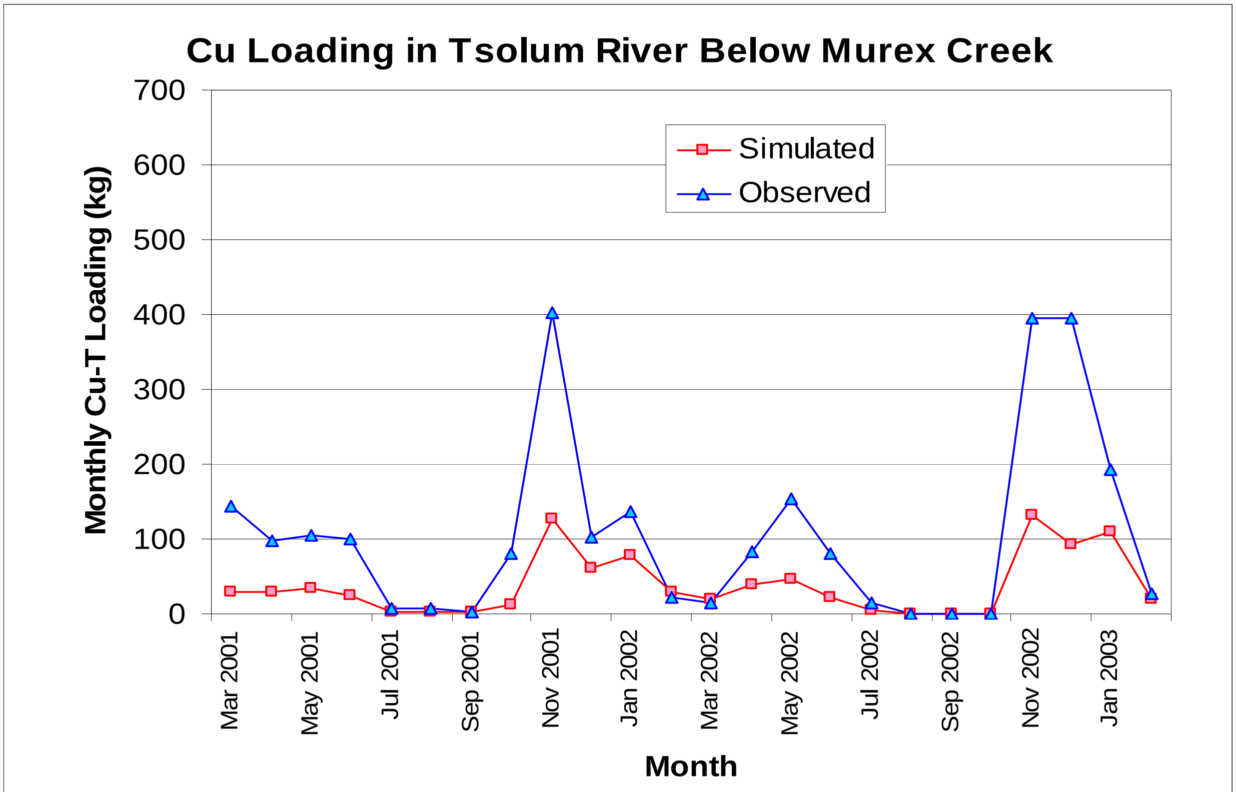
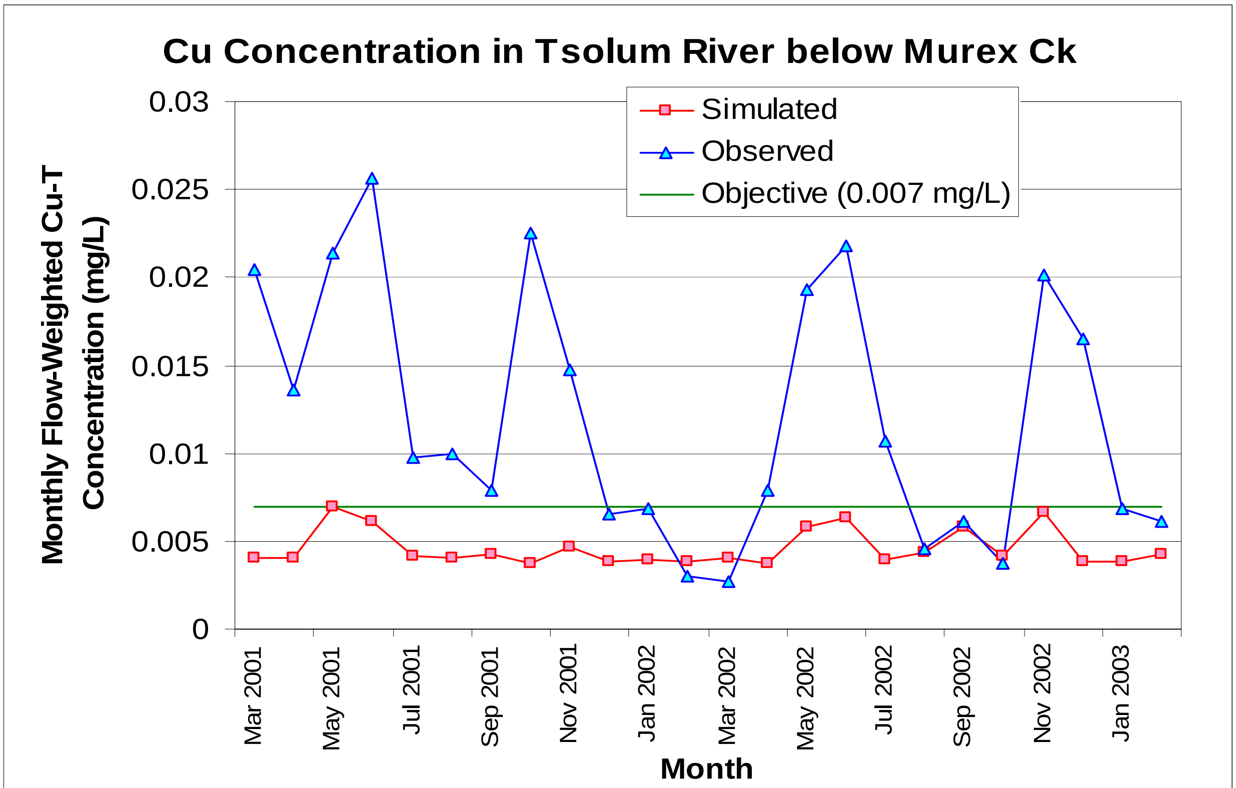
Scenario 3
Same as Scenario 1 Except Pipeline Used to Convey Mine Water to Pyrrhotite Lake

Job No: 1CT001.000
Filename: Figure 1_Location.ppt

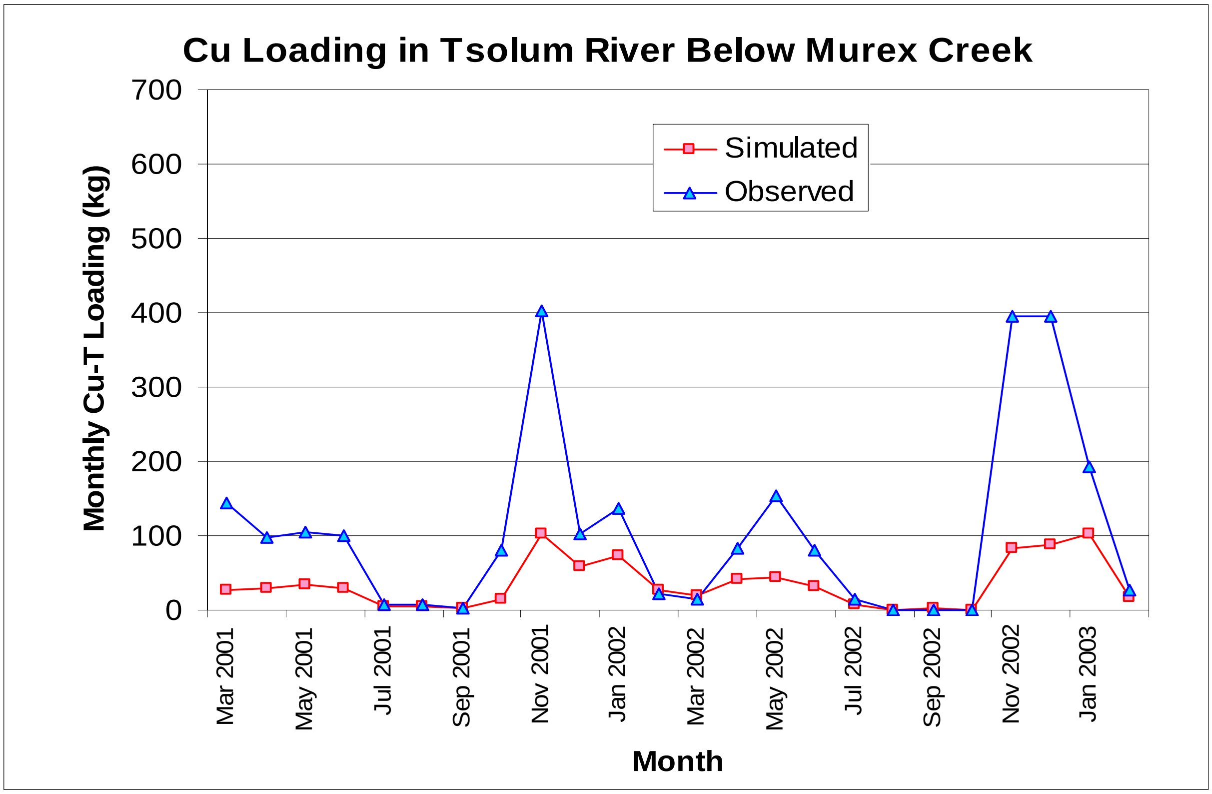
Mt. Washington Remediation
Detailed Design

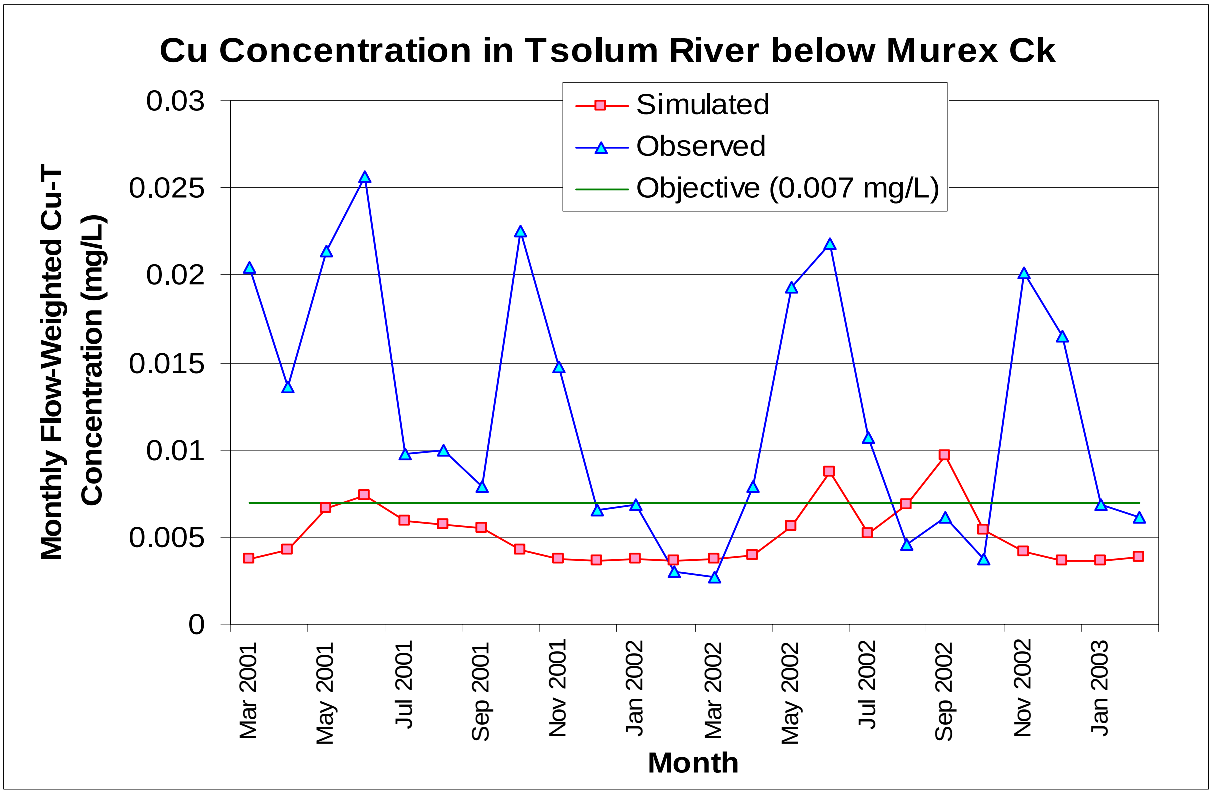
Date: Nov. 2007 | Approved: | Figure: **C-12**





