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March 30, 2015

Mr. Robert Holmes, Director
Mineral Resources Branch
Yukon Government - Energy, Mines & Resources
#400-211 Main Street, Box 2703
Whitehorse, Yukon Y1A 2C6

Dear Mr. Holmes,

RE: Quartz Mining Licence QML–0011 Annual Report

To date, StrataGold Corporation (SGC) has not provided written notice of its intent to commence the Undertaking as required by Paragraph 3.2 of QML-0011 and no production or development has occurred on the Eagle Gold Project (the Project). Activity at the Project site during the term of the QML has involved the continued collection of baseline environmental data and ongoing hard rock exploration.

The objective of the 2014 environmental program was to collect continuous environmental data to augment the existing baseline dataset for future regulatory applications and operational plans. Temperature, rainfall, wind speed and direction, relative humidity, barometric pressure and solar radiation all continue to be measured at 15-minute intervals at the Potato Hills and Camp climate stations. Snow pack surveys were conducted in spring 2014 in which snow depth, snow water-equivalent, and snow density were sampled.

The continuous streamflow stations, consisting of a permanent staff gauge, pressure transducer and datalogger to record water level continuously at 15-minute intervals, continued in active operation during the ice-free season. Discharge measurements were conducted during periodic station visits and related to the corresponding water level at the time of measurement. Water samples were collected from midstream following the methods outlined in the BC Freshwater Biological Sampling Manual (BC Ministry of Water, Land Air Protection 2003) during periodic station visits. Surface water quality samples were collected for laboratory analysis at these stations as well as several additional stations in the project area (consistent with previous years). In some cases point discharge measurements were also conducted where a sample was collected consistent with the data collection programs in previous years.

Groundwater monitoring was generally conducted as part of each site visit discussed above and included the downloading of the continuous water level measurements from nine monitoring wells equipped with automated dataloggers, the manual measurement of groundwater levels in wells on the Project site, and the collection of groundwater quality samples for laboratory analysis.

As described in Section 5 of the Eagle Gold Project Decommissioning and Reclamation Plan - Stage 1 Construction Plan, Version 2013-01, SGC intends to initiate reclamation and closure research program during construction and throughout operations. To assist with Project planning, revegetation trials and passive treatment system trials have been initiated prior to the construction phase. The objective of the revegetation trials is to test the viability of incorporating biochar and other soil amendments into final site reclamation. Preliminary results (as discussed in the attached Revegetation and Bioremediation Trials on the Dublin Gulch Property) have been encouraging with robust plant growth achieved using compost and biochar on a site selected for its proximity to the Project, the low likelihood of near term disturbance, and the relative absence of natural vegetation due to exploration disturbances during the early 1960s.

SGC is currently collaborating with Yukon College to evaluate the efficiency of anaerobic bioreactors, in support of developing components of the proposed passive treatment systems for closure. In 2014, four lab-scale bioreactors with/without wood chips were established using on-site creek sediments (to be used as inoculum) from the Eagle Pup channel. These were fed with either or some combination of a weak methanol solution, effluent collected from eight field barrels located on site, and/or a synthetic solution based on predicted closure water quality. The bioreactors have been exposed to either cold and/or standard temperature conditions.

The 2014 hard rock exploration program on the Property focused primarily on the Olive Zone located approximately 2km northeast of the Eagle Gold Zone. The 2014 Olive Zone program included the completion of 49 exploration diamond drill holes, 12 metallurgical diamond drill holes, 7 geotechnical drill holes (with a collective total of 9,800m) and 882m of surface trenching. To support the metallurgical program, bottle roll tests have been completed and column leach testing is ongoing.

The current 100-person exploration camp located at the Project site was utilized for the 2014 exploration and environmental programs. As the operation of the exploration camp, in its current configuration, is considered by SGC to be a component of the Class IV Mining Land Use Approval LQ00303, specific details regarding occupancy rates will be provided in the annual report for LQ00303.

In January 2014, to support the phased licencing of the Project, SGC applied to the Yukon Water Board (YWB) for the amendment of Type B Water Use Licence QZ11-013 to support the construction activities contemplated in QML-0011 with the exception of any development of the open pit area. The YWB officially granted the amendment of QZ11-013 on February 4, 2015.

In August 2014, SGC applied to the YWB for a Type A Water Use Licence for stage 2 construction, operations and closure of the Project. The application is currently in the adequacy review period and is expected to proceed to the public comment period in April 2015.

Given the existing status of Project development, and the details provided herein, the suggested annual report content specified in item 10 of you letter dated November 12, 2013 is currently not applicable.

Sincerely,

Mark Ayranto
Executive Vice President
Victoria Gold Corp.

REVEGETATION AND BIOREMEDIATION TRIALS

ON THE DUBLIN GULCH PROPERTY

2012 to 2014

Near Peso adit, July 2012

For

Victoria Gold Corp.

Submitted by

Laberge
ENVIRONMENTAL SERVICES

January 2015

Laberge
ENVIRONMENTAL SERVICES
P.O. Box 21072
Whitehorse, Y.T.
Y1A 6P7

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LETTER OF TRANSMITTAL

January 25th, 2015

Steve Wilbur
Victoria Gold Corp
PO Box 49215, Suite 584 - 1055 Dunsmuir Street
Vancouver, BC
V7X 1K8

Dear Steve:

Re: **Revegetation and Bioremediation Trials on the Dublin Gulch Property, 2012 to 2014**

We are pleased to submit herewith, the above report covering the installation of test plots and two years of assessment of the revegetation trials with a focus on biochar as one of the amendments.

Should you have any questions or comments on the report, please do not hesitate to contact the undersigned.

Sincerely,

Bonnie Burns
Laberge Environmental Services

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1.0 INTRODUCTION

1.1 Background

The claims at the Peso site were first staked in June 1910 by J. Alverson and G. Huffman, who sank a 4.9 m shaft in 1912 and trenched until 1916 (Yukon Minfile). In 1948, with antimony in demand, Cecil D. Poli re-staked Alverson's old silver-lead-antimony property as the Peso 1 – 12 claims and trenched the vein by hand. On route back to Haggart Creek he discovered the Rex vein two miles to the southeast. The Peso vein gave 40 ounces of silver per ton and a sample from the Rex vein gave 25 ounces per ton. These properties were optioned in the early 1950s at the height of the boom but no significant work was done on them (Aho, 2006).

In 1961 Tanar Gold Mines Ltd transferred the claims to a new company, Peso Silver Mines Ltd who carried out extensive exploration from 1961 to 1965, including underground development on the Peso vein. The two main vein zones at Peso Rex contained a reasonably well proven-probable reserve of about 154,000 tons at 20.9 ounces of silver per ton and 3.7% lead (Campbell, 1965). The veins contain abundant pyrite and arsenopyrite, with jamesonite, tetrahedrite and minor shalerite and bismuthinite, including the metallic minerals galena and chalcopyrite (Aurum Geological Consultants, 1992).

M.J. Moreau explored with hand trenching in 1986 and bought the Peso and Rex claims at a Sheriff's sale in August 1988 (Yukon Minfile).

In 1991, M. J. Moreau Enterprises Ltd made a request of Aurum Geological Consultants to prepare a report summarizing the economic potential of the Pierre Property, which included the Peso claims. Results from samples collected in 1991 from the No. 1 Vein (Peso) returned a high silver value of 318.5 ppm which when fire assayed returned 37.8 oz/ton silver (Aurum Geological Consultants, 1992).

In 1994 First Dynasty Mines Ltd acquired claims throughout the area and in 1996 its wholly owned subsidiary, New Millennium Mining Ltd carried out a major drilling program in the Dublin Gulch area.

Stratagold acquired the Dublin Gulch property in 2004 and commenced a drilling program in 2005 to delineate the Eagle Zone. Victoria Gold Corp. assumed control in 2009.

Recent exploration work has been undertaken by Victoria Gold in the Rex/Peso area, however the locations of the trial plots are outside of the active zone and provide a representative site for the revegetation experiment which is unlikely to be disturbed by near term exploration or development programs.

1.2 Scope of Work

Victoria Gold Corp has sponsored revegetation research in support of reclamation planning for the Eagle Gold Project at their Dublin Gulch Property. The objective of the revegetation program at Peso is to test the viability of incorporating biochar and other soil amendments into the site with a goal of creating an ultimate reclamation and revegetation plan that will be transferable to the Eagle Gold Project Reclamation and Closure Plan (StrataGold 2014). The Peso site was chosen because 1) there were existing and un-reclaimed facilities (waste dump and trenches) at the site that were located in similar terrain and with similar climate conditions and geologic properties as the Eagle Gold Project, and 2) unlike other areas within the Eagle Gold Project area subject to exploration, construction and other activities, the established plots at Peso would remain undisturbed.

Biochar is a light charcoal material produced by heating or combusting biomass under low or no oxygen conditions, a process known as pyrolosis. Residues of incomplete organic pyrolysis (e.g., from cooking fires), are thought to be the key component of terra preta soils a very dark fertile anthropogenic soil known most commonly from the Amazon basin. It was most likely intentionally developed by humans between 450BC and 950AD to improve the poor soil conditions in the Amazonian basin. Terra preta is characterized by high concentrations of low temperature charcoal; quantities of pottery shards; and organic matter such as plants, animals, bones and feces (Bates, 2010). While the biochar process has been known for over a century, recent efforts are underway to recreate the fertile Terra preta like soils through the biochar process (Economist 2009).

One of the greatest benefits of biochar is its capacity to transform degraded land. It adds moisture retention to arid soils, it provides surface area for microbes and nutrients to use and it can lock carbon into the ground for very long periods (Bruges, 2009). The agronomic and environmental benefits of adding biochar to soils have been investigated for many years, but in the past several years research has begun into the use of biochar for bioremediation of mine-affected soil (Laberge Environmental Services, 2012). For example, Fellet *et al* (2011) found that an increase in biochar content in mine tailings reduced the bioavailability of cadmium, lead, thallium and zinc. In column leaching tests, the sorption of cadmium and zinc to biochar's surfaces reduced their leachate concentrations by 300 and 45 fold respectively (Beesley and Marmiroli, 2011). Therefore, as well as enhancing growing conditions in the soil for successful plant growth, biochar can also help to sequester metals and mitigate leachate water quality.

The organic material (i.e., trees, shrubs and organic surface cover) that will be cleared from the various development areas to make way for mining operations at Eagle Gold, can be processed into biochar on site thus creating a local source and thereby eliminating the introduction of unknown or unwanted components of outsourced biochar. The pyrolysis of plant biomass to generate biochar converts much of the carbon into a form of carbon which is very stable in soils for hundreds of years. Thus, by creating biochar from the plant overburden, instead of allowing it to naturally decompose and consequently release carbon dioxide (a greenhouse gas) into the atmosphere, the carbon becomes unavailable and is sequestered. If applicable, Victoria Gold could earn carbon credits by 1) producing its own biochar as a soil amendment for the site's closure activities and 2) planting vegetation. Currently there is not a system of carbon credits in the Yukon, nor a tax on carbon like in British Columbia, however the sequestration of carbon through these activities offsets at least some of the carbon dioxide that the mine emits and thus lowers its carbon footprint.

2.0 STUDY AREA

The Eagle Gold Project at Dublin Gulch is located approximately 85 km northeast of the village of Mayo in central Yukon and lies wholly within the traditional territory of the First Nation of the Na Cho Nyak Dun. The project is 100% owned by Victoria Gold Corp and covers an area of approximately 650 square kilometers. Its centre is situated at the confluence of Haggart Creek and Dublin Gulch at the UTM Coordinates 7100950N / 453750E, Zone 8, NAD 83 Datum.

The historic Peso Minesite is located approximately 6.5 km west of the camp at the Eagle Gold Project, near Secret Creek, a tributary to Haggart Creek (Figure 1). The study area lies within the northern region of the North Yukon Plateau ecoregion in the Stewart River sub-basin of the Yukon River watershed. This area is generally characterized by rolling uplands with steep slopes leading into U-shaped valleys (Smith *et al,* 2006). There are two zones within the Eagle Gold Site; subalpine, and open black spruce forests at lower elevations. The subalpine zones (above 1225 m asl) are generally dominated by dwarf birch and willows. Other species occurring within the forested areas are Alaska birch, aspen, balsam poplar and white spruce, depending on aspect. Subalpine fir are also found in small pockets at higher elevations (Stantec, 2011).

Climate stations are operational within the Eagle Gold Project area at the Potato Hills Station (1420 masl) and at the Camp Station (782 masl). Knight Piesold Consulting (KPC) examined and summarized the meteorological data collected over a four year period, 2009 to 2012 (KPC, 2013). Since the two climate stations are located at significantly different elevations and thus will have varied temperature and precipitation results due to orographic tendencies, KPC used a reference elevation of 1125m for their analysis and summary. Table 1 summarizes selected climatic parameters for this elevation.

TABLE 1 MEANS FOR SELECTED CLIMATIC PARAMENTERS AT ELEVATION 1125m

Parameter	Value
Mean annual temperature	-4.2
Mean January temperature	-19.7
Mean July temperature	11.4
Mean annual precipitation	500 mm
Mean annual rainfall	190 mm
Mean annual snowfall (water-equivalent)	310 mm
Mean annual rainfall/snowfall distribution	38% / 62%

Taken from KPC 2013

Since the elevation of the vegetation trials is slightly lower than 1125 m (see Table 2), the above values should be relatively representative of temperature and rainfall at the Peso plots.

The majority of the exploration work at the Peso site was completed during the early 1960s. With the exception of dense growth of alders at the less disturbed sites, very little natural revegetation has taken place in the areas disturbed by historical activities in the Peso area over this time period. Vegetation in the adjacent undisturbed and lesser disturbed sites consists of subalpine fir, white spruce, black spruce and paper birch, with occasional balsam poplar and trembling aspen. Mountain alder, dwarf birch, Scouler's willow and blue-green willow are the most common medium to tall shrub species. The ground cover includes low shrubs such as Labroador tea, Beauverd's spiraea, kinnikinick, lingonberry, blueberry and crowberry. Dwarf dogwood, toadflax, lupine and fireweed are the most common forb species (Laberge Environmental Services and NND-DC, 2004).

During a reconnaissance trip in June 2012, two sites were selected for the revegetation trials, an exploration trench and the waste rock dump. Although trenching has been undertaken at the site since the early 1900s, mostly hand trenching, it is assumed that the trench chosen for the trials was a result of bulldozer exploration in the early 1960s by Peso Silver Mines. Three blocks, each containing 5 test plots, were established at the trench site. Block #1 is located north of an exploration trail and the other 2 Blocks are located south.

The Peso adit is located approximately 250 m west of the trench. Peso Silver Mines conducted underground development on the Peso vein resulting in the formation of the waste rock dump on the west facing slope. The waste rock dump covers an area approximately 50 m by 70 m. It is comprised of three lifts varying in thickness from two to six meters. A total of three blocks, each containing 5 test plots, were established on each tier. The locations of the blocks are detailed below in Table 2 and shown on Figure 2.

TABLE 2 BLOCK LOCATIONS AT PESO

Site	Latitude	Longitude	Elevation (m)
Trench:			
Block #1	64^o 00.649'	135^o 58.038'	1040
Block #2	64^o 00.607'	135^o 58.119'	1030
Block #3	64^o 00.601'	135^o 58.154'	1042
Waste Rock:			
Block #1	64^o 00.616'	135^o 58.360'	992
Block #2	64^o 00.595'	135^o 58.388'	986
Block #3	64^o 00.630'	135^o 58.390'	973

FIGURE 1 REVEGETATION AND BIOREMEDIATION TRIAL LOCATIONS ON THE DUBLIN GULCH PROPERTY

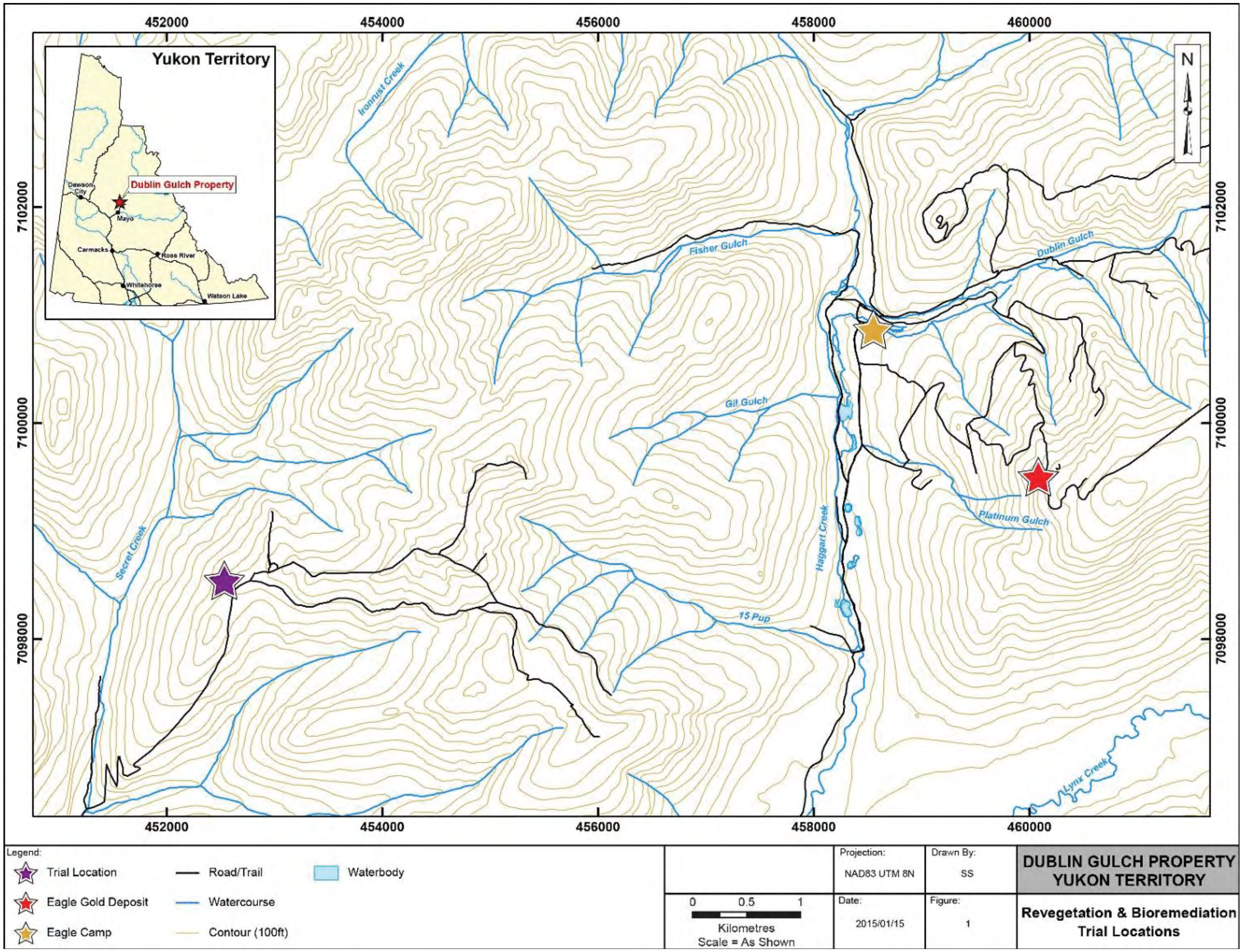
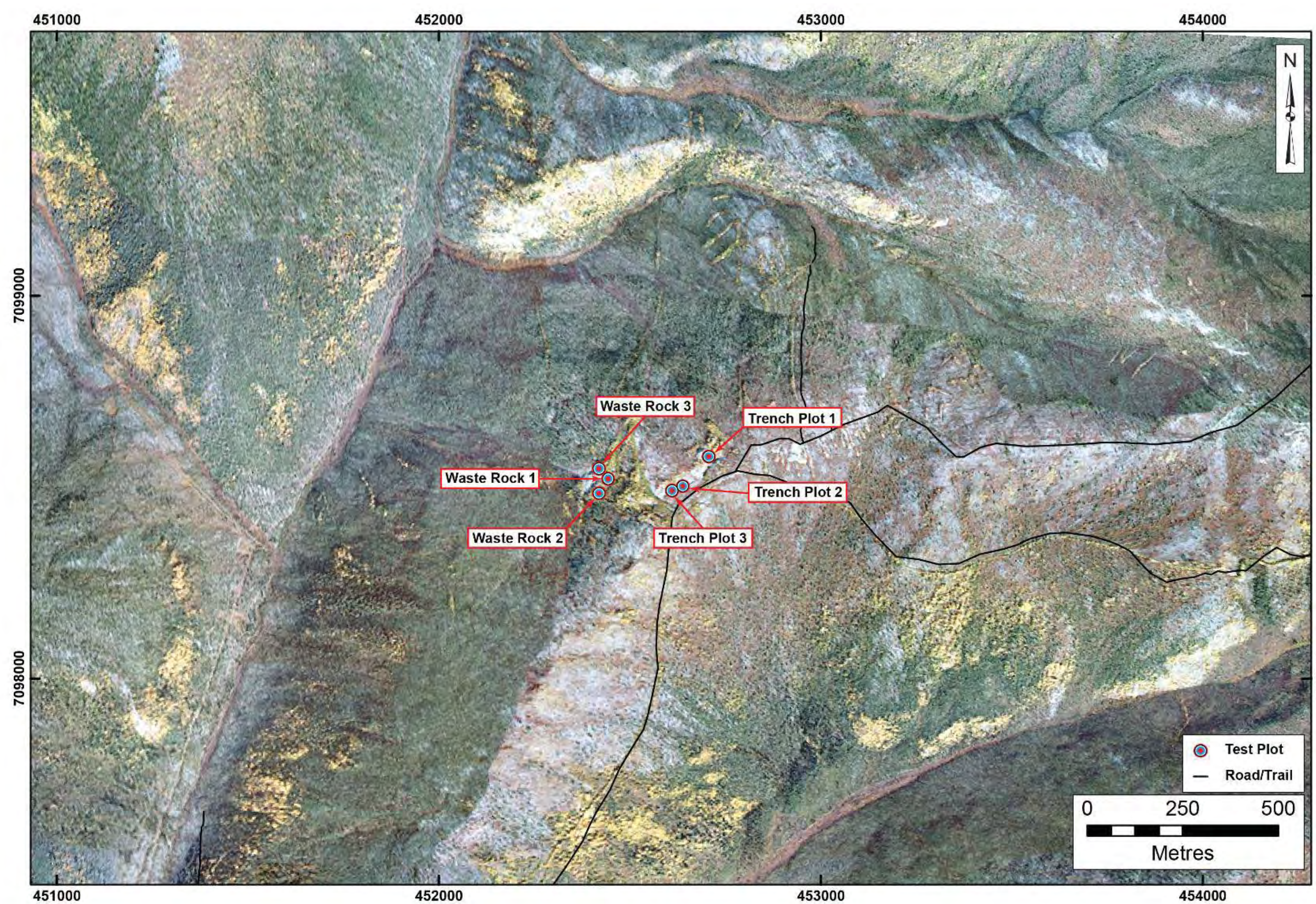


FIGURE 2 TEST PLOT LOCATIONS AT THE OLD PESO MINESITE



3.0 STUDY DESIGN

3.1 Soil Analysis

The success of a revegetation project depends firstly on characterizing site-specific conditions such as soil fertility, climate, aspect, elevation, slope, drainage, etc, prior to making any decisions regarding seed mixes and amendments.

For the purposes of this study, a reconnaissance visit to the old Peso minesite was initially conducted on June 24th, 2012. After assessing the area, two sites were chosen for the revegetation trials and are described in Section 2.0. Soil samples were collected from these sites and sent to Maxxam Analytical Laboratory in Burnaby, BC. The complete analytical report can be found in Appendix A, with selected parameters presented below in Table 3.

TABLE 3 SOIL CHARACTERISTICS, JUNE 2012

PARAMETER	UNITS	WASTE ROCK	TRENCH
Soluble (2:1) pH	pH Units	2.62	5.15
Total Kjeldahl Nitrogen	mg/kg	180	98
Carbon Nitrogen Ratio	N/A	20.1	0
Total Organic Carbon (C)	%	0.37	<0.20
Organic Matter	%	0.64	<0.35
Available (NH4F) Nitrogen (N)	mg/kg	<2.0	<2.0
Available (NH4F) Phosphorus (P)	mg/kg	2.9	1.8
Available (NH4OAc) Potassium (K)	mg/kg	<2.0	8.5
Cation exchange capacity	cmol+/Kg	<10	<10
% sand by hydrometer	%	nd	70
% silt by hydrometer	%	nd	25
Clay Content	%	nd	5.6
Loss on Ignition	%	6.1	4.0
Texture	N/A	nd	SANDY LOAM
Total Aluminum (Al)	mg/kg	2690	2350
Total Antimony (Sb)	mg/kg	3680	3580
Total Arsenic (As)	mg/kg	6150	9810
Total Cadmium (Cd)	mg/kg	4.88	4.28
Total Chromium (Cr)	mg/kg	6.7	12.2
Total Cobalt (Co)	mg/kg	3.54	5.33
Total Copper (Cu)	mg/kg	210	75.9
Total Iron (Fe)	mg/kg	57500	46300
Total Lead (Pb)	mg/kg	9070	7330
Total Mercury (Hg)	mg/kg	0.796	0.410
Total Nickel (Ni)	mg/kg	9.06	12.0
Total Selenium (Se)	mg/kg	19.3	12.7
Total Silver (Ag)	mg/kg	89.4	103
Total Zinc (Zn)	mg/kg	252	129

nd = not done

The soil is extremely acidic at the waste rock site and strongly acidic at the trench site. Acid tolerant plant species consequently were selected for the revegetation project. Soil samples collected from the waste rock in 2003 showed it to be extremely acidic with a pH value of 2.8 (Laberge, 2004). Soil samples collected near the portal and from the easternmost lobe of the waste rock in 1997 were potentially acid generating following bottle roll tests (Environmental Services, 1998). The soil samples collected in 2012 confirm the strong acidity of the waste rock dump (pH 2.6).

All available nutrients were extremely low where detected. Organic matter and total organic carbon was very low at the waste rock site and below the detection limits at the trench site. Cation exchange capacity was below measurable limits at both sites.

Concentrations of antimony, arsenic and lead were extremely high at both sites. Antimony is a trace element and background levels are generally very low. Antimony concentrations are usually much greater at mining and contaminated sites.

Background levels of arsenic in soils are low and rarely exceed 15 mg/kg (Singh, 2005). Arsenic concentrations were very high at the Peso site with much higher levels that appear atypical when compared to other sites sampled for soil geochemistry at the Dublin Gulch site (Burns, 2013).

Lead concentrations were also extremely high in the two soil samples at Peso and were much greater than documented at other locations at Dublin Gulch.

Generally the metal concentrations were similar at both of the selected trial sites.

3.2 Field Design

3.2.1 Site Preparation

The plots at the two sites were installed on July 19th, 2012. Three blocks of plots were situated on relatively level ground with the same aspect at each site. Each block measured 5m by 2m and contained 10 one meter square plots. The blocks and plots were measured and demarked with orange fluorescent painted rebar. Labeled flagging tape was added to each corner pin of the plots.

The plots were prepared and seeded from September 18th to 20th, 2012. Each plot to be seeded was scarified first with a hand-cultivator (tine length 15 cm), and then raked with a fine-toothed rake (see Photo #1, Appendix B). Soil amendments were well mixed into the prepared plot and then the seeds were hand broadcast throughout the plot. Each plot was tamped gently but firmly with the back of a rake to create micro-sites and achieve good seed placement.

Every other plot within each block was seeded, allowing the unseeded/untreated plots to represent buffer zones. The implementation of buffer plots ensures that each test plot is isolated and uninfluenced from neighboring plots. As well, each plot can be assessed and closely examined without the risk of trampling on plants on the other test plots. Further details, including photographs are included in a report prepared for Victoria Gold (Laberge, 2013). As described below, due to the differences in acidity at the two sites, slightly different seed mixes and treatments were prepared.

3.2.2 Treatments

The intention of these trials was to determine in a relatively simple manner which amendments might be utilized for successful native plant growth to initiate the restoration process. The amendments used in these trials were biochar, compost, leonardite and dolomite.

Raw biochar chips were obtained locally from Zukas Farms, Whitehorse Yukon. Prior to application they were ground in a steel-blade seed grinder to produce a fine, almost powdery mix. It has been well established that biochar on its own (due to the lack of nutrients) is insufficient as an amendment on poor soils (Peltz *et al*, Beesley and Marmiroli, 2011, Beesley *et al*, 2010), hence it was combined with nutrient rich compost for each plot.

Bags of compost were obtained from the co-operative project at the Whitehorse Solid Waste Facility which produces commercial quantities of high quality compost.

Leonardite is defined as a naturally occurring oxidized form of lignite coal that is rich in humic acids. Its main use is as a soil amendment in agriculture and reclamation. For the purposes of this study, leonardite was obtained from Tisdale, Saskatchewan. This leonardite consisted mostly of humic acid with small amounts of fluvic acid and required minimal processing. It was also included with the amendments for some of the plots as an additional source of nutrients.

Due to the relatively higher acidity at the waste rock dump site, commercially available dolomite, purchased from Canadian Tire, was added to the amendment mix at some of the plots to create some buffering capacity.

No other fertilization was used and the plots were not watered at any time. The plots were exposed to the natural conditions that existed at each of the local areas throughout the seasons. Thus, aside from the initial site development and treatment, no other treatment or site modification was used.

3.2.2.1 Waste Rock Site

In attempts to control acid generation and enhance soil rehabilitation, the following amendments were used on the waste rock sites; biochar, compost, leonardite and dolomite lime.
The application rates per plot are as follows:

- 6 liters of biochar (just under 1 kg)
- 15 liters (1/2 bag) of compost
- 0.15 kg/m2 of leonardite
- 3.3 kg/m2 of dolomite

There were five treatments per block of plots:

Treatment Method	Treatment Composition
1	Seed only
2	Seed, biochar, compost
3	Seed, biochar, compost, leonardite
4	Seed, biochar, compost, dolomite lime
5	Seed, biochar, compost, leonardite, dolomite lime

The layout of the plots and treatments per block is presented in Figure 3. Each treatment is represented once per block and three times in total for the site. The shaded plots received no treatments and represent buffers between plots.

FIGURE 3 LAYOUT OF TREATMENTS (# in bold) AND PLOTS AT WASTE ROCK

Waste Rock Block #1 (on top near the adit) – seeded and amendments added Sept 18, 2012 @13:00

1 Plot # 1-1		**3** Plot # 1-3		**5** Plot # 1-5
	2 Plot # 1-2		**4** Plot # 1-4	

Waste Rock Block #2 – (on second tier) seeded and amendments added on September 18, 2012 @ 14:30

	2 Plot # 2-2		**4** Plot # 2-4	
1 Plot # 2-1		**3** Plot # 2-3		**5** Plot # 2-5

Waste Rock Block #3 – (on third tier from top) seeded and amendments added on September 18, 2012 @ 16:00

1 Plot # 3-1		**3** Plot # 3-3		**5** Plot # 3-5
	2 Plot # 3-2		**4** Plot # 3-4	

3.2.2.2 Trench Site

The soil at the trench site was not as acidic as on the waste rock, with a pH of 5.15, consequently dolomite lime was not included as an amendment. Biochar, compost and leonardite were again applied to the trench plots at the following application rates:

- 3 litres of biochar
- 15 liters (1/2 bag) of compost
- 0.15 kg/m2 of leonardite

There were three treatments per block of plots:

Treatment Method	Treatment Composition
1	Seed only
2	Seed, biochar, compost
3	Seed, biochar, compost, leonardite

The layout of the plots and treatments per block is presented in Figure 4. Each treatment is represented five times for the site. The shaded plots received no treatments and represent buffers between plots.

FIGURE 4 LAYOUT OF TREATMENTS (# in bold) AND PLOTS AT TRENCH SITE

Trench Block #1 – seeded and amendments added on September 19, 2012 @ 11:00

1 Plot #1-1A		**3** Plot #1-3		**2** Plot #1-2B
	2 Plot #1-2A		**1** Plot #1-1B	

Trench Block #2 – seeded and amendments added on September 18, 2012 @ 18:00

	1 Plot # 2-1A		**3** Plot # 2-3A	
3 Plot # 2-3B		**2** Plot # 2-2		**1** Plot # 2-1B

Trench Block #3 – seeded and amendments added on September 19th, 2012 @ 10:00.

2 Plot #3-2A		**1** Plot #3-1		**3** Plot #3-3B
	3 Plot #3-3A		**2** Plot #3-2B	

3.2.3 Seed Mix

The species chosen for the trials were determined through consultation of the Yukon Revegetation Manual (Matheus and Oztmigt, 2012) as well as through the observation of species currently growing in the near vicinity of the sites. The appropriate seed mixes were distributed for each plot as per the quantities noted in Table 3. In addition, because alder grows prolifically around the site and is well adapted to localized conditions, a small handful of local alder seeds were collected on site and distributed with the seed mix. Furthermore, alder fixes nitrogen and all parts of the plants contribute nitrogen to the soil during decomposition. Seeds from Hedysarum plants (a nitrogen fixing legume) were also added to the mix to increase the nitrogen potential.

The seed mix is slightly different for each site due to soil conditions. The soil at the waste rock site was extremely acidic, had little to no nutrient values and was highly mineralized (refer to Table 2). Several plant species were chosen due to their tolerances to acidic, low nutrient levels, drought and/or heavy metal conditions in the growth medium. The seed rate, adjusted to 1m^2 plot size, is also provided in Table 3. The soil at the trench site was not as acidic as on the waste rock dump and slight alterations were made to the seed mix (Table 3).

TABLE 4 SEED MIX AND RATE OF APPLICATION FOR WASTE ROCK AND TRENCH SITES

Common Name	Scientific Name	Application rate/plot at Waste Rock	Application rate/plot at Trench
Sheep fescue	*Festuca ovina*	0.4 g	0.4 g
Tufted hairgrass	*Deschampsia caespitosa*	0.14 g	0.14 g
Glaucous bluegrass	*Poa glauca*	0.19 g	---
Alpine bluegrass	*Poa alpina*	---	0.21 g
Tickle grass	*Agrostis scabra*	0.04 g	---
Spike Trisetum	*Trisetum spicatum*	---	0.9 g
Bear root	*Hedysarum alpinum*	20 seeds	20 seeds
Alder	*Alnus viridus*	small handful	small handful

The first six plant species are native occurring plants with commercially available accredited seed, which was obtained from BrettYoung™ of Calmar, Alberta. Alder seeds were hand collected from local plants at the site on the day of planting and spread onto each plot. Hedysarum seeds, previously collected from various sites in the Yukon, were also added to the plots.

4.0 PLOT ASSESSMENTS

4.1 Methods

The trial plots have been assessed on three different occasions to date; July 2013, September 2013 and early August 2014. The August 2014 assessment represents two complete years of growth following seeding in September 2012.

Vegetation cover and composition are two indicators frequently used in terrestrial monitoring programs (Godı´nez-Alvarez *et al*, 2008). Vegetation cover is determined through point-based methods or ocular estimates. Due to the small size of the examined plots and the young stage of growth, ocular estimates were made for the cover of each plot. Ocular estimates have a subjective element. In order to minimize observer variance, the same experienced team members were used for each assessment.

Species richness[1] was determined through the counting of the number of species present in each plot. Species for some of the grasses used in these trials could not be accurately identified as they had not reached maturity.

4.2 RESULTS

The results for all three assessments are presented in Table 5 for the Waste Rock Site and Table 6 for the Trench Site, both in Appendix C. The percentage of vegetative cover, composition and overall health were observed for each plot.

Generally the cover of the plots increased over time. The exception to this was the plots that received no amendments (seed only). On some of these plots there initially was some minor growth however it had died back in later assessments. Cover at all of the treated plots in Block 3 of the Waste Rock site also decreased over time. Figures 5 and 6 in Appendix C display the cover of all the plots during the assessment conducted on August 5th, 2014. The greatest cover commonly occurred at the plots amended with biochar and compost only.

Plant growth was stressed in the plots that were seeded with no treatment (Treatment #1). The healthiest plots generally occurred at those treated with biochar and compost only (Treatment #2), and the addition of dolomite tended to assist in the health at some of the plots at the Waste Rock site. The inclusion of Leonardite did not show any marked improvements in any of the plots and actually tended to decrease the health in the plants on some of the plots on the Waste Rock site.

[1] Species richness is the number of different species represented in an ecological community, landscape or region. Species richness is simply a count of species, and it does not take into account the abundances of the species or their relative abundance distributions.

Table 7 in Appendix C shows the species richness and the dominant species where applicable, at each of the plots. Most species of grass are difficult to identify until they are in flower. However some grasses can be identified in the immature stage such as the bluegrasses. They have wider leaf blades and are of a slightly different green colour and thus can be differentiated from the other grasses species that were seeded at the plots. Few plants were mature enough at the Trench site to accurately quantify the dominant species for any of the plots at this time.

Many plants had reached maturity in several of the waste rock plots. For each of the Waste Rock plots where enough mature plants existed to determine species, Ticklegrass (*Agrostis scabra*) was the dominant species. Although Ticklegrass was not one of the species planted at the Trench plots it was a common mature plant in several of the plots. Ticklegrass is a common native plant throughout the site, growing along the edges of the cleared areas and was prolific along the access road at the higher elevations near the Peso site.

Ticklegrass is a common pioneering plant, tolerant to acidic soils, drought, heavy metals and low nutrient conditions, and can grow on permafrost ground and on fine or coarse sediments (Matheus and Oztmigt, 2012). All of these attributes make Ticklegrass an ideal reclamation species for the Peso site. It is short lived, three to five years, and propagates through self seeding. As a pioneering species, Ticklegrass does not compete well with other grasses and will eventually give way to more aggressive species. Future monitoring will determine if it continues to grow at the plots, however its leaf litter will aid in building up the soil for other species as well.

Taxonomic richness, a measure of biodiversity, can indicate the health and productivity of a community. The number of planted species per plot was six, however assessments revealed that a couple of plots exceeded this number since any occurrence of an invading native species was also included (Table 7, Appendix C). Relatively high species richness was noted at some of the low cover sites since an individual alder, hedysarum or willow plant was included in the count as well as unidentified stressed grass. The average species richness per treatment method was calculated for the study period at each site and is displayed below in Table 8.

TABLE 8 AVERAGE SPECIES RICHNESS PER TREATMENT FOR THE PLOTS

Treatment	Trench Plots N=5	Waste Rock Plots N=3
Seed only	2.1	0.1
Seed, biochar, compost	4.3	3.6
Seed, biochar, compost, leonardite	4.2	1.9
Seed, biochar, compost, dolomite lime		2.8
Seed, biochar, compost, leonardite, dolomite lime		2.7

The plots with the highest species richness at both sites were those treated with biochar and compost only. The inclusion of leonardite in the trench plots also appeared to increase species richness. Although not as effective in increasing species richness as the use of only biochar and compost at the waste rock sites, the addition of dolomite appeared to assist with the acidity.

5.0 CONCLUSIONS AND RECOMMENDATIONS

There is little doubt that amendments are required for plants to grow in the study area. All non-treated seeded plots produced no to very little growth. The acidic soil conditions at the Peso trench and the waste rock sites present a challenging scenario in relation to the site conditions at the majority of other disturbed sites in the Dublin Gulch area. However, the success of using compost and biochar to achieve robust plant growth on these highly mineralized and acidic soils, especially on the waste rock dump, is very encouraging.

The evaluation of the revegetation trials using the various treatments and seed mixes requires longer term monitoring. It is recommended that annual monitoring be continued during mid-summer for at least a total of five years after which the program should be re-evaluated, and/or modified to assess the effect of particular variables (i.e., soil grain size distribution, aspect, treatment modifications, etc).

It is recommended that during the 2015 monitoring program mature plant tissues are collected for metal analysis from some of the plots. Concurrently soil samples should be collected at the same plots to determine the degree of any metal uptake. Plant tissues from the same species growing naturally in the area would also be analyzed.

The analysis should also determine if the cation exchange capacity (CEC) has been increased through the use of biochar on the plots. CEC is important to fertility as it assists in the retention of nutrients (nitrogen and phosphorus) and cations (like potassium) in soil.

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APPENDIX A

ANALYTICAL RESULTS – SOIL, 2012

- **MAXXAM JOB # B256252**

Your Project #: BIOCHAR RESEARCH
Your C.O.C. #: EB492312

Attention: Ken Nordin
LABERGE ENVIRONMENTAL SERVICES
WHITEHORSE
405 Ogilvie Street
PO Box 21072
Whitehorse, YT
CANADA Y1A 6P7

Report Date: 2012/07/13

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B256252
Received: 2012/06/29, 14:00

Sample Matrix: Soil
Samples Received: 4

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Cation Exchange Capacity (1)	4	2012/07/10	2012/07/10	AB SOP-00009	SSMA 18.2, EPA 200.7
Carbon Nitrogen Ratio (1)	4	2012/07/05	2012/07/13	Calc	
Elements by ICPMS (total)	4	2012/07/05	2012/07/05	BBY7SOP-00001	EPA 6020A
Potassium (Available) (1)	4	2012/07/09	2012/07/09	AB SOP-00042	EPA 200.7
Loss on Ignition, Org. & Inorg. Residue (2)	4	N/A	2012/07/06	BBY6SOP-00040	Carter SSMA 44.3
Nitrate-N (Available) (1)	4	2012/07/09	2012/07/09	AB SOP-00023	SM 4110-B
Organic Matter - Calculated from LOI	4	N/A	2012/07/06	BBY6SOP-00040	Carter SSMA 44.3
Phosphorus (Available by ICP) (1)	4	2012/07/09	2012/07/09	AB SOP-00042	EPA 200.7
pH (2:1 DI Water Extract)	4	2012/07/05	2012/07/05	BBY6SOP-00028	Carter, SSMA 16.2
Texture by Hydrometer (1)	3	N/A	2012/07/13	AB SOP-00030	MMFSPA Ch9
Texture Class (1)	3	N/A	2012/07/13	AB SOP-00030	MMFSPA Ch9
Total Kjeldahl Nitrogen - Soil (1)	4	2012/07/13	2012/07/13	AB SOP-00008	EPA 351.1, 351.2
Organic Carbon and Organic Matter (1)	4	2012/07/11	2012/07/11	AB SOP-00012	MMFSPA Ch6

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) This test was performed by Maxxam Calgary Environmental
(2) Loss on Ignition was reported on a dry weight basis.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Tabitha Rudkin, Burnaby Project Manager
Email: TRudkin@maxxam.ca
Phone# (604) 638-2639

==
Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.
Total cover pages: 1

CARBON NITROGEN RATIO (TKN,TOC)

Maxxam ID		DV0612	DV0613	DV0614	DV0615		
Sampling Date		2012/06/24 12:00	2012/06/24 12:00	2012/06/26 12:00	2012/06/26 12:00		
COC Number		EB492312	EB492312	EB492312	EB492312		
	UNITS	**PESO WASTE ROCK**	**PESO TRENCHES**	**WHC A,B,C**	**MSGM A,B,C**	**RDL**	**QC Batch**

Misc. Inorganics							
Total Kjeldahl Nitrogen	mg/kg	180	98	18	18	10	6000949
Misc. Inorganics							
Carbon Nitrogen Ratio	N/A	20.1	0.000	0.000	142	N/A	5976738
Organic Matter	%	0.64	<0.35	<0.35	0.44	0.35	5991753
Total Organic Carbon (C)	%	0.37	<0.20	<0.20	0.25	0.20	5991753

RDL = Reportable Detection Limit

NPK (AVAILABLE)

Maxxam ID		DV0612	DV0613	DV0614	DV0615		
Sampling Date		2012/06/24 12:00	2012/06/24 12:00	2012/06/26 12:00	2012/06/26 12:00		
COC Number		EB492312	EB492312	EB492312	EB492312		
	UNITS	**PESO WASTE ROCK**	**PESO TRENCHES**	**WHC A,B,C**	**MSGM A,B,C**	**RDL**	**QC Batch**

Nutrients							
Available (NH4F) Nitrogen (N)	mg/kg	<2.0	<2.0	<2.0	22	2.0	5985283
Available (NH4F) Phosphorus (P)	mg/kg	2.9	1.8	<1.0	<1.0	1.0	5978596
Available (NH4OAc) Potassium (K)	mg/kg	<2.0	8.5	72	150	2.0	5978595

RDL = Reportable Detection Limit

Maxxam Job #: B256252
Report Date: 2012/07/13

LABERGE ENVIRONMENTAL SERVICES
Client Project #: BIOCHAR RESEARCH

RESULTS OF CHEMICAL ANALYSES OF SOIL

Maxxam ID		DV0612	DV0613	DV0614	DV0615		
Sampling Date		2012/06/24 12:00	2012/06/24 12:00	2012/06/26 12:00	2012/06/26 12:00		
COC Number		EB492312	EB492312	EB492312	EB492312		
	UNITS	**PESO WASTE ROCK**	**PESO TRENCHES**	**WHC A,B,C**	**MSGM A,B,C**	**RDL**	**QC Batch**
Elements							
Cation exchange capacity	cmol+/Kg	<10	<10	48	38	10	5984044
Misc. Inorganics							
Organic Matter	%	6.1	4.0	2.2	1.8	1.0	5976739
Physical Properties							
% sand by hydrometer	%		70	39	23	2.0	5999590
% silt by hydrometer	%		25	48	54	2.0	5999590
Clay Content	%		5.6	12	23	2.0	5999590
Loss on Ignition	%	6.1	4.0	2.2	1.8	1.0	5978220
Texture	N/A		SANDY LOAM	LOAM	SILT LOAM	N/A	5970847

RDL = Reportable Detection Limit

Maxxam Job #: B256252
Report Date: 2012/07/13

LABERGE ENVIRONMENTAL SERVICES
Client Project #: BIOCHAR RESEARCH

CSR/CCME METALS IN SOIL (SOIL)

Maxxam ID		DV0612	DV0613	DV0614	DV0615		
Sampling Date		2012/06/24 12:00	2012/06/24 12:00	2012/06/26 12:00	2012/06/26 12:00		
COC Number		EB492312	EB492312	EB492312	EB492312		
	UNITS	**PESO WASTE ROCK**	**PESO TRENCHES**	**WHC A,B,C**	**MSGM A,B,C**	**RDL**	**QC Batch**
Physical Properties							
Soluble (2:1) pH	pH Units	2.62	5.15	8.56	8.30	0.010	5974214
Total Metals by ICPMS							
Total Aluminum (Al)	mg/kg	2690	2350	10100	12200	100	5974132
Total Antimony (Sb)	mg/kg	3680	3580	1.32	1.45	0.10	5974132
Total Arsenic (As)	mg/kg	6150	9810	16.3	74.2	0.50	5974132
Total Barium (Ba)	mg/kg	46.0	46.8	90.9	31.5	0.10	5974132
Total Beryllium (Be)	mg/kg	<0.40	<0.40	<0.40	1.29	0.40	5974132
Total Bismuth (Bi)	mg/kg	527	372	9.59	0.14	0.10	5974132
Total Cadmium (Cd)	mg/kg	4.88	4.28	0.223	0.571	0.050	5974132
Total Calcium (Ca)	mg/kg	306	332	31300	35300	100	5974132
Total Chromium (Cr)	mg/kg	6.7	12.2	20.0	19.3	1.0	5974132
Total Cobalt (Co)	mg/kg	3.54	5.33	32.5	7.92	0.30	5974132
Total Copper (Cu)	mg/kg	210	75.9	2420	105	0.50	5974132
Total Iron (Fe)	mg/kg	57500	46300	143000	27900	100	5974132
Total Lead (Pb)	mg/kg	9070	7330	6.27	27.0	0.10	5974132
Total Lithium (Li)	mg/kg	<5.0	<5.0	7.3	20.7	5.0	5974132
Total Magnesium (Mg)	mg/kg	512	<100	46400	7890	100	5974132
Total Manganese (Mn)	mg/kg	927	189	803	640	0.20	5974132
Total Mercury (Hg)	mg/kg	0.796	0.410	<0.050	<0.050	0.050	5974132
Total Molybdenum (Mo)	mg/kg	0.87	0.74	36.1	3.16	0.10	5974132
Total Nickel (Ni)	mg/kg	9.06	12.0	13.9	3.14	0.80	5974132
Total Phosphorus (P)	mg/kg	500	623	527	738	10	5974132
Total Potassium (K)	mg/kg	475	340	2020	839	100	5974132
Total Selenium (Se)	mg/kg	19.3	12.7	1.01	1.13	0.50	5974132
Total Silver (Ag)	mg/kg	89.4	103	2.57	1.21	0.050	5974132
Total Sodium (Na)	mg/kg	<100	<100	104	468	100	5974132
Total Strontium (Sr)	mg/kg	114	134	88.9	77.4	0.10	5974132
Total Thallium (Tl)	mg/kg	0.259	0.169	0.064	0.077	0.050	5974132
Total Tin (Sn)	mg/kg	35.0	38.8	0.75	0.52	0.10	5974132
Total Titanium (Ti)	mg/kg	31.1	5.8	380	549	1.0	5974132
Total Uranium (U)	mg/kg	3.73	4.81	3.31	0.419	0.050	5974132
Total Vanadium (V)	mg/kg	9.8	12.2	43.3	32.0	2.0	5974132

RDL = Reportable Detection Limit

Maxxam Job #: B256252
Report Date: 2012/07/13

LABERGE ENVIRONMENTAL SERVICES
Client Project #: BIOCHAR RESEARCH

CSR/CCME METALS IN SOIL (SOIL)

Maxxam ID		DV0612	DV0613	DV0614	DV0615		
Sampling Date		2012/06/24 12:00	2012/06/24 12:00	2012/06/26 12:00	2012/06/26 12:00		
COC Number		EB492312	EB492312	EB492312	EB492312		
	UNITS	**PESO WASTE ROCK**	**PESO TRENCHES**	**WHC A,B,C**	**MSGM A,B,C**	**RDL**	**QC Batch**
Total Zinc (Zn)	mg/kg	252	129	59.7	135	1.0	5974132
Total Zirconium (Zr)	mg/kg	9.15	9.77	3.24	6.91	0.50	5974132

RDL = Reportable Detection Limit

General Comments

Results relate only to the items tested.

Maxxam

Success Through Science®

LABERGE ENVIRONMENTAL SERVICES
Attention: Ken Nordin
Client Project #: BIOCHAR RESEARCH
P.O. #:
Site Location:

Quality Assurance Report

Maxxam Job Number: VB256252

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	UNITS	QC Limits
5974132 DJ	Matrix Spike	Total Antimony (Sb)	2012/07/05		94	%	75 - 125
		Total Arsenic (As)	2012/07/05		99	%	75 - 125
		Total Barium (Ba)	2012/07/05		NC	%	75 - 125
		Total Beryllium (Be)	2012/07/05		105	%	75 - 125
		Total Cadmium (Cd)	2012/07/05		100	%	75 - 125
		Total Chromium (Cr)	2012/07/05		97	%	75 - 125
		Total Cobalt (Co)	2012/07/05		99	%	75 - 125
		Total Copper (Cu)	2012/07/05		90	%	75 - 125
		Total Lead (Pb)	2012/07/05		97	%	75 - 125
		Total Lithium (Li)	2012/07/05		102	%	75 - 125
		Total Manganese (Mn)	2012/07/05		NC	%	75 - 125
		Total Mercury (Hg)	2012/07/05		106	%	75 - 125
		Total Molybdenum (Mo)	2012/07/05		100	%	75 - 125
		Total Nickel (Ni)	2012/07/05		89	%	75 - 125
		Total Selenium (Se)	2012/07/05		102	%	75 - 125
		Total Silver (Ag)	2012/07/05		98	%	75 - 125
		Total Strontium (Sr)	2012/07/05		97	%	75 - 125
		Total Thallium (Tl)	2012/07/05		101	%	75 - 125
		Total Tin (Sn)	2012/07/05		95	%	75 - 125
		Total Titanium (Ti)	2012/07/05		NC	%	75 - 125
		Total Uranium (U)	2012/07/05		99	%	75 - 125
		Total Vanadium (V)	2012/07/05		NC	%	75 - 125
		Total Zinc (Zn)	2012/07/05		NC	%	75 - 125
	QC Standard	Total Aluminum (Al)	2012/07/05		100	%	70 - 130
		Total Antimony (Sb)	2012/07/05		86	%	70 - 130
		Total Arsenic (As)	2012/07/05		89	%	70 - 130
		Total Barium (Ba)	2012/07/05		96	%	70 - 130
		Total Cadmium (Cd)	2012/07/05		91	%	70 - 130
		Total Calcium (Ca)	2012/07/05		89	%	70 - 130
		Total Chromium (Cr)	2012/07/05		98	%	70 - 130
		Total Cobalt (Co)	2012/07/05		87	%	70 - 130
		Total Copper (Cu)	2012/07/05		72	%	70 - 130
		Total Iron (Fe)	2012/07/05		92	%	70 - 130
		Total Lead (Pb)	2012/07/05		94	%	70 - 130
		Total Magnesium (Mg)	2012/07/05		88	%	70 - 130
		Total Manganese (Mn)	2012/07/05		93	%	70 - 130
		Total Mercury (Hg)	2012/07/05		114	%	70 - 130
		Total Molybdenum (Mo)	2012/07/05		91	%	70 - 130
		Total Nickel (Ni)	2012/07/05		72	%	70 - 130
		Total Phosphorus (P)	2012/07/05		87	%	70 - 130
		Total Strontium (Sr)	2012/07/05		82	%	70 - 130
		Total Thallium (Tl)	2012/07/05		90	%	70 - 130
		Total Titanium (Ti)	2012/07/05		105	%	70 - 130
		Total Uranium (U)	2012/07/05		82	%	70 - 130
		Total Vanadium (V)	2012/07/05		99	%	70 - 130
		Total Zinc (Zn)	2012/07/05		72	%	70 - 130
	Spiked Blank	Total Antimony (Sb)	2012/07/05		97	%	75 - 125
		Total Arsenic (As)	2012/07/05		98	%	75 - 125
		Total Barium (Ba)	2012/07/05		97	%	75 - 125
		Total Beryllium (Be)	2012/07/05		104	%	75 - 125
		Total Cadmium (Cd)	2012/07/05		101	%	75 - 125
		Total Chromium (Cr)	2012/07/05		97	%	75 - 125
		Total Cobalt (Co)	2012/07/05		99	%	75 - 125
		Total Copper (Cu)	2012/07/05		100	%	75 - 125
		Total Lead (Pb)	2012/07/05		96	%	75 - 125

LABERGE ENVIRONMENTAL SERVICES
Attention: Ken Nordin
Client Project #: BIOCHAR RESEARCH
P.O. #:
Site Location:

Quality Assurance Report (Continued)

Maxxam Job Number: VB256252

QA/QC Batch Num	Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	UNITS	QC Limits
5974132	DJ	Spiked Blank	Total Lithium (Li)	2012/07/05		98	%	75 - 125
			Total Manganese (Mn)	2012/07/05		95	%	75 - 125
			Total Mercury (Hg)	2012/07/05		106	%	75 - 125
			Total Molybdenum (Mo)	2012/07/05		97	%	75 - 125
			Total Nickel (Ni)	2012/07/05		97	%	75 - 125
			Total Selenium (Se)	2012/07/05		102	%	75 - 125
			Total Silver (Ag)	2012/07/05		97	%	75 - 125
			Total Strontium (Sr)	2012/07/05		95	%	75 - 125
			Total Thallium (Tl)	2012/07/05		93	%	75 - 125
			Total Tin (Sn)	2012/07/05		93	%	75 - 125
			Total Titanium (Ti)	2012/07/05		95	%	75 - 125
			Total Uranium (U)	2012/07/05		95	%	75 - 125
			Total Vanadium (V)	2012/07/05		96	%	75 - 125
			Total Zinc (Zn)	2012/07/05		104	%	75 - 125
		Method Blank	Total Aluminum (Al)	2012/07/05	<100		mg/kg	
			Total Antimony (Sb)	2012/07/05	<0.10		mg/kg	
			Total Arsenic (As)	2012/07/05	<0.50		mg/kg	
			Total Barium (Ba)	2012/07/05	<0.10		mg/kg	
			Total Beryllium (Be)	2012/07/05	<0.40		mg/kg	
			Total Bismuth (Bi)	2012/07/05	<0.10		mg/kg	
			Total Cadmium (Cd)	2012/07/05	<0.050		mg/kg	
			Total Calcium (Ca)	2012/07/05	<100		mg/kg	
			Total Chromium (Cr)	2012/07/05	<1.0		mg/kg	
			Total Cobalt (Co)	2012/07/05	<0.30		mg/kg	
			Total Copper (Cu)	2012/07/05	<0.50		mg/kg	
			Total Iron (Fe)	2012/07/05	<100		mg/kg	
			Total Lead (Pb)	2012/07/05	<0.10		mg/kg	
			Total Lithium (Li)	2012/07/05	<5.0		mg/kg	
			Total Magnesium (Mg)	2012/07/05	<100		mg/kg	
			Total Manganese (Mn)	2012/07/05	<0.20		mg/kg	
			Total Mercury (Hg)	2012/07/05	<0.050		mg/kg	
			Total Molybdenum (Mo)	2012/07/05	<0.10		mg/kg	
			Total Nickel (Ni)	2012/07/05	<0.80		mg/kg	
			Total Phosphorus (P)	2012/07/05	<10		mg/kg	
			Total Potassium (K)	2012/07/05	<100		mg/kg	
			Total Selenium (Se)	2012/07/05	<0.50		mg/kg	
			Total Silver (Ag)	2012/07/05	<0.050		mg/kg	
			Total Sodium (Na)	2012/07/05	<100		mg/kg	
			Total Strontium (Sr)	2012/07/05	<0.10		mg/kg	
			Total Thallium (Tl)	2012/07/05	<0.050		mg/kg	
			Total Tin (Sn)	2012/07/05	<0.10		mg/kg	
			Total Titanium (Ti)	2012/07/05	<1.0		mg/kg	
			Total Uranium (U)	2012/07/05	<0.050		mg/kg	
			Total Vanadium (V)	2012/07/05	<2.0		mg/kg	
			Total Zinc (Zn)	2012/07/05	<1.0		mg/kg	
			Total Zirconium (Zr)	2012/07/05	<0.50		mg/kg	
		RPD	Total Aluminum (Al)	2012/07/05	3.5		%	35
			Total Antimony (Sb)	2012/07/05	NC		%	30
			Total Arsenic (As)	2012/07/05	2.1		%	30
			Total Barium (Ba)	2012/07/05	23.3		%	35
			Total Beryllium (Be)	2012/07/05	NC		%	30
			Total Bismuth (Bi)	2012/07/05	NC		%	30
			Total Cadmium (Cd)	2012/07/05	NC		%	30
			Total Calcium (Ca)	2012/07/05	2.1		%	30
			Total Chromium (Cr)	2012/07/05	3.1		%	30

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LABERGE ENVIRONMENTAL SERVICES
Attention: Ken Nordin
Client Project #: BIOCHAR RESEARCH
P.O. #:
Site Location:

Quality Assurance Report (Continued)

Maxxam Job Number: VB256252

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	UNITS	QC Limits
5974132 DJ	RPD	Total Cobalt (Co)	2012/07/05	0.5		%	30
		Total Copper (Cu)	2012/07/05	4.5		%	30
		Total Iron (Fe)	2012/07/05	0.2		%	30
		Total Lead (Pb)	2012/07/05	4.7		%	35
		Total Lithium (Li)	2012/07/05	NC		%	30
		Total Magnesium (Mg)	2012/07/05	4.3		%	30
		Total Manganese (Mn)	2012/07/05	1.7		%	30
		Total Mercury (Hg)	2012/07/05	NC		%	35
		Total Molybdenum (Mo)	2012/07/05	NC		%	35
		Total Nickel (Ni)	2012/07/05	2.2		%	30
		Total Phosphorus (P)	2012/07/05	3.0		%	30
		Total Potassium (K)	2012/07/05	5.4		%	35
		Total Selenium (Se)	2012/07/05	NC		%	30
		Total Silver (Ag)	2012/07/05	NC		%	35
		Total Sodium (Na)	2012/07/05	NC		%	35
		Total Strontium (Sr)	2012/07/05	12.8		%	35
		Total Thallium (Tl)	2012/07/05	NC		%	30
		Total Tin (Sn)	2012/07/05	NC		%	35
		Total Titanium (Ti)	2012/07/05	2.2		%	35
		Total Uranium (U)	2012/07/05	NC		%	30
		Total Vanadium (V)	2012/07/05	4.4		%	30
		Total Zinc (Zn)	2012/07/05	0.6		%	30
		Total Zirconium (Zr)	2012/07/05	NC		%	30
5974214 NS6	Spiked Blank	Soluble (2:1) pH	2012/07/05		101	%	96 - 104
	RPD	Soluble (2:1) pH	2012/07/05	0.5		%	20
5978220 JGD	Method Blank	Loss on Ignition	2012/07/06	<1.0		%	
	RPD [DV0615-01]	Loss on Ignition	2012/07/06	NC		%	35
5978595 PL	Spiked Blank	Available (NH4OAc) Potassium (K)	2012/07/09		95	%	80 - 120
	Method Blank	Available (NH4OAc) Potassium (K)	2012/07/09	<2.0		mg/kg	
	RPD	Available (NH4OAc) Potassium (K)	2012/07/09	0.4		%	35
5978596 PL	Spiked Blank	Available (NH4F) Phosphorus (P)	2012/07/09		101	%	80 - 120
	Method Blank	Available (NH4F) Phosphorus (P)	2012/07/09	<1.0		mg/kg	
	RPD	Available (NH4F) Phosphorus (P)	2012/07/09	NC		%	35
5984044 DL6	RPD [DV0612-02]	Cation exchange capacity	2012/07/10	NC		%	35
5985283 RP0	Matrix Spike	Available (NH4F) Nitrogen (N)	2012/07/09		100	%	80 - 120
	Spiked Blank	Available (NH4F) Nitrogen (N)	2012/07/09		98	%	90 - 110
	Method Blank	Available (NH4F) Nitrogen (N)	2012/07/09	<2.0		mg/kg	
	RPD	Available (NH4F) Nitrogen (N)	2012/07/09	NC		%	35
5991753 DL6	QC Standard	Organic Matter	2012/07/11		94	%	83 - 118
		Total Organic Carbon (C)	2012/07/11		94	%	83 - 118
	RPD [DV0613-02]	Organic Matter	2012/07/11	NC		%	35
		Total Organic Carbon (C)	2012/07/11	NC		%	35
5999590 KVD	QC Standard	% sand by hydrometer	2012/07/13		99	%	88 - 112
		% silt by hydrometer	2012/07/13		101	%	85 - 115
		Clay Content	2012/07/13		100	%	79 - 121
	RPD	% sand by hydrometer	2012/07/13	4.2		%	35
		% silt by hydrometer	2012/07/13	7.6		%	35
		Clay Content	2012/07/13	15.7		%	35
6000949 IA0	Matrix Spike [DV0615-02]	Total Kjeldahl Nitrogen	2012/07/13		90	%	75 - 125
	QC Standard	Total Kjeldahl Nitrogen	2012/07/13		90	%	75 - 125
	Spiked Blank	Total Kjeldahl Nitrogen	2012/07/13		105	%	75 - 125
	Method Blank	Total Kjeldahl Nitrogen	2012/07/13	<10		mg/kg	
	RPD [DV0615-02]	Total Kjeldahl Nitrogen	2012/07/13	NC		%	35

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

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LABERGE ENVIRONMENTAL SERVICES
Attention: Ken Nordin
Client Project #: BIOCHAR RESEARCH
P.O. #:
Site Location:

Quality Assurance Report (Continued)

Maxxam Job Number: VB256252

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.
QC Standard: A blank matrix to which a known amount of the analyte has been added. Used to evaluate analyte recovery.
Spiked Blank: A blank matrix to which a known amount of the analyte has been added. Used to evaluate analyte recovery.
Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.
NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was not sufficiently significant to permit a reliable recovery calculation.
NC (RPD): The RPD was not calculated. The level of analyte detected in the parent sample and its duplicate was not sufficiently significant to permit a reliable calculation.

Validation Signature Page

Maxxam Job #: B256252

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

Lili Zhou, Senior analyst, Inorganic department.

Rob Reinert, Data Validation Coordinator

==

Maxxam

Burnaby: 4606 Canada Way, Burnaby, BC V5G 1K5 Ph: (604) 734-7276 Fax: (604) 731-2386, Toll Free: (800) 665-8566

CHAIN OF CUSTODY RECORD

Click here to get the COC number

Maxxam Job #: B256252 COC #: EB492312 Page: 1 of 1

Invoice To: Require Report? Yes ☐ No ☐

Company Name:	Laberge Environmental Services
Contact Name:	Ken Nordin
Address:	Box 21072 Whitehorse Yukon, PC: Y1A 6P7
Phone / Fax#:	Ph: 867 668 6838 Fax: 867 667 6956
E-mail	

Report To:

Company Name:	same
Contact Name:	
Address:	PC:
Phone / Fax#:	Ph: Fax:
E-mail	

PO #:	
Quotation #:	
Project #:	Biochar Research
Proj. Name:	
Location:	
Sampled by:	Ken Nordin

REGULATORY REQUIREMENTS:

- ☐ CSR
- ☐ CCME
- ☐ BC Water Quality
- ☐ Other
- ☐ DRINKING WATER

SERVICE REQUESTED:

- ◉ Regular Turn Around Time (TAT) (5 days for most tests)
- RUSH (Please contact the lab) ○ 1 Day ○ 2 Day ○ 3 Day
- Date Required:

SPECIAL INSTRUCTIONS:
Return Cooler ☐ Ship Sample Bottles (please specify) ☐

ANALYSIS REQUESTED

	* Sample Identification	Lab Identification (Lab Use Only)	Sample Type	Date/Time(24hr) Sampled	Field Filtered? Y/N Dissolved Metals (DM)	Field Acidified? Y/N	Field Acidified? Y/N Total Metals	Cation Exchange Capacity (CEC)	Water Holding Capacity	% Organic Matter	metals	NPK (Nutrients)	pH	Particle size	C:N Ratio	Number of Containers
1	Peso Waste Rock	DV0612		12/06/24 12:00				x	x	x	x	x	x	x	x	
2	Peso Trenches	DV0613		12/06/24 12:00				x	x	x	x	x	x	x	x	
3	WHC A,B,C	DV0614		12/06/26 12:00				x	x	x	x	x	x	x	x	
4	MSGM A,B,C	DV0615		12/06/26 12:00				x	x	x	x	x	x	x	x	
5																
6																
7																
8																
9																
10																
11																
12																

Ken Nordin:
Please Homogenize WHC and MSGM jars A, B and C to form single sample for each.

B256252

*Relinquished By: (Print name and sign)	Date (yy/mm/dd):	Time (24hr):	Received by: (Print name and sign)	Date (yy/mm/dd):	Time (24 hr):	Time Sensitive
Ken Nordin	12/06/28	17:00	Laurel Berthier	2012/06/29	14:00	☐

Laboratory Use Only

Temperature on Receipt (°C)	Custody Seal	Yes	No
A) 18 B) 17 C) 18	Present?	☐	☑
Just sampled & rec'd on ice: ☐	Intact?	☐	N/A

*IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORDS. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

APPENDIX B

PHOTOGRAPHS, 2012 TO 2014

PHOTOGRAPHS OF THE PESO RESEARCH SITES, 2012 TO 2014

Photo #1: Each plot was first decompacted using a 5-pronged hand cultivator. Sept 2012.

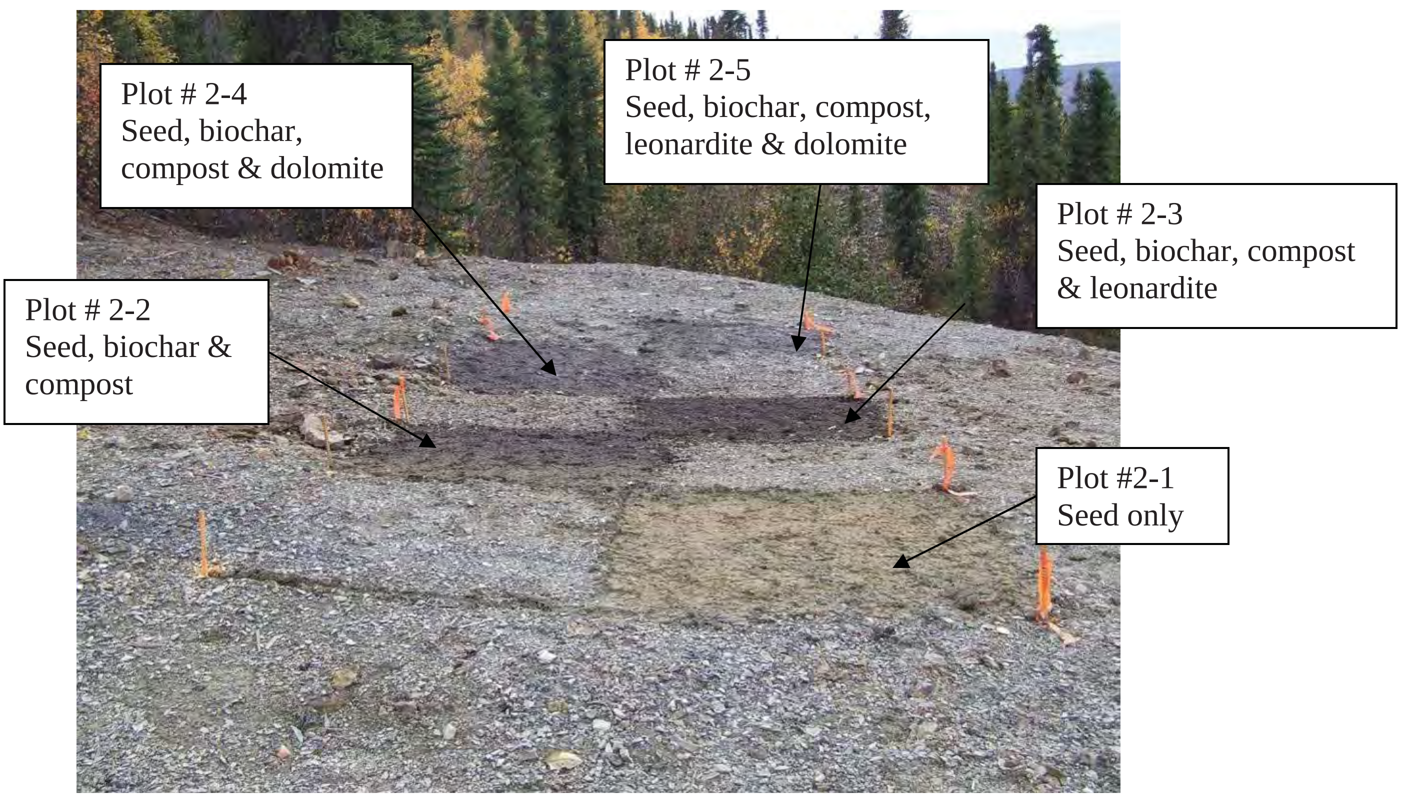

Photo #2: Seeded and treated plots at Block #2 on the waste rock dump, Sept 2012.

Photo #3: Trench Block #1. Plot # 1-2B in lower right corner. July 25th, 2013

Photo #4: Trench Block #1. Plot # 1-2B in lower right corner. August 5th, 2014

Photo #5: Trench Block #2. Plot # 2-1B in lower left. July 25th, 2013

Photo #6: Trench Block #2: Plot # 2-3A in lower right corner. September 15th, 2013.

Photo #7: Trench Block #3. Plot # 3-2A in lower left corner. July 25th, 2013

Photo #8: Trench Block #3. Plot # 3-2A in lower left corner. August 5th, 2014

Photo #9: Waste Rock Block #1: Plot # 1-1 in lower left corner. July 25th, 2013

Photo #10: Waste Rock Block #1, Plot # 1-1 in lower left corner. August 5th, 2014

Photo #11: Waste Rock Block #2, Plot # 2-1 in lower right corner. July 25th, 2013.

Photo #12: Waste Rock Block #2, Plot # 2-1 in lower right corner. August 5th, 2014 The pinkish colour are the mature seed heads of Ticklegrass.

Photo #13: Waste Rock Block #3. Plot # 3-5 in lower right of the block, July 25th, 2013

Photo #14: Waste Rock Block #3. Plot # 3-5 in lower right corner, August 5th, 2014

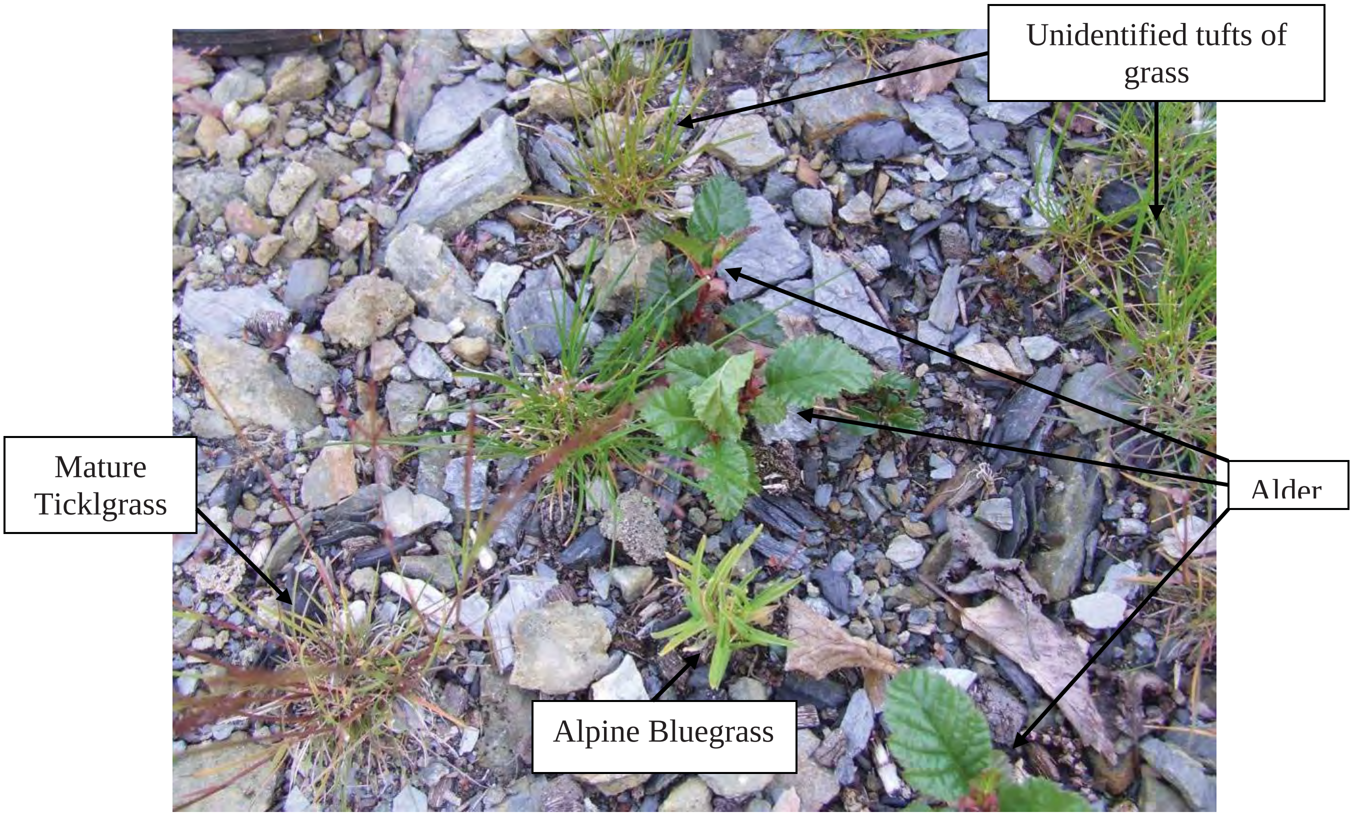

Photo #15: Diverse growth at Plot # 1-3 at the Trench site, August 5th, 2014

Photo #16: Healthy growth at Plot # 2-2 at the Trench site, August 5th, 2014.

Photo #17: Plot # 3-2A was diverse and had the most mature plants of any plots at the Trench site, August 5th, 2014.

Photo # 18: Plot # 1-2 at the Waste Rock site had many mature ticklegrass plants, Aug 5th, 2014.

Photo #19: There were also many mature Ticklegrass plants at Block 2 at the Waste Rock Site, August 5th, 2014. Plot # 2-3 is in the centre of the photo.

Photo #20: Plot # 3-4 was the healthiest plot in Block 3 of the Waste Rock Site, August 5th, 2014.

APPENDIX C

REVEGETATION ASSESSMENT RESULTS

APPENDIX C, TABLE 5 ASSESSMENTS OF THE PLOTS AT THE WASTE ROCK SITE, 2013 and 2014

BLOCK #1

Plot #	Date	% Cover	Species, height cm and/or # of individuals	Overall Health	Comments
1-1	Jul-13	0			bare plot
	Sep-13	<1	1 blade of unidentifiable grass	stressed	bare plot
	Aug-14	0			bare plot, moist soil
1-2	Jul-13	40 - 50	2 species of grass - unidentified alder, 8 plants hedysarum, 2 plants	good	tallest and most robust growth of all plots in block
	Sep-13	60 - 65	tickle grass, some in seed, max 30 cm glaucous bluegrass up to 12 cm sheep fescue (?), 8 cm alder < 1cm hedysarum, < 2cm	good	green healthy growth, signs of grazing
	Aug-14	70	tufted hairgrass, 2 plants up to 40 cm ticklegrass, many plants, avg 35 cm sheep fescue, 3 mature plants, max 35 to 40 cm alder, 7 plants	good	even coverage of plot, 1 willow in plot
1-3	Jul-13	15 - 20	small tufts of unidentified grass alder, 2 plants - very small	good	
	Sep-13	30 - 35	glaucous bluegrass up to 8 cm unidentified grass up to 10 cm alder, <1 cm	good	sporadic cover
	Aug-14	40	ticklegrass, max 35 cm alder, 1 plant	fairly good	uneven distribution, bare sections
1-4	Jul-13	10 - 15	small tufts of unidentified grass, at least 2 species	fairly good	
	Sep-13	30 - 35	glaucous bluegrass up to 8 cm unidentified grass up to 4 cm alder, <1 cm	partially stressed	
	Aug-14	50	ticklegrass, many mature plants, up to 30 cm sheep fescue, a few plants, up to 15 cm alder, 5 plants	good	uneven distribution
1-5	Jul-13	5	sparse short growth of grasses	stressed	
	Sep-13	50	glaucous bluegrass, 4 cm tickle grass up to 3 cm unidentified grass up to 4 cm alder, < 2cm hedysarum	good	Signs of grazing. even coverage of growth
	Aug-14	60	tickle grass, mature, max 25 cm immature glacous bluegrass immature grass - may be sheep fescue alder, 2 plants	good	Several tufts of unidentifiable grass.

APPENDIX C, TABLE 5 ASSESSMENTS OF THE PLOTS AT THE WASTE ROCK SITE, 2013 and 2014

BLOCK #2

Plot #	Date	% Cover	Species, height cm and/or # of individuals	Overall Health	Comments
2-1	Jul-13	0	no sign of any growth		bare plot
	Sep-13	0	no sign of any growth		bare plot
	Aug-14	0	no sign of any growth		bare plot
2-2	Jul-13	35	unidentified tufts of grass - healthy alder, 1 plant, very small hedysarum, 2 plants	good	coverage mostly on east half
	Sep-13	50	ticklegrass up to 16 cm sheep fescue up to 12 cm glaucous bluegrass up to 8 cm alder hedysarum,	good	growth covers most of the eastern half of plot
	Aug-14	60	ticklegrass, mature, max 30 cm alder, 7 plants volunteer willow, 6 plants volunteer spruce, 2 plants	good	growth covers most of the eastern half of plot
2-3	Jul-13	45	unidentified tufts of grass - healthy alder, 9 plants	good	more even coverage
	Sep-13	60	ticklegrass up to 11 cm glaucous bluegrass up to 11 cm alder, several small seedlings	good	even cover of plot
	Aug-14	60	ticklegrass, max 38 cm immature sheep fescue alder, >20 plants	good	even distribution
2-4	Jul-13	50	unidentified tufts of 2 to 3 species of grass - healthy glacuous bluegrass alder, 1 plant	good	even growth on plot
	Sep-13	60	glaucous bluegrass up to 8 cm sheep fescue up to 4 cm ticklegrass up to 3 cm alder, <1 cm	good	even cover of plot
	Aug-14	60	sheep fescue, several mature immature glaucous bluegrass, up to 15 cm alder, 15 plants	good	even distribution 1 volunteer willow plant
2-5	Jul-13	30	unidentified tufts of grass - healthy hedysarum, 2 plants	good	
	Sep-13	40 - 50	tickle grass up to 30 cm glaucous bluegrass up to 13 cm alder, < 1cm	good	even cover of plot, less robust growth than plot 2-4
	Aug-14	50	tickle grass, many mature, up to 30 cm sheep fescue, several, up to 25 cm alder, 8 plants	good	

APPENDIX C, TABLE 5 ASSESSMENTS OF THE PLOTS AT THE WASTE ROCK SITE, 2013 and 2014

BLOCK #3

Plot #	Date	% Cover	Species, height cm and/or # of individuals	Overall Health	Comments
3-1	Jul-13	0	no growth		bare plot
	Sep-13	0	no growth		bare, moist plot
	Aug-14	0	no growth		moose track in plot
3-2	Jul-13	30	unidentified tufts of grass alder, 5 plants	partially stressed	growth localized, plants appear stressed on right side
	Sep-13	30	ticklegrass, lots in seed, up to 35 cm glaucous bluegrass up to 8 cm	partially stressed	
	Aug-14	20	ticklegrass, mature, max 33 cm sheep fescue, several mature, max 15 cm	partially stressed	half of plot is bare
3-3	Jul-13	5	sparse stressed grass growth	stressed	
	Sep-13	5 - 10	unidentified grass up to 5 cm	stressed	
	Aug-14	0	dead grasses from last year's growth	stressed	
3-4	Jul-13	40 - 50	many tufts of healthy unidentified grasses	good	good growth in lower half
	Sep-13	50	tickle grass, some in seed, up to 4 cm sheep fescue (?), 7 cm glaucous bluegrass, up to 2 cm	good	
	Aug-14	35	ticklegrass, up to 35 cm tufted hairgrass, 1 mature plant, up to 40 cm sheep fescue, 1 mature plant, up to 34 cm	good	healthiest plot in Block #3
3-5	Jul-13	<10	unidentified grasses	partially stressed	some tufts quite healthy
	Sep-13	10 - 15	glaucous bluegrass, < 2 cm unidentified grass up to 3 cm	stressed	most plants are brown
	Aug-14	<10	tickle grass, a few mature and immature, up to 25 cm glacous bluegrass, 1 mature, 25 cm stressed stunted grasses dead grass from last year	stressed	good soil moisture

NOTE: stressed = brown or withered plants
good = green plants showing vigor

APPENDIX C, TABLE 6 ASSESSMENTS OF THE PLOTS AT THE TRENCH SITE, 2013 and 2014

BLOCK #1

Plot #	Date	% Cover	Species, avg height cm and/or # of individuals	Overall Health	Comments
1-1A	Jul-13	<1	sparse scraggly grass growth 1 hedysarum	stressed	a few shoots deep in gravel
	Sep-13	<1	unidentifiable grass, mostly brown, 2-3 cm	stressed	some green growth
	Aug-14	0			no growth
1-2A	Jul-13	45 - 50	alpine bluegrass unidentifiable grass hedysarum, 7 plants	good	even grass cover
	Sep-13	50	alpine bluegrass < 2cm 2 other grass species up to 4cm alder < 1cm hedysarum, < 2cm	good	Signs of grazing.
	Aug-14	60	alpine bluegrass ticklegrass, max 30 cm sheep fescue, max 30 cm alder, 13 plants	good	lots of tufts of unidentifiable grass 5 - 7 cm tall
1-3	Jul-13	40	alpine bluegrass unidentified grasses hedysarum, 8 plants alder, 3 plants	good	most robust growth in Block #1
	Sep-13	50 - 60	alpine bluegrass, dominant species, < 3cm 3 other grass species up to 5 cm alder, <2 cm hedysarum, < 2cm	good	Signs of grazing.
	Aug-14	70	ticklegrass, max 30 cm, more mature plants than 1-2A alpine bluegrass, avg 4 cm alder, 8 plants sheep fescue, max 22 cm, 1 mature plant	good	Lots of tufts of unidentifiable grass 5 - 6 cm tall. Signs of grazing.
1-1B	Jul-13	<5	unidentified grass hedysarum, 4 plants alder, 1 plant	stressed	but some green growth
	Sep-13	<5	brown grasses, 2 - 4 cm hedysarum	stressed	
	Aug-14	<1	hedysarum, 1 plant	stressed	dead grass from last year
1-2B	Jul-13	35	alpine bluegrass unidentified grasses hedysarum alder	good	even coverage of plot
	Sep-13	45	alpine bluegrass, 2 - 3 cm 3 other grass species, 2 - 4 cm alder, < 1cm	good	Signs of grazing. scat in plot
	Aug-14	60	tickle grass, many mature, max 38 cm alpine bluegrass, 3-4 cm, not as many as 1-3 alder, 4 plants some small hedysarum	good	Several tufts of unidentifiable grass. Alder leaf litter from near by.

APPENDIX C, TABLE 6 ASSESSMENTS OF THE PLOTS AT THE TRENCH SITE, 2013 and 2014

BLOCK #2

Plot #	Date	% Cover	Species, height cm and/or # of individuals	Overall Health	Comments
2-3A	Jul-13	25 - 30	unidentifed grasses alder, 2 plants hedysarum, 1 plant	good	Buffer plot above 2-3A and beside 2-1A has 14 alder and 1 labrador tea.
	Sep-13	35	alpine bluegrass, <2cm 3 other species of grass alder	good	Signs of grazing. Rabbit pellet spruce seedling
	Aug-14	45	spiked trisetum, 2 mature, up to 27 cms sheep fescue, 5 mature, up to 27 cm alpine bluegrass, <2cm lots of tufts of unidentifed grasses alder, 6 plants	good	1 possible volunteer blueberry plant in plot
2-1A	Jul-13	<5	sparse straggly grass shoots alder, 3 plants	stressed	
	Sep-13	<5	2 grasses, 2 - 3 cm hedysarum, 1 plant alder	stressed	Most grasses were brown
	Aug-14	<1	small grasses alder, 3 plants	stressed	1 labrador tea in plot
2-2	Jul-13	40	alpine bluegrass unidentified grasses	good	even distribution
	Sep-13	45	alpine bluegrass, 2 cm unidentified grass species up to 5 cm	good	
	Aug-14	50	sheep fescue, several mature, up to 25 cm lots of immature apline bluegrass, <3 cm spiked trisetum, 3 mature, up to 15 cms tickle grass, 1 mature, up to 23 cm alder, 2 plants	good	good healthy coverage
2-3B	Jul-13	20	unidentified tufts of grasses hedysarum, 1 plant	good	
	Sep-13	30	alpine bluegrass, 2 cm 2 species of grass, <4 cm hedysarum	good	Tiny capped mushrooms in plot.
	Aug-14	40	tickle grass, 2 plants up to 20 cm alpine bluegrass, 1 mature, up to 10 cm several tufts of unknown grasses alder, 1 plant	good	2 alders growing just outside of plot
2-1B	Jul-13	<5	a few blades of unidentifed grass hedysarum, 1 plant	stressed	1 spruce seedling in plot
	Sep-13	5	unidentified grass, 3 - 4 cm alder, <1 cm, 4 plants	stressed	most grasses are brown
	Aug-14	<1	quite a bit of dead grass - didn't survive alder, 3 plants	stressed	possible 3 willows in plot

APPENDIX C, TABLE 6 ASSESSMENTS OF THE PLOTS AT THE TRENCH SITE, 2013 and 2014

BLOCK #3

Plot #	Date	% Cover	Species, avg height cm and/or # of individuals	Overall Health	Comments
3-2A	Jul-13	40	unidentified tufts of grass - lots alpine bluegrass, alder, 1 plant hedysarum, 2 plants	good	robust healthy plot
	Sep-13	40	alpine bluegrass, 2 cm 2 other grass species, <4 cm hedysarum, <1 cm alder, <1 cm	good	Sign of grazing. Some moss in plot
	Aug-14	60	tufted hairgrass, 4 mature plants, up to 70 cm ticklegrass, mature up to 35 cm sheep fescue, mature up to 35 cm spiked trisetum, mature up to 33 cm alpine bluegrass, lots of immature, < 3cm alder, 1 plant	good	4 volunteer willow in plot, very diverse plot, has the most mature plants
3-3A	Jul-13	35	unidentified tufts of grass - lots tufted hairgrass, 1 mature plant	good	
	Sep-13	40	tufted hairgrass, mature, up to 30 cm alpine bluegrass, 2 cm other grasses, 3 cm alder	good	Sign of grazing.
	Aug-14	50	tufted hairgrass, mature, up to 42 cm ticklegrass, mature up to 36 cm sheep fescue, mature up to 30 cm spiked trisetum, mature up to 20 cm alpine bluegrass, lots of immature, 2 - 4 cm alder, 4	good	1 willow in plot
3-1	Jul-13	5	sparse unhealthy unidentified grass	stressed	in upper right corner only
	Sep-13	5 - 10	unidentifed grass, <3 cm alder, <1 cm	stressed	grass is brown
	Aug-14	<5	sheep fescue, immature - small but healthy ticklegrass, 1 mature, 10 cm alder, 10 plants, very small	good	1 labrador tea and 1 tiny spruce seedling in plot, one fairly large aspen growing downhill of plot
3-2B	Jul-13	20	unidentified small tufts of grasses alpine bluegrass alder, 3 plants hedysarum, 5 plants	good	
	Sep-13	30	alder, <2cm, 12 plants alpine bluegrass, < 2cm unidentified grass, < 4cm hedysarum, < 2cm	partially stressed	But lots of green healthy plants.
	Aug-14	40	tickle grass up to 15 cm alpine bluegrass unidentified immature grasses alder, approx 20	good	1 willow growing in plot
3-3B	Jul-13	10 - 15	small tufts of unidenfied grasses alpine bluegrass alder, 5 plants hedysarum, 1 plant	fairly good	possible willow in plot
	Sep-13	15 - 20	alpine bluegrass, < 1cm unidentified grass, < 3cm alder, < 1cm hedysarum, < 2cm	good	plants appear healthy although small
	Aug-14	30	unidentified tufts of grass - several alpine bluegrass, immature alder, 9 plants	good	no mature grasses 1 spruce in plot 1 willow in plot

NOTE: stressed = brown or withered plants
good = green plants showing vigor

APPENDIX C, FIGURE 5 Waste Rock Site as Assessed on August 5th, 2014

Treatment Number	Treatment
1	Seed only
2	Seed, biochar, compost
3	Seed, biochar, compost, leonardite
4	Seed, biochar, compost, dolomite lime
5	Seed, biochar, compost, leonardite, dolomite lime

Waste Rock Block #1

1 Plot # 1-1 C = 0% D = 0		**3** Plot # 1-3 C = 40% D = 2		**5** Plot # 1-5 C = 60% D = 4
	2 Plot # 1-2 C = 70% D = 5		**4** Plot # 1-4 C = 50% D = 3	

Waste Rock Block #2

	2 Plot # 2-2 C = 60% D = 4		**4** Plot # 2-4 C = 60% D = 3	
1 Plot # 2-1 C = 0% D = 0		**3** Plot # 2-3 C = 60% D = 3		**5** Plot # 2-5 C = 50% D = 3

Waste Rock Block #3

1 Plot # 3-1 C = 0% D = 0		**3** Plot # 3-3 C = 0% D = 0		**5** Plot # 3-5 C = <10% D = 3
	2 Plot # 3-2 C = 20% D = 2		**4** Plot # 3-4 C = 35% D = 3	

C = Cover D = Diversity [orange box] → Buffer plots – not seeded or treated.

APPENDIX C, FIGURE 6 Trench Site as Assessed on August 5th, 2014

Treatment Number	Treatment
1	Seed only
2	Seed, biochar, compost
3	Seed, biochar, compost, leonardite

Trench Block #1

1 Plot #1-1A C = 0% D = 0		**3** Plot #1-3 C = 70% D = 4		**2** Plot #1-2B C = 60% D = 4
	2 Plot #1-2A C = 60% D = 4		**1** Plot #1-1B C = <1% D = 1	

Trench Block #2

	1 Plot # 2-1A C = <1% D = 3		**3** Plot # 2-3B C = 40% D = 4	
3 Plot # 2-3A C = 45% D = 6		**2** Plot # 2-2 C = 50% D = 5		**1** Plot # 2-1B C = <1% D = 2

Trench Block #3

2 Plot #3-2A C = 60% D = 8		**1** Plot #3-1 C = <5% D = 5		**3** Plot #3-3B C = 30% D = 5
	3 Plot #3-3A C = 50% D = 7		**2** Plot #3-2B C = 40% D = 5	

C = Cover D = Diversity → Buffer plots – not seeded or treated.

APPENDIX C, TABLE 7 SPECIES RICHNESS AND DOMINANT SPECIES WHERE APPLICABLE, AT EACH PLOT AT THE TRENCH AND WASTE ROCK SITES

Site	Block #	Plot #	Date	Richness (# of species)	Dominant Species (if identifiable)
TRENCH	1	1-1A	2013/Jul	2	
			2013/Sep	1	
			2014/Aug	0	
		1-2A	2013/Jul	3	
			2013/Sep	5	
			2014/Aug	4	
		1-3	2013/Jul	4	
			2013/Sep	6	
			2014/Aug	4	
		1-1B	2013/Jul	3	
			2013/Sep	2	
			2014/Aug	1	
		1-2B	2013/Jul	4	
			2013/Sep	5	
			2014/Aug	4	
	2	2-3A	2013/Jul	3	
			2013/Sep	5	
			2014/Aug	6	
		2-1A	2013/Jul	2	
			2013/Sep	3	
			2014/Aug	3	
		2-2	2013/Jul	2	
			2013/Sep	2	
			2014/Aug	5	
		2-3B	2013/Jul	2	
			2013/Sep	2	
			2014/Aug	4	
		2-1B	2013/Jul	3	
			2013/Sep	2	
			2014/Aug	2	
	3	3-2A	2013/Jul	4	
			2013/Sep	5	
			2014/Aug	8	
		3-3A	2013/Jul	2	
			2013/Sep	4	
			2014/Aug	7	
		3-1	2013/Jul	1	
			2013/Sep	2	
			2014/Aug	5	
		3-2B	2013/Jul	4	
			2013/Sep	4	
			2014/Aug	5	
		3-3B	2013/Jul	4	
			2013/Sep	5	
			2014/Aug	5	

Site	Block #	Plot #	Date	Richness (# of species)	Dominant Species (if identifiable)
WASTE ROCK	1	1-1	2013/Jul	0	
			2013/Sep	1	
			2014/Aug	0	
		1-2	2013/Jul	4	
			2013/Sep	5	
			2014/Aug	5	*Agrostis scabra*
		1-3	2013/Jul	2	
			2013/Sep	3	
			2014/Aug	2	*Agrostis scabra*
		1-4	2013/Jul	2	
			2013/Sep	3	
			2014/Aug	3	*Agrostis scabra*
		1-5	2013/Jul	1	
			2013/Sep	5	
			2014/Aug	4	*Agrostis scabra*
	2	2-1	2013/Jul	0	
			2013/Sep	0	
			2014/Aug	0	
		2-2	2013/Jul	3	
			2013/Sep	5	
			2014/Aug	4	*Agrostis scabra*
		2-3	2013/Jul	2	
			2013/Sep	3	
			2014/Aug	3	*Agrostis scabra*
		2-4	2013/Jul	3	
			2013/Sep	4	
			2014/Aug	3	*Agrostis scabra*
		2-5	2013/Jul	2	
			2013/Sep	3	
			2014/Aug	3	*Agrostis scabra*
	3	3-1	2013/Jul	0	
			2013/Sep	0	
			2014/Aug	0	
		3-2	2013/Jul	2	
			2013/Sep	2	
			2014/Aug	2	
		3-3	2013/Jul	1	
			2013/Sep	1	
			2014/Aug	0	
		3-4	2013/Jul	1	
			2013/Sep	3	
			2014/Aug	3	*Agrostis scabra*
		3-5	2013/Jul	1	
			2013/Sep	2	
			2014/Aug	3	