Shooting Range Site Characterization
Hiland Mountain Correctional Center
Eagle River, Alaska

October 2018

SHANNON & WILSON, INC.

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

Excellence. Innovation. Service. Value.

Since 1954.

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100200

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SHOOTING RANGE SITE CHARACTERIZATION
HILAND MOUNTAIN CORRECTIONAL CENTER
EAGLE RIVER, ALASKA

1.0 INTRODUCTION

This report presents the results of Shannon & Wilson's site characterization and solid waste removal activities conducted at the Southcentral Law Enforcement Shooting Range (Property). This work was performed as part of our July 6, 2016 *Workplan for Site Characterization, Hiland Mountain Correctional Center Shooting Range, Eagle River, Alaska,* which was approved by Mr. Grant Lidren of the Alaska Department of Environmental Conservation (ADEC) in the form of an email on July 7, 2016. Authorization was received from the Department of Transportation & Public Facilities (ADOT&PF) through Notice to Proceed (NTP) 20 under our Professional Services Agreement No. 02532064. The work was conducted in accordance with out April 13, 2018 proposal.

2.0 SITE AND PROJECT DESCRIPTION

The project site is located east of the Glenn Highway frontage road, in the southeast ¼ of Section 14, Township 14 North, Range 2 West, Seward Meridian, Alaska. For the purposes of this report, the "project site" is defined as the former shooting range located east of the Hiland Mountain Correctional Center (HMCC) structures. A vicinity map showing the site and surrounding area is included as Figure 1. A site plan of the area is included as Figure 2.

The site was used as a shooting range by the Alaska Department of Corrections between 1980 and 1998. It is our understanding that the range was used by the DOC staff and other law enforcement personnel. Weapons used at the range were primarily handguns (.38 and .40 S&W) and shotguns (12 gage). The range is approximately 30 yards long. Weapons were fired at stationary targets set in steel brackets mounted in the concrete firing lanes. The range is currently inactive. Current DOC staff are unaware of any regrading activities at the range backstop.

2.1 Prior Investigations

On April 28, 2009, a representative from Shannon & Wilson collected and screened surface soil samples from the former firing range. The samples were collected from three separate areas: grid area, target line, and berm backstop. The grid comprised of four approximately equal areas, between the firing line and the target line. Using hand tools, the samples were collected from the upper 4 inches of surface soil to qualitatively evaluate and document the extent of lead impact.

The target line and the berm backstop area soils were qualitatively evaluated to a maximum depth of 12 inches below ground surface (bgs). Spent ammunition casings were observed throughout the project site, although no visible lead fragments were noted in the sample areas.

A total of 43 surface soil samples were visually screened for lead fragments, and eight analytical samples were collected. Analytical samples were collected from four locations within the grid—one sample from each of the four areas. Within each grid, analytical samples were collected from areas where the most spent cartridges were observed. Samples were also collected from two locations along the former target line and two locations from the backstop berm.

Six of the eight analytical soil samples contained lead concentrations that exceed the ADEC Method 2 cleanup level for residential soil. Additionally, lead concentrations in five samples also exceed the Resource Conservation and Recovery Act (RCRA) standard for leachable lead. The highest concentrations were reported in the samples from the berm backstop.

2.2 Regulatory Status

Under traditional interpretations of ADEC and Resource Conservation, and Recovery Act (RCRA) regulations, lead shot and lead-contaminated soil that is moved, excavated or otherwise managed is a generated waste, and subject to 40 CFR 262.11 requiring evaluation for hazardous characteristics that may cause it to be classified as a hazardous waste. Based on the sampling conducted on the Property, soil excavated would likely be classified as a characteristic hazardous waste. This classification would necessitate obtaining an Environmental Protection Agency (EPA) identification number, conducting cradle-to-grave tracking of the generated material, and disposing the material in a permitted RCRA Subtitle C landfill if it fails the RCRA criteria for leachable lead.

Moreover, recent court cases and EPA interpretations suggest that lead shot in the environment, even if undisturbed by human activities, can become a RCRA waste, if present at a closed or abandoned shooting range. This changes the traditional interpretation and can require removing all lead shot from the range; regardless if the soil samples pass the ADEC and RCRA criteria.

The site is currently classified as an inactive range. No changes to the range have occurred that would prevent the range from becoming active in the future. The long-term intent of DOC is to close this range and use other facilities for training. The purpose of this project is to evaluate the potential costs associated with range closure.

3.0 FIELD ACTIVITIES

The field activities during this portion of the project included further identifying areas containing spent bullets and bullet fragments, documenting the extent of lead contamination in soil, and

conducting bench-scale testing to evaluate the effectiveness of stabilizing the lead in soil. Work on this project was conducted by ADEC-Qualified Environmental Professionals, as defined by 18 Alaska Administrative Code (AAC) 75.990. SGS North America Inc. (SGS) of Anchorage, Alaska performed the laboratory testing of analytical soil samples under subcontract to Shannon & Wilson. Site photographs are included in Appendix A. Field notes are provided in Appendix B.

3.1 Work Plan Modifications

The field activities were performed in general accordance with our July 6, 2016 *Workplan for Site Characterization, Hiland Mountain Correctional Center Shooting Range, Eagle River, Alaska.* A metal detector was used to evaluate the lateral extents of the backstop impact areas. This survey indicated the presence of lead fragments in a horizontal band across the backstop and not in individual impact areas in line with the shooting lanes. The area of the backstop excluded from the backstop decision unit is shown on Figure 2. This modification was approved by ADEC via email on June 19, 2018.

3.2 Decision Unit Characterization

As described in the work plan the following decision units were identified:

- Decision Unit 1. Firing line to 5 yards downrange.
- Decision Unit 2. Five yards downrange to 25 yards downrange.
- Decision Unit 3. Twenty-five yards downrange to the toe of the backstop.
- Decision Unit 4. Backstop outside of bullet impact areas.

A Multi-increment (MI) sampling method was used to obtain representative samples of the surface soil. Non-volatile MI sampling was conducted in general accordance with the ADEC's *Draft Guidance on Multi-Increment Soil Sampling* (May 2009) and the U.S. Army Corps of Engineers' *Interim Guidance 09-02, Implementation of Incremental Sampling (IS) of Soil for the Military Munitions Response Program* (July 2009). One MI sample was collected from each decision unit.

A square-based grid system was used to overlay each decision unit. The grid system was sized such that each decision unit contained at least 100 possible sampling locations. The Shannon & Wilson representatives marked the approximate grid centers with labeled pin flags as shown in Photo 1 in Appendix A. For each decision unit, a random number generator was used to select 50 sub-portion sample locations. Primary sub-portion samples were collected from the center of the grid square as shown in Photo 2. Duplicate and replicate samples were collected from Decision Unit 3 as described in the work plan. The duplicate sub-portion samples were collected

from the same grid square as the primary sample and 8 inches north of each primary sub-portion sample. Replicate sub-portion sample locations were determined using a random number generator to select new grid squares.

At each sub-sample location, approximately 20 grams of soil were collected using a decontaminated sampling spoon and field scale. Effort was taken to collect silt and fine-grained sand with particle diameters of less than 2 millimeters. Due to the moisture content, each sub-portion sample was dried on site using a portable stove as shown in Photo 3. Once the sub-portion sample was sufficiently friable for sieving, the Shannon & Wilson representatives used a portable #10 sieve to remove material with grain size diameter greater than 2 millimeters as shown in Photo 4. The material larger than the #10 sieve was visually evaluated for bullet fragments. A single lead fragment was observed in the samples collect from Decision Unit 4. Lead fragments were not observed in the samples collected from the other decision units.

Following sieving, the sub-portion samples were placed into a common container. Once all 50 sub-portion samples were collected, the entire bulk sample was spread on a new piece of visqueen. The Shannon & Wilson representatives lifted each corner of the visqueen at least four times to homogenize the material. The homogenized material was spread out across the visqueen to a depth of about 0.5-inch and divided into 30 equal sections as shown in Photo 5. Soil was collected from the center of each section (30 portions) to develop a laboratory sample with a mass of 1 gram. Shannon & Wilson's field representatives used clean stainless-steel spoons and wore new nitrile gloves to transfer analytical soil samples into laboratory-supplied containers. The sample jars were placed in coolers and transferred to the laboratory using chain of custody procedures. The MI samples were analyzed for total lead by EPA Method 6020. A sample from the homogenized sample was also collected and analyzed for leachable lead by EPA Method 1311/6020. Descriptions of the sample depths and sample descriptions are presented in Table 1.

3.3 Impact Area Characterization

The bullet impact area near the central firing lane was characterized by collecting samples in six-inch increments horizontally into the backstop. These samples, from 0 to 6 inches, 6 to 12 inches, 12 to 18 inches, and 18 to 24 inches, were individually screened with a #10 sieve. The material larger than the #10 sieve was then visually evaluated for bullet fragments. The number of bullets and fragments decreased in each sample with depth. Table 1 contains a description of the samples collected.

After review of the analytical results and sample description it appears that samples IA1-12-18 and IA1-18-24 were mis-identified in the field. This is based on the observation of bullets in one

sample and the analytical sample results. In reviewing the field notes it was observed that the sample labeled as IA1-18-24 (deeper) was collected at an earlier time than the sample labeled IA1-12-18 (shallower). In the report and tables we are reporting the corrected sample numbers.

No bullets were found in the sample from 18-24 inches and fragments were only observed in the samples collected shallower than 12 inches. Photo 6 shows representative bullets and lead fragments recovered from the impact area. The soil finer than the #10 sieve from each sample interval was collected and analyzed for total lead by EPA Method 6020 and leachable lead by EPA Method 1311/6020.

3.4 Bench Scale Testing

Shannon & Wilson conducted bench scale testing of lead stabilization using soil from Decision Units 3 and 4 and an impact area. The soil for testing was a grab sample taken from the approximate midpoint of the decision units. The impact area just to the south of the one characterized was selected for bench scale testing. This location was selected because it was undisturbed and was assumed to have similar bullet concentrations.

The soil from the decision units was amended with rock phosphorous at 4 and 10 times the stoichiometric ratio for generating lead phosphate based on the characterization sampling results. Due to the amount of lead in the impact area soil, rock phosphorous was applied at approximately 8 times the stoichiometric ratio. As shown in Photos 7 and 8 this resulted in approximately equal volumes of soil and rock phosphorous. The soil and phosphate were mixed by hand and allowed to react for approximately 22 days before analysis. A second round of performance samples were analyzed approximately 40 days after application of the rock phosphorous. The performance samples were analyzed for leachable lead by EPA Method 1311/6020.