SRK Consulting Engineers and Scientists VANCOUVER	**Tsolum River Partnership**	**Scenario 4 No Equalization Reservoir with 90% Load Reduction at Mine Site**		
Job No: 1CT001.000 Filename: Figure 1_Location.ppt	Mt. Washington Remediation Detailed Design	Date: Nov. 2007	Approved:	Figure: **C-13**





SRK Consulting Engineers and Scientists VANCOUVER	**Tsolum River Partnership**	**Scenario 5** **No Equalization Reservoir and Outflows from Pyrrhotite Lake Treated to a Concentration of 0.05 mg/L**		
Job No: 1CT001.000 Filename: Figure 1_Location.ppt	Mt. Washington Remediation Detailed Design	Date: Nov. 2007	Approved:	Figure: **C-14**

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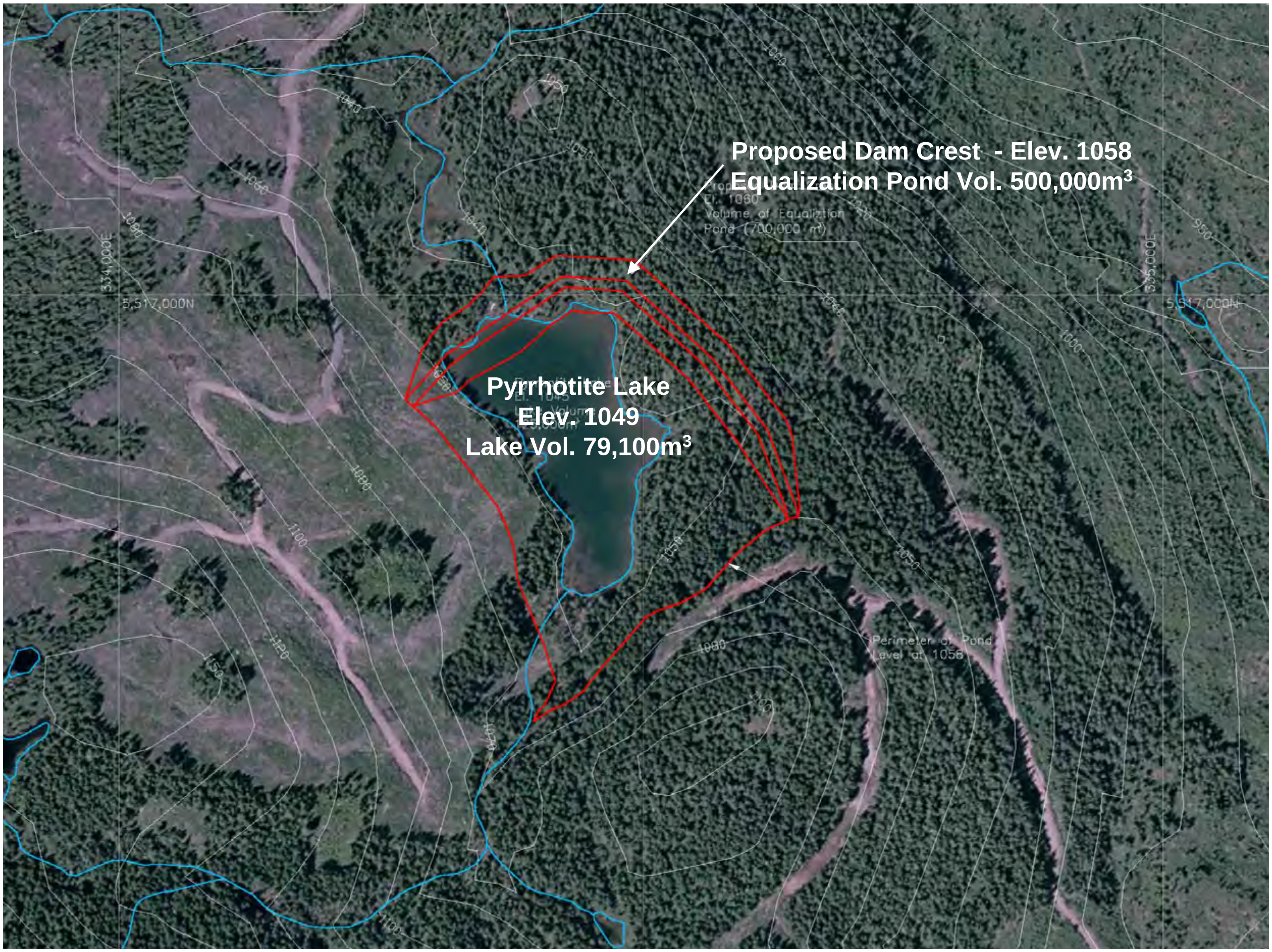
Tsolum River Partnership

Aerial Photos of Pyrrhotite Lake

Job No: 1CT001.000 Filename: Figure 3-9_16-20-Branch126-TsolumRiver_20070220.ppt	Mt. Washington Remediation Detailed Design	Date: Nov. 2007	Approved:	Figure: **C-15**



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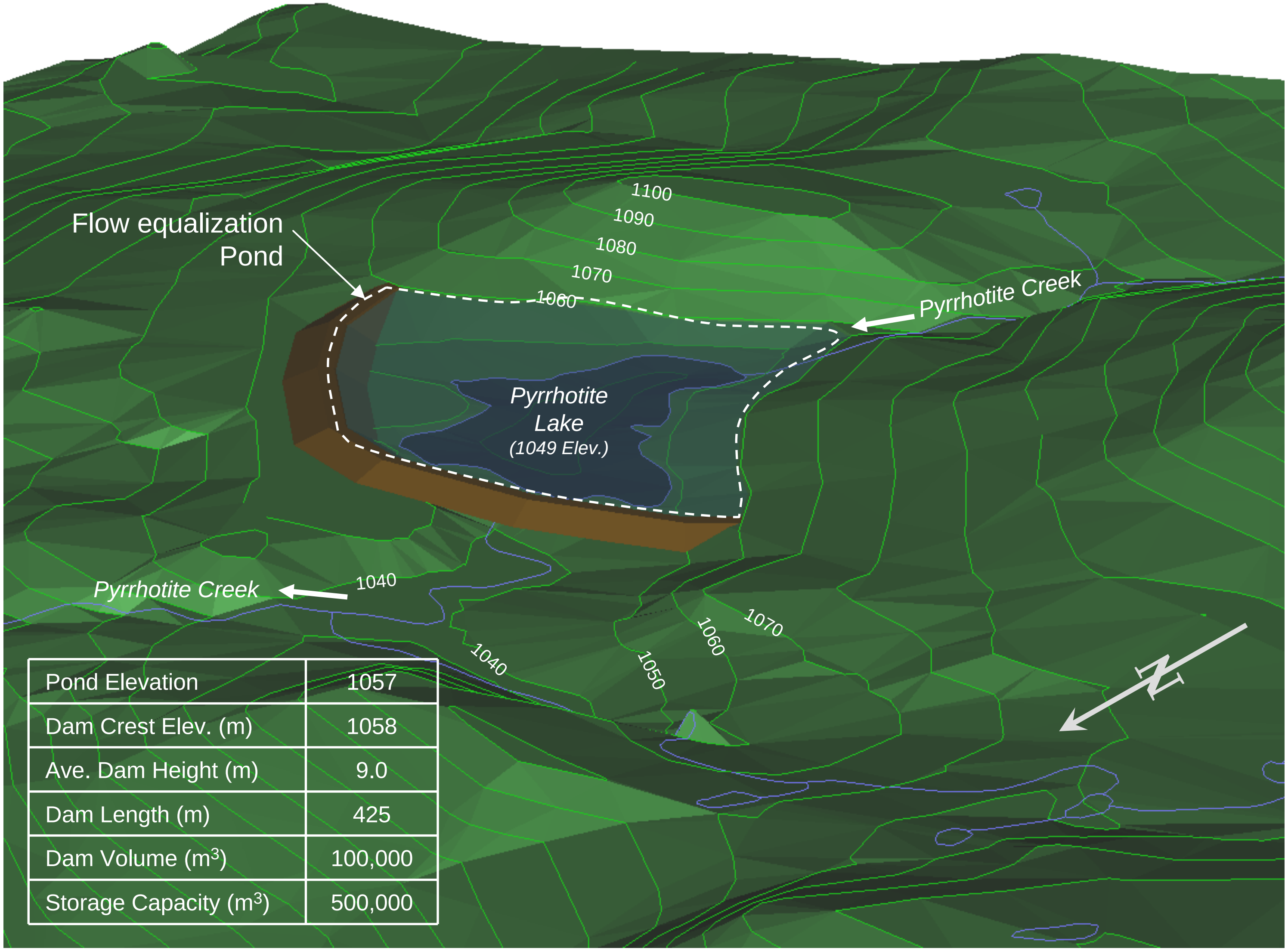
Tsolum River Partnership

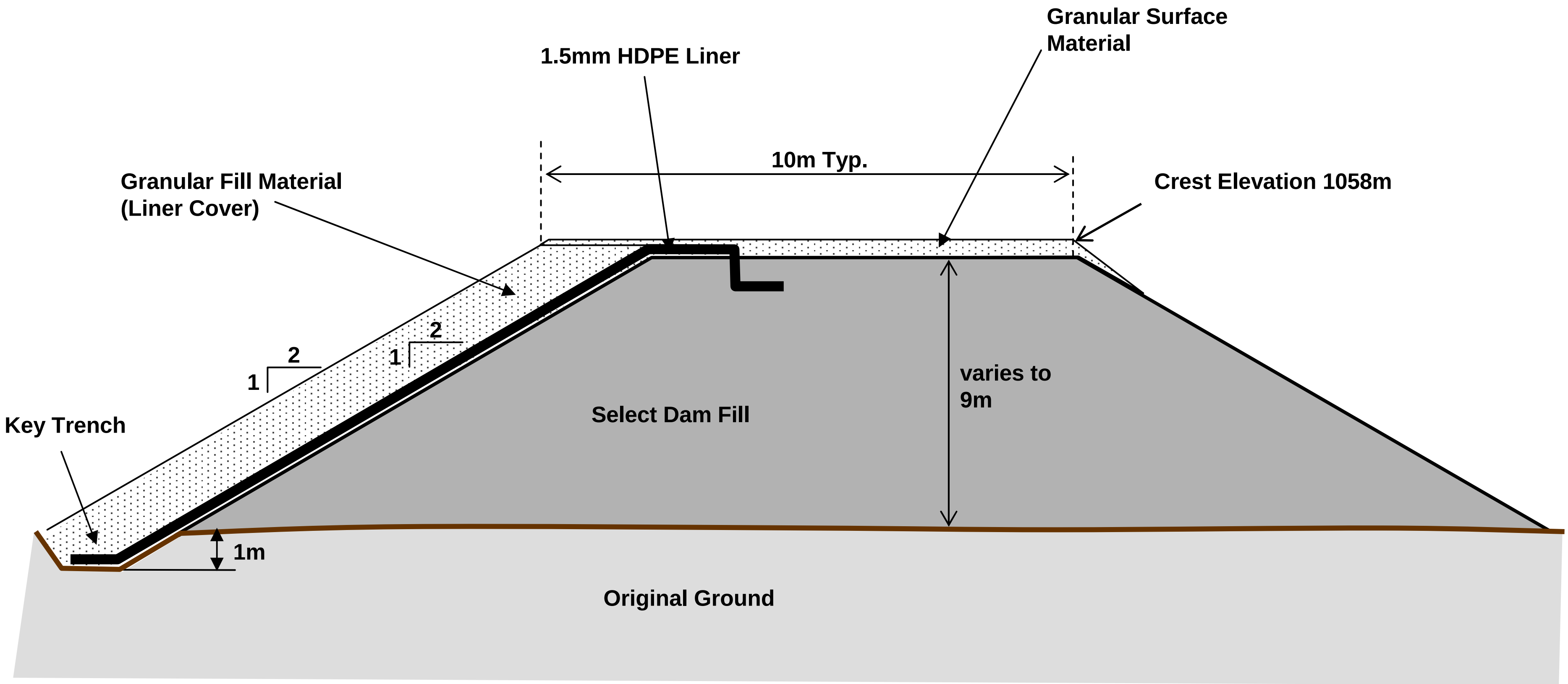
Site Plan of Potential Flow Equalization Reservoir (Elev. 1058) (Method Option 1a)

