Remedial Excavation and Soil Sampling Report

Calder Limestone Mine
Prince of Wales Island, Alaska
HydroCon Project Number: 2015-010

Prepared for:

Columbia River Carbonates
P.O. Box 2350
Woodland, Washington 98674

May 26, 2016

Prepared by:

HydroCon, LLC
510 Allen Street, Suite B Kelso, Washington 98626
p: (360) 703-6079 f: (360) 703-6086
www.hydroconllc.net

Table of Contents

1.0 INTRODUCTION 1
1.1 Site Description 1
1.2 Site History 1
1.3 Scope of Services 3
2.0 PRE-FIELD ACTIVTIES 3
2.1 Preparation of Site-Specific Health and Safety Plan 3
2.2 Field Screening Methods 3
2.3 Soil Cleanup Levels 4
3.0 SOIL SAMPLING AND ANALYSIS 4
4.0 SUPPLEMENTAL REMEDIAL EXCAVATION 4
4.1 Camp Generator Supplemental Remedial Excavation 5
4.2 Soil Treatment 5
5.0 SOIL ANALYTICAL RESULTS 6
6.0 CONCLUSIONS AND RECOMMENDATIONS 6
6.1 Camp Generator Area 6
6.2 HydroCon Stockpile 7
6.3 Fueling Station and Historical Stockpiles 7
7.0 DATA QUALITY REVIEW 8
8.0 QUALIFICATIONS 8

List of Figures

Figure 1 – Site Vicinity Map
Figure 2 – Site Features
Figure 3 – Camp Generator Layout and Excavation Sample Locations

List of Tables

Table 1 – 2016 Soil Analytical Results

Appendices

Appendix A - Photographic Documentation
Appendix B - Laboratory Report and Chain-of-Custody Documentation
Appendix C - Stockpile Sampling Plan
Appendix D - Laboratory Data Review Checklist

1.0 INTRODUCTION

1.1 Site Description

The site is located in the northwest portion of the Prince of Wales Island in Alaska (Figure 1). It is currently operating as a calcium carbonate mine, owned and operated by Columbia River Carbonates (CRC). The site includes an open-pit calcium carbonate mine, loading/barge area, fueling station, shop area, and camp site. Additional site improvements include gravel access roadways, diesel power generators, and a water treatment/storage system.

1.2 Site History

In July 2004, Carson Dorn, Inc. (CDI) conducted a site assessment of the subject site. During the assessment, diesel-contaminated soils were observed adjacent to the Camp Generator, downhill from the two 18,000-gallon diesel aboveground storage tanks (ASTs), also known as the Fueling Station, and in an existing stockpile of soil. CDI also noted the presence of a drum storage area west of the Fueling Station. These and other site features are shown on Figure 2.

CDI collected five soil samples during the site assessment. Soil analytical results indicated that the existing 15 cubic yard stockpile (Sample C-1) had a diesel-range organics (DRO) concentration of 4,780 milligrams per kilogram (mg/kg). The two soil samples collected from Camp Generator area had a DRO concentration of 9,750 mg/kg near the 500-gallon diesel AST used to supply the generator (Sample G-2) and 485,000 mg/kg at the door of the Camp Generator (Sample G-1). In the Fueling Station area, a sample collected from the end of the westerly 18,000 AST had a DRO concentration of 16,400 mg/kg. The Method Two Alaska Department of Environmental Conservation (ADEC) cleanup level for DRO is 230 mg/kg.

In August 2004, CDI performed a drum inventory at the site. A total of 93 drums were present. Eighty of the drums were located in the drum storage area next to the Fueling Station and remainder of the drums was located in the Shop area. The contents of the drums included new and used gasoline, diesel, oil, grease, antifreeze, and water. The contents were consolidated into 51 drums and shipped off the island for recycling.

In September 2004, CDI provided oversight for the removal of contaminated soil by excavation from the two areas above. An estimated total of 100 cubic yards of soil was generated from the two excavations and from the 15 cubic yard stockpile and placed into an approximately 22'W x 60'L x 2'H (~100 cubic yards) bioremediation cell constructed on the site. This stockpile is referred to as the CDI Stockpile in this document.

In 2012, CRC performed a remedial excavation near the Camp Generators. Visibly stained soil was removed from the area south of the generator. The excavation measured approximately 50' x 30'. The depth of the excavation was approximately 6 feet below ground surface (bgs). No confirmation

samples were collected at that time. The contaminated soil was transported to the onsite bioremediation cell staging area. The soil was placed on and covered with heavy gauge plastic sheeting. Two stockpiles were created: 35'L x 16'W x 3.5'H (approximately 135 cubic yards) and 30'L x 10'W x 1.5'H (approximately 16 cubic yards). These stockpiles are referred to as the CRC1 and CRC2 Stockpiles, respectively, in this document.

In August 2015 HydroCon personnel mobilized to the site to provide oversight and direction of the remedial excavation in the two identified areas (Camp Generator and Fueling Station). Southeast Road Builders Construction Company (subcontractor for CRC) performed the excavation using a Cat 336E trackhoe. All PCS was placed into a dump truck and hauled to the newly constructed biotreatment cell area referred to as the HydroCon Stockpile (Figure 2). Excavation activities were completed in both areas until either field screening indicated that the contamination was no longer present or camp infrastructure presented obstruction for further remedial activities. Confirmation soil samples were collected from both excavation areas. Soil removed from the excavation was placed in a stockpile ("HydroCon" stockpile, Figure 2) and the pile was fertilized at a rate of 400 pounds urea and 100 pounds of phosphorus potassium fertilizer mix per 100 cubic yards of soil. The soil was mixed using the excavator bucket. After mixing, 10 mm polyethylene liners were placed over the stockpiled soil. In addition, HydroCon completed sampling of the existing stockpiles (CDI, CRC1, and CRC2).

The details of this work were provided in a HydroCon report, *Remedial Excavation and Soil Stockpile Sampling Report*, dated October 25, 2015. The report provided the following conclusions and recommendations:

Camp Generator Area:
Approximately 180 cubic yards of PCS was removed from the Camp Generator area. The majority of accessible PCS was removed from this area of the site. HydroCon suggested performing additional remedial excavation to remove as much of the remaining PCS in this area of the site as practical.

Fueling Station
Approximately 200 cubic yards of PCS was removed from the Fueling Station area. Soil analytical results indicate that most of the confirmation soil sampling locations still had DRO concentrations above the 230 mg/kg CUL for diesel. HydroCon recommended performing additional remedial excavation to remove as much of the remaining PCS in this area of the site as practical once the mining season was closed and the haul road could be temporarily closed to gain access to the remaining PCS to the south.

CDI Stockpile
Soil analytical results indicated that enhanced bioremediation of soil in this stockpile has been successful at reducing DRO and constituents below ADEC's respective CULs. HydroCon recommended using the treated soil as fill at the site in areas away from any water body or remedial excavation.

CRC1 Stockpile

The concentration of DRO in this stockpile still remains above ADEC's CUL. HydroCon recommended further augmentation of the stockpile using tilling and fertilizer to reduce the concentration of DRO below ADEC's cleanup level followed by confirmation sampling in late Summer 2016.

CRC2 Stockpile

Soil analytical results indicated that enhanced bioremediation of soil in this stockpile has been successful at reducing DRO and constituents below ADEC's respective CULs. HydroCon recommended to use the treated soil as fill at the site in areas away from any water body or remedial excavation.

HydroCon Stockpile

At the completion of remedial excavation the stockpile was fertilized using 1,600 pounds of urea and 400 pounds of phosphorus potassium fertilizer mix. HydroCon recommended further augmentation of the stockpile using tilling and fertilizer to reduce the concentration of DRO below ADEC's cleanup level followed by confirmation sampling in late Summer 2016.

1.3 Scope of Services

This report details the supplemental remedial excavation and soil sampling activities completed at the subject site in April 2016. The objective of the scope of services was to perform supplemental remedial excavation of petroleum contaminated soil (PCS) from the Camp Generator area of the site (Figure 2) where a historical release of diesel fuel has impacted soil quality. Additional excavation in the Fueling Station area was not completed due to the active status of the mine and use of the haul road, the inability to move the ASTs, and other camp infrastructure. HydroCon performed the work following the procedures described in the Cleanup Action and Sampling Plan dated June 26, 2015. Details of the work are provided below.

2.0 PRE-FIELD ACTIVTIES

2.1 Preparation of Site-Specific Health and Safety Plan

HydroCon updated the site specific health and safety plan (HASP) to govern health and safety protocols used during this investigation. Work was performed using Occupational Safety and Health Administration (OSHA) Level D work attire consisting of hard hats, safety glasses, protective gloves, and protective boots.

2.2 Field Screening Methods

Field screening was performed during excavation to assess the nature and extent of petroleum contamination. Field screening consisted of volatile organic vapor measurements using a photoionization detector (PID), sheen testing, visual observations (staining, etc.), and olfactory

observations. A portion of each soil sample was placed in a sealed Zip-Lock baggie. The tip of the PID was inserted into the Zip-Lock bag in the airspace above the soil sample and the PID measurement was recorded. The PID was calibrated before use each day to a test gas standard consisting of 100 ppmv isobutylene. Because several factors can affect PID readings (e.g. moisture, temperature, and background conditions), HydroCon determined that a value of 1 ppm or greater may indicate the presence of organic vapors originating from contaminants at the site. Sheen testing consisted of placing a small portion of soil in clear water and observing the water for the presence of hydrocarbon sheen

All field observations, field measurements, soil sampling locations, site sketches, etc. were recorded of field forms. The data on these field forms was used to prepare this report and graphics herein.

2.3 Soil Cleanup Levels

The proposed cleanup levels for this project are Method Two of ADEC's Oil Pollution and Hazardous Substances Pollution Control Regulations (Table B2, 18 AAC 75). The cleanup levels (based on over 40 inches of rainfall) are:

Parameter	ADEC Cleanup Level (CUL) in mg/kg		
	Ingestion	Inhalation	Migration to Groundwater
DRO	8,250	12,500	230
Benzene	120	8.5	0.025
Toluene	6,600	220	6.5
Ethylbenzene	8,300	81	6.9
Total Xylenes	16,600	63	63

3.0 SOIL SAMPLING AND ANALYSIS

The source of contamination at Camp Generator (Figure 3) are spills from the ASTs used to store diesel, therefore all samples were analyzed for DRO using Alaska's Method AK102. Field duplicate samples were also collected for quality control purposes. At the request of ADEC, the analysis for benzene, toluene, ethylbenzene, and total xylenes (BETX) by EPA Method 8260B was also analyzed in confirmation samples at an approximate rate of one per ten samples.

All soil samples were placed in laboratory-prepared glass jars and uniquely labeled with the sample identification number, date and time of sample collection, and site name. The sample jars were placed in a chilled cooler along with chain-of-custody documentation and transported to Friedman & Bruya laboratory in Seattle, Washington via air freight.