4.0 LABORATORY ANALYSIS

A total of 10 characterization soil samples were analyzed for total lead by EPA Method 6020A and leachable lead by EPA Method 1311/6020. Note that all MI analytical samples were collected from the material that passed through a #10 sieve. Eight soil samples collected from the bench scale testing locations following phosphate stabilization were analyzed for TCLP lead by EPA Method 1311/6020. Two samples were also collected for soil parameters including pH, phosphorus, and sulfate. Analytical samples were submitted to SGS using chain-of-custody procedures and tested on a standard 10-day turnaround time.

5.0 DISCUSSION OF ANALYTICAL RESULTS

According to the ADEC's *Oil and Other Hazardous Substances Pollution Control Regulations* (18 AAC 75, November 2017), the cleanup level for lead in soil is 400 mg/kg based on a residential exposure scenario and 800 mg/kg based on a commercial/industrial exposure scenario. TCLP lead soil results were compared to the RCRA characteristic waste standard of 5 milligrams per liter (mg/L) leachable lead listed in 40 Code of Federal Regulations (CFR) 261.

5.1 Decision Unit Characterization Results

A coefficient of variation (CV) of 0.22 was calculated for the duplicate and replicate MI samples from Decision Unit 3. Based on the results of this calculation, the Student T-test (CV less than 1.5) was used to calculate the 95-percent upper confidence level (UCL) of the mean concentration of lead in the soil. Because the Decision Units are expected to contain similar contaminant distributions, this CV was applied to the other Decision Units to calculate the 95-percent UCL. A summary of the sample results and calculated 95-percent UCL is included in Table 2.

Based on the sampling conducted, Decision Units 1 and 2 both have a total lead and a 95-percent UCL lead concentration less than the ADEC's residential cleanup level. The samples collected did not contain observable bullets or lead fragments. The samples from these two decision units contained leachable lead less than the EPA's criterion of 5 milligrams per liter (mg/L).

While bullets or lead fragments were not observed in the samples collected from Decision Unit 3, both the total lead and the 95-percent UCL lead concentration exceeds the ADEC criteria for residential and commercial exposure scenarios. The samples also failed the leachable lead criterion with a maximum concentration of 26.7 mg/L reported.

One bullet was found in the Decision Unit 4 sample and the sample contained a 95-percent UCL lead concentration of 16,187 mg/kg which exceeds the ADEC criterion. The Decision Unit 4 sample also failed the leachable lead criterion with a concentration of 27.6 mg/L.

5.2 Impact Area Characterization Results

Each sample collected in the Impact Area shallower than 18 inches contained total and leachable lead above the applicable criteria. The concentrations of total lead decreased from 69,000 mg/kg in the shallow sample to 1,190 mg/kg in the sample from 12 to 18 inches. The number of bullets observed followed this same pattern with more than 40 observed in the shallow sample to 1 observed in the sample from 12 to 18 inches.

The sample collected from 18-24 inches contained 185 mg/kg lead and 0.252 mg/L leachable lead which meet the ADEC and EPA criteria.

5.3 Bench Scale Testing Results

Two soil samples were collected for general soil chemistry evaluation. The sample results indicated low concentrations of naturally occurring phosphorus and sulfate. The measured pH ranged from 5.90 to 6.00 su which is fairly low for mineral soil in southcentral Alaska.

While the bench scale testing results show some reduction in leachable lead concentrations, none of the samples tested met the EPA's 5.0 mg/L criterion for leachable lead.

5.4 Quality Assurance Summary

The project laboratory follows on-going quality assurance/quality control procedures to evaluate conformance to applicable ADEC data quality objectives (DQOs). Internal laboratory controls to assess data quality for this project included surrogates, method blanks, laboratory control sample/laboratory control sample duplicates (LCS/LCSD), and matrix spike/matrix spike (MS/MSD) duplicates. If a DQO was not met, the project laboratory provides a notation identifying the problem in the case narrative section of their (See Appendix C).

External quality controls include a duplicate sample and replicate sample set collected from Decision Unit 3. The coefficient of variation (CV) for this MI sample set was calculated at 0.22. A CV greater than 3 indicates that the data is not usable due to errors in the sampling process or the presence of areas of significantly higher contaminant concentration. Therefore, the MI sample results are considered representative of the decision units.

Shannon & Wilson reviewed the SGS data deliverables and completed the ADEC's laboratory data review checklist (LDRC) for each laboratory report, which are included in Appendix C. Quality control non-conformances and the impact to data quality/usability are described in further detail in the LDRCs. In our opinion, no non-conformances that would adversely impact data usability were noted, and we find the project data to be complete and useable to support the project purpose and objective.

6.0 GENERATED WASTE

The bullets and bullet fragments observed during sampling are stored at the site for future recycling. They are stored in a labeled, five-gallon bucket stored in a storage shed on the west side of the range. Personal protective and disposable sampling equipment was placed in a dumpster for disposal as solid waste.

7.0 CONCLUSIONS

Based on the sampling conducted, the soil in Decision Units 1 and 2 meet the ADEC criteria for allowable lead concentration and no remedial activities are required. While bullets and lead

fragments were not observed in this area, bullet casings and spent shells were observed. This solid waste should be collected and properly disposed.

The soil in Decision Units 3 and 4, and the Impact Area, exceed the ADEC criterion for lead in soil for residential and commercial exposure scenarios. The soil also exceeds the EPA's criteria for leachable lead and would be considered a characteristic waste when generated. These results are consistent with the results of the discreet sampling conducted in July 2009. Based on the bench scale testing conducted, the addition of rock phosphate will not adequately stabilize the lead to meet the leachability criteria. Bullets and lead fragments were observed in the samples collected from Decision Unit 4 and the Impact Area. Sieving was effective at collecting bullets and bullet fragments, however the soil that passed through the sieve failed the leachability criterion for lead.

A range closure plan should be developed to remove and properly dispose the lead-impacted soil in Decision Units 3 and 4 and the Impact Area. Based on the sampling conducted there is no benefit to handling soil from the three areas separately. Due to the low pH of the soil, we recommend removing the upper four-inches of soil from Decision Unit 3, the upper 18-inches of soil from Decision Unit 4, and the upper 18-inches of soil from the Impact Areas and disposed as a D008 characteristic hazardous waste. Following removal of this soil a metal detector should be used to evaluate the resulting surface for bullets and lead fragments using a random grid. If bullets or lead fragments are observed, addition soil should be removed and disposed as above. Once the bullets and lead fragments are removed from the area, MI samples should be collected from the three decision units (Decision Units 3 and 4 and the Impact Area) to evaluate the effectiveness of the lead removal.

ADEC approval of the range closure plan will be required. Additionally, the range closure plan will have to comply with the requirements of 40 CFR 261 including obtaining an EPA identification number, preparing waste manifests, and disposal in a RCRA Subtitle C landfill.

8.0 CLOSURE/LIMITATIONS

This report was prepared for the exclusive use of ADOT&PF, herein referred to as the Client, and their representatives. The findings within this report are based on the limited sampling and analyses that were conducted. They should not be construed as definite conclusions regarding the site's soil conditions. It is possible that our tests missed higher levels, although our intention was to sample in accordance with the ADEC-approved work plan. As a result, the sampling, analyses, and data interpretations can provide you with only our professional judgment as to the environmental characteristics of this site, and in no way guarantees that an agency or its staff will reach the same conclusions as Shannon & Wilson, Inc. The data presented in this report should

be considered representative of the time of our site assessment. Changes in site conditions can occur over time, due to natural forces or human activity. In addition, changes in government codes, regulations, or laws may occur. Because of such changes beyond our control, our observations and interpretations may need to be revised.

Shannon & Wilson has prepared the document in Appendix D, Important Information About Your Geotechnical/Environmental Report, to assist you and others in understanding the use and limitations of our reports. You are advised that various state and federal agencies (ADEC, EPA, etc.) may require the reporting of this information. Shannon & Wilson does not assume the responsibility for reporting these findings and therefore has not, and will not, disclose the results of this study unless specifically requested and authorized by you, or as required by law.

We appreciate the opportunity to be of service to you. Please contact the undersigned at (907) 561-2120 with questions or comments concerning this report.

Sincerely,

SHANNON & WILSON, INC.

Stafford Glashan, P.E.
Senior Engineer

TABLE 1
SAMPLE LOCATIONS AND DESCRIPTIONS

Sample Number	Date	Sample Location and Description (See Figure 2)	Depth (inches bgs)
Decision Unit Samples			
* DU1	6/18/2018	Decision Unit 1 MI sample, no bullets or fragments observed	1.0
* DU2	6/19/2018	Decision Unit 2 MI sample, no bullets or fragments observed	1.0
* DU3	6/19/2018	Decision Unit 3 MI sample, no bullets or fragments observed	1.0
* DU3R	6/19/2018	Decision Unit 3 replicate sample, no bullets or fragments observed	1.0
* DU39	6/19/2018	Decision Unit 3 duplicate sample, no bullets or fragments observed	1.0
* DU3-44	6/19/2018	Decision Unit 3 grab sample for soil chemistry	1.0
* DU4	6/20/2018	Decision Unit 4 MI sample, one bullet and no fragments observed	1.0
Impact Area Samples			
* IA1-0-6	6/20/2018	Impact Area 1, >20 bullets and numerous fragments recovered	0-6
* IA1-6-12	6/20/2018	Impact Area 1, 4 bullets and few fragments recovered	6-12
* IA1-12-18~	6/20/2018	Impact Area 1, 1 bullet and no fragments recovered	12-18
* IA1-18-24~	6/20/2018	Impact Area 1, no bullets or fragments recovered	18-24
* IA1-12-18NV	6/20/2018	Impact Area 1 grab sample for soil chemistry	1.0

Notes:

* = Sample analyzed by the project laboratory (See Table 2)

~ = Samples apparently mis-labeled in field. See Report.

bgs = below ground surface

MI = Multi Increment

TABLE 2
SUMMARY OF SOIL ANALYTICAL RESULTS

Parameter Tested	Method*	Cleanup Level**	Sample ID Number^, and Collection Depth in Inches bgs (See Table 1 and Figure 2)						
			Decision Units						
			DU1 1.0	DU2 1.0	DU3 1.0	DU3R 1.0	DU39 1.0	DU344 1.0	DU4 1.0
Total Lead -mg/kg	EPA 6020A	400	**61.4**	**193**	**1,570**	**1,960**	**2,420**	-	**11,900**
95% UCL Lead - mg/kg	Calculation‡	400	**83.5**	**262**	**2,700**	**2,700**	**2,700**	-	**16,184**
TCLP Lead - mg/L	EPA 1311/6020A	5	**0.556**	**0.799**	**17.7**	**26.7**	**15.9**	-	**27.6**
pH - Standard Units		NA	-	-	-	-	-	**6.00**	-
Phosphorus - mg/kg		NA	-	-	-	-	-	**635**	-
Sulfate - mg/kg		NA	-	-	-	-	-	**4.44**	-
4x Phosphate - 22 days post application									
TCLP Lead - mg/L	EPA 1311/6020A	5	-	-	**25.2**	-	-	-	**75.6**
10x Phosphate - 22 days post application									
TCLP Lead - mg/L	EPA 1311/6020A	5	-	-	**29.3**	-	-	-	**29.5**
10x Phosphate - 40 days post application									
TCLP Lead - mg/L	EPA 1311/6020A	5	-	-	**22.1**	-	-	-	**85.8**

Notes:

* = See Appendix C for compounds tested, methods, and laboratory reporting limits.