Job No: 1CT001.000	Mt. Washington Remediation Detailed Design	Date: Nov. 2007	Approved:	Figure: C-16
Filename: Figure 3-9_16-20-Branch126-TsolumRiver_20070220.ppt				

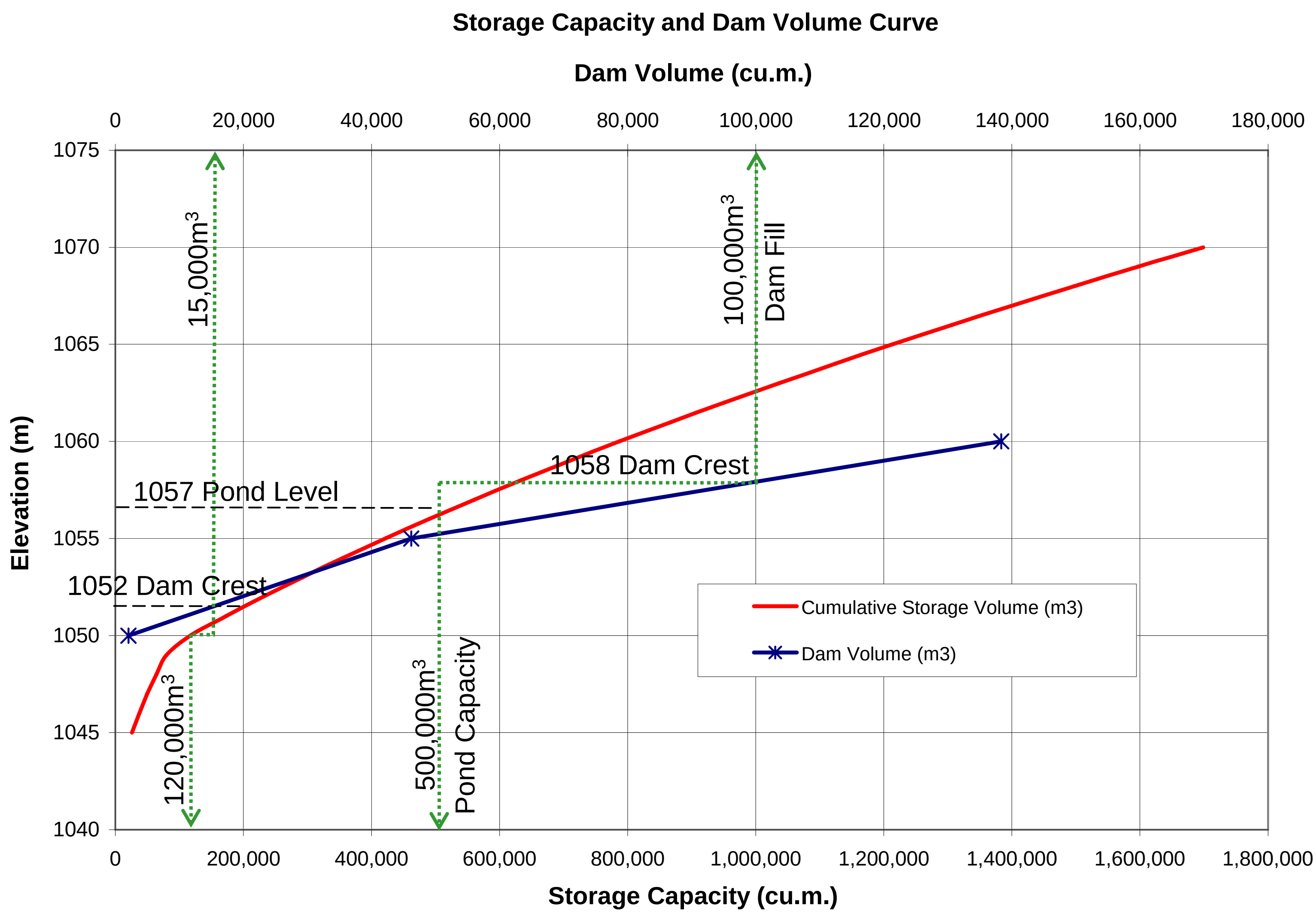


Pond Elevation	1057
Dam Crest Elev. (m)	1058
Ave. Dam Height (m)	9.0
Dam Length (m)	425
Dam Volume (m^3)	100,000
Storage Capacity (m^3)	500,000

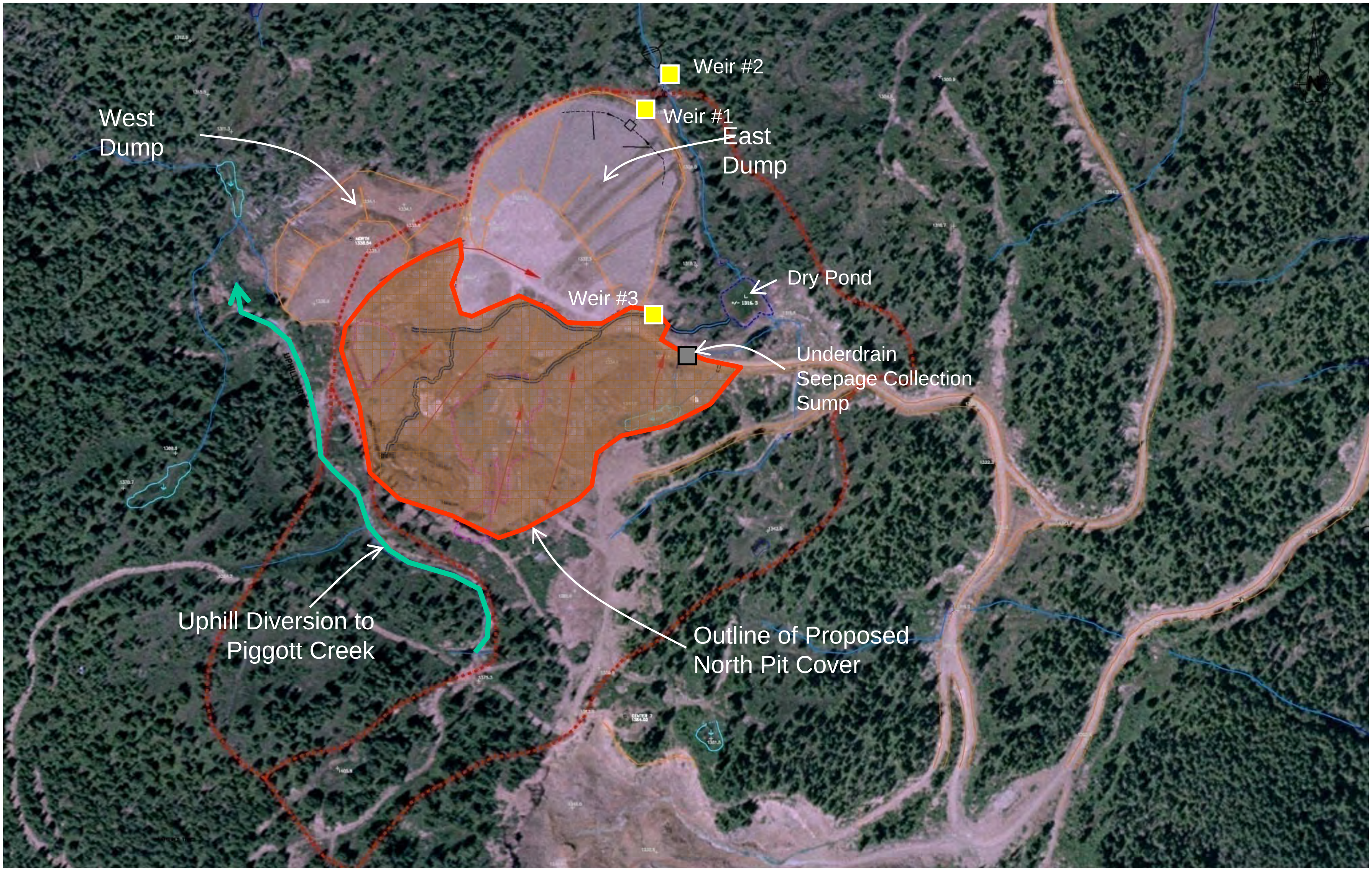
SRK Consulting *Engineers and Scientists* VANCOUVER	**Tsolum River Partnership**	**3D Schematic of Flow Equalization Reservoir (Elev. 1058)**
Job No: 1CT001.000 Filename: Figure 3-9_16-20-Branch126-TsolumRiver_20070220.ppt	Mt. Washington Remediation Detailed Design	Date: Nov. 2007 / Approved: / Figure: **C-17**



SRK Consulting Engineers and Scientists VANCOUVER	Tsolum River Partnership	Flow Equalization Reservoir Typical Dam Section (Method Option 1a)
Job No: 1CT001.000 Filename: Figure 3-9_16-20-Branch126-TsolumRiver_20070220.ppt	Mt. Washington Remediation Detailed Design	Date: Nov. 2007 / Approved: / Figure: C-18



SRK Consulting Engineers and Scientists VANCOUVER	**Tsolum River Partnership**	**Flow Equalization Reservoir Storage Capacity Curve**
Job No: 1CT001.000 Filename: Figure 3-9_16-20-Branch126-TsolumRiver_20070220.ppt	Mt. Washington Remediation Detailed Design	Date: Nov. 2007 Approved: Figure: **C-19**



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Tsolum River Partnership

Site Plan for North Pit Cover

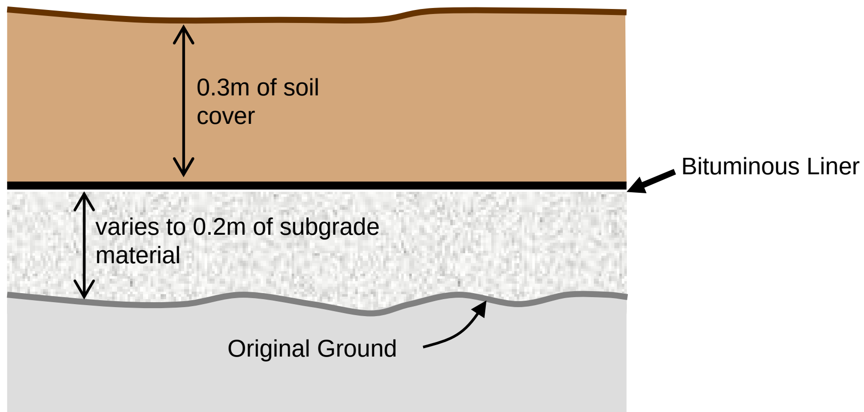
Job No: 1CT001.000

Filename: Figure 3-9_16-20-Branch126-TsolumRiver_20070220.ppt

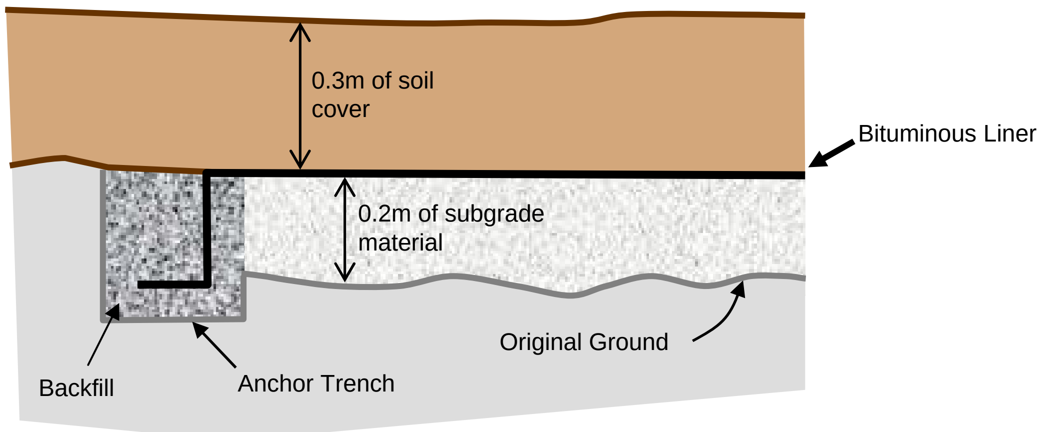
Mt. Washington Remediation
Detailed Design

Date:	Approved:	Figure:
Nov. 2007		C-20

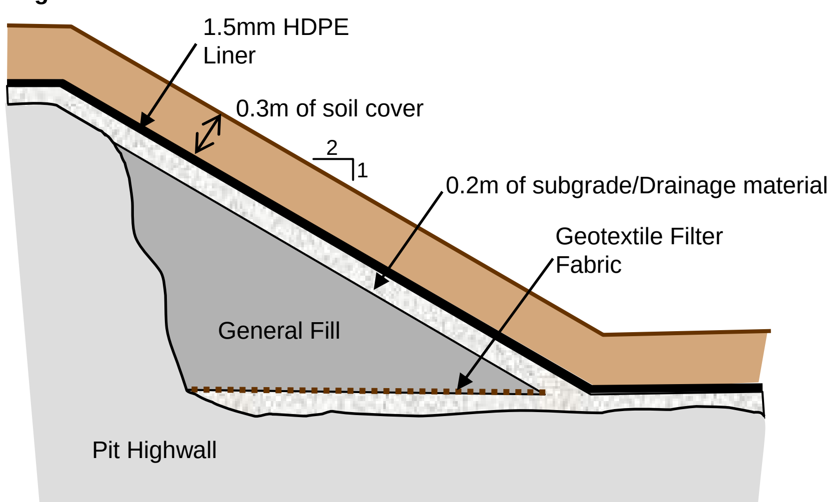
Typical Liner Cover Detail



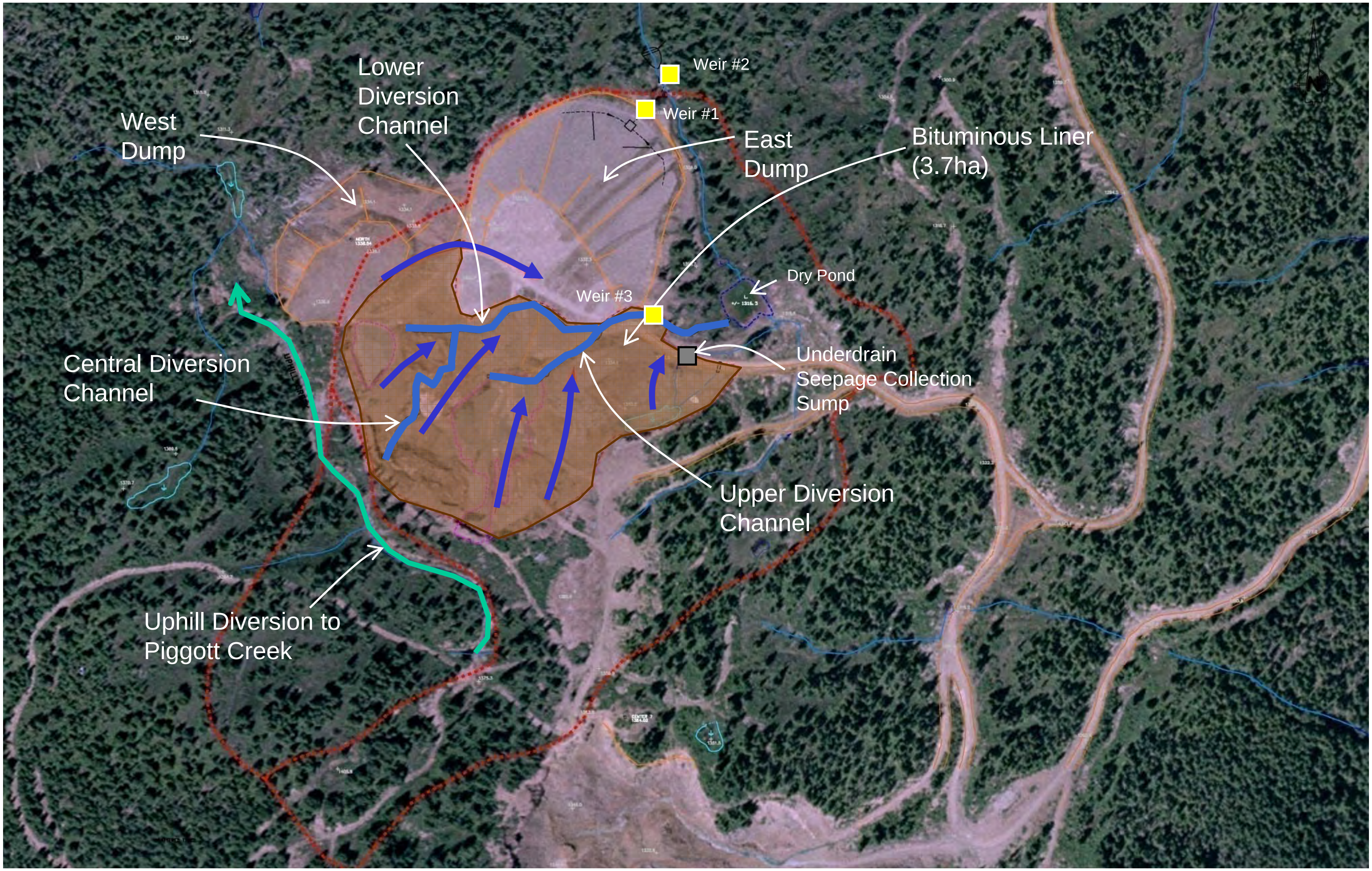
Typical Liner Anchorage



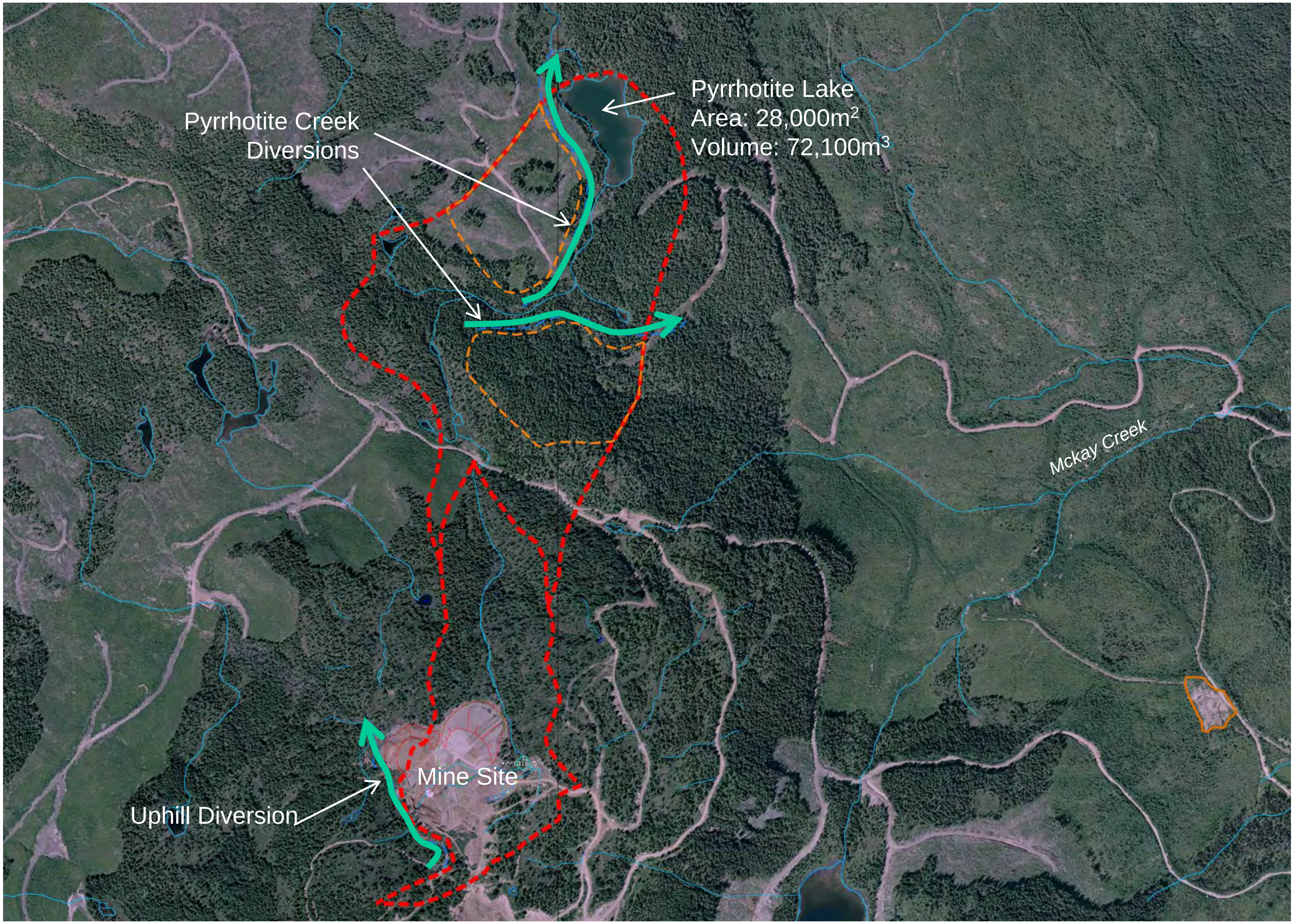
Typical Highwall Profile



SRK Consulting Engineers and Scientists VANCOUVER	**Tsolum River Partnership**	**Typical Details for Bituminous Liner**
Job No: 1CT001.000 Filename: Figure 21_25-Typ Details.ppt	Mt. Washington Remediation Detailed Design	Date: Nov. 2007 / Approved: / Figure: **C-21**

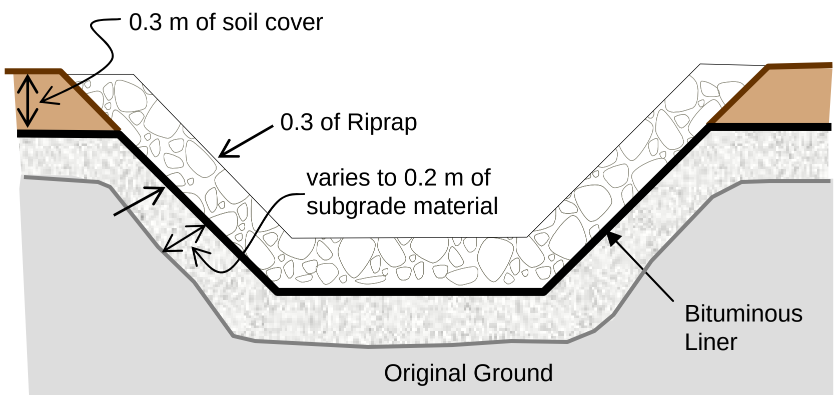


SRK Consulting Engineers and Scientists VANCOUVER	Tsolum River Partnership	Surface Diversions at Mine Site		
Job No: 1CT001.000 Filename: Figure 3-9_16-20-Branch126-TsolumRiver_20070220.ppt	Mt. Washington Remediation Detailed Design	Date: Nov. 2007	Approved:	Figure: C-22

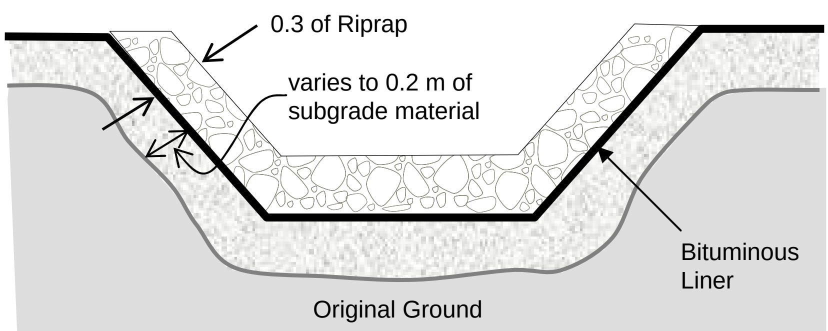


SRK Consulting Engineers and Scientists VANCOUVER	Tsolum River Partnership	Pyrrhotite Lake Surface Water Diversions		
Job No: 1CT001.000 Filename: Figure 3-9_16-20-Branch126-TsolumRiver_20070220.ppt	Mt. Washington Remediation Detailed Design	Date: Nov. 2007	Approved:	Figure: C-23

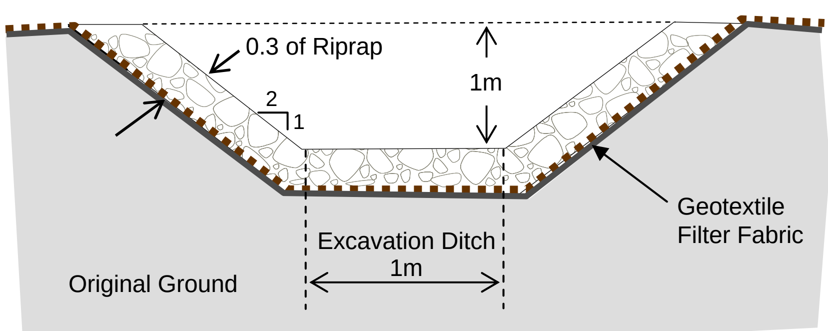
Typical Pit Drainage Channel Section



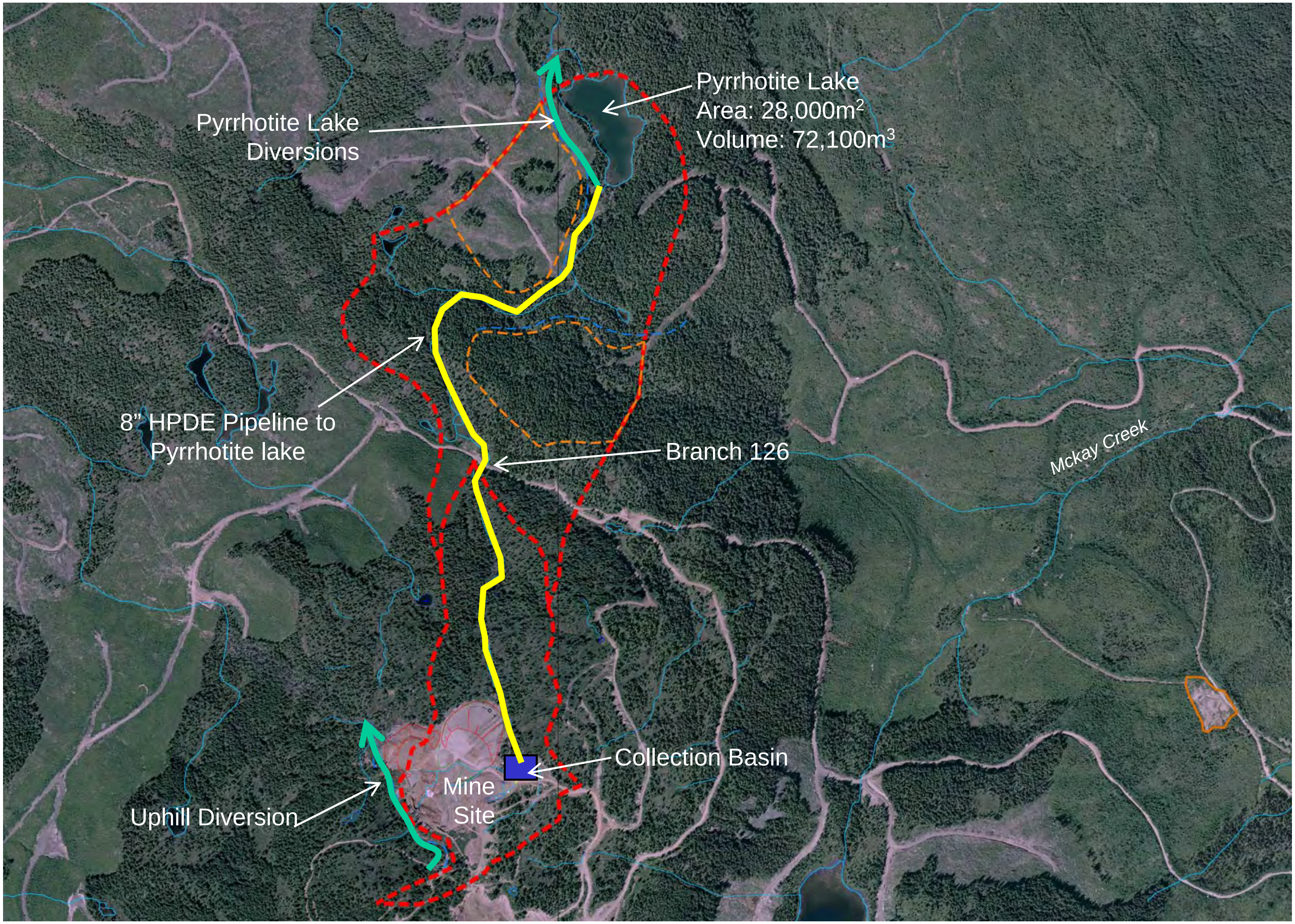
Typical Uphill Diversion



Typical Surface Diversion Channel – Pyrrhotite Lake



SRK Consulting Engineers and Scientists VANCOUVER	**Tsolum River Partnership**	**Typical Details for Surface Diversions**
Job No: 1CT001.000 Filename: Figure 21_25-Typ Details.ppt	Mt. Washington Remediation Detailed Design	Date: Nov. 2007 / Approved: / Figure: **C-24**



SRK Consulting Engineers and Scientists VANCOUVER	Tsolum River Partnership	Pipeline Alignment Site Plan		
Job No: 1CT001.000 Filename: Figure 3-9_16-20-Branch126-TsolumRiver_20070220.ppt	Mt. Washington Remediation Detailed Design	Date: Nov. 2007	Approved:	Figure: C-25

Attachment C-1

Pyrrhotite Lake Volume, Environmental Canada

McCandless,Rob [PYR]

To: Watson,Barry [PYR]
Subject: RE: Pyrotite Lake Volume

From: Watson,Barry [PYR]
Sent: Thursday, July 31, 1997 5:18 PM
To: McCandless,Rob [PYR]
Cc: Watson,Barry [PYR]
Subject: Pyrotite Lake Volume

Dear Robert:

Applications & Services GIS unit has calculated the volume of Pyrrhotite Lake, Near Mt. Washington, Courtney, B.C. at approximately 72100.4 cubic metres, based on the drawing delineations and profiles you provided.

You should be aware that the scale of the drawing you provided is suspect at 1:2,500. I noticed a large discrepancy between the area measurements of Phyrrhotite Lake derived from the TimberWest drawing (approx. 29,200 square metres) as compared to the 1:50,000 Watershed Atlas delineation (47,850 square metres) that I have on a digital map provided by the province. Both lake delineations had roughly the same shape though I do not have evidence to support the drastic area change based on the year of the air-photos nor the lake level fluctuation based on the month of the year. I realize we are pushing the map scales beyond their accuracy specifications.

I wanted to bring this discrepancy to your attention, so you might use the volume calculation with some caution.

Payment should be made via a Branch Transfer through your administrator of funds from your cost code to mine or Mert Horita (Supervisor).

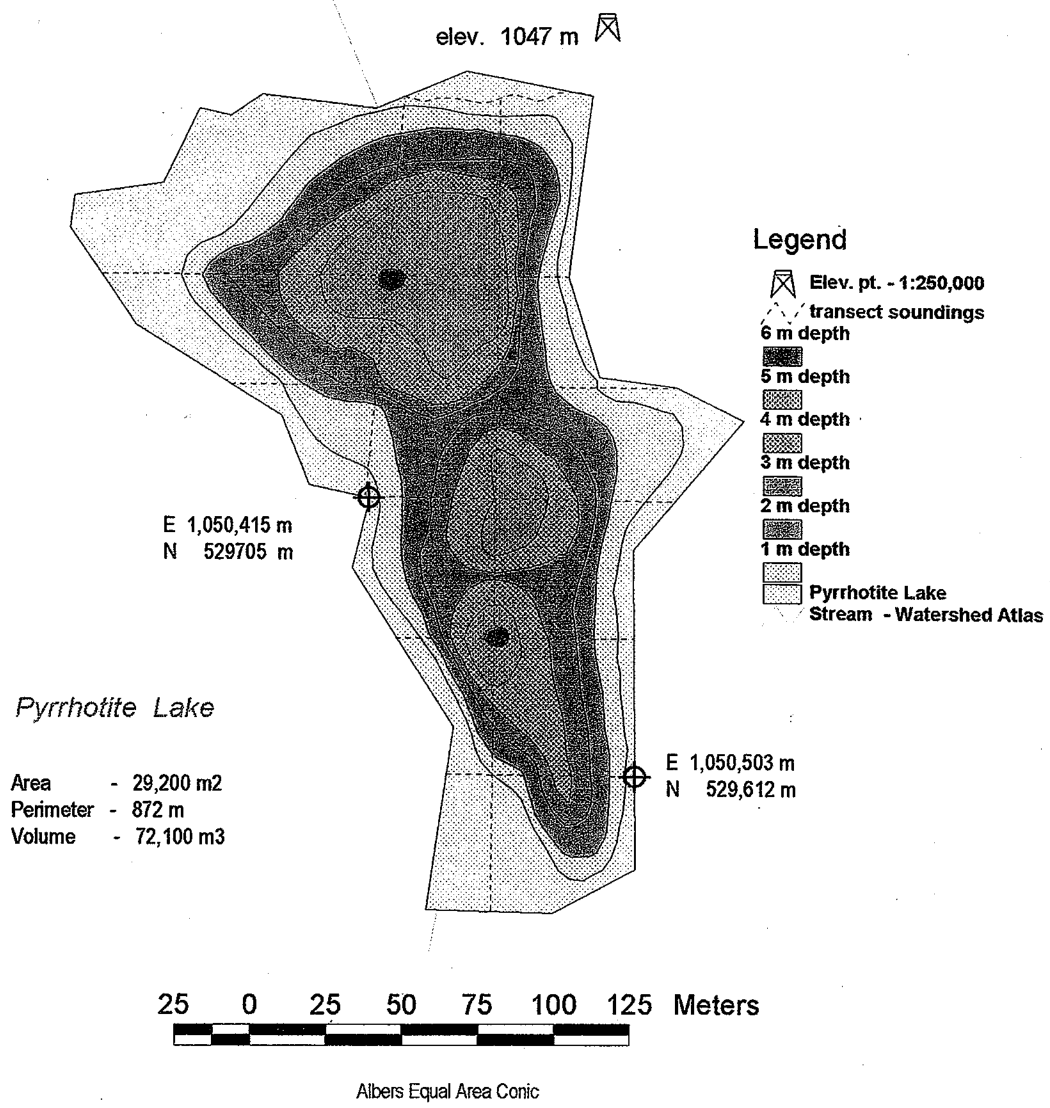
Please transfer $350 to the GIS Unit, Applications & Services Division, AEB

Financial code - 9416-1341-0000-101

Thank You for the cost recovery support. Please contact me if you have concerns regarding value of service.

Barry Watson
GIS Coordinator / Analyst

Pyrrhotite Lake, near Mt. Washington, Courtenay, B.C.



Attachment C-2
Cost Estimate Tables

Table C-1 Flow Equalization Basin Capital and Operating Costs

Design Parameters	Crest	El 1058 (without diversion)	El 1052 (without diversion)	El 1057 (with diversion)	El 1053.5 (with 200mm pipeline)
Pond Elevation	m	1057	1050	1056	1052.5
Storage capacity	(m^3)	500,000	12,000	425,000	200,000
Fill volume	(m^3)	100,000	15,000	80,000	30,000
Liner area	(m^2)	9,400	2,700	7,750	5,400
Length of dam	(m)	425	350	410	375
Crest Width	m	10	10	10	10
Sideslopes	H:V	2:1	2:1	2:1	2:1
Cost Summary Table					
Direct cost					
Survey		$ 20,000.00	$ 20,000.00	$ 20,000.00	$ 20,000.00
Clearing and Grubbing		$ 19,550.00	$ 7,700.00	$ 17,220.00	$ 15,400.00
Foundation Preparation		$ 117,300.00	$ 46,200.00	$ 103,200.00	$ 92,400.00
Dam fill Placement		$ 2,100,000.00	$ 315,000.00	$ 1,680,000.00	$ 630,000.00
Liner placement		$ 112,800.00	$ 32,400.00	$ 93,000.00	$ 64,800.00
Outlet Control System		$ 150,000.00	$ 150,000.00	$ 150,000.00	$ 150,000.00
Spillway		$ 100,000.00	$ 100,000.00	$ 100,000.00	$ 100,000.00
Subtotal Direct Cost		$ 2,619,650.00	$ 671,300.00	$ 2,163,420.00	$ 1,072,600.00
Indirect Costs					
Mob and Demob		$ 60,000.00	$ 60,000.00	$ 60,000.00	$ 60,000.00
On-site Engineering Representive		$ 60,000.00	$ 60,000.00	$ 60,000.00	$ 60,000.00
Engineering and QA (10% of direct)		$ 261,965.00	$ 67,130.00	$ 216,342.00	$ 107,260.00
Subtotal Indirect Cost		$ 381,965.00	$ 187,130.00	$ 336,342.00	$ 227,260.00
Contingency (15% of Direct)		$ 392,947.50	$ 100,695.00	$ 324,513.00	$ 160,890.00
Total Capital		$ 3,394,562.50	$ 959,125.00	$ 2,824,275.00	$ 1,460,750.00
Annual Operating (Maintenance)		$ 50,000.00	$ 50,000.00	$ 50,000.00	$ 50,000.00
Net Present value (NPV)					

Table C-2 Cover/Liner Capital and Operating Costs

Design Parameters		Soil/Till	Concrete	GCL	Bitumen
Liner Area	(m^2)	37000	37000	37000	37000
Liner Volume	(m^3)	37000	1900	0	0
Subgrade/underdrain Volume	(m^3)	7000	7000	7000	7000
Geotextile area	(m^2)	600	600	600	600
Geogrid area	(m^2)	0	0	37000	0
Liner cover Volume	(m^3)	10500	10500	37000	10500
Cost Summary Table					
Direct cost					
Survey		$ 20,000.00	$ 20,000.00	$ 20,000.00	$ 20,000.00
Subgrade/underdrain preparation		$ 37,000.00	$ 37,000.00	$ 37,000.00	$ 37,000.00
Liner Installation		$ 1,147,000.00	$ 1,141,000.00	$ 455,100.00	$ 684,500.00
Seepage collection system and sump		$ 80,000.00	$ 80,000.00	$ 80,000.00	$ 80,000.00
Cover Placement		$ 220,500.00	$ 220,500.00	$ 777,000.00	$ 220,500.00
Seed and Fertilize cover		$ 11,000.00	$ 11,000.00	$ 11,000.00	$ 11,000.00
Subtotal Direct Cost		$ 1,515,500.00	$ 1,509,500.00	$ 1,380,100.00	$ 1,053,000.00
Indirect Costs					
Mob and Demob		$ 60,000.00	$ 60,000.00	$ 60,000.00	$ 60,000.00
On-site Engineering Representive		$ 60,000.00	$ 60,000.00	$ 60,000.00	$ 60,000.00
Engineering and QA (10% of direct)		$ 151,550.00	$ 150,950.00	$ 138,010.00	$ 105,300.00
Subtotal Indirect Cost		$ 271,550.00	$ 270,950.00	$ 258,010.00	$ 225,300.00
Contingency (15% of Direct)		$ 227,325.00	$ 226,425.00	$ 207,015.00	$ 157,950.00
Total Capital		$ 2,014,375.00	$ 2,006,875.00	$ 1,845,125.00	$ 1,436,250.00
Annual Operating (Maintenance)		$ 20,000.00	$ 20,000.00	$ 20,000.00	$ 20,000.00
Net Present value (NPV)					

Table C-3 Cover Benefits vs. Disadvantages

Option	Pros	Cons
Till Cover	• Long Term Durability • Ease of construction, require no special technicians or equipment for installation • Minimum subgrade requirements	• Relative High permeability with soil available on site • Long haul distance hence increase cost • Volume of suitable material maybe difficult to find
Bituminous Liner	• Long Term Durability • Ease of installation • Very low permeability • Cheaper unit cost relative to till	• Require subgrade preparation • Relatively higher material cost than GCL • susceptible to long term traffic if left expose
GCL Liner	• Ease of installation • Low permeability • Cheapest material unit cost	• Requires confining stress to perform • Susceptible to weather if exposed • Requires relatively more subgrade preparation compare to Bituminous Liner • Might requires an extra layer of geogrid for poor subgrade condition • Strict construction weather conditions
Concrete Liner	• Very low permeability • Long Term Durability	• Expensive material unit cost • Require extensive subgrade preparation and installation process • Susceptible to long term cracking and settlement • Strict construction weather conditions

Table C-4 Surface Diversions - Capital and Operating Costs

Design Parameters		Uphill	Cover Surface Drainage	Pyrrhotite Lake	Pyrrhotite Creek
Length	(m)	360	500	1260	740
Excavation	(m^3)	1080	0	3780	2220
Geotextile	(m^2)	2000	0	6800	4000
Riprap	(m^3)	600	810	2040	1200
Cost Summary Table					
Direct cost					
Survey		$ 10,000.00	$ 5,000.00	$ 15,000.00	$ 7,500.00
Clear and Grub		$ 2,000.00	$ -	$ 6,800.00	$ 4,000.00
Excavation		$ 21,600.00	$ -	$ 22,680.00	$ 13,320.00
Subgrade Preparation		$ 12,000.00	$ -	$ -	$ -
Supply and placement of Geotextile		$ -	$ -	$ 20,400.00	$ 12,000.00
Supply and placement of Bituminous Liner		$ 37,000.00	$ -	$ -	$ -
Supply and placement of Riprap		$ 8,280.00	$ 11,500.00	$ 29,980.00	$ 27,600.00
Subtotal Direct Cost		$ 90,880.00	$ 16,500.00	$ 94,860.00	$ 64,420.00
Indirect Costs					
Mob and Demob		$ 60,000.00	$ 60,000.00	$ 60,000.00	$ 60,000.00
On-site Engineering Representive		$ 60,000.00	$ 60,000.00	$ 60,000.00	$ 60,000.00
Engineering and QA (10% of direct)		$ 9,088.00	$ 1,650.00	$ 9,486.00	$ 6,442.00
Subtotal Indirect Cost		$ 129,088.00	$ 121,650.00	$ 129,486.00	$ 126,442.00
Contingency (15% of Direct)		$ 13,632.00	$ 2,475.00	$ 14,229.00	$ 9,663.00
Total Capital		$ 233,600.00	$ 140,625.00	$ 238,575.00	$ 200,525.00
Annual Operating (Maintenance)		$ 20,000.00	$ 20,000.00	$ 20,000.00	$ 20,000.00
Net Present value (NPV)					

Table C-5 Pipeline Capital and Operating Costs

Design Parameters		200mm	100mm
Lenth of HDPE Pipeline to Pyrrhotite lake	(m)	1800	1800
Diameter of Pipe (150L/s for the 200mm pipe)	mm	200	100
Average Grade	%	15	15
Cost Summary Table			
Direct cost			
Survey		$ 15,000.00	$ 15,000.00
Clearing and grubbing		$ 9,200.00	$ 9,200.00
Subgrade Preparation for Inlet Structure		$ 1,200.00	$ 1,200.00
Inlet Structure		$ 30,000.00	$ 15,000.00
Pipeline Procurement and Assembly		$ 57,600.00	$ 30,000.00
Pipeline Alignment and Anchorage		$ 400,000.00	$ 200,000.00
Subtotal Direct Cost		$ 513,000.00	$ 270,400.00
Indirect Costs			
Mob and Demob		$ 60,000.00	$ 40,000.00
On-site Engineering Representive		$ 60,000.00	$ 60,000.00
Engineering and QA (10% of direct)		$ 51,300.00	$ 27,040.00
Subtotal Indirect Cost		$ 171,300.00	$ 127,040.00
Contingency (15% of Direct)		$ 76,950.00	$ 40,560.00
Total Capital		$ 761,250.00	$ 438,000.00
Annual Operating (Maintenance)		$ 30,000.00	$ 30,000.00
Net Present value (NPV)			

Table C-6 Method Option 1a – Costs

Option 1a	
-60% load reduction at the Mine site (partial Liner)	
-Flow Equalization Pond with 500,000m^3 capacity (Dam EL. 1058)	
- Ideal flow pacing	
- no Treatment	
-no surface diversions around Pyrrhotite lake	
- Uphill Diversion upgrade	
Capital costs	
Partial Bitumen Cover (60% of Full cover)	$861,750
Cover Drainage	$140,625
Uphill Diversion Upgrade	$233,600
Flow Equalization Pond	$3,394,562
Total capital cost	$4,630,537
Annual Operating Cost	$110,000

Table C-7 Method Option 1b – Costs

Option 1b - as for Option 1a but with low management of flow pacing -Water quality objectives for Tsolum not always met	
Capital costs	
Partial Cover (60% of Full cover)	$861,750
Cover Drainage	$140,625
Uphill Diversion Upgrade	$233,600
Flow Equalization Pond	$3,394,562
Total capital cost	$4,630,537
Annual Operating Cost	$110,000

Table C-8 Method Option 2 – Costs

Option 1b - as for Option 1a but with low management of flow pacing -Water quality objectives for Tsolum not always met	
Capital costs	
Partial Cover (60% of Full cover)	$861,750
Cover Drainage	$140,625
Uphill Diversion Upgrade	$233,600
Flow Equalization Pond	$3,394,562
Total capital cost	$4,630,537
Annual Operating Cost	$110,000

Table C-9 Method Option 3 – Costs

Option 3	
- as for Option 2 but with pipeline from the minesite to Pyrrhotite lake -Reduced Flow Equalization Pond with 200,000m^3 capacity (EL. 1053.5) -Divert Pyrrhotite Creek around Pyrrhotite lake	
Capital costs	
Partial Cover (60% of Full cover)	$861,750
Cover Drainage	$140,625
Uphill Diversion Upgrade	$233,600
Pyrrhotite Creek Diversion around Pyrrhotite lake	$200,525
200mm HDPE Pipeline to Pyrrhotite lake	$761,250
Flow Equalization Pond	$1,460,750
Total capital cost	$3,658,500
Annual Operating Cost	$160,000

Table C-10 Method Option 4 – Costs

Option 4	
- 90% load reduction -No equalization Pond -Short term Water Treatment at Br 126 or Pyrrhotite lake -100mm Pipeline from sump at pit to Pyrrhotite lake -Divert Pyrrhotite Creek around Pyrrhotite lake	
Capital costs	
Full Cover (Bitumen)	$1,436,250
Cover Drainage	$140,625
Uphill Diversion Upgrade	$233,600
Pyrrhotite Creek Diversion around Pyrrhotite lake	$200,525
100mm HDPE Pipeline to Pyrrhotite lake	$438,000
Water Treatment	$200,000
Flow Equalization Pond	$0
Total capital cost	$2,649,000
Annual Operating Cost (incl Treatment)	$175,000

Appendix D
Stability Analyses

SRK Consulting (Canada) Inc.
Suite 2200 – 1066 West Hastings Street
Vancouver, B.C. V6E 3X2
Canada

vancouver@srk.com
www.srk.com

Tel: **604.681.4196**
Fax: **604.687.5532**

Memorandum

To:	File (Appendix D)	**Date:**	December 19, 2007
Project:	Mt. Washington Reclamation Project	**From:**	Alvin Tong
Subject:	Liner Cover Slope Stability Analysis	**Project #:**	1CT001.001

1 Introduction

The Mt. Washington Reclamation is located on Vancouver Island approximately 60km north of Courtenay. A component of the overall work for the project involves placing bedding material and buttresses along pit high walls in preparation to install a bituminous liner. A silty sand (till) material will be placed on top of the liner to for protection and growth medium. Slope stability analysis was done on the buttress and liner cover. This memorandum outlines the detail on the stability analysis.

2 Methodology

The analysis was done with SLOPE-W from Geo-Slope International. The process result is a factor of safety (FOS) analysis on failure planes in a typical cross-sectional profile of the buttresses. The program uses multiple slip radii planes and centers to calculate the FOS of each possible failure slip planes. Static and pseudo-dynamic scenarios are analyzed for stability. The factor of safety provide a quantitative probability of failure.

For this analysis, the till liner cover, growth medium, bituminous liner and till buttress are considered in the analysis. The boundary limits are extended 2.0m from the crest and the toe of the buttress to ensure buffer space of potential slip planes. The water table is only considered above the bituminous liner as it acts as an impermeable layer to isolate surface water within the till cover material. The buttresses will be either dry or drained via underdrain system. The parameters of the analysis are listed below:

- Material Properties
  - Growth Medium: Bulk density = 17.6kN/m^3 (85% compaction), Cohesion = 1kPa, ϕ = 30°
  - Till Liner Cover: Bulk density = 17.6kN/m^3 (85% compaction), Cohesion = 0kPa, ϕ = 35°
  - Bituminous Liner: Bulk density = 30.0kN/m^3 (estimated unit weight), ϕ = 26°
  - Till Buttress: Bulk density = 19.6kN/m^3 (95% compaction), Cohesion = 0kPa, ϕ = 37°
- Buttress Dimensions: 2H to 1V (Horizontal to Vertical) slope, 6m high
- Liner Cover Dimensions: 3H to 1V (Horizontal to Vertical) slope, 6 high with overall 1m thickness.
- Dynamic Load: Peak Ground Acceleration (50% load of a 2%/50year event) = 0.123g
- Static Piezometric Surface: various scenario from 100% to 50% saturation of the material above bituminous liner

The friction angle for the till material and growth medium are typical engineering values. The friction angle for the bituminous liner is from suggested design value from the manufacturer. Note that there are two different surfaces on the liner as one side is sanded while the other side is smooth. For a conservative approach to the analysis, the sanded side is ignored and only the lower smooth side engineering properties are used in the analysis. The bulk density for the growth medium is typical engineering value and the till bulk density is calculated from maximum bulk density from laboratory Modified Proctor Testing.

The peak ground acceleration is a suggested value from Interpolate 2005 National Building Code of Canada for the Site. The 2% of 50 year event is 0.246g and a 50% loading was used in the analysis at 0.123g.

The various degrees of saturation are to simulate the cover condition during different seasons and events. The 100% saturation simulates the unlikelihood of a high surge event during freshet and heavy precipitation. The lower degrees of simulates various drainage conditions and moisture conditions. The pore water pressure is only applied to the soil material on top of the liner since the liner is impermeable.

Twenty-five potential slip radii planes and nine hundred potential centers were defined within the cover zone for the analysis.

3 Results

The results from the stability analysis summarized in Table 3.1 below:

Table 3.1: FOS Summary

Degree of Saturation	Static Scenario	Pseudo-Static Scenario
100%	1.325	1.030
90%	1.527	1.172
70%	1.863	1.399
50%	2.157	1.604

The attached Figures D-1 shows the analysis results.

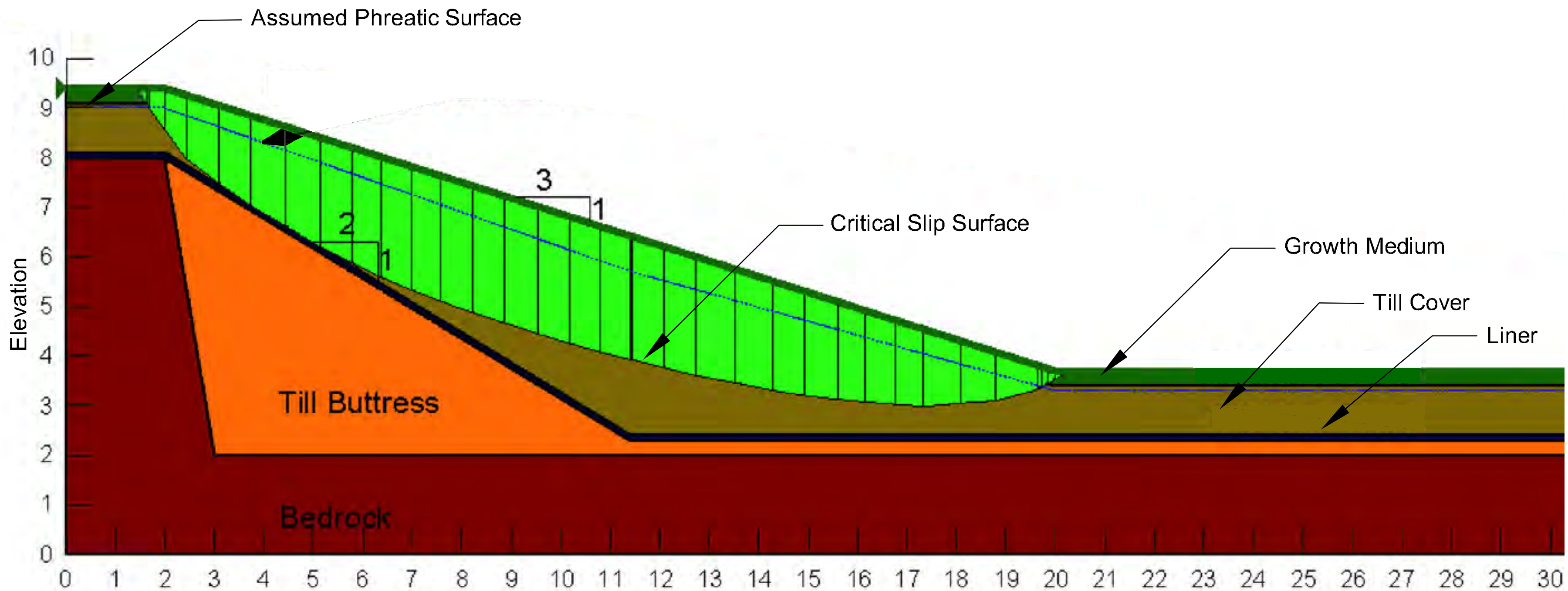
The critical slip surface is typically along the upper slope section of the bituminous liner and soil material contact. As mentioned in the previous section, the buttress is expected to be dry or highly drained and the bituminous liner will separate the watertable above from infiltrating the buttress. The failure surface as shown on the figure is circular type failure typically without (penetrating) ripping the liner. The minimum FOS under static conditions is 1.325. The minimum FOS for the pseudo-dynamic scenario is 1.030. This analysis show the slope will not undergo catastrophic failure in the extreme unlikelihood event of an earthquake event in fully saturated condition. In an expected event of 70% saturation, the FOS is well above the accepted value of 1.3.

Figure

- Material Properties

- Growth Medium: Bulk density = 17.6kN/m3 (85% compaction), Cohesion = 1kPa, f = 30°
- Till Liner Cover: Bulk density = 17.6kN/m3 (85% compaction), Cohesion = 0kPa, f = 35°
- Bituminous Liner: Bulk density = 30.0kN/m3 (estimated unit weight), f = 26°
- Till Buttress: Bulk density = 19.6kN/m3 (95% compaction), Cohesion = 0kPa, f = 37°

	Factors of Safety	
Degree of Saturation	Static Conditions	Pseudo-Static Conditions
100%	1.325	1.030
90%	1.527	1.172
70%	1.863	1.399
50%	2.157	1.604



SRK Consulting
Engineers and Scientists
Vancouver B.C.

Tsolum River Partnership

Mt. Washington Remediation

Detailed Design

Slope Stability Analysis Results

SRK JOB NO.: 1CT001.001-700

FILE NAME: 1CT001001-700-18.dwg

DATE: Nov. 07

APPROVED: PMH

FIGURE: D - 1

Appendix E
Site Photos

Photo 1: View east with covered East Dump background and asphalt impregnated geotextile in midground.

Photo 2: Pit wall at western perimeter of the pit adjacent to Seep 16.

Photo 3: Areas requiring minimum site preparation adjacent to Seep 16.

Photo 4: West Dump in background with washed areas of pit floor in foreground.

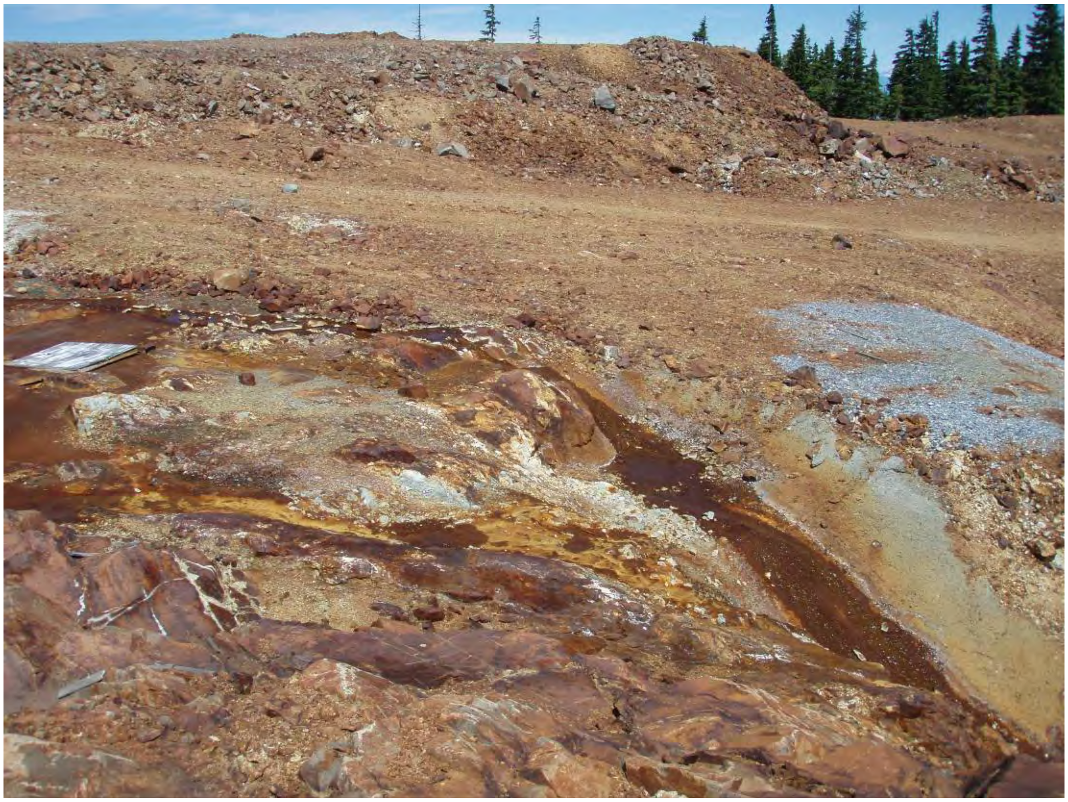


Photo 5: Smooth surfaces within the washed areas of the pit floor with West Dump in background.

Photo 6: Irregular sharp and angular areas of the pit floor that will require significant site preparation.

Photo 7: Irregular sharp and angular areas o the pit floor that will require significant site preparation.

Photo 8: Flow in existing shotcrete lined ditches in pit area.

Photo 9: Pit wall requiring buttress fill prior to covering.

Photo 10: Bitumin impregnated geotextile.

Photo 11: Washed areas of pit floor with bitumin impregnated geotextile in foreground.

Photo 12: Upper seepage collection channel.

Photo 13: Washed areas of pit floor.

Photo 14: Uphill diversion ditch looking north.

Photo 15: Area adjacent to Seep 2.

Photo 16: Seepage from Seep 2.

Photo 17: Seepage from Seep 2 to culvert into Dry Pond.

Photo 18: Seep 2.


Photo 19: Seep 3 at toe of East Dump.


Photo 20: Revegation Strips on East Dump.

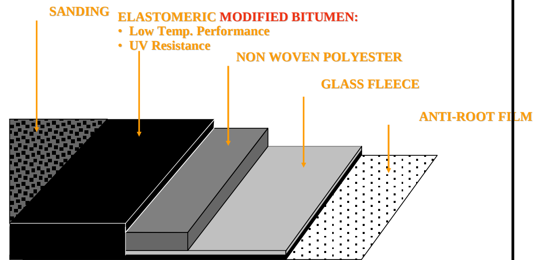
Photo 21: Weir 1 at toe of East Dump.

Appendix F
Case History on Bituminous Geomembrane Liners

Bituminous Liner Installation

COLETANCHE

Bituminous Liner Installation



COLETANCHE

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Remove Polyethylene film

Welding and rolling (Marouflage)

Completion of welding with small trowel

Baker Creek – Giant Mine Realignment Project – Liner Installation

Baker Creek – Giant Mine Realignment Project – Liner Installation

Baker Creek – Giant Mine Realignment Project – Liner Installation

Baker Creek – Giant Mine
Realignment Project – Liner Installation

Baker Creek – Giant Mine
Realignment Project – Liner Installation

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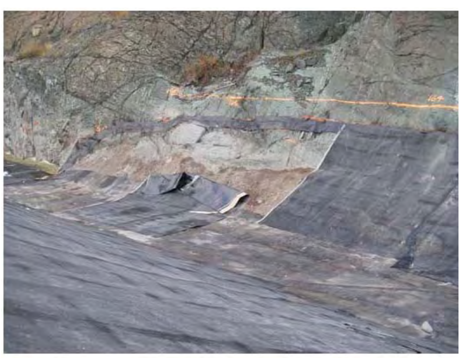
Baker Creek – Giant Mine
Realignment Project – Liner Installation



Baker Creek – Giant Mine
Realignment Project – Liner Installation

Baker Creek – Giant Mine
Realignment Project – Liner Installation

Baker Creek – Giant Mine
Realignment Project – Liner Installation

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Realignment Project – Liner Installation

Baker Creek – Giant Mine
Realignment Project – Liner Installation

Baker Creek – Giant Mine
Realignment Project – Liner Installation

Baker Creek – Giant Mine
Realignment Project – Liner Installation

Appendix G
Groundwater Monitoring

SRK Consulting
Engineers and Scientists

SRK Consulting (Canada) Inc.
Suite 2200 – 1066 West Hastings Street
Vancouver, B.C. V6E 3X2
Canada

vancouver@srk.com
www.srk.com

Tel: 604.681.4196
Fax: 604.687.5532

Memo

To:	File (Appendix G).	**Date:**	December 19, 2007
cc:		**From:**	D. Mackie
Subject:	Mt. Washington – Groundwater Monitoring Well Network	**Project #:**	1CT001.001

As part of the Mt. Washington Remediation Plan, a bituminous geomembrane and till cover will be placed over the pit area to reduce infiltration of precipitation and snowmelt, thus reducing mobilisation of copper from site materials to downgradient surface water. To allow monitoring of groundwater quality after cover emplacement, a monitoring network utilizing existing groundwater monitoring wells and new monitoring wells will be used. Use of existing monitoring wells, from which historical data is available, will allow comparison of water quality from pre- to post-cover installation periods while new monitoring wells will assess downgradient water quality. In addition, vibrating wire piezometers will be installed within the highwall buttress to monitor the effects of porewater pressure post-construction on the effects of seepage from the pitwalls and the performance of underdrains.

Groundwater data has been previously reported for two general monitoring well series at site: the "BH 89" and "SP" series. In 1999, 10 of the existing 14 "BH 89" series monitoring wells were accessed for water level and water quality data. At that time, the "SP" series monitoring wells were typically dry, elevations were unknown and data was not reported. As of November 2007, only four "BH 89" series monitoring wells were accessible. It is proposed that all four of the remaining "BH 89" series monitoring wells are adapted for use as long term monitoring wells after cover installation. Combined with seep, surface water monitoring and monitoring wells downgradient of the East Dump this should be sufficient for assessing cover performance. Monitoring well locations are shown on Figure G-1. The table below summarises current details for the four existing monitoring wells as well as three new monitoring wells.

Well #	Total Depth (m)	Lithology of Screen Zone	Steel Surface Casing Stickup (m)	PVC Stickup Above Steel Casing(m)
BH 89-3	7.09	Mine waste, Bedrock	0.31	1.14
BH 89-4	5.99	Bedrock	0.56	0.56
BH 89-7	3.32	Mine waste, Bedrock	0.42	0.35
BH 89-13	5.66	Bedrock	0.26	-0.07
BH 07-1	<10m	Overburden and/or bedrock	To be determined	
BH 07-2	<10m			
BH 07-3	<10m			

The existing monitoring wells will require upgrades to both allow access once the cover is installed and provide appropriate surface seals to inhibit infiltration alongside the stickups. Upgrades will include:

- Where necessary, PVC stickups will be extended above the top of the proposed till soil cover.
- Based on original hydrogeologic logs prepared by Golder Associates in 1989, each PVC monitoring well extends through a 0.5m long section of 152mm diameter steel surface casing. In the annular space

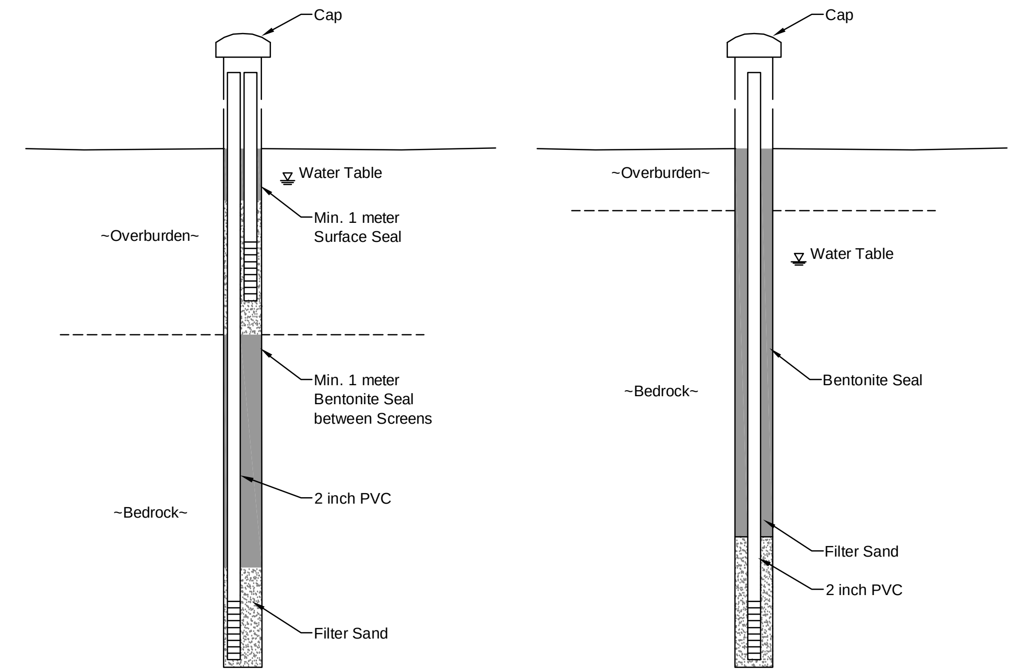
between steel casing and PVC, the upper six inches of existing material in each will be removed and replaced with an appropriate grout or cement seal.
- Prior to emplacement of the till cover, a section of large diameter PVC or steel casing will be installed over the monitoring well PVC to provide protection during till emplacement.
- The bituminous liner will be thermally welded directly to the steel surface casing.
- After emplacement of the till, a lockable steel protective cover will be installed.

Monitoring wells installed for the purpose of this program will be completed based on field conditions, primarily the depth to water and lithology. If overburden thickness is significant and the water table in the overburden, nested piezometers will be installed, one in the shallow bedrock and one in the overburden at a sufficient depth below the water table to remain saturated. Final decision on piezometer design will be the responsibility of the field Engineer.

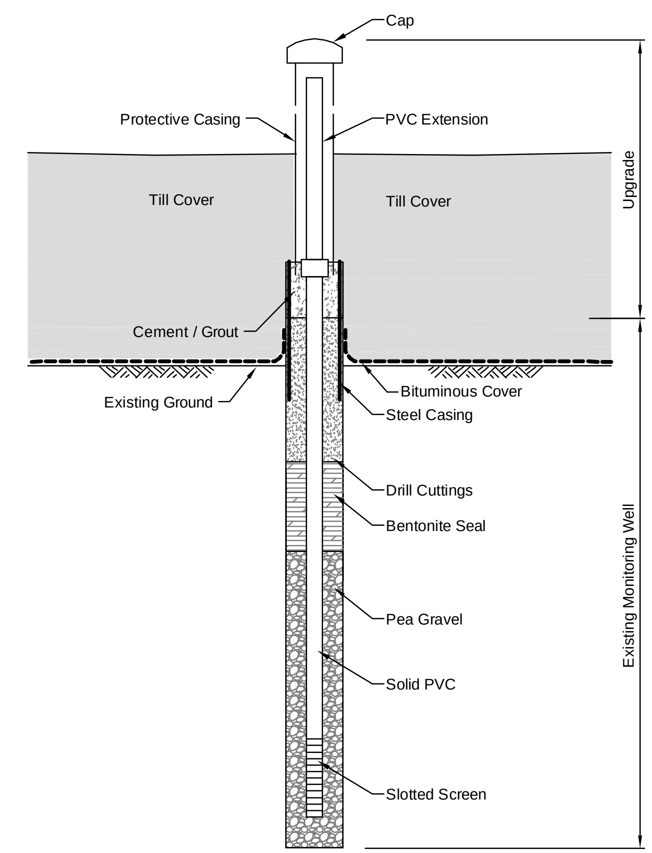
Schematics of the proposed completions are shown on Figure G-1.

The vibrating wire piezometer was chosen for their ease of construction and flexibility of installation. They are intended to be installed in highwall buttress that is more than 3m high. The piezometer head will be imbedded into the fill during construction. The locations of the piezometer and post mounts will be determined by the Engineer during construction to fit site conditions. The cable will route out from the bituminous liner to a post for data acquisition. The data will provide information for pore pressure from the groundwater seepage within the buttress below the liner and to monitor the performance of the underdrains.

Figure G-1
Proposed Long Term Monitoring Wells



Schematic of Options for New Monitoring Wells



Typical Schematic for Existing Monitoring Well

LEGEND

WEIR #2	V-NOTCH WEIRS	BH00-01	PROPOSED LONG TERM MONITORING WELLS (Existing)
	SURFACE DIVERSIONS	BH07-01	PROPOSED LONG TERM MONITORING WELLS (New Location)
	PROPOSED COVER OUTLINE	BH 89-11	MONITORING WELLS
	EXISTING SHOTCRETE LINED SEEPAGE COLLECTION CHANNEL	SP 24,25	STANDPIPE PIEZOMETERS

0 10 20 30 40 50
Scale in Metres

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Engineers and Scientists
Vancouver B.C.

SRK JOB NO.: 1CT001.001-700
FILE NAME: 1CT001001-700-17.dwg

Tsolum River Partnership

Mt. Washington Remediation

Detailed Design

Proposed Long Term Monitoring Wells

DATE:	APPROVED:	FIGURE:
Nov. 07	PMH	G-1

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