4.0 SUPPLEMENTAL REMEDIAL EXCAVATION

On April 7, 2016, HydroCon directed remedial excavation of PCS at the Camp Generator area. Southeast Road Builders Construction Company (subcontractor for CRC) performed the excavation using a Cat 336E trackhoe. All PCS was placed into a dump truck and hauled to the newly constructed

biotreatment cell area referred to as the HydroCon Stockpile (Figure 2). The PCS was placed on top of new 30-mil plastic geomembrane, as described in the approved work plan. A discussion of the supplemental remedial excavation is provided below. Photographs of the remedial activities are provided in Appendix A.

4.1 Camp Generator Supplemental Remedial Excavation

The remedial excavation began immediately north of the northern extent of the 2015 remedial excavation and as close to the drainage ditch (western limit) as practical. The excavation proceeded as far north and east as practical until physical constraints (proximity to the drainage ditch to the northwest; wetland area, water treatment Conex®, and camp water tank [poly tank on Figure 3] to the north/northeast; and Mess Hall to the east) prevented any further excavation. Approximately 200 cubic yards of PCS was removed from this area of the site. The extent of remedial excavation is illustrated on Figure 3.

Soil exhibiting moderate to strong diesel odor, visible staining and PID readings up to 50 ppm were observed in the excavation. The soil in the upper 2 feet within the excavation consisted of gravel and cobble fill. The soil underlying the fill consisted of native fine sand and low to medium plastic fines with abundant organic material, wood debris, and logs. Water seeping in from the drainage ditch was observed when the excavation reached a depth of approximately 6.5 feet bgs. Minimal accumulation of water occurred on the excavation floor and was left in place. The excavation was advanced to a depth of 7 feet bgs.

HydroCon collected confirmation soil samples from the sidewalls (samples S9 through S15 at approximate depths between 5 and 6 feet bgs) and floor of the excavation (samples F4-7 through F6-7). No further excavation was attempted due to physical constraints. Since this area of the site is used as living quarters, power generation, and the potable water supply system, further remedial action will have to wait until the mining season is over so that the water treatment container and water storage tank can be moved to gain more access to PCS. However, based on the close proximity to the north adjacent wetland area, additional excavation may not be feasible.

4.2 Soil Treatment

All PCS removed from the remedial excavation was transported to the newly constructed Bio Cell area (referred to as the “HydroCon Stockpile”) shown on Figure 2. This soil stockpile is located on relatively flat ground with no surface water bodies within 100 feet. Approximately 200 additional cubic yards of PCS was placed on top of 30-mil geomembrane liners in approximate 3-foot lifts.

As the soil was excavated (using an approximately 1.5 cubic yard excavator bucket) it was fertilized at a rate of 6 pounds urea and 1.5 pounds of phosphorus potassium fertilizer mix per 1.5 cubic yards of soil. The soil was mixed as the excavator dumped into the dump truck and again as the dump truck placed the material in the stockpile. After the completion of excavation activities, 10 mm polyethylene liners were placed over the stockpiled soil.

HydroCon will prepare a Bioremediation Management Plan for ADEC approval with sampling and reporting schedules. This document will be attached to the Environmental Site Activity Report that will be submitted following the field work described herein. CRC will implement the Plan and till the piles on a monthly basis as weather allows using on-site equipment and labor.

5.0 SOIL ANALYTICAL RESULTS

All sample analyses were performed by Friedman & Bruya, Inc. of Seattle, Washington. Laboratory Reports are included in Appendix B. Analytical results are summarized in Table 1.

Due to the abundant amount of wood and organic material in the soil in this area of the site, HydroCon requested that the laboratory perform a second analysis of the soil samples using silica gel cleanup on the DRO analysis.

A total of ten confirmation soil samples were collected from the remedial excavation (seven sidewall and three floor samples). Six samples had DRO concentrations that exceeded ADEC's cleanup level (CUL) for migration to groundwater (F6-7, S9-6, S11-5, S12-6, S13-6, and S14-5); however all of the detected concentrations were below the ingestion and inhalation exposure pathways. Two of the three floor samples were below the CUL; however the third floor sample (F6-7) was collected from an area with significantly more water. This likely resulted in a biased high concentration due to the presence of petroleum impacted water. Despite this, the detected concentration was below the ingestion and inhalation CULs. Generally, the floor results indicate that the vertical extent of contamination has been removed from this area of the site. The sampling locations that did not pass the migration to groundwater CUL criteria are located in areas that are next to obstructions that prevented further excavation.

One sample (F6-7) was analyzed for BTEX. Soil analytical results indicated that toluene (0.12 mg/kg) was detected at a concentration of 0.12 mg/kg, well below all of the ADEC CULs. Benzene, toluene, and ethylbenzene were not detected above the laboratory's MRL.

6.0 CONCLUSIONS AND RECOMMENDATIONS

Conclusions and recommendations for each area of the site where remedial action has taken place are provided below.

6.1 Camp Generator Area

Approximately 200 cubic yards of PCS was removed from the Camp Generator area. The majority of accessible PCS was removed from this area of the site. Although the concentrations detected in a number of the confirmation samples exceed the migration to groundwater CUL, the concentrations were significantly below the ingestion and inhalation CULs. The camp currently sources its drinking

water from a surface water body (spring) located north of the camp area. This water is passed through a treatment system prior to storage in a water tank near the mess hall building. There is no current use of groundwater at the site and the site is isolated enough that the chance of significant impacts to other groundwater uses is very unlikely.

The concentrations in the PCS remaining at the site (in both the Camp Generator and Fueling Station areas) are all below the Method Two ingestion and inhalation CULs. In addition, the PCS has been excavated to the point where access to the material requires an excavator, further reducing the potential for contact. As a result, HydroCon does not recommend further remedial excavation in this location and that a request for conditional closure (which may potentially limit the use of shallow groundwater at the site) be requested from ADEC, pending the successful bioremediation of the stockpiles.

6.2 HydroCon Stockpile

As the PCS was removed from the excavation it was fertilized using a total of approximately 525 pounds of urea and 130 pounds of phosphorus potassium fertilizer mix. The fertilizer was mixed into the PCS as it was dumped into the dump truck and then again when the load was placed in the stockpile. While the concentrations of DRO remaining in place at the site are below the ingestion and inhalation exposure pathways, the HydroCon stockpile contains PCS (excavated from the Camp Generator and Fueling Station areas) at much higher concentrations (based on the results of confirmation sampling from the August 2015 remedial activities). As a result, HydroCon recommends the following actions:

- Monthly tilling of the stockpile should be completed, using the backhoe bucket, as weather allows.
- Place the plastic liner over the stockpile after the conclusion of each tilling event.
- Perform confirmation soil sampling at the end of the summer 2016. Based on the volume of the stockpile, a total of 44 samples should be collected. See Appendix C for specific details regarding stockpile sampling.
- Should the results of the sampling indicate concentrations still exceed ADEC CULs, a supplemental fertilizer application (using the same volume and fertilizer mix as was applied in the first batch) should be completed in the Spring 2017 followed by monthly tilling. Confirmation soil sampling will be performed in the end of summer 2017.

6.3 Fueling Station and Historical Stockpiles

Although no additional remedial excavation was completed in the Fueling Station area and while the concentrations detected in the confirmation samples 2016collected during the August 2015 remedial event exceed the migration to groundwater pathway, none of the detected concentrations exceed the ingestion and/or inhalation CULs. As discussed above (in Section 6.1) the drinking water source for the camp is located up-gradient of the camp and significantly further from the Fueling Station. In addition,

shallow groundwater is not currently being utilized at the site and as a result, the migration to groundwater does not appear to represent an applicable exposure pathway. Based on the results from the August 2015 sampling event and the current/future expected use of the site, no further remedial excavation appears necessary in the Fueling Station area.

In addition, while DRO was detected at concentrations above the migration to groundwater pathway in 10 of the samples collected from the CDI, CRC 1, and CRC 2 stockpiles, none of the detected concentrations exceed the ingestion and/or inhalation CULs. As a result, no additional sampling of these stockpiles appears necessary.

7.0 DATA QUALITY REVIEW

HydroCon performed a quality assurance/quality control (QA/QC) review of the analytical results, which is presented below. A Laboratory Data Review Checklist is included in Appendix D.

Results for total petroleum hydrocarbon as diesel using method AK 102 for samples S10-5, S15-6 and Dup were given the lab qualifier "x". The lab qualifier "x" is defined as "The sample chromatographic pattern does not resemble the fuel standard used for quantitation."

Results for BTEX using method 8021B were given the laboratory qualifier "pc". The "pc" qualifier is defined as "the sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate."

A QA/QC review of the analytical results included a review of accuracy and precision of the data supplied by the laboratory. In addition, the RPD was calculated for the field duplicate DUP, which was collected by HydroCon from sample S15-6. The field duplicate RPD for Diesel Range Organics and Diesel Range Organics with Silica Gel between these sample results is greater than 35 % at 80% and 79%, respectively.

All other quality control criteria are acceptable for the samples, and no action is required.

8.0 QUALIFICATIONS

HydroCon's services were performed in a manner consistent with generally accepted practices of the profession undertaken in similar studies in the same geographical area during the same time period. HydroCon makes no warranties, either expressed or implied, regarding the findings, conclusions or recommendations. Please note that HydroCon does not warrant the work of laboratories, regulatory agencies, or other third parties supplying information used in the preparation of the report.

Findings and conclusions resulting from these services are based upon information derived from the on-site activities and other services performed under this scope of work; such information is subject to change over time. Certain indicators of the presence of hazardous substances, petroleum products, or other constituents may have been latent, inaccessible, unobservable, nondetectable or not present during these services, and we cannot represent that the site contains no hazardous substances, toxic

materials, petroleum products, or other latent conditions beyond those identified during this monitoring. Subsurface conditions may vary from those encountered at specific sampling locations or during other surveys, tests, assessments, investigations, or exploratory services; the data, interpretations and findings are based solely upon data obtained at the time and within the scope of these services.

This report is intended for the sole use of **Columbia River Carbonates**. This report may not be used or relied upon by any other party without the written consent of HydroCon. The scope of services performed in execution of this evaluation may not be appropriate to satisfy the needs of other users, and use or re-use of this document or the findings, conclusions, or recommendations is at the risk of said user.

The conclusions presented in this report are, in part, based upon subsurface sampling performed at selected locations and depths. There may be conditions between borings or samples that differ significantly from those presented in this report and which cannot be predicted by this study.

Signature:

Report Prepared By:

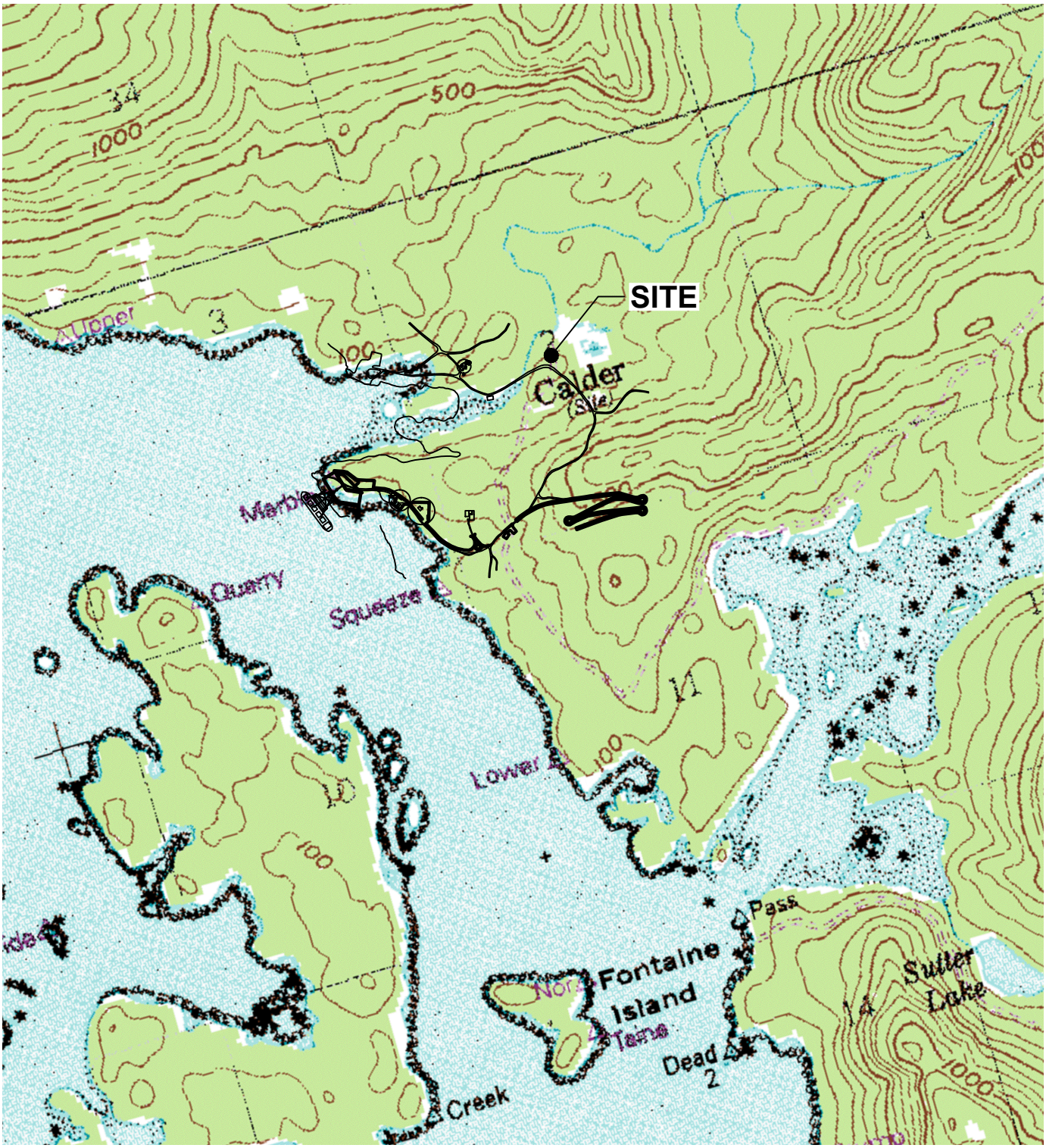
for

Jonathan Horowitz
Project Engineer

Report Reviewed By:

Craig Hultgren, LHG
Senior Geologist/Project Manager

FIGURES



NOTE(S):

USGS, PETERSBURG (A-5) QUADRANGLE
ALASKA
1:63 360 SERIES (TOPOGRAPHIC)

0 2000 4000

SCALE IN FEET
1" = 2000'

N
W E
S

HydroCon
510 Allen St. Suite B Kelso, Wa 98626, Ph(360)-703-6086

DATE: 4-26-16
DWN: JJT
CHK: CH
APPROVED: CH
PRJ. MGR: CH
PROJECT NO: 2015-010

FIGURE 1
SITE LOCATION MAP

CALDER MINE
PRINCE WALES ISLAND
ALASKA

C:\Users\Josh\Desktop\Autocad Backup\Hydrocon-Autocad\2015-010 Calder Mine\2016\April 2016\2015-010_BM-CMS-042016.dwg 2.17.2014

CAMP GENSET

Area of
Contamination

HYDROCON
STOCKPILES

CALDER MINE SITE

Area of
Contamination

SHOP AREA

CDI STOCKPILE
CRC STOCKPILES

FUELING
STATION

N
W E
S

0 500 1000
SCALE IN FEET
1" = 500'

Hydro Con
510 Allen St. Suite B Kelso, Wa 98626, Ph(360)-703-6086

DATE: 4-26-16
DWN: JJT
CHK: CH
APPROVED:
PRJ. MGR: CH
PROJECT NO:
2015-010

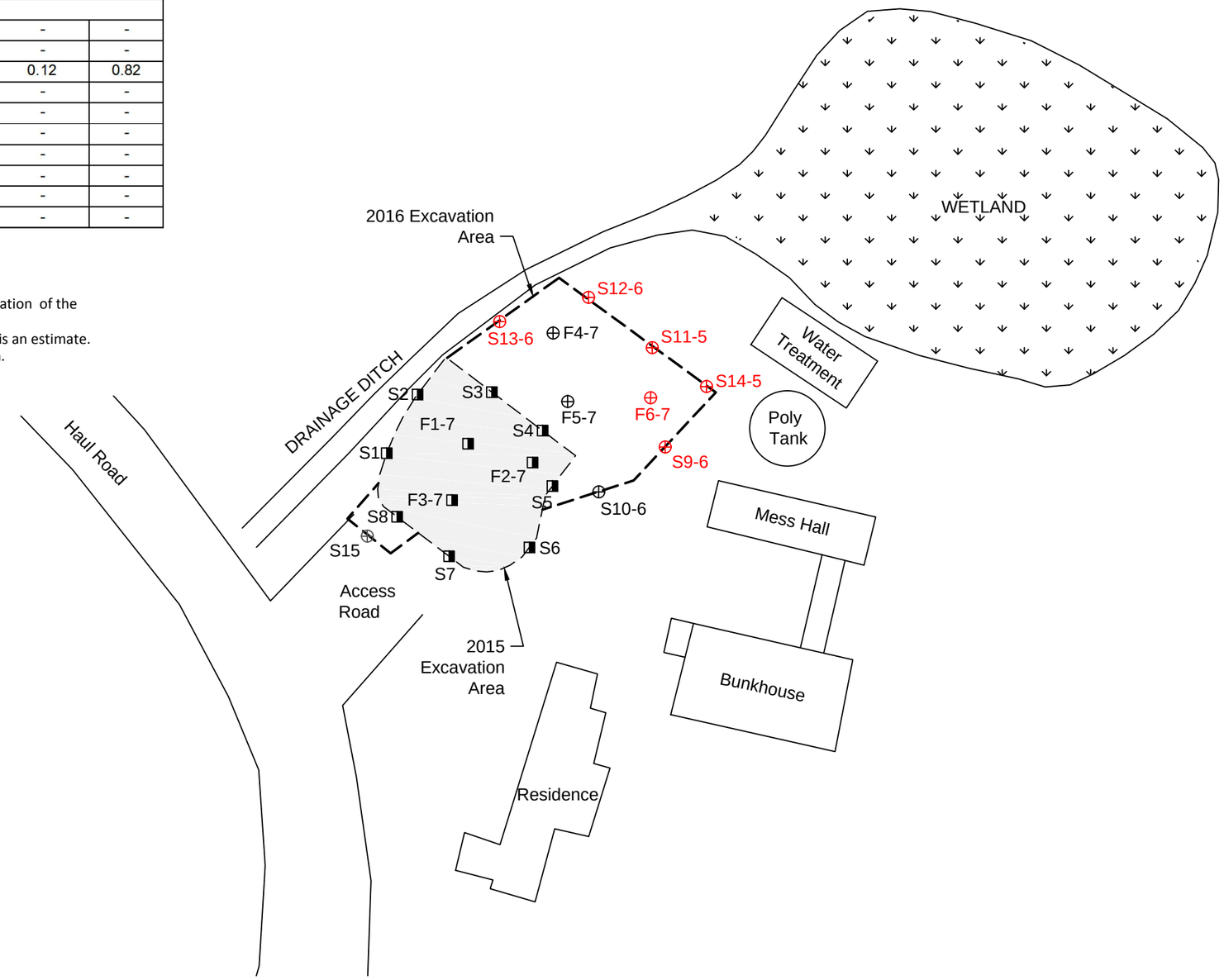
FIGURE 2
SITE FEATURES

CALDER MINE
PRINCE OF WALES ISLAND
ALASKA

C:\Users\Josh\Desktop\Autocad Backup\Hydrocon-Autocad\2015-010 Calder Mine\2016\April 2016\2015-010_BM-CMS-042016.dwg 2.17.2014

Field ID	Analytical Results (mg/kg)					
	DRPH	Diesel Range TPH+SG	Benzene	Ethylbenzene	Toluene	Xylene Total
ADEC Method 2 OPHSPCR	**230**	**230**	**0.025**	**6.9**	**6.5**	**63**
Camp Remediation Excavation						
F4-7	10	13	-	-	-	-
F5-7	<5	<5	-	-	-	-
F6-7	**2,700**	**2,500**	<0.02	<0.02	0.12	0.82
S9-6	**620**	**380**	-	-	-	-
S10-5	160x	<20	-	-	-	-
S11-5	**500**	**300**	-	-	-	-
S12-6	**420**	220	-	-	-	-
S13-6	**550**	**550**	-	-	-	-
S14-5	**830**	**990**	-	-	-	-
S15-6	60x	65	-	-	-	-

Notes:
Red denotes concentration exceeds ADEC Cleanup Level.
Lab Qualifiers:
J - The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.
x - The sample chromatographic pattern does not resemble the fuel standard used for quantification.



LEGEND

- SITE BOUNDARY
- EXISTING ACCESS ROAD
- EXISTING STRUCTURES
- S1 EXCAVATION SOIL SAMPLE (2015)
- S9 EXCAVATION SOIL SAMPLE (2016)
- EXCAVATION LOCATION
- EXCAVATION LOCATION

*RED INDICATES IMPACTED SOIL

N W E S

0 20 40
SCALE IN FEET
1" = 20'

HydroCon
510 Allen St. Suite B Kelso, Wa 98626, Ph(360)-703-6086

DATE: 4-26-16
DWN: JJT
CHK: CH
APPROVED:
PRJ. MGR: CH
PROJECT NO: 2015-010

FIGURE 3
CAMP GENSET LAYOUT AND EXCAVATION
SAMPLE LOCATIONS AND ANALYTICAL RESULTS (03/16)
CALDER MINE
PRINCE OF WALES ISLAND
ALASKA

C:\Users\Josh\Desktop\Autocad Backup\Hydrocon-Autocad\2015-010 Calder Mine\2016\April 2016\2015-010_BM-CMS-042016.dwg 2.17.2014

TABLES

Table 1
2016 Soil Analytical Results
Calder Mine
Alaska

	AK 102		SW8021B			
	Diesel Range Organics	Diesel Range TPH+SG	Benzene	Ethylbenzene	Toluene	Xylene Total
ADEC Method 2 Cleanup Levels	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Migration to Groundwater	230	230	0.025	6.9	6.5	63
Ingestion	8,250	8,250	120	8,300	6,600	16,600
Inhalation	12,500	12,500	8.5	81	220	63

Field ID	Date						
Camp Remediation Excavation							
F4-7	4/7/16	10	13	-	-	-	-
F5-7	4/7/16	<5	<5	-	-	-	-
F6-7	4/7/16	2,700	2,500	<0.02	<0.02	0.12	0.82
S9-6	4/7/16	620	380	-	-	-	-
S10-5	4/7/16	160x	<20	-	-	-	-
S11-5	4/7/16	500	300	-	-	-	-
S12-6	4/7/16	420	220	-	-	-	-
S13-6	4/7/16	550	550	-	-	-	-
S14-5	4/7/16	830	990	-	-	-	-
S15-6	4/7/16	60x	65	-	-	-	-
DUP	4/7/16	140x	150	-	-	-	-

Notes

Red denotes concentration exceeds ADEC Method 2 cleanup level.
Samples analyzed by Friedman & Bruya, Inc., of Seattle, Washington.
Alaska Dept of Conservation Method 2 Oil Pollution & Hazardous Substances Pollution Control Regulations,
Table B2, 18 AAC75, based on >40 inches of rainfall migration to groundwater.
< = not detected at a concentration exceeding the laboratory MRL shown
mg/kg = milligrams per kilogram
ADEC - Alaska Dept of Conservation

Qualifiers

ec - Method reporting limit exceeds Clean Up Level.
ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.
x - The sample chromatographic pattern does not resemble the fuel standard used for quantification.

APPENDIX A
APPENDIX A - PHOTOGRAPHIC DOCUMENTATION

PHOTO 1
View of supplimental remedial excavation, facing north. Notice significant wood debris.

PHOTO 2
View of southern (right side of photo) and western excavation events. Note proximity of blue water supply treatment conex(R) (blue in upper right corner).

PHOTO 3
Perched water (trapped in voids of initial excavation pit) entered the excavation as it was expanded southwest.

HydroCon

DATE: 6-1-16
DWN: JJT
CHK: JH
APPROVED: CH
PRJ. MGR: CH
PROJECT NO: 2015-010

PHOTOPLATE 1
SITE PHOTOGRAPHS

CALDER MINE
PRINCE WALES ISLAND
ALASKA

C:\Users\Josh\Desktop\Autocad Files\Hydrocon-Autocad\2015-010 Calder Mine\2016\April 2016\2015-010_PP-050416.dwg 2.17.2014

PHOTO 4
View of excavation being backfilled.

PHOTO 5
View of excavation completely backfilled. Note close proximity of backfilled excavation to water supply treatment conex(R) (blue) and water supply storage tank (black).

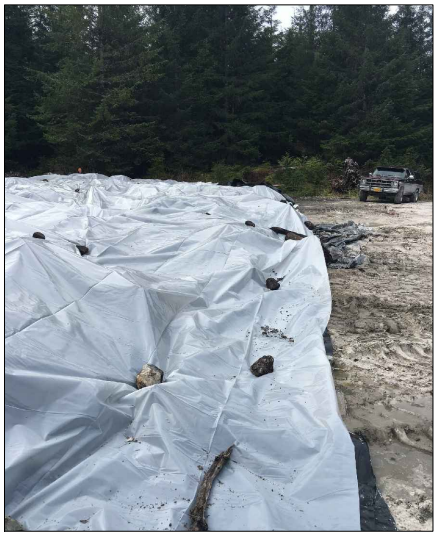


PHOTO 6
Typical view of "HydroCon stockpile covered with plastic.

HydroCon

DATE: 6-1-16
DWN: JJT
CHK: JH
APPROVED: CH
PRJ. MGR: CH
PROJECT NO: 2015-010

PHOTOPLATE 2
SITE PHOTOGRAPHS

CALDER MINE
PRINCE WALES ISLAND
ALASKA

C:\Users\Josh\Desktop\Autocad Files\Hydrocon-Autocad\2015-010 Calder Mine\2016\April 2016\2015-010_PP-050416.dwg 2.17.2014

APPENDIX B

APPENDIX B - LABORATORY REPORT AND CHAIN-OF-CUSTODY DOCUMENTATION

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

April 20, 2016

Craig Hultgren, Project Manager
HydroCon
510 Allen St, Suite B
Kelso, WA 98626

Dear Mr. Hultgren:

Included is the amended report from the testing of material submitted on April 9, 2016 from the CRC 2015-010, F&BI 604172 project. Per your request, the project ID has been amended.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
c: Jonathan Horowitz
HDC0419R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

April 19, 2016

Craig Hultgren, Project Manager
HydroCon
510 Allen St, Suite B
Kelso, WA 98626

Dear Mr. Hultgren:

Included are the results from the testing of material submitted on April 9, 2016 from the CRC 2015-010, F&BI 604172 project. There are 9 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
c: Jonathan Horowitz
HDC0419R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on April 9, 2016 by Friedman & Bruya, Inc. (ADEC laboratory approval number UST-007) from the HydroCon CRC 2015-010, F&BI 604172 project. The samples were received at 4°C in good condition and were refrigerated upon receipt. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	HydroCon	Date Sampled
604172 -01	F4-7	04/07/16
604172 -02	F5-7	04/07/16
604172 -03	F6-7	04/07/16
604172 -04	S9-6	04/07/16
604172 -05	S10-5	04/07/16
604172 -06	S11-5	04/07/16
604172 -07	S12-6	04/07/16
604172 -08	S13-6	04/07/16
604172 -09	S14-5	04/07/16
604172 -10	S15-6	04/07/16
604172 -11	Dup	04/07/16

The samples were analyzed as follows.

DRO (soil) - Analysis Method AK 102, Extraction Method 3550B

All quality control requirements were acceptable.

Date of Report: 04/19/16
Date Received: 04/09/16
Project: CRC 2015-010, F&BI 604172
Date Extracted: NA
Date Analyzed: 04/12/16

RESULTS FROM THE ANALYSIS OF THE SOIL SAMPLES FOR PERCENT MOISTURE USING ASTM D2216-98

Sample ID Laboratory ID	% Moisture
F4-7 604172-01	32
F5-7 604172-02	46
F6-7 604172-03	51
S9-6 604172-04	82
S10-5 604172-05	87
S11-5 604172-06	78
S12-6 604172-07	80
S13-6 604172-08	14
S14-5 604172-09	26
S15-6 604172-10	9
Dup 604172-11	9

Date of Report: 04/19/16
Date Received: 04/09/16
Project: CRC 2015-010, F&BI 604172
Date Extracted: 04/12/16
Date Analyzed: 04/12/16

RESULTS FROM THE ANALYSIS OF SOIL SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL USING METHOD AK 102

Results Reported on a Dry Weight Basis
Results Reported as mg/kg (ppm)

Sample ID Laboratory ID	Diesel Range (C_{10}-C_{25})	Surrogate (% Recovery) (Limit 60-120)
F4-7 604172-01	10	92
F5-7 604172-02	<5	97
F6-7 604172-03	2,700	77
S9-6 604172-04	620	72
S10-5 604172-05	160 x	90
S11-5 604172-06	500	94
S12-6 604172-07	420	100
S13-6 604172-08	550	89
S14-5 604172-09	830	78
S15-6 604172-10	60 x	107

Date of Report: 04/19/16
Date Received: 04/09/16
Project: CRC 2015-010, F&BI 604172
Date Extracted: 04/12/16
Date Analyzed: 04/12/16

RESULTS FROM THE ANALYSIS OF SOIL SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL USING METHOD AK 102

Results Reported on a Dry Weight Basis
Results Reported as mg/kg (ppm)

Sample ID Laboratory ID	Diesel Range (C_{10}-C_{25})	Surrogate (% Recovery) (Limit 60-120)
Dup 604172-11	140 x	105
Method Blank 06-715 MB	<5	110

Date of Report: 04/19/16
Date Received: 04/09/16
Project: CRC 2015-010, F&BI 604172
Date Extracted: 04/12/16
Date Analyzed: 04/15/16

RESULTS FROM THE ANALYSIS OF SOIL SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL USING METHOD AK 102
Sample Extracts Passed Through a Silica Gel Column Prior to Analysis
Results Reported on a Dry Weight Basis
Results Reported as mg/kg (ppm)

Sample ID Laboratory ID	Diesel Range (C_{10}-C_{25})	Surrogate (% Recovery) (Limit 60-120)
F4-7 604172-01	13	82
F5-7 604172-02	<5	84
F6-7 604172-03	2,500	98
S9-6 604172-04	380	75
S10-5 604172-05 1/4	<20	84
S11-5 604172-06	300	102
S12-6 604172-07	220	98
S13-6 604172-08	550	106
S14-5 604172-09	990	103
S15-6 604172-10	65	102

Date of Report: 04/19/16
Date Received: 04/09/16
Project: CRC 2015-010, F&BI 604172
Date Extracted: 04/12/16
Date Analyzed: 04/15/16

RESULTS FROM THE ANALYSIS OF SOIL SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL USING METHOD AK 102
Sample Extracts Passed Through a Silica Gel Column Prior to Analysis
Results Reported on a Dry Weight Basis
Results Reported as mg/kg (ppm)

Sample ID Laboratory ID	Diesel Range (C_{10}-C_{25})	Surrogate (% Recovery) (Limit 60-120)
Dup 604172-11	150	107
Method Blank 06-715 MB	<5	101

Date of Report: 04/19/16
Date Received: 04/09/16
Project: CRC 2015-010, F&BI 604172

QUALITY ASSURANCE RESULTS FROM THE ANALYSIS OF SOIL SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL USING METHOD AK 102

Laboratory Code: 604172-11 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet Wt)	Percent Recovery MS	Acceptance Criteria
Diesel	mg/kg (ppm)	500	130	126	50-150

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel	mg/kg (ppm)	500	113	112	75-125	1

Date of Report: 04/19/16
Date Received: 04/09/16
Project: CRC 2015-010, F&BI 604172

QUALITY ASSURANCE RESULTS FROM THE ANALYSIS OF SOIL SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL USING METHOD AK 102

Laboratory Code: 604172-11 (Matrix Spike) Silica Gel

Analyte	Reporting Units	Spike Level	Sample Result (Wet Wt)	Percent Recovery MS	Acceptance Criteria
Diesel	mg/kg (ppm)	500	140	132	50-150

Laboratory Code: Laboratory Control Sample Silica Gel

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel	mg/kg (ppm)	500	110	108	75-125	2

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

604172

SAMPLE CHAIN OF CUSTODY

ME 04/09/16

A04

Page # 1 of 2

Send Report To Jonathan Horowitz
Company HydroCon
Address 510 Allen St.
City, State, ZIP Kelso, WA 98626
Phone # 360-703-6036 Fax # 360-703-6077

SAMPLERS (signature)
PROJECT NAME/NO. GDC 12015.010 "CRC" per JH — PO#
REMARKS ML 4/19/16 Send results to Craig Hultgren

TURNAROUND TIME
☑ Standard (2 Weeks)
☐ RUSH
Rush charges authorized by

SAMPLE DISPOSAL
☐ Dispose after 30 days
☐ Return samples
☐ Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	ANALYSES REQUESTED: TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260	SVOCs by 8270	HFS	Dx by AK102	Dx by AK103 "SG"					Notes
F4-7	01A	4/7/16	9:15	Soil	2							X	⊕					⊕ per JH
F5-7	02		9:20	"														4/13/16
F6-7	03		9:25					☆										ML
S9-6	04		9:30															☆ per JH
S10-5	05		9:35															ML 4/19/16
S11-5	06		9:40															
S12-6	07		9:45															
S13-6	08		9:50															
S14-5	09		10:00															4 °C
S15-6	10		11:20		1								Samples received at					

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	Jonathan Horowitz	HydroCon	4/8/16	17:00
Received by:	Jason Bruya	F&B	4/9	1600
Relinquished by:				
Received by:				

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

FORMS\COC\COC.DOC

604172

SAMPLE CHAIN OF CUSTODY

ME 04/09/16

AU4

Send Report To Jonathan Horowitz
Company HydroCon
Address 510 Alder St.
City, State, ZIP Kelso, WA 98626
Phone #360-703-6086 Fax #360-703-6079

SAMPLERS (signature)
PROJECT NAME/NO. COC / 2015-010
PO#
REMARKS Send results to Craig Huttgren

TURNAROUND TIME
☒ Standard (2 Weeks)
☐ RUSH
Rush charges authorized by

SAMPLE DISPOSAL
☐ Dispose after 30 days
☐ Return samples
☐ Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260	SVOCs by 8270	HFS	PAHs by 8270 SIM	Pb by 6010					Notes
DUP	"	4/7/16	-	Soil	-							X	⊕					
																		Sampling received at 4 °C

ANALYSES REQUESTED

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

FORMS\COC\COC.DOC

	SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:		Jonathan Horowitz	HydroCon	4/8/16	12:00
Received by:		James Bruya	FFB	4/9	0600
Relinquished by:					
Received by:					

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

April 22, 2016

Craig Hultgren, Project Manager
HydroCon
510 Allen St, Suite B
Kelso, WA 98626

Dear Mr. Hultgren:

Included are the additional results from the testing of material submitted on April 9, 2016 from the CRC 2015-010, F&BI 604172 project. There are 4 pages included in this report.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
c: Jonathan Horowitz
HDC0422R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on April 9, 2016 by Friedman & Bruya, Inc. (ADEC laboratory approval number UST-007) from the HydroCon CDC 2015-010, F&BI 604172 project. The samples were received at 4°C in good condition and were refrigerated upon receipt. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	HydroCon	Date Sampled
604172 -01	F4-7	04/07/16
604172 -02	F5-7	04/07/16
604172 -03	F6-7	04/07/16
604172 -04	S9-6	04/07/16
604172 -05	S10-5	04/07/16
604172 -06	S11-5	04/07/16
604172 -07	S12-6	04/07/16
604172 -08	S13-6	04/07/16
604172 -09	S14-5	04/07/16
604172 -10	S15-6	04/07/16
604172 -11	Dup	04/07/16

The samples were analyzed as follows.

BTEX (soil) - Analysis Method 8021B, Extraction Method 5035

The BTEX sample was not received in a methanol preserved container. The data were flagged accordingly. All other quality control requirements were acceptable.

Date of Report: 04/22/16
Date Received: 04/09/16
Project: CRC 2015-010, F&BI 604172
Date Extracted: 04/20/16
Date Analyzed: 04/20/16

**RESULTS FROM THE ANALYSIS OF SOIL SAMPLES
FOR BENZENE, TOLUENE, ETHYLBENZENE, AND XYLENES
USING METHOD 8021B**

Results Reported on a Dry Weight Basis
Results Reported as mg/kg (ppm)

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Surrogate (% Recovery) (Limit 50-132)
F6-7 pc 604172-03	<0.02	<0.02	0.12	0.82	97
Method Blank 06-743 MB2	<0.02	<0.02	<0.02	<0.06	93

Date of Report: 04/22/16
Date Received: 04/09/16
Project: CRC 2015-010, F&BI 604172

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, AND XYLENES USING EPA METHOD 8021B

Laboratory Code: 604312-26 (Duplicate)

Analyte	Reporting Units	Sample Result (Wet Wt)	Duplicate Result (Wet Wt)	RPD (Limit 20)
Benzene	mg/kg (ppm)	<0.02	<0.02	nm
Toluene	mg/kg (ppm)	<0.02	<0.02	nm
Ethylbenzene	mg/kg (ppm)	<0.02	<0.02	nm
Xylenes	mg/kg (ppm)	<0.06	<0.06	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	mg/kg (ppm)	0.5	92	66-121
Toluene	mg/kg (ppm)	0.5	89	72-128
Ethylbenzene	mg/kg (ppm)	0.5	93	69-132
Xylenes	mg/kg (ppm)	1.5	91	69-131

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

604172

SAMPLE CHAIN OF CUSTODY

ME 04/09/16

A04

Page # 1 of 2

Send Report To Jonathan Horowitz
Company HydroCon
Address 510 Allen St.
City, State, ZIP Kelso, WA 98626
Phone # 360-703-6036 Fax # 360-703-6077

SAMPLERS (signature)
PROJECT NAME/NO. GDC 12015.010 "CRC" per JH — PO#
REMARKS ML 4/19/16 Send results to Craig Hultgren

TURNAROUND TIME
☑ Standard (2 Weeks)
☐ RUSH
Rush charges authorized by

SAMPLE DISPOSAL
☐ Dispose after 30 days
☐ Return samples
☐ Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	ANALYSES REQUESTED: TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260	SVOCs by 8270	HFS	Dx by AK102	Dx by AK103 "SG"					Notes
F4-7	01A	4/7/16	9:15	Soil	2							X	⊕					⊕ per JH
F5-7	02		9:20	"														4/13/16
F6-7	03		9:25					☆										ML
S9-6	04		9:30															☆ per JH
S10-5	05		9:35															ML 4/19/16
S11-5	06		9:40															
S12-6	07		9:45															
S13-6	08		9:50															
S14-5	09		10:00															4 °C
S15-6	10		11:20		1								Samples received at					

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	Jonathan Horowitz	HydroCon	4/8/16	17:00
Received by:	Jason Bruya	F&B	4/9	1600
Relinquished by:				
Received by:				

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

FORMS\COC\COC.DOC

604172

SAMPLE CHAIN OF CUSTODY

ME 04/09/16

AU4

Send Report To Jonathan Horowitz
Company HydroCon
Address 510 Alder St.
City, State, ZIP Kelso, WA 98626
Phone #360-703-6086 Fax #360-703-6079

SAMPLERS (signature)
PROJECT NAME/NO. COC / 2015-010
PO#
REMARKS Send results to Craig Huttgren

TURNAROUND TIME
☒ Standard (2 Weeks)
☐ RUSH
Rush charges authorized by

SAMPLE DISPOSAL
☐ Dispose after 30 days
☐ Return samples
☐ Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260	SVOCs by 8270	HFS	PAHs by 8270 SIM	Pb by 6010					Notes
DUP	"	4/7/16	-	Soil	-							X	⊕					
																		Sampling received at 4 °C

ANALYSES REQUESTED

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

FORMS\COC\COC.DOC

	SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:		Jonathan Horowitz	HydroCon	4/8/16	12:00
Received by:		James Bruya	FFB	4/9	0600
Relinquished by:					
Received by:					

APPENDIX C
STOCKPILE MANAGEMENT AND SAMPLING PLAN

Stockpile Management and Sampling Plan

Calder Limestone Mine
Calder Bay, Prince of Wales Island, Alaska

Prepared for:
Columbia River Carbonates
P.O. Box 2350
Woodland, Washington

May 27, 2016

Prepared by:

HydroCon, LLC
510 Allen Street, Suite B Kelso, Washington 98626
p: (360) 703-6079 f: (360) 703-6086
www.hydroconllc.net

Table of Contents

1.0 INTRODUCTION 3
1.1 Site Description 3
1.2 Site History 3
2.0 PRE-SAMPLING ACTIVITIES 3
3.0 STOCKPILE SAMPLING 3
3.1 Number and Location of Samples 3
3.2 Laboratory Analysis 4
4.0 SAMPLING ANALYSIS AND REPORTING 4
5.0 QUALIFICATIONS 4

List of Figures

Figure 1 – Site Vicinity Map
Figure 2 – HydroCon Stockpile Sampling Map

Appendix

Appendix A – Standard Operating Procedures

1.0 INTRODUCTION

This Stockpile Sampling Plan has been prepared to provide CRC with the methodology to complete the stockpile sampling activities.

1.1 Site Description

The site is located in the northwest portion of the Prince of Wales Island in Alaska (Figure 1). It is currently operating as a calcium carbonate mine, owned and operated by Columbia River Carbonates (CRC). The site includes an open-pit calcium carbonate mine, loading/barge area, fueling station, shop area, and camp site. Additional site improvements include gravel access roadways, diesel power generators, and a water treatment/storage system.

1.2 Site History

In July 2004, Carson Dorn, Inc. (CDI) conducted a site assessment of the subject site. During the assessment, diesel-contaminated soils were observed adjacent to the Camp Generator, downhill from the two 18,000-gallon diesel aboveground storage tanks (ASTs), also known as the Fueling Station, and in an existing stockpile of soil. CDI also noted the presence of a drum storage area west of the Fueling Station. These and other site features are shown on Figure 2.

CDI collected five soil samples during the site assessment. Soil analytical results indicated that the existing 15 cubic yard stockpile (Sample C-1) had a diesel-range organics (DRO) concentration of 4,780 milligrams per kilogram (mg/kg). The two soil samples collected from Camp Generator area had a DRO concentration of 9,750 mg/kg near the 500-gallon diesel AST used to supply the generator (Sample G-2) and 485,000 mg/kg at the door of the Camp Generator (Sample G-1). In the Fueling Station area, a sample collected from the end of the westerly 18,000 AST had a DRO concentration of 16,400 mg/kg. The Method Two Alaska Department of Environmental Conservation (ADEC) cleanup level for DRO is 230 mg/kg.

In August 2004, CDI performed a drum inventory at the site. A total of 93 drums were present. Eighty of the drums were located in the drum storage area next to the Fueling Station and remainder of the drums was located in the Shop area. The contents of the drums included new and used gasoline, diesel, oil, grease, antifreeze, and water. The contents were consolidated into 51 drums and shipped off the island for recycling.

In September 2004, CDI provided oversight for the removal of contaminated soil by excavation from the two areas above. An estimated total of 100 cubic yards of soil was generated from the two excavations and from the 15 cubic yard stockpile and placed into an approximately 22'W x 60'L x 2'H (~100 cubic yards) bioremediation cell constructed on the site. This stockpile is referred to as the CDI Stockpile in this document.

In 2012, CRC performed a remedial excavation near the Camp Generators. Visibly stained soil was removed from the area south of the generator. The excavation measured approximately 50' x 30'. The depth of the excavation was approximately 6 feet below ground surface (bgs). No confirmation samples were collected at that time. The contaminated soil was transported to the onsite bioremediation cell staging area. The soil was placed on and covered with heavy gauge plastic sheeting. Two stockpiles were created: 35'L x 16'W x 3.5'H (approximately 135 cubic yards) and 30'L x 10'W x 1.5'H (approximately 16 cubic yards). These stockpiles are referred to as the CRC1 and CRC2 Stockpiles, respectively, in this document.

In August 2015 HydroCon personnel mobilized to the site to provide oversight and direction of the remedial excavation in the two identified areas (Camp Generator and Fueling Station)[1]. Southeast Road Builders Construction Company (subcontractor for CRC) performed the excavation using a Cat 336E trackhoe. All PCS was placed into a dump truck and hauled to the newly constructed biotreatment cell area referred to as the HydroCon Stockpile (Figure 2). Excavation activities were completed in both areas until either field screening indicated that the contamination was no longer present or camp infrastructure presented obstruction for further remedial activities. Confirmation soil samples were collected from both excavation areas. Soil removed from the excavation was placed in a stockpile ("HydroCon" stockpile, Figure 2) and the pile was fertilized at a rate of 400 pounds urea and 100 pounds of phosphorus potassium fertilizer mix per 100 cubic yards of soil. The soil was mixed using the excavator bucket. After mixing, 10 mm polyethylene liners were placed over the stockpiled soil. In addition, HydroCon completed sampling of the existing stockpiles (CDI, CRC1, and CRC2).

On April 7, 2016, HydroCon directed remedial excavation of approximately 200 cubic yards of PCS at the Camp Generator area[2]. Southeast Road Builders Construction Company (subcontractor for CRC) performed the excavation using a Cat 336E trackhoe. All PCS was placed into a dump truck and hauled to the newly constructed biotreatment cell area referred to as the HydroCon Stockpile (Figure 2). The PCS was placed on top of new 30-mil plastic geomembrane, as described in the approved work plan.

As the soil was excavated (using an approximately 1.5 cubic yard excavator bucket) it was fertilized at a rate of 6 pounds urea and 1.5 pounds of phosphorus potassium fertilizer mix per 1.5 cubic yards of soil. The soil was mixed as the excavator dumped into the dump truck and again as the dump truck placed the material in the stockpile. After the completion of excavation activities, 10 mm polyethylene liners were placed over the stockpiled soil.

This Stockpile Sampling Plan is intended to provide CRC with the methodology to complete the sampling activities recommended above.

[1] HydroCon 2015. Remedial Excavation and Soil Sampling Report. Calder Limestone Mine, Prince of Wales Island, Alaska. Prepared for Columbia River Carbonates. October 5.

[2] HydroCon 2016. Remedial Excavation and Soil Sampling Report. Calder Limestone Mine, Prince of Wales Island, Alaska. Prepared for Columbia River Carbonates. May 26.

2.0 SAMPLING ACTIVITIES

An overview of the sampling activities includes the following:

- Monthly tilling of the stockpile should be completed through the summer of 2016, using the backhoe bucket, as weather allows.
- Place the plastic liner over the stockpile after the conclusion of each tilling event.
- Perform confirmation soil sampling at the end of the summer 2016. Based on the volume of the stockpile, a total of 44 samples should be collected. .
- Should the results of the sampling indicate concentrations still exceed ADEC CULs, a supplemental fertilizer application (using the same volume and fertilizer mix as was applied in the first batch) should be completed in the Spring 2017 followed by monthly tilling. Confirmation soil sampling will be performed in the end of summer 2017.

2.1 Pre-sampling Activities

This section provides a discussion of the pre-sampling activities that should be completed prior to the collection of stockpile samples.

Stockpile Tilling
In an effort to increase the oxygen levels in the stockpile, it should be tilled on a monthly basis.

Replacement of Plastic Liner
After the completion of each tilling event, the plastic cover over the stockpile should be replaced.

2.2 Stockpile sampling

Stockpile sampling will be conducted with the last tilling event of the summer of 2016.

2.2.1 Number and Location of Samples

The ADEC guidance document recommends collection of 1 sample for every 10 cubic yards of stockpiled soil. In addition, a duplicate sample should be collected for every ten samples. Based on the approximate volume of stockpiled soil (400 cubic yards), 44 (including duplicate samples) should be collected. The samples should be collected from an evenly spaced a grid at various depths (one sample per grid point). Figure 2 illustrates the approximate sample locations.

2.2.2 Laboratory Analysis

A total of 44 soil samples should be collected for laboratory analysis. Each sample should be analyzed for DRO by Alaska's Method AK102. In addition, one in ten samples should be analyzed for benzene, toluene, ethylbenzene, and total xylenes (BTEX) by EPA Method 8260B. Samples should be placed in laboratory supplied containers and uniquely labeled with the sample identification number, date and time of sample collection, and site name. The sample jars should be placed in a chilled cooler along with chain-of-custody documentation and transported to Friedman & Bruya laboratory in Seattle, Washington for analysis as described in SOP-02 (Appendix A).

2.2.3 2017 Activities

In the event that soil concentrations are not reduced to cleanup levels in 2016, the management of the stockpile will include the following:

With the first tilling event in the Spring of 2017, supplemental application of soil treatment additives should be completed at the following rates:

- Urea – at a rate of 400 pounds per 100 cubic yards of soil; and
- Phosphorus Potassium Fertilizer (20:20:0 mix) – at a rate of 100 pounds per 100 cubic yards of soil.

Monthly tilling and cover replacement will occur throughout the spring and summer. A sampling event as described above will be conducted following the final tilling event in the late summer of 2017.

2.2.4 Sampling Analysis and Reporting

After receipt of the analytical results, HydroCon will prepare a report summarizing the field activities, sampling methodologies, analytical results, and recommendations. Reports will be prepared following the late summer stockpile sampling events.

3.0 QUALIFICATIONS

HydroCon's services were performed in a manner consistent with generally accepted practices of the profession undertaken in similar studies in the same geographical area during the same time period. HydroCon makes no warranties, either expressed or implied, regarding the findings, conclusions or recommendations. Please note that HydroCon does not warrant the work of laboratories, regulatory agencies, or other third parties supplying information used in the preparation of the report.

Findings and conclusions resulting from these services are based upon information derived from the on-site activities and other services performed under this scope of work; such information is subject to change over time. Certain indicators of the presence of hazardous substances, petroleum products, or other constituents may have been latent, inaccessible, unobservable, nondetectable or not present during these services, and we cannot represent that the site contains no hazardous substances, toxic materials, petroleum products, or other latent conditions beyond those identified during this monitoring. Subsurface conditions may vary from those encountered at specific sampling locations or during other surveys, tests, assessments, investigations, or exploratory services; the data, interpretations and findings are based solely upon data obtained at the time and within the scope of these services.

This report is intended for the sole use of **Columbia River Carbonates**. This report may not be used or relied upon by any other party without the written consent of HydroCon. The scope of services performed in execution of this evaluation may not be appropriate to satisfy the needs of other users, and use or re-use of this document or the findings, conclusions, or recommendations is at the risk of said user.

The conclusions presented in this report are, in part, based upon subsurface sampling performed at selected locations and depths. There may be conditions between borings or samples that differ significantly from those presented in this report and which cannot be predicted by this study.

Signature:

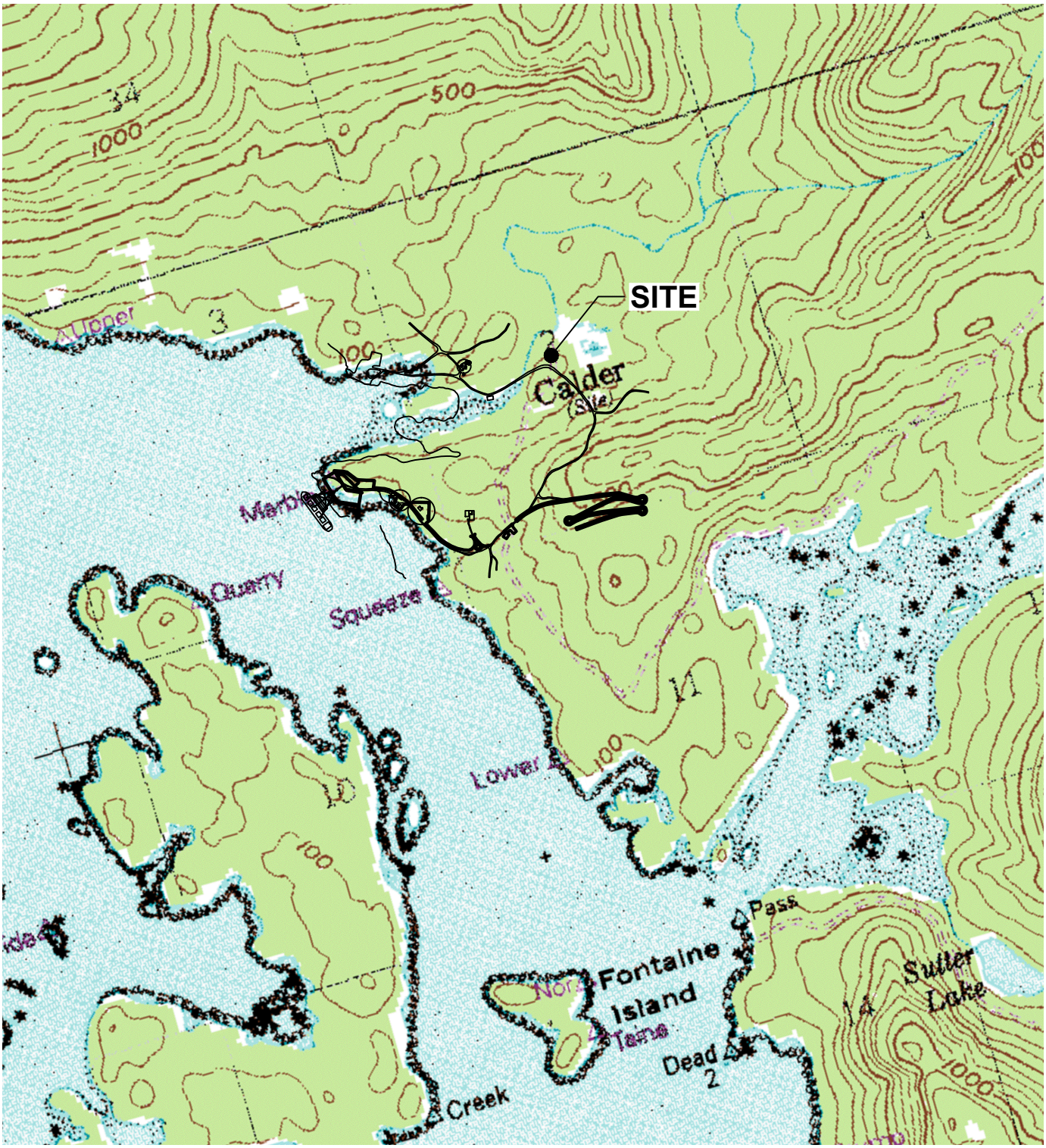
Report Prepared By:

Jonathan Horowitz, PE
Project Engineer

Report Reviewed By:

Craig Hultgren, LHG
Senior Project Geologist

FIGURES



NOTE(S):

USGS, PETERSBURG (A-5) QUADRANGLE
ALASKA
1:63 360 SERIES (TOPOGRAPHIC)

0 2000 4000

SCALE IN FEET
1" = 2000'

N
W E
S

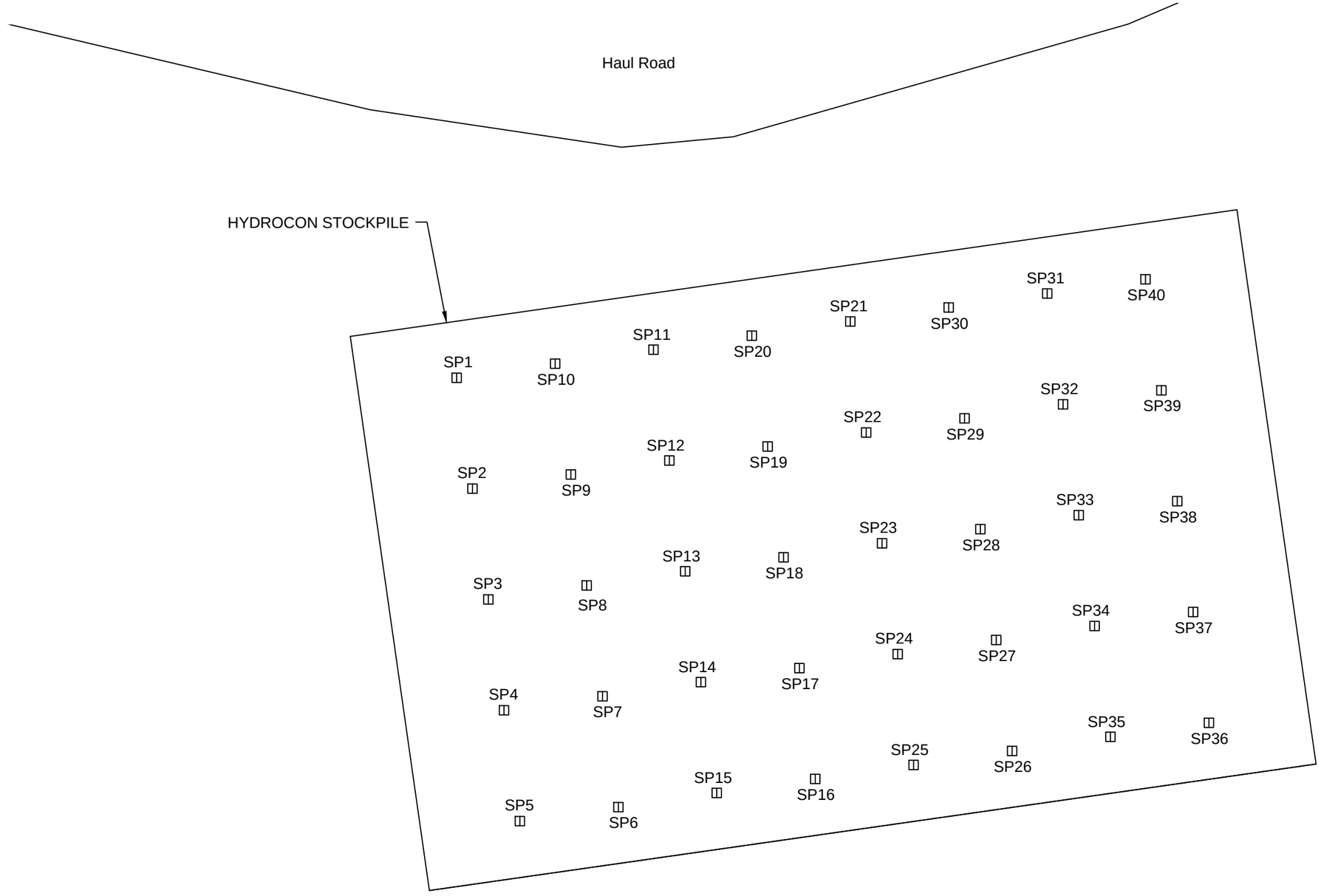
HydroCon
510 Allen St. Suite B Kelso, Wa 98626, Ph(360)-703-6086

DATE: 4-26-16
DWN: JJT
CHK: CH
APPROVED: CH
PRJ. MGR: CH
PROJECT NO: 2015-010

FIGURE 1
SITE LOCATION MAP

CALDER MINE
PRINCE WALES ISLAND
ALASKA

C:\Users\Josh\Desktop\Autocad Backup\Hydrocon-Autocad\2015-010 Calder Mine\2016\April 2016\2015-010_BM-CMS-042016.dwg 2.17.2014



LEGEND

EXISTING ACCESS ROAD

STOCKPILE

SP1 PROPOSED EXCAVATION STOCKPILE SOIL SAMPLE LOCATIONS

N W E S

0 20 40

SCALE IN FEET

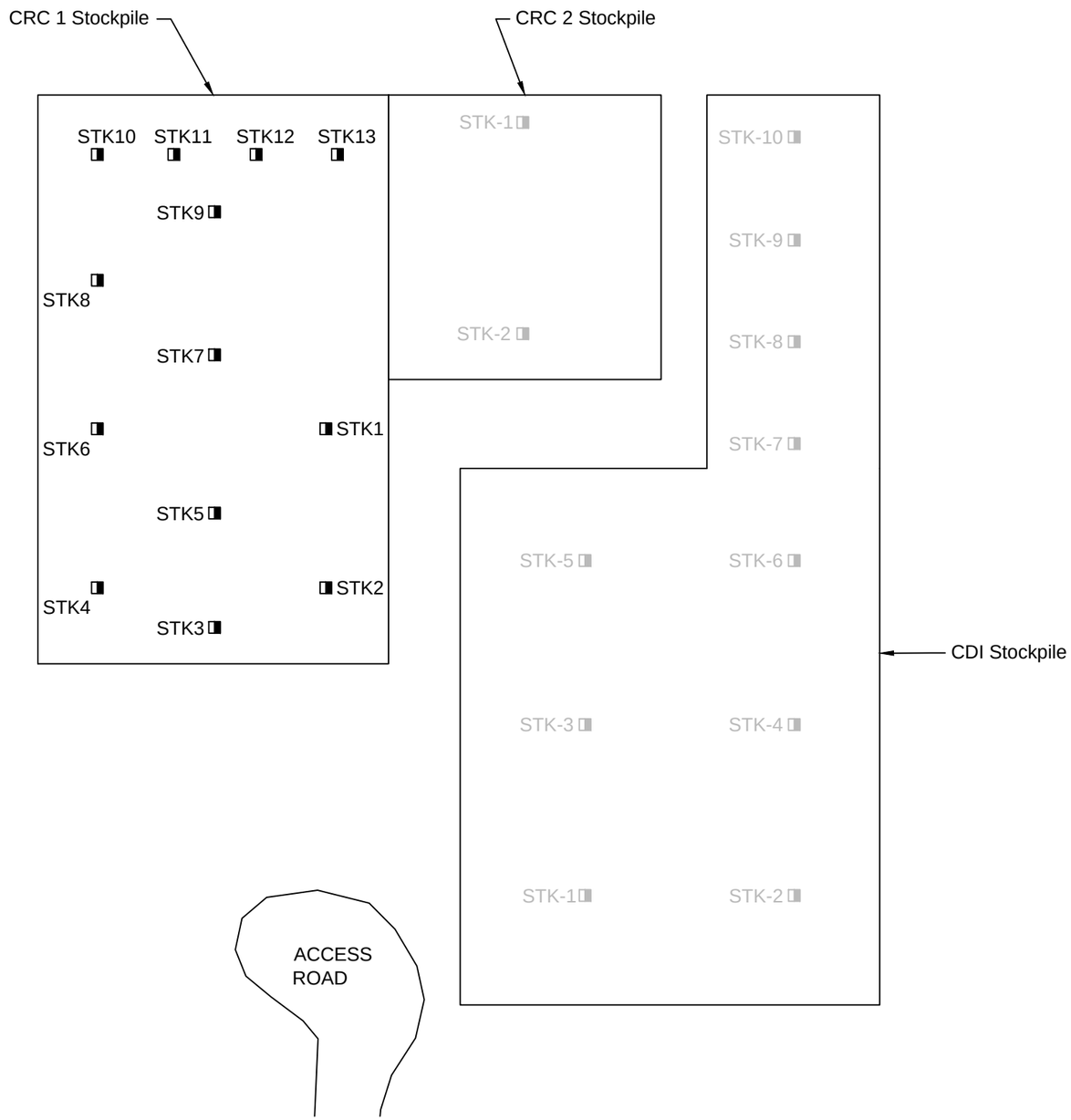
1" = 20'

510 Allen St. Suite B Kelso, Wa 98626, Ph(360)-703-6086

DATE: 5-27-16
DWN: JJT
CHK: CH
APPROVED:
PRJ. MGR: CH
PROJECT NO: 2015-010

FIGURE 2
PROPOSED HYDROCON STOCKPILE
SAMPLE LOCATIONS
CALDER MINE
PRINCE OF WALES ISLAND
ALASKA

C:\Users\Josh\Desktop\Autocad Files\Hydrocon-Autocad\2015-010 Calder Mine\2016\April 2016\2015-010_BM-CMS-050516.dwg 2.17.2014



LEGEND

EXISTING ACCESS ROAD

STOCKPILE

STK1 EXCAVATION STOCKPILE SOIL SAMPLE LOCATIONS

N W E S

0 20 40

SCALE IN FEET
1" = 20'

510 Allen St. Suite B Kelso, Wa 98626, Ph(360)-703-6086

DATE: 5-27-16
DWN: JJT
CHK: CH
APPROVED:
PRJ. MGR: CH
PROJECT NO: 2015-010

FIGURE 3
PROPOSED EXCAVATION SAMPLING LOCATIONS
AT BIOREMEDIATION CELLS (03/16)
CALDER MINE
PRINCE OF WALES ISLAND
ALASKA

C:\Users\Josh\Desktop\Autocad Files\Hydrocon-Autocad\2015-010 Calder Mine\2016\April 2016\2015-010_BM-CMS-050516.dwg 2.17.2014

APPENDIX A
STANDARD OPERATING PROCEDURES

STANDARD OPERATING PROCEDURE SOP-02
SAMPLE PACKAGING AND SHIPPING

Specific requirements for sample packaging and shipping must be followed to ensure the proper transfer and documentation of environmental samples collected during field operations. Procedures for the careful and consistent transfer of samples from the field to the laboratory are outlined herein.

EQUIPMENT REQUIRED

Specific equipment or supplies necessary to properly pack and ship environmental samples include the following:

- Ice in sealed bags or blue ice
- Sealable airtight bags
- Plastic garbage bags
- Coolers
- Bubble wrap
- Fiber reinforced packing tape
- Scissors
- Chain-of-custody seals
- Airbills for overnight shipment
- Sample analysis request forms.

PROCEDURE

The following steps should be followed to ensure the proper transfer of samples from the field to the laboratories:

- Appropriately document all samples using the proper logbooks and tracking forms.
- Make sure all applicable laboratory quality control sample designations have been made on the sample analysis request forms. Samples that will be archived for future possible analysis should be clearly identified on the sample analysis request (chain-of-custody) form. Such samples should also be labeled on the sample analysis request form as "Do Not Analyze": Hold and archive for possible future analysis" because some laboratories interpret "archive" as meaning to continue holding the residual sample after analysis.
- Notify the laboratory contact and the project quality assurance/quality control (QA/QC) coordinator that samples will be shipped and the estimated arrival time. Send copies of all chain-of-custody, sample analysis request, and packing list forms to the laboratory *QA/QC* coordinator.
- Clean the outside of all dirty sample containers to remove any residual contamination.

- Check sample containers against the chain-of-custody forms to make sure all samples intended for shipment are accounted for.
- Store each sample container in a sealable bag that allows the sample label to be read. Volatile organic analyte (VOA) vials for a single sample must be encased in bubble wrap or foam rubber before being sealed in bags.
- Choose the appropriate size cooler (or coolers) and line with bubble wrap and a plastic garbage bag.
- Fill the cooler with the samples, separating glass containers with bubble wrap and allowing room for ice to keep the samples cold. Add enough ice or blue ice to keep the samples refrigerated overnight. Avoid separating the- samples from the ice with excess bubble wrap because it will insulate the containers from the ice. After all samples and ice have been added to the cooler, use bubble wrap to fill any empty space to keep the samples from shifting during transport.
- Remember to consolidate any VOA samples in a single cooler, and ship them with a trip blank, if the quality assurance project plan calls for one.
- Once all the samples are packed, close the plastic garbage bag and fasten it with a chain-of-custody seal.
- Store the signed chain-of-custody, sample analysis request, and packing list forms in a sealable bag and tape it to the inside of the cooler lid.
- Once the cooler is sufficiently packed to prevent shifting of the containers, close the lid and seal it shut using fiber reinforced packing tape. Also, if the cooler has a drain at the bottom, it should be taped shut.
- As security against unauthorized handling of the samples, apply one or two chain-of-custody seals across the opening of the cooler lid. Be sure the seals are properly affixed to the cooler so they are not removed during shipment.
- Label the cooler with destination and return addresses, and add other appropriate stickers, such as "This End Up," "Fragile," and "Handle With Care."
- If an overnight courier is used, fill out the airbill as required and fasten it to the top of the cooler. The identification number sticker should be taped to the lid, because tracking problems can occur if a sticker is removed during shipment.

APPENDIX D

LABORATORY DATA REVIEW CHECKLIST

Laboratory Data Review Checklist

Completed by:	Eureka Project Solutions; Emily Swanson		
Title:	Environmental Scientist	Date:	5/12/16
CS Report Name:	Calder CRC 2015-010	Report Date:	4/20/16, 4/22/16
Consultant Firm:	HydroCon		
Laboratory Name:	Friedman & Bruya, Inc.	Laboratory Report Number:	604172
ADEC File Number:	1532.38.001	ADEC RecKey Number:	

1. Laboratory

a. Did an ADEC CS approved laboratory receive and perform all of the submitted sample analyses?

(X) Yes ( ) No ( ) NA (Please explain.) Comments:

b. If the samples were transferred to another "network" laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses ADEC CS approved?

( ) Yes ( ) No (X) NA (Please explain) Comments:

Samples were not transferred.

2. Chain of Custody (COC)

a. COC information completed, signed, and dated (including released/received by)?

(X) Yes ( ) No ( ) NA (Please explain) Comments:

b. Correct analyses requested?

(X) Yes ( ) No ( ) NA (Please explain) Comments:

3. Laboratory Sample Receipt Documentation

a. Sample/cooler temperature documented and within range at receipt (4° ± 2° C)?

(X) Yes ( ) No ( ) NA (Please explain) Comments:

b. Sample preservation acceptable - acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)?

○ Yes ☒ No ○ NA (Please explain) Comments:

For sample F6-7, no methanol preserved sample volume was provided for 8021 BTEX analysis.

c. Sample condition documented - broken, leaking (Methanol), zero headspace (VOC vials)?

○ Yes ☒ No ○ NA (Please explain) Comments:

d. If there were any discrepancies, were they documented? - For example, incorrect sample containers/ preservation, sample temperature outside of acceptance range, insufficient or missing samples, etc.?

☒ Yes ○ No ○ NA (Please explain) Comments:

For sample F6-7, no methanol preserved sample volume was provided for 8021 BTEX analysis.

e. Data quality or usability affected? (Please explain)

Comments:

Results for Benzene, Toluene, Ethylbenzene, and Xylenes using method 8021B were given the lab qualifier "pc" defined as "The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate."

4. Case Narrative

a. Present and understandable?

☒ Yes ○ No ○ NA (Please explain) Comments:

This case narrative encompasses samples received on April 9, 2016 by Friedman & Bruya, Inc. (ADEC laboratory approval number UST-007) from the HydroCon CRC2015-010, F&BI 604172 project. The samples were received at 4°C in good condition and were refrigerated upon receipt.

b. Discrepancies, errors or QC failures identified by the lab?

○ Yes ☒ No ○ NA (Please explain) Comments:

c. Were all corrective actions documented?

○ Yes ○ No ☒ NA (Please explain) Comments:

No corrective actions needed.

d. What is the effect on data quality/usability according to the case narrative?

Comments:

Data is usable to meet project objectives.

5. Samples Results

a. Correct analyses performed/reported as requested on COC?

(X) Yes ( ) No ( ) NA (Please explain) Comments:

b. All applicable holding times met?

(X) Yes ( ) No ( ) NA (Please explain) Comments:

c. All soils reported on a dry weight basis?

(X) Yes ( ) No ( ) NA (Please explain) Comments:

d. Are the reported PQLs less than the Cleanup Level or the minimum required detection level for the project?

(X) Yes ( ) No ( ) NA (Please explain) Comments:

e. Data quality or usability affected? (Please explain) Comments:

6. QC Samples

a. Method Blank

i. One method blank reported per matrix, analysis and 20 samples?

(X) Yes ( ) No ( ) NA (Please explain) Comments:

ii. All method blank results less than PQL?

(X) Yes ( ) No ( ) NA (Please explain) Comments:

iii. If above PQL, what samples are affected? Comments:

iv. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

○ Yes ○ No ☒ NA (Please explain) Comments:

No affected samples.

v. Data quality or usability affected? (Please explain) Comments:

b. Laboratory Control Sample/Duplicate (LCS/LCSD)

i. Organics - One LCS/LCSD reported per matrix, analysis and 20 samples? (LCS/LCSD required per AK methods, LCS required per SW846)

☒ Yes ○ No ○ NA (Please explain) Comments:

ii. Metals/Inorganics - One LCS and one sample duplicate reported per matrix, analysis and 20 samples?

○ Yes ○ No ☒ NA (Please explain) Comments:

No inorganics analysis present.

iii. Accuracy - All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods: AK101 60%-120%, AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages)

☒ Yes ○ No ○ NA (Please explain) Comments:

iv. Precision - All relative percent differences (RPD) reported and less than method or laboratory limits? And project specified DQOs, if applicable. RPD reported from LCS/LCSD, MS/DMSD, and or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)

○ Yes ○ No ☒ NA (Please explain) Comments:

Laboratory duplicate not associated with samples.

v. If %R or RPD is outside of acceptable limits, what samples are affected?

Comments:

vi. Do the affected samples(s) have data flags? If so, are the data flags clearly defined?

○ Yes ○ No ☒ NA (Please explain) Comments:

vii. Data quality or usability affected? (Please explain) Comments:

c. Surrogates - Organics Only

i. Are surrogate recoveries reported for organic analyses - field, QC and laboratory samples?

☒ Yes ○ No ○ NA (Please explain) Comments:

ii. Accuracy - All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods 50-150 %R; all other analyses see the laboratory report pages)

☒ Yes ○ No ○ NA (Please explain) Comments:

iii. Do the sample results with failed surrogate recoveries have data flags? If so, are the data flags clearly defined?

○ Yes ○ No ☒ NA (Please explain) Comments:

No failed surrogate recoveries in this report.

iv. Data quality or usability affected? (Use the comment box to explain.). Comments:

d. Trip Blank - Volatile analyses only (GRO, BTEX, Volatile Chlorinated Solvents, etc.): Water and Soil

i. One trip blank reported per matrix, analysis and for each cooler containing volatile samples? (If not, enter explanation below.)

○ Yes ☒ No ○ NA (Please explain.) Comments:

No trip blanks with this sample set.

ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC? (If not, a comment explaining why must be entered below)

○ Yes ○ No ☒ NA (Please explain.) Comments:

No trip blanks with this sample set.

iii. All results less than PQL?

(X) Yes ( ) No ( ) NA (Please explain.) Comments:

iv. If above PQL, what samples are affected?

Comments:

v. Data quality or usability affected? (Please explain.)

Comments:

e. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples?

(X) Yes ( ) No ( ) NA (Please explain) Comments:

ii. Submitted blind to lab?

(X) Yes ( ) No ( ) NA (Please explain.) Comments:

iii. Precision - All relative percent differences (RPD) less than specified DQOs?
(Recommended: 30% water, 50% soil)

$$\text{RPD (\%)} = \text{Absolute Value of: } \frac{(R_1 - R_2)}{((R_1 + R_2)/2)} \times 100$$

Where R_1 = Sample Concentration

R_2 = Field Duplicate Concentration

( ) Yes (X) No ( ) NA (Please explain) Comments:

Field duplicate from parent sample S15-6 has an RPD of 80% for Diesel Range Organics and 79% for Diesel Range Organics with Silica Gel.

iv. Data quality or usability affected? (Use the comment box to explain why or why not.)

(X) Yes ( ) No ( ) NA (Please explain) Comments:

Field duplicate was outside of acceptance criteria.

f. Decontamination or Equipment Blank (if applicable)

○ Yes ☒ No ○ NA (Please explain) Comments:

i. All results less than PQL?

○ Yes ○ No ☒ NA (Please explain) Comments:

No Equipment Blank present.

ii. If above PQL, what samples are affected?

Comments:

iii. Data quality or usability affected? (Please explain.)

Comments:

7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.)

a. Defined and appropriate?

☒ Yes ○ No ○ NA (Please explain) Comments:

Results for total petroleum hydocarbon as diesel using method AK 102 for samples S10-5, S15-6 and Dup were given the lab qualifier "x". The lab qualifier "x" is defined as "The sample chromatographic pattern does not resemble the fuel standard used for quantitation."

Reset Form