** = Soil cleanup levels are the most stringent ADEC Method Two standards listed in Tables B1 and B2, 18 Alaska Administrative Code (AAC) 75, for the "over 40 inches (precipitation) zone" (November 2017).

‡ = Based on Coefficient of Variability of 0.22 and Student-t test calculated from Decision Unit 3 samples

^ = Sample ID number preceded by "100200-" on the chain of custody form

mg/kg = Milligrams per kilogram

mg/L = Milligrams per liter

61.4 = Analyte detected at a concentration less than the applicable ADEC cleanup level

- = Analyte concentration exceeds most stringent ADEC or EPA criterion

- = Sample not tested for this analyte

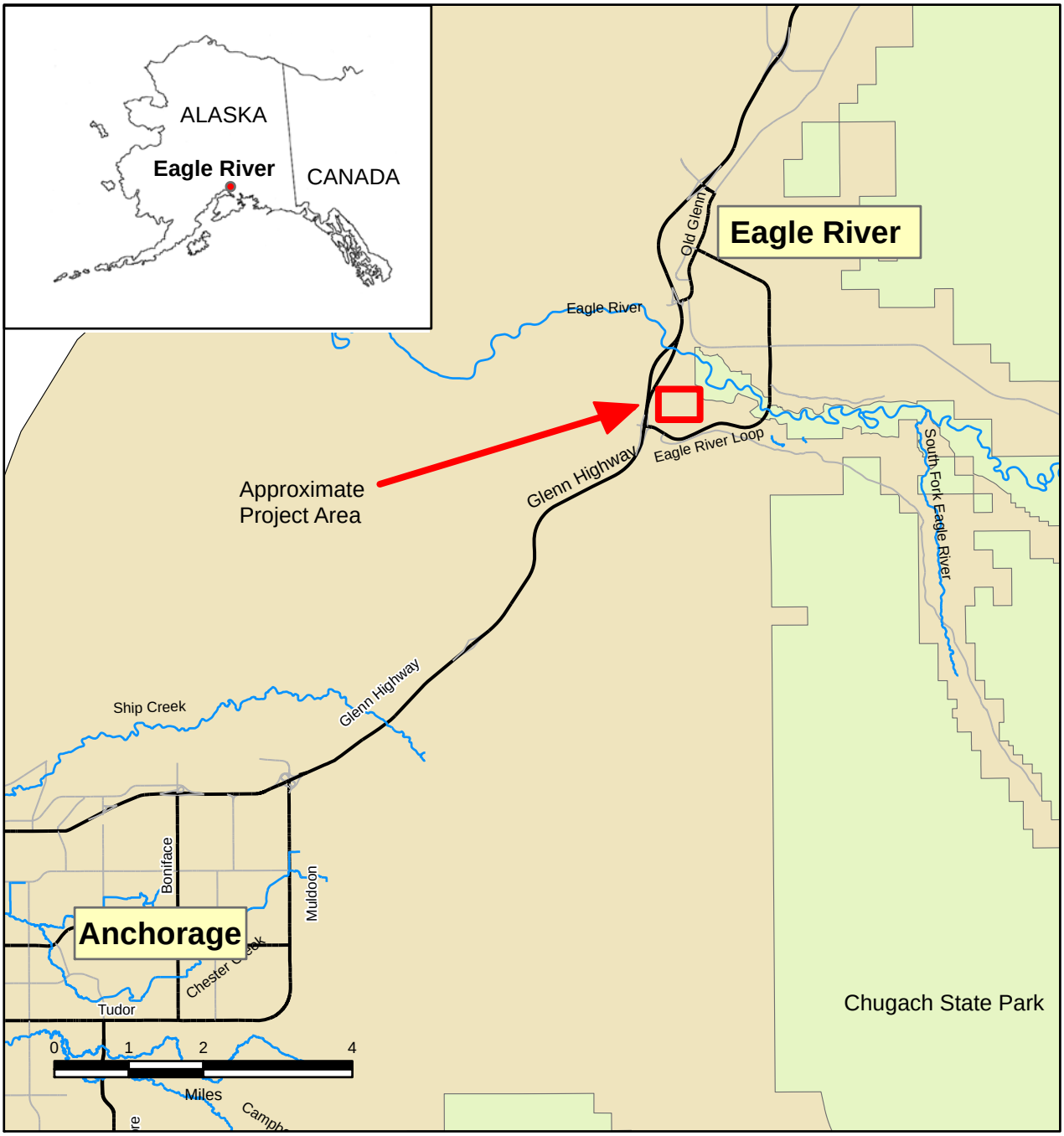
bgs = below ground surface

TABLE 2
SUMMARY OF SOIL ANALYTICAL RESULTS

Parameter Tested	Method*	Cleanup Level**	Sample ID Number^, and Collection Depth in Inches bgs (See Table 1 and Figure 2)				
			Impact Areas				
			IA1-0-6 0-6	IA1-6-12 6-12	IA1-12-18~ 12-18	IA1-18-24~ 18-24	IA1-12-18NV 1.0
Total Lead -mg/kg	EPA 6020A	400	**69,000**	**2,970**	**1,190**	**185**	-
TCLP Lead - mg/L	EPA 1311/6020A	5	**788**	**8.13**	**15.8**	**0.252**	-
pH - Standard Units		NA	-	-	-	-	**5.90**
Phosphorus - mg/kg		NA	-	-	-	-	**742**
Sulfate - mg/kg		NA	-	-	-	-	**11.2**
8x Phosphate - 22 day post application TCLP Lead - mg/L	EPA 1311/6020A	5	**656**	-	-	-	-
8x Phosphate - 40 days post application TCLP Lead - mg/L	EPA 1311/6020A	5	**455**	-	-	-	-

Notes:

*	= See Appendix C for compounds tested, methods, and laboratory reporting limits.
**	= Soil cleanup levels are the most stringent ADEC Method Two standards listed in Tables B1 and B2, 18 Alaska Administrative Code (AAC) 75, for the "over 40 inches (precipitation) zone" (November 2017).
‡	= Based on Coefficient of Variability of 0.215 and Student-t test calculated from Decision Unit 3 samples
^	= Sample ID number preceded by "100200-" on the chain of custody form
mg/kg	= Milligrams per kilogram
mg/L	= Milligrams per liter
61.4	= Analyte detected at a concentration less than the applicable ADEC cleanup level
788	= Analyte concentration exceeds most stringent ADEC or EPA criterion
-	= Sample not tested for this analyte
~	= Samples apparently mis-labeled in field. See Report.
bgs	= below ground surface



Map adapted from files provided by the Municipality of Anchorage, Geographical Information Systems website

LEGEND

Streams

Streets and Roads

Major

Secondary

N

HMCC Shooting Range
Eagle River, Alaska

VICINITY MAP

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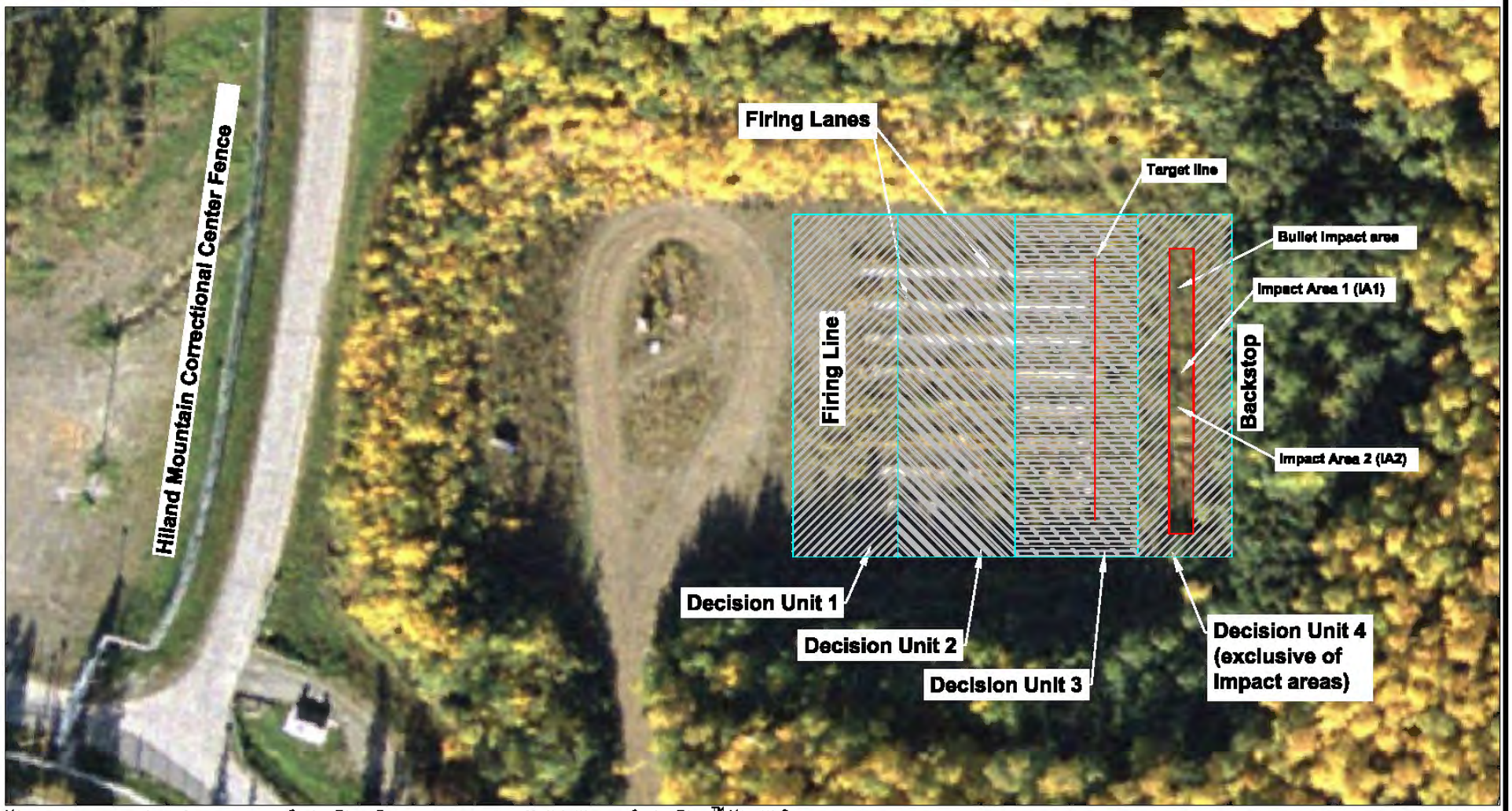
FIG. 1



0 30 60 120

APPROXIMATE SCALE IN FEET

N

HMCC Shooting Range
Eagle River, Alaska

SITE PLAN

October 2018 100200-001

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FIG. 2

APPENDIX A

SITE PHOTOGRAPHS

Photo 1: Looking south across the firing lanes with grid for Decision Unit 2 being set up.

Photo 2: Collecting sample from Decision Unit 1.

HMCC Shooting Range
Eagle River, Alaska

PHOTOS 1 AND 2

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Photo 3: Drying the sub-portion sampling prior to sieving.

Photo 4: Hand sieving sub-portion through a #10 (2mm) sieve.

HMCC Shooting Range Eagle River, Alaska	
PHOTOS 3 AND 4	
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Photo 5: Preparing to collect a 1 mg sample for lab analysis.

Photo 6: Lead fragments found in the impact area.

HMCC Shooting Range Eagle River, Alaska	
PHOTOS 5 AND 6	
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Photo 7: Bench scale impact area sample (left) and phosphate (right).

Photo 8: Impact Area bench scale sample after mixing.

HMCC Shooting Range
Eagle River, Alaska

PHOTOS 7 AND 8

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APPENDIX B

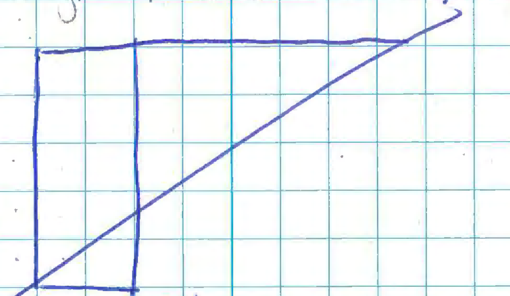
FIELD NOTES

Stafford, Matt, Jake HMCC Shooting Range

0900 Arrive onsite, complete verbal JSA

0926 Stafford uses metal detector to locate location of bullets in berm. Begin marking out grids

0939 Set grid for DU1 140' x 40'



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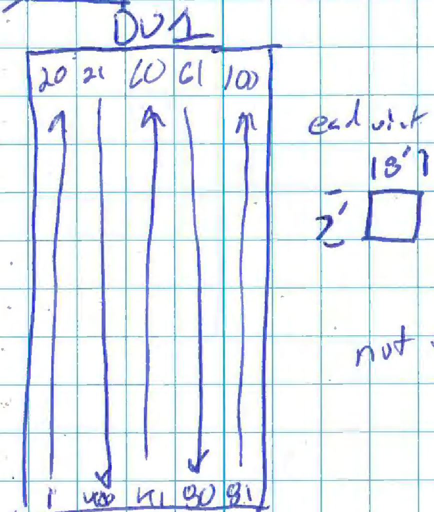


not to scale

Rite in the Rain

1120 Jake completes flag placement
per random # generator sheet
photos 167 & 166 of DV1
MV

1144 Begin sampling DV1
Samples collect from 0-2" below ground
surface and under vegetated mats (when applicable)
photo 168

1209 photo 169 of Jake sampling DV1

1216 Matt begins setting up DV2 site
Jake continue DV1 soil aliquot collecting

1252 Complete sample DV1 subpart collection. Start drying
photo ~~169~~ 170 MV of drying
~~Sample~~ MV sample is moist
brown silt w/ sand.

1323 Break up "moist clumps" during stirring.
This process will be used on all future samples

1328 Sieve DV1 sample

1343 photo of sieving process 171

1352 Divide sieved sample into 30 pt grid
collect 2.1g of sample
photo ~~170~~ MV 172
fill 8oz jar for TCLP

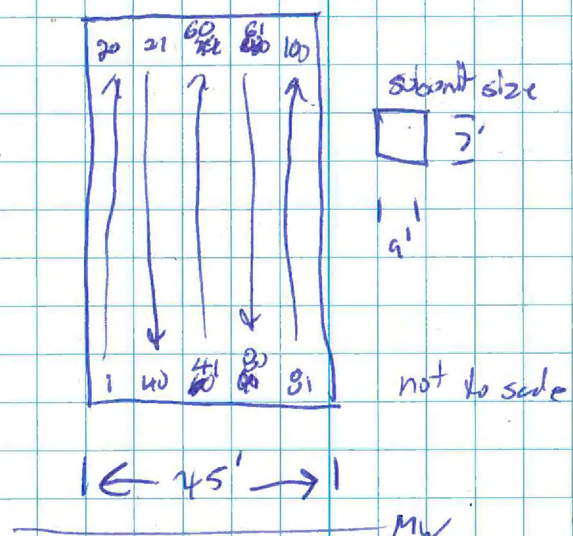
1403 Dispose remaining sample in subunit #1

1417 Jake tears down DU1

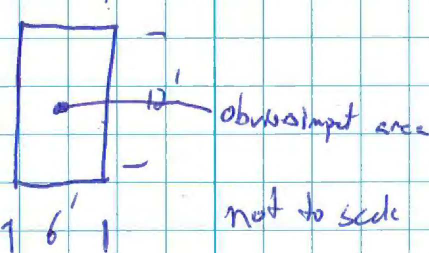
Matt continues to setup DU2 ← flags placed per spreadsheet

1424 Complete DU2 setup

1'



1510 measure impact area



~~1300~~ 1520 load things into shed

1533 leave site, back to anchorage

6/19/18 Matt Vaals, Jake Kesler

0837 Arrive onsite, Matt Vaals
Begin prep to sample DV2
Notice site is considerably dryer than yesterday, all gulf locations appear intact

0908 photograph 173 showing how duplicate samples were collected

0909 photograph 174 show DV2 sample location and extents of unit

0912 Check sample cooler. Plenty of ice, samples are adequately chilled

0918 Begin sampling DV2
photograph of weigh sub-samples, 175

0959 Complete sample collection, begin drying sample on stoves. Sample moist overall

1110 Jake arrives onsite. Starts placing pin flags in the DV3 per the spreadsheet at random B's MV

1033 Remove Sample from heat, allow to cool

1048 Jake begins sample collection from DV3
see next page for drawing.

1051 Begin sieving primary Sample DV2

1106 photo of sieved material and rejects. 176

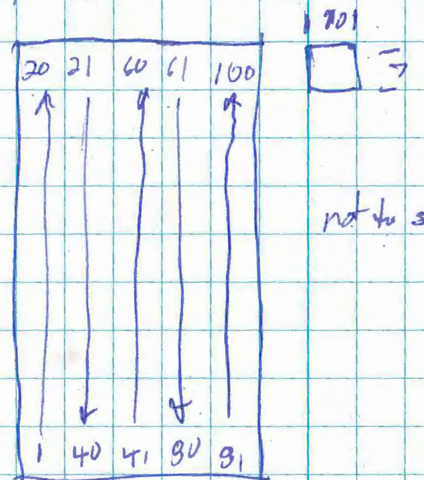
1109 Begin sieving duplicate sample DV2

1144 Complete sieving

MK

6/14/18

DU3



1122 check scale, recalibrate
divide primary DU 20 into 30 subplots
1126 photos 177 and 178 of sampling process
Δ 1129 collect sample ~~DU2~~ 100200-DU2
Δ 1147 ~~collect sample 100200-DU29, duplicate of DU29~~ MW sample not submitted MW, see below
1153 Dispose of extra sample in grid #1
(primary, dup, and sieved extra
1156 Jake completes Bulk sample collection of DU3
1200 Call Stafford. Discuss duplicate samples.
Will discard sample from DU29. Recollect in
DU3 per workplan
1230 Begin drying DU3. Jake collects duplicate
Bin next of primary sample pit

Rite in the Rain

6/19/18

1300 Complete dry. Jake comple bulk sample collect at DU3 duplicate

1302 Steve DU3 primary and start dry duplicate no ballot fragments located during sieving

1316 photo 179 of DU3 during named sample

1320 reorganize pin flags in DU3 per random number spreadsheet

1323 Collect 100200-DU3 by Jake

1353 complete dry at DU3 duplicate. Jake to sieve and collect sample

1401 Collect 100200-DU3-44 from grid 44 at DU3. this was chosen by using the 25th digit of the entire random number generator set.

1507 Jake collect bulk replicate sample from DU3, Matt sets up grid #1 in DU4 for sampling

1517 Begin drying DU3 replicate

1554 Complete mapping out of DU4, see seperate sheet.

1600 Jake has completed sieving and will collect sample shortly

1601 Collect 100200-DU3R

6/19/18

1606 dispose of remaining sample in grid 1
Take the fake sample back to office ~~tomorrow~~ tonight to change out tag
1608 partially dismantle DU3
1626 leave site

Rite in the Rain

Soil Sampling Form

Project Number: 100200			**Sampled By:** Matt Woods		
Sample ID: 100200-IA1-12-18			Sample Time: 1219	Sample Date: 6/20/18	
Duplicate ID: —			MS/MSD Yes (No)	Trip Blank Required: Yes (No)	
Sample Type			**Sample Location**		
(Grab)	Composite, number of parts ___		Surface Boring Test Pit	Sample Depth (ft bgs): 12-18	
Sample Description					
Gravel (3 – 0.08 in)	Sand (0.08 – 0.003 in)	Silt (< 0.003 in)	Clay (no grains visible)	Organic Soil	Peat
GW GP GM GC	SW SP SM SC	ML MH	CL CH	OL/OH	PT
Color: Brown	%Coarse:	%Fines: sieved	Peat/Organic Soil Likely Present (Y/N): Y		
Moisture (Dry, Moist, Wet/Saturated): Dried on stove			Stained: no	Odor: none	

Analyses	Number of Bottles	Notes:
Total Pb	1 4oz	1 bullet recovered during sieving
TCLP Pb	1 8oz	

Project Number: 100200			**Sampled By:** Jack Kesler		
Sample ID: 100200-DU4			Sample Time: 1300	Sample Date:	
Duplicate ID: —			MS/MSD Yes (No)	Trip Blank Required: Yes No	
Sample Type			**Sample Location**		
Grab	(Composite), number of parts 55		(Surface) Boring Test Pit	Sample Depth (ft bgs): 0.1	
Sample Description					
Gravel (3 – 0.08 in)	Sand (0.08 – 0.003 in)	Silt (< 0.003 in)	Clay (no grains visible)	Organic Soil	Peat
GW GP GM GC	SW SP SM SC	ML MH	CL CH	OL/OH	PT
Color: Brown	%Coarse:	%Fines: sieved	Peat/Organic Soil Likely Present (Y/N): Y		
Moisture (Dry, Moist, Wet/Saturated): Dried on stove			Stained: no	Odor: none	

Analyses	Number of Bottles	Notes:
		1 bullet recover 110 gm total submit sample decision unit
		total Pb sample weight: 1.1 kg

Project Number:			**Sampled By:**		
Sample ID:			Sample Time:	Sample Date:	
Duplicate ID:			MS/MSD Yes No	Trip Blank Required: Yes No	
Sample Type			**Sample Location**		
Grab	Composite, number of parts ___		Surface Boring Test Pit	Sample Depth (ft bgs):	
Sample Description					
Gravel (3 – 0.08 in)	Sand (0.08 – 0.003 in)	Silt (< 0.003 in)	Clay (no grains visible)	Organic Soil	Peat
GW GP GM GC	SW SP SM SC	ML MH	CL CH	OL/OH	PT
Color:	%Coarse:	%Fines:	Peat/Organic Soil Likely Present (Y/N):		
Moisture (Dry, Moist, Wet/Saturated):			Stained:	Odor:	

Analyses	Number of Bottles	Notes:

Soil Sampling Form

Project Number: 100200			**Sampled By:** Matt Ward		
Sample ID: 100200-IA1-0-6			Sample Time: 1104	Sample Date: ~~6/20/18~~ 6/20/18	
Duplicate ID: —			MS/MSD Yes (No)	Trip Blank Required: Yes (No)	
Sample Type			**Sample Location**		
(Grab)	Composite, number of parts _____		Surface (Boring) Test Pit	Sample Depth (ft bgs): in bgs 0-6	
Sample Description				2 horizons	
Gravel (3 – 0.08 in)	Sand (0.08 – 0.003 in)	Silt (< 0.003 in)	Clay (no grains visible)	Organic Soil	Peat
GW GP GM GC	SW SP SM SC	ML MH	CL CH	OL/OH	PT
Color: Brown	%Coarse:	%Fines: Sieved	Peat/Organic Soil Likely Present (Y/N): Y, slight		
Moisture (Dry, Moist, Wet/Saturated): Dried on stove		Stained: ~~NSW~~ no	Odor: none		

Analyses	Number of Bottles	Notes:
TCLP Pb	1 4oz	many bullets sieved out, appears small bits of lead remain in sieved portion, Est >20
Total Pb	1 8oz	

Project Number: 100200			**Sampled By:** Matt Wards		
Sample ID: 100200-IA1-6-12			Sample Time: 1119	Sample Date: 6/20/18	
Duplicate ID: —			MS/MSD Yes (No)	Trip Blank Required: Yes (No)	
Sample Type			**Sample Location**		
(Grab)	Composite, number of parts _____		Surface (Boring) Test Pit	Sample Depth (ft bgs): in 6-12	
Sample Description				2 horizons	
Gravel (3 – 0.08 in)	Sand (0.08 – 0.003 in)	Silt (< 0.003 in)	Clay (no grains visible)	Organic Soil	Peat
GW GP GM GC	SW SP SM SC	ML MH	CL CH	OL/OH	PT
Color: Brown	%Coarse:	%Fines: → Sieved	Peat/Organic Soil Likely Present (Y/N): Y, slight		
Moisture (Dry, Moist, Wet/Saturated): Dried on stove		Stained: no	Odor: none		

Analyses	Number of Bottles	Notes:
total Pb	1 4oz	4 bullets sieved out, some smaller shard present
TCLP Pb	1 8oz	

Project Number: 100200			**Sampled By:** Matt Wards		
Sample ID: 100200-IA1-18-24			Sample Time: 1155	Sample Date: 6/20/18	
Duplicate ID: —			MS/MSD Yes (No)	Trip Blank Required: Yes (No)	
Sample Type			**Sample Location**		
(Grab)	Composite, number of parts _____		Surface (Boring) Test Pit	Sample Depth (ft bgs): in 18-24	
Sample Description					
Gravel (3 – 0.08 in)	Sand (0.08 – 0.003 in)	Silt (< 0.003 in)	Clay (no grains visible)	Organic Soil	Peat
GW GP GM GC	SW SP SM SC	ML MH	CL CH	OL/OH	PT
Color: light brown	%Coarse:	%Fines: → sieved	Peat/Organic Soil Likely Present (Y/N): N		
Moisture (Dry, Moist, Wet/Saturated): Dry		Stained: no	Odor: none		

Analyses	Number of Bottles	Notes:
total Pb	1 4oz	prior to sieving mineral soil with ~~more~~ mm larger gravel. No bullet shards or bullets observed in sample
TCLP Pb	1 x 8oz	

Soil Sampling Form

Project Number: 100200			**Sampled By:** Matt Woods		
Sample ID: 100200-DU3-44			Sample Time: — 1403 Sample Date:		
Duplicate ID: —			MS/MSD Yes (No) Trip Blank Required: Yes (No)		
Sample Type			**Sample Location**		
(Grab)	Composite, number of parts ____		(Surface) Boring Test Pit	Sample Depth (ft bgs): .1	
Sample Description					
Gravel (3 – 0.08 in)	Sand (0.08 – 0.003 in)	Silt (< 0.003 in)	Clay (no grains visible)	Organic Soil	Peat
GW GP GM GC	SW SP SM SC	(ML) MH	CL CH	OL/OH	PT
Color: Brown	%Coarse: 5	%Fines: 95	Peat/Organic Soil Likely Present (Y/N): slight		
Moisture (Dry, Moist, Wet/Saturated): Moist		Stained: no	Odor: non		

Analyses	Number of Bottles	Notes:
ph	1 4oz jar	
phosphorus		
Sulfide		

Project Number: 100200			**Sampled By:** Jake Kester		
Sample ID:			Sample Time: 1601 Sample Date:		
Duplicate ID:			MS/MSD Yes (No) Trip Blank Required: Yes (No)		
Sample Type			**Sample Location**		
Grab	Composite, number of parts ____		Surface Boring Test Pit	Sample Depth (ft bgs):	
Sample Description					
Gravel (3 – 0.08 in)	Sand (0.08 – 0.003 in)	Silt (< 0.003 in)	Clay (no grains visible)	Organic Soil	Peat
GW GP GM GC	SW SP SM SC	ML MH	CL CH	OL/OH	PT
Color:	%Coarse:	%Fines:	Peat/Organic Soil Likely Present (Y/N):		
Moisture (Dry, Moist, Wet/Saturated):		Stained:	Odor:		

Analyses	Number of Bottles	Notes:

MW 6/19/18

Project Number: 100200			**Sampled By:** Matt Wood		
Sample ID: 100200-IA2-12-18-MW			Sample Time: 1019 Sample Date: 6/20/18		
Duplicate ID: —			MS/MSD Yes (No) Trip Blank Required: Yes (No)		
Sample Type			**Sample Location**		
(Grab)	Composite, number of parts ____		Surface (Boring) Test Pit	Sample Depth (ft bgs): 12-R	
Sample Description					
Gravel (3 – 0.08 in)	Sand (0.08 – 0.003 in)	Silt (< 0.003 in)	Clay (no grains visible)	Organic Soil	Peat
GW GP GM GC	SW SP SM SC	(ML) MH	CL CH	OL/OH	PT
Color: Brown	%Coarse: 5	%Fines: 95	Peat/Organic Soil Likely Present (Y/N):		
Moisture (Dry, (Moist), Wet/Saturated):		Stained: no	Odor: none		

Analyses	Number of Bottles	Notes:
ph	1 4oz	
phosphorus		
Sulfide		

Soil Sampling Form

Project Number: 100200			**Sampled By:** Matt Wood		
Sample ID: 100200-DU1			Sample Time: 1352	Sample Date: 6/18/18	
Duplicate ID: —			MS/MSD Yes (No)	Trip Blank Required: Yes (No)	
Sample Type			**Sample Location**		0-.1
Grab	Composite, number of parts 50		(Surface) Boring Test Pit	Sample Depth (ft bgs): .1	
Sample Description					
Gravel (3 – 0.08 in)	Sand (0.08 – 0.003 in)	Silt (< 0.003 in)	Clay (no grains visible)	Organic Soil	Peat
GW GP GM GC	SW SP SM SC	ML MH	CL CH	OL/OH	PT
Color: Brown	%Coarse:	%Fines:	Peat/Organic Soil Likely Present (Y/N):		
Moisture (Dry, Moist, Wet/Saturated): Dry		Stained: no	Odor: none		

Analyses	Number of Bottles	Notes:
Total Pb	1 4oz	no lead fragments observed in sample,
TCLP Pb	1 8oz	

Project Number: 100200			**Sampled By:** Matt Woods		
Sample ID: 100200-DU2			Sample Time: 1124	Sample Date: 6/19/18	
Duplicate ID: ~~100200-DU29, time of 1447~~ discarded			MS/MSD Yes (No)	Trip Blank Required: Yes (No)	
Sample Type			**Sample Location**		
Grab	Composite, number of parts 50		Surface Boring Test Pit	Sample Depth (ft bgs): 0-.1	
Sample Description					
Gravel (3 – 0.08 in)	Sand (0.08 – 0.003 in)	Silt (< 0.003 in)	Clay (no grains visible)	Organic Soil	Peat
GW GP GM GC	SW SP SM SC	ML MH	CL CH	OL/OH	PT
Color: Brown	%Coarse:	%Fines:	Peat/Organic Soil Likely Present (Y/N):		
Moisture (Dry, Moist, Wet/Saturated): Dry		Stained: no	Odor: none		

Analyses	Number of Bottles	Notes:
Total Pb	1 4oz	No lead fragments observed in sample
~~Total~~ TCLP Pb	1 8oz	~~Total~~ sample weight for total lead: 1.1g ~~Duplicate weight 1.2g~~ discarded

Project Number: 100200			**Sampled By:** Jake Kesler		
Sample ID: 100200-DU3			Sample Time: 1323	Sample Date: 6/19/18	
Duplicate ID: 100200-DU39, sample time 1405			MS/MSD Yes. (No)	Trip Blank Required: Yes (No)	
Sample Type			**Sample Location**		
Grab	Composite, number of parts 50		(Surface) Boring Test Pit	Sample Depth (ft bgs): 0-.1	
Sample Description					
Gravel (3 – 0.08 in)	Sand (0.08 – 0.003 in)	Silt (< 0.003 in)	Clay (no grains visible)	Organic Soil	Peat
GW GP GM GC	SW SP SM SC	ML MH	CL CH	OL/OH	PT
Color: Brown	%Coarse:	%Fines:	Peat/Organic Soil Likely Present (Y/N):		
Moisture (Dry, Moist, Wet/Saturated): dry		Stained: no	Odor: none		

Analyses	Number of Bottles	Notes:
Total Pb	1 4oz	Sample ~~taken~~ weight 1.1g, no bullet frags in sieve after
~~Total~~ TCLP	1 8oz	

↑ Replicate 100200-DU3R. Sample weight 1.1g, no bullet frags observed, 50 pt composite

APPENDIX C

RESULTS OF ANALYTICAL TESTING
BY
SGS NORTH AMERICA, INC. OF ANCHORAGE, ALASKA
AND
ADEC LABORATORY DATA REVIEW CHECKLISTS

Laboratory Report of Analysis

To: Shannon & Wilson, Inc.
5430 Fairbanks St. Suite 3
Anchorage, AK 99518
(907)433-3240

Report Number: **1183056**

Client Project: **HMCC Shooting Range**

Dear Matt Woods,

Enclosed are the results of the analytical services performed under the referenced project for the received samples and associated QC as applicable. The samples are certified to meet the requirements of the National Environmental Laboratory Accreditation Conference Standards. Copies of this report and supporting data will be retained in our files for a period of ten years in the event they are required for future reference. All results are intended to be used in their entirety and SGS is not responsible for use of less than the complete report. Any samples submitted to our laboratory will be retained for a maximum of fourteen (14) days from the date of this report unless other archiving requirements were included in the quote.

If there are any questions about the report or services performed during this project, please call Jillian at (907) 562-2343. We will be happy to answer any questions or concerns which you may have.

Thank you for using SGS North America Inc. for your analytical services. We look forward to working with you again on any additional analytical needs.

Sincerely,
SGS North America Inc.

Jillian Vlahovich Date
Project Manager
Jillian.Vlahovich@sgs.com

SGS North America Inc. 200 West Potter Drive, Anchorage, AK 99518
t 907.562.2343 f 907.561.5301 www.us.sgs.com

Case Narrative

SGS Client: **Shannon & Wilson, Inc.**
SGS Project: **1183056**
Project Name/Site: **HMCC Shooting Range**
Project Contact: **Matt Woods**

Refer to sample receipt form for information on sample condition.

1183056013(1454949MS) (1454953) MS

6020A - Metals MS recovery for lead (47%) does not meet QC criteria. The post digestion spike was successful.

1183056013(1454949MSD) (1454954) MSD

6020A - Metals MSD recovery for lead (83%) does not meet QC criteria. The post digestion spike was successful.

*QC comments may be associated with the field samples found in this report. When applicable, comments will be applied to associated field samples.

SGS North America Inc.
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t 907.562.2343 **f** 907.561.5301 www.us.sgs.com

Laboratory Qualifiers

Enclosed are the analytical results associated with the above work order. All results are intended to be used in their entirety and SGS is not responsible for use of less than the complete report. This document is issued by the Company under its General Conditions of Service accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx>. Attention is drawn to the limitation of liability, indenmification and jurisdiction issues defined therein.

Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. Any unauthorized alteration, forgery or falsification of the context or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

SGS maintains a formal Quality Assurance/Quality Control (QA/QC) program. A copy of our Quality Assurance Plan (QAP), which outlines this program, is available at your request. The laboratory certification numbers are AK00971 DW Chemistry (Provisionally Certified as of 06/11/2018 for Mercury by EPA245.1,Beryllium and Copper by EPA200.8) & Microbiology & 17-021 (CS) for ADEC and 2944.01 for DOD ELAP/ISO17025 (RCRA methods: 1020B, 1311, 3010A, 3050B, 3520C, 3550C, 5030B, 5035A, 6020A, 7470A, 7471B, 8015C, 8021B, 8082A, 8260C, 8270D, 8270D-SIM, 9040C, 9045D, 9056A, 9060A, AK101 and AK102/103). Except as specifically noted, all statements and data in this report are in conformance to the provisions set forth by the SGS QAP and, when applicable, other regulatory authorities.

The following descriptors or qualifiers may be found in your report:

*	The analyte has exceeded allowable regulatory or control limits.
!	Surrogate out of control limits.
B	Indicates the analyte is found in a blank associated with the sample.
CCV/CVA/CVB	Continuing Calibration Verification
CCCV/CVC/CVCA/CVCB	Closing Continuing Calibration Verification
CL	Control Limit
DF	Analytical Dilution Factor
DL	Detection Limit (i.e., maximum method detection limit)
E	The analyte result is above the calibrated range.
GT	Greater Than
IB	Instrument Blank
ICV	Initial Calibration Verification
J	The quantitation is an estimation.
LCS(D)	Laboratory Control Spike (Duplicate)
LLQC/LLIQC	Low Level Quantitation Check
LOD	Limit of Detection (i.e., 1/2 of the LOQ)
LOQ	Limit of Quantitation (i.e., reporting or practical quantitation limit)
LT	Less Than
MB	Method Blank
MS(D)	Matrix Spike (Duplicate)
ND	Indicates the analyte is not detected.
RPD	Relative Percent Difference
U	Indicates the analyte was analyzed for but not detected.

Note: Sample summaries which include a result for "Total Solids" have already been adjusted for moisture content. All DRO/RRO analyses are integrated per SOP.

Sample Summary

Client Sample ID	Lab Sample ID	Collected	Received	Matrix
100200-IA1-0-6	1183056001	06/20/2018	06/20/2018	Soil/Solid (dry weight)
100200-IA1-6-12	1183056002	06/20/2018	06/20/2018	Soil/Solid (dry weight)
100200-IA1-18-24	1183056003	06/20/2018	06/20/2018	Soil/Solid (dry weight)
100200-IA1-12-18	1183056004	06/20/2018	06/20/2018	Soil/Solid (dry weight)
100200-IA1-12-18-NV	1183056005	06/20/2018	06/20/2018	Soil/Solid (dry weight)
100200-DU2	1183056006	06/19/2018	06/20/2018	Soil/Solid (dry weight)
100200-DU3R	1183056007	06/19/2018	06/20/2018	Soil/Solid (dry weight)
100200-DU3-44	1183056008	06/19/2018	06/20/2018	Soil/Solid (dry weight)
100200-DU39	1183056009	06/19/2018	06/20/2018	Soil/Solid (dry weight)
100200-DU3	1183056010	06/19/2018	06/20/2018	Soil/Solid (dry weight)
100200-DU1	1183056011	06/18/2018	06/20/2018	Soil/Solid (dry weight)
100200-DU4	1183056012	06/20/2018	06/20/2018	Soil/Solid (dry weight)
100200-IA1-0-6	1183056013	06/20/2018	06/20/2018	Solid/Soil (Wet Weight)
100200-IA1-6-12	1183056014	06/20/2018	06/20/2018	Solid/Soil (Wet Weight)
100200-IA1-18-24	1183056015	06/20/2018	06/20/2018	Solid/Soil (Wet Weight)
100200-IA1-12-18	1183056016	06/20/2018	06/20/2018	Solid/Soil (Wet Weight)
100200-DU2	1183056017	06/19/2018	06/20/2018	Solid/Soil (Wet Weight)
100200-DU3R	1183056018	06/19/2018	06/20/2018	Solid/Soil (Wet Weight)
100200-DU39	1183056019	06/19/2018	06/20/2018	Solid/Soil (Wet Weight)
100200-DU3	1183056020	06/19/2018	06/20/2018	Solid/Soil (Wet Weight)
100200-DU1	1183056021	06/18/2018	06/20/2018	Solid/Soil (Wet Weight)
100200-DU4	1183056022	06/20/2018	06/20/2018	Solid/Soil (Wet Weight)

Method	Method Description
SW9056A	Ion Chromatographic Analysis Soils/Solid
SW6020A TCLP	Metals by ICP-MS
SW6020A	Metals by ICP-MS (S)
SM21 2540G	Percent Solids SM2540G
SW9045D	pH, Soil (S)

SGS North America Inc.
200 West Potter Drive, Anchorage, AK 99518
t 907.562.2343 **f** 907.561.5301 www.us.sgs.com

Detectable Results Summary

Client Sample ID: **100200-IA1-0-6**			
Lab Sample ID: 1183056001	Parameter	Result	Units
Metals by ICP/MS	Lead	69000	mg/Kg
Client Sample ID: **100200-IA1-6-12**			
Lab Sample ID: 1183056002	Parameter	Result	Units
Metals by ICP/MS	Lead	2970	mg/Kg
Client Sample ID: **100200-IA1-18-24**			
Lab Sample ID: 1183056003	Parameter	Result	Units
Metals by ICP/MS	Lead	1190	mg/Kg
Client Sample ID: **100200-IA1-12-18**			
Lab Sample ID: 1183056004	Parameter	Result	Units
Metals by ICP/MS	Lead	185	mg/Kg
Client Sample ID: **100200-IA1-12-18-NV**			
Lab Sample ID: 1183056005	Parameter	Result	Units
Characterization	pH	5.90	pH units
Metals by ICP/MS	Phosphorus	742	mg/Kg
Waters Department	Sulfate	11.2	mg/Kg
Client Sample ID: **100200-DU2**			
Lab Sample ID: 1183056006	Parameter	Result	Units
Metals by ICP/MS	Lead	193	mg/Kg
Client Sample ID: **100200-DU3R**			
Lab Sample ID: 1183056007	Parameter	Result	Units
Metals by ICP/MS	Lead	1960	mg/Kg
Client Sample ID: **100200-DU3-44**			
Lab Sample ID: 1183056008	Parameter	Result	Units
Characterization	pH	6.00	pH units
Metals by ICP/MS	Phosphorus	635	mg/Kg
Waters Department	Sulfate	4.44	mg/Kg
Client Sample ID: **100200-DU39**			
Lab Sample ID: 1183056009	Parameter	Result	Units
Metals by ICP/MS	Lead	2420	mg/Kg
Client Sample ID: **100200-DU3**			
Lab Sample ID: 1183056010	Parameter	Result	Units
Metals by ICP/MS	Lead	1570	mg/Kg
Client Sample ID: **100200-DU1**			
Lab Sample ID: 1183056011	Parameter	Result	Units
Metals by ICP/MS	Lead	61.4	mg/Kg
Client Sample ID: **100200-DU4**			
Lab Sample ID: 1183056012	Parameter	Result	Units
Metals by ICP/MS	Lead	11900	mg/Kg

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Detectable Results Summary

Client Sample ID: **100200-IA1-0-6**
Lab Sample ID: 1183056013
TCLP Constituents Metals

Parameter	Result	Units
Lead	788	mg/L

Client Sample ID: **100200-IA1-6-12**
Lab Sample ID: 1183056014
TCLP Constituents Metals

Parameter	Result	Units
Lead	8.13	mg/L

Client Sample ID: **100200-IA1-18-24**
Lab Sample ID: 1183056015
TCLP Constituents Metals

Parameter	Result	Units
Lead	15.8	mg/L

Client Sample ID: **100200-IA1-12-18**
Lab Sample ID: 1183056016
TCLP Constituents Metals

Parameter	Result	Units
Lead	0.252	mg/L

Client Sample ID: **100200-DU2**
Lab Sample ID: 1183056017
TCLP Constituents Metals

Parameter	Result	Units
Lead	0.799	mg/L

Client Sample ID: **100200-DU3R**
Lab Sample ID: 1183056018
TCLP Constituents Metals

Parameter	Result	Units
Lead	26.7	mg/L

Client Sample ID: **100200-DU39**
Lab Sample ID: 1183056019
TCLP Constituents Metals

Parameter	Result	Units
Lead	15.9	mg/L

Client Sample ID: **100200-DU3**
Lab Sample ID: 1183056020
TCLP Constituents Metals

Parameter	Result	Units
Lead	17.7	mg/L

Client Sample ID: **100200-DU1**
Lab Sample ID: 1183056021
TCLP Constituents Metals

Parameter	Result	Units
Lead	0.556	mg/L

Client Sample ID: **100200-DU4**
Lab Sample ID: 1183056022
TCLP Constituents Metals

Parameter	Result	Units
Lead	27.6	mg/L

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Results of **100200-IA1-0-6**

Client Sample ID: **100200-IA1-0-6**
Client Project ID: **HMCC Shooting Range**
Lab Sample ID: 1183056001
Lab Project ID: 1183056

Collection Date: 06/20/18 11:09
Received Date: 06/20/18 16:00
Matrix: Soil/Solid (dry weight)
Solids (%):93.6
Location:

Results by **Metals by ICP/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Lead	69000		97.3	30.2	mg/Kg	5000		06/24/18 06:04

Batch Information

Analytical Batch: MMS10213
Analytical Method: SW6020A
Analyst: ACF
Analytical Date/Time: 06/24/18 06:04
Container ID: 1183056001-A

Prep Batch: MXX31682
Prep Method: SW3050B
Prep Date/Time: 06/22/18 11:14
Prep Initial Wt./Vol.: 1.098 g
Prep Extract Vol: 50 mL

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Results of **100200-IA1-6-12**

Client Sample ID: **100200-IA1-6-12**
Client Project ID: **HMCC Shooting Range**
Lab Sample ID: 1183056002
Lab Project ID: 1183056

Collection Date: 06/20/18 11:19
Received Date: 06/20/18 16:00
Matrix: Soil/Solid (dry weight)
Solids (%):92.2
Location:

Results by **Metals by ICP/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Lead	2970		10.7	3.31	mg/Kg	500		06/24/18 06:09

Batch Information

Analytical Batch: MMS10213
Analytical Method: SW6020A
Analyst: ACF
Analytical Date/Time: 06/24/18 06:09
Container ID: 1183056002-A

Prep Batch: MXX31682
Prep Method: SW3050B
Prep Date/Time: 06/22/18 11:14
Prep Initial Wt./Vol.: 1.015 g
Prep Extract Vol: 50 mL

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Results of **100200-IA1-18-24**

Client Sample ID: **100200-IA1-18-24**
Client Project ID: **HMCC Shooting Range**
Lab Sample ID: 1183056003
Lab Project ID: 1183056

Collection Date: 06/20/18 11:55
Received Date: 06/20/18 16:00
Matrix: Soil/Solid (dry weight)
Solids (%):99.5
Location:

Results by **Metals by ICP/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Lead	1190		1.90	0.590	mg/Kg	100		06/24/18 06:14

Batch Information

Analytical Batch: MMS10213
Analytical Method: SW6020A
Analyst: ACF
Analytical Date/Time: 06/24/18 06:14
Container ID: 1183056003-A

Prep Batch: MXX31682
Prep Method: SW3050B
Prep Date/Time: 06/22/18 11:14
Prep Initial Wt./Vol.: 1.057 g
Prep Extract Vol: 50 mL

Print Date: 06/28/2018 2:09:07PM

J flagging is activated

Results of **100200-IA1-12-18**

Client Sample ID: **100200-IA1-12-18**
Client Project ID: **HMCC Shooting Range**
Lab Sample ID: 1183056004
Lab Project ID: 1183056

Collection Date: 06/20/18 12:19
Received Date: 06/20/18 16:00
Matrix: Soil/Solid (dry weight)
Solids (%):89.7
Location:

Results by **Metals by ICP/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Lead	185		1.09	0.337	mg/Kg	50		06/24/18 00:31

Batch Information

Analytical Batch: MMS10213
Analytical Method: SW6020A
Analyst: ACF
Analytical Date/Time: 06/24/18 00:31
Container ID: 1183056004-A

Prep Batch: MXX31682
Prep Method: SW3050B
Prep Date/Time: 06/22/18 11:14
Prep Initial Wt./Vol.: 1.027 g
Prep Extract Vol: 50 mL

Print Date: 06/28/2018 2:09:07PM

J flagging is activated

Results of **100200-IA1-12-18-NV**

Client Sample ID: **100200-IA1-12-18-NV**
Client Project ID: **HMCC Shooting Range**
Lab Sample ID: 1183056005
Lab Project ID: 1183056

Collection Date: 06/20/18 10:19
Received Date: 06/20/18 16:00
Matrix: Soil/Solid (dry weight)
Solids (%):71.2
Location:

Results by **Characterization**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
pH	5.90		0.00100	0.00100	pH units			06/22/18 17:00

Batch Information

Analytical Batch: TCLP9467
Analytical Method: SW9045D
Analyst: TFK
Analytical Date/Time: 06/22/18 17:00
Container ID: 1183056005-A

Results of **100200-IA1-12-18-NV**

Client Sample ID: **100200-IA1-12-18-NV**
Client Project ID: **HMCC Shooting Range**
Lab Sample ID: 1183056005
Lab Project ID: 1183056

Collection Date: 06/20/18 10:19
Received Date: 06/20/18 16:00
Matrix: Soil/Solid (dry weight)
Solids (%):71.2
Location:

Results by **Metals by ICP/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Phosphorus	742		129	40.1	mg/Kg	50		06/27/18 21:09

Batch Information

Analytical Batch: MMS10218
Analytical Method: SW6020A
Analyst: ACF
Analytical Date/Time: 06/27/18 21:09
Container ID: 1183056005-A

Prep Batch: MXX31691
Prep Method: SW3050B
Prep Date/Time: 06/27/18 11:20
Prep Initial Wt./Vol.: 1.087 g
Prep Extract Vol: 50 mL

Results of **100200-IA1-12-18-NV**

Client Sample ID: **100200-IA1-12-18-NV**
Client Project ID: **HMCC Shooting Range**
Lab Sample ID: 1183056005
Lab Project ID: 1183056

Collection Date: 06/20/18 10:19
Received Date: 06/20/18 16:00
Matrix: Soil/Solid (dry weight)
Solids (%):71.2
Location:

Results by **Waters Department**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Sulfate	11.2		2.76	0.856	mg/Kg	1		06/22/18 23:57

Batch Information

Analytical Batch: WIC5786
Analytical Method: SW9056A
Analyst: AYC
Analytical Date/Time: 06/22/18 23:57
Container ID: 1183056005-A

Prep Batch: WXX12394
Prep Method: METHOD
Prep Date/Time: 06/22/18 18:11
Prep Initial Wt./Vol.: 4.0695 g
Prep Extract Vol: 40 mL

Results of **100200-DU2**

Client Sample ID: **100200-DU2**
Client Project ID: **HMCC Shooting Range**
Lab Sample ID: 1183056006
Lab Project ID: 1183056

Collection Date: 06/19/18 11:29
Received Date: 06/20/18 16:00
Matrix: Soil/Solid (dry weight)
Solids (%):99.0
Location:

Results by **Metals by ICP/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Lead	193		0.920	0.285	mg/Kg	50		06/24/18 00:36

Batch Information

Analytical Batch: MMS10213
Analytical Method: SW6020A
Analyst: ACF
Analytical Date/Time: 06/24/18 00:36
Container ID: 1183056006-A

Prep Batch: MXX31682
Prep Method: SW3050B
Prep Date/Time: 06/22/18 11:14
Prep Initial Wt./Vol.: 1.098 g
Prep Extract Vol: 50 mL

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Results of **100200-DU3R**

Client Sample ID: **100200-DU3R**
Client Project ID: **HMCC Shooting Range**
Lab Sample ID: 1183056007
Lab Project ID: 1183056

Collection Date: 06/19/18 16:01
Received Date: 06/20/18 16:00
Matrix: Soil/Solid (dry weight)
Solids (%):100
Location:

Results by **Metals by ICP/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Lead	1960		1.83	0.567	mg/Kg	100		06/24/18 06:18

Batch Information

Analytical Batch: MMS10213
Analytical Method: SW6020A
Analyst: ACF
Analytical Date/Time: 06/24/18 06:18
Container ID: 1183056007-A

Prep Batch: MXX31682
Prep Method: SW3050B
Prep Date/Time: 06/22/18 11:14
Prep Initial Wt./Vol.: 1.094 g
Prep Extract Vol: 50 mL

Print Date: 06/28/2018 2:09:07PM

J flagging is activated

Results of **100200-DU3-44**

Client Sample ID: **100200-DU3-44**
Client Project ID: **HMCC Shooting Range**
Lab Sample ID: 1183056008
Lab Project ID: 1183056

Collection Date: 06/19/18 14:03
Received Date: 06/20/18 16:00
Matrix: Soil/Solid (dry weight)
Solids (%):85.5
Location:

Results by **Characterization**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
pH	6.00		0.00100	0.00100	pH units			06/22/18 17:00

Batch Information

Analytical Batch: TCLP9467
Analytical Method: SW9045D
Analyst: TFK
Analytical Date/Time: 06/22/18 17:00
Container ID: 1183056008-A

Print Date: 06/28/2018 2:09:07PM

J flagging is activated

Results of **100200-DU3-44**

Client Sample ID: **100200-DU3-44**
Client Project ID: **HMCC Shooting Range**
Lab Sample ID: 1183056008
Lab Project ID: 1183056

Collection Date: 06/19/18 14:03
Received Date: 06/20/18 16:00
Matrix: Soil/Solid (dry weight)
Solids (%):85.5
Location:

Results by **Metals by ICP/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Phosphorus	635		110	34.1	mg/Kg	50		06/27/18 21:14

Batch Information

Analytical Batch: MMS10218
Analytical Method: SW6020A
Analyst: ACF
Analytical Date/Time: 06/27/18 21:14
Container ID: 1183056008-A

Prep Batch: MXX31691
Prep Method: SW3050B
Prep Date/Time: 06/27/18 11:20
Prep Initial Wt./Vol.: 1.062 g
Prep Extract Vol: 50 mL

Print Date: 06/28/2018 2:09:07PM

J flagging is activated

Results of **100200-DU3-44**

Client Sample ID: **100200-DU3-44**
Client Project ID: **HMCC Shooting Range**
Lab Sample ID: 1183056008
Lab Project ID: 1183056

Collection Date: 06/19/18 14:03
Received Date: 06/20/18 16:00
Matrix: Soil/Solid (dry weight)
Solids (%):85.5
Location:

Results by **Waters Department**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Sulfate	4.44		2.29	0.711	mg/Kg	1		06/23/18 00:53

Batch Information

Analytical Batch: WIC5786
Analytical Method: SW9056A
Analyst: AYC
Analytical Date/Time: 06/23/18 00:53
Container ID: 1183056008-A

Prep Batch: WXX12394
Prep Method: METHOD
Prep Date/Time: 06/22/18 18:11
Prep Initial Wt./Vol.: 4.078 g
Prep Extract Vol: 40 mL

Results of **100200-DU39**

Client Sample ID: **100200-DU39**
Client Project ID: **HMCC Shooting Range**
Lab Sample ID: 1183056009
Lab Project ID: 1183056

Collection Date: 06/19/18 14:05
Received Date: 06/20/18 16:00
Matrix: Soil/Solid (dry weight)
Solids (%):99.3
Location:

Results by **Metals by ICP/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Lead	2420		1.98	0.612	mg/Kg	100		06/24/18 06:23

Batch Information

Analytical Batch: MMS10213
Analytical Method: SW6020A
Analyst: ACF
Analytical Date/Time: 06/24/18 06:23
Container ID: 1183056009-A

Prep Batch: MXX31682
Prep Method: SW3050B
Prep Date/Time: 06/22/18 11:14
Prep Initial Wt./Vol.: 1.02 g
Prep Extract Vol: 50 mL

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Results of **100200-DU3**

Client Sample ID: **100200-DU3**
Client Project ID: **HMCC Shooting Range**
Lab Sample ID: 1183056010
Lab Project ID: 1183056

Collection Date: 06/19/18 13:23
Received Date: 06/20/18 16:00
Matrix: Soil/Solid (dry weight)
Solids (%):98.3
Location:

Results by **Metals by ICP/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Lead	1570		1.94	0.602	mg/Kg	100		06/24/18 06:28

Batch Information

Analytical Batch: MMS10213
Analytical Method: SW6020A
Analyst: ACF
Analytical Date/Time: 06/24/18 06:28
Container ID: 1183056010-A

Prep Batch: MXX31682
Prep Method: SW3050B
Prep Date/Time: 06/22/18 11:14
Prep Initial Wt./Vol.: 1.048 g
Prep Extract Vol: 50 mL

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Results of **100200-DU1**

Client Sample ID: **100200-DU1**
Client Project ID: **HMCC Shooting Range**
Lab Sample ID: 1183056011
Lab Project ID: 1183056

Collection Date: 06/18/18 13:52
Received Date: 06/20/18 16:00
Matrix: Soil/Solid (dry weight)
Solids (%):98.3
Location:

Results by **Metals by ICP/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Lead	61.4		0.932	0.289	mg/Kg	50		06/24/18 02:00

Batch Information

Analytical Batch: MMS10213
Analytical Method: SW6020A
Analyst: ACF
Analytical Date/Time: 06/24/18 02:00
Container ID: 1183056011-A

Prep Batch: MXX31682
Prep Method: SW3050B
Prep Date/Time: 06/22/18 11:14
Prep Initial Wt./Vol.: 1.091 g
Prep Extract Vol: 50 mL

Print Date: 06/28/2018 2:09:07PM

J flagging is activated

Results of **100200-DU4**

Client Sample ID: **100200-DU4**
Client Project ID: **HMCC Shooting Range**
Lab Sample ID: 1183056012
Lab Project ID: 1183056

Collection Date: 06/20/18 13:00
Received Date: 06/20/18 16:00
Matrix: Soil/Solid (dry weight)
Solids (%):97.1
Location:

Results by **Metals by ICP/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Lead	11900		10.1	3.13	mg/Kg	500		06/24/18 06:47

Batch Information

Analytical Batch: MMS10213
Analytical Method: SW6020A
Analyst: ACF
Analytical Date/Time: 06/24/18 06:47
Container ID: 1183056012-A

Prep Batch: MXX31682
Prep Method: SW3050B
Prep Date/Time: 06/22/18 11:14
Prep Initial Wt./Vol.: 1.021 g
Prep Extract Vol: 50 mL

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Results of **100200-IA1-0-6**

Client Sample ID: **100200-IA1-0-6**
Client Project ID: **HMCC Shooting Range**
Lab Sample ID: 1183056013
Lab Project ID: 1183056

Collection Date: 06/20/18 11:09
Received Date: 06/20/18 16:00
Matrix: Solid/Soil (Wet Weight)
Solids (%):
Location:

Results by **TCLP Constituents Metals**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Lead	788	*	0.400	0.124	mg/L	200	(<5)	06/25/18 16:19

Batch Information

Analytical Batch: MMS10215
Analytical Method: SW6020A TCLP
Analyst: DSH
Analytical Date/Time: 06/25/18 16:19
Container ID: 1183056013-A

Prep Batch: MXT5643
Prep Method: SW3010A
Prep Date/Time: 06/25/18 08:00
Prep Initial Wt./Vol.: 2.5 mL
Prep Extract Vol: 25 mL

Print Date: 06/28/2018 2:09:07PM

J flagging is activated

Results of **100200-IA1-6-12**

Client Sample ID: **100200-IA1-6-12**
Client Project ID: **HMCC Shooting Range**
Lab Sample ID: 1183056014
Lab Project ID: 1183056

Collection Date: 06/20/18 11:19
Received Date: 06/20/18 16:00
Matrix: Solid/Soil (Wet Weight)
Solids (%):
Location:

Results by **TCLP Constituents Metals**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Lead	8.13	*	0.0500	0.0155	mg/L	25	(<5)	06/25/18 14:36

Batch Information

Analytical Batch: MMS10215
Analytical Method: SW6020A TCLP
Analyst: DSH
Analytical Date/Time: 06/25/18 14:36
Container ID: 1183056014-A

Prep Batch: MXT5643
Prep Method: SW3010A
Prep Date/Time: 06/25/18 08:00
Prep Initial Wt./Vol.: 2.5 mL
Prep Extract Vol: 25 mL

Print Date: 06/28/2018 2:09:07PM

J flagging is activated

Results of **100200-IA1-18-24**

Client Sample ID: **100200-IA1-18-24**
Client Project ID: **HMCC Shooting Range**
Lab Sample ID: 1183056015
Lab Project ID: 1183056

Collection Date: 06/20/18 11:55
Received Date: 06/20/18 16:00
Matrix: Solid/Soil (Wet Weight)
Solids (%):
Location:

Results by **TCLP Constituents Metals**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Lead	15.8	*	0.0500	0.0155	mg/L	25	(<5)	06/25/18 14:54

Batch Information

Analytical Batch: MMS10215
Analytical Method: SW6020A TCLP
Analyst: DSH
Analytical Date/Time: 06/25/18 14:54
Container ID: 1183056015-A

Prep Batch: MXT5643
Prep Method: SW3010A
Prep Date/Time: 06/25/18 08:00
Prep Initial Wt./Vol.: 2.5 mL
Prep Extract Vol: 25 mL

Print Date: 06/28/2018 2:09:07PM

J flagging is activated

Results of **100200-IA1-12-18**

Client Sample ID: **100200-IA1-12-18**
Client Project ID: **HMCC Shooting Range**
Lab Sample ID: 1183056016
Lab Project ID: 1183056

Collection Date: 06/20/18 12:19
Received Date: 06/20/18 16:00
Matrix: Solid/Soil (Wet Weight)
Solids (%):
Location:

Results by **TCLP Constituents Metals**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Lead	0.252		0.0500	0.0155	mg/L	25	(<5)	06/25/18 14:59

Batch Information

Analytical Batch: MMS10215
Analytical Method: SW6020A TCLP
Analyst: DSH
Analytical Date/Time: 06/25/18 14:59
Container ID: 1183056016-A

Prep Batch: MXT5643
Prep Method: SW3010A
Prep Date/Time: 06/25/18 08:00
Prep Initial Wt./Vol.: 2.5 mL
Prep Extract Vol: 25 mL

Print Date: 06/28/2018 2:09:07PM

J flagging is activated

Results of **100200-DU2**

Client Sample ID: **100200-DU2**
Client Project ID: **HMCC Shooting Range**
Lab Sample ID: 1183056017
Lab Project ID: 1183056

Collection Date: 06/19/18 11:29
Received Date: 06/20/18 16:00
Matrix: Solid/Soil (Wet Weight)
Solids (%):
Location:

Results by **TCLP Constituents Metals**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Lead	0.799		0.0500	0.0155	mg/L	25	(<5)	06/25/18 15:04

Batch Information

Analytical Batch: MMS10215
Analytical Method: SW6020A TCLP
Analyst: DSH
Analytical Date/Time: 06/25/18 15:04
Container ID: 1183056017-A

Prep Batch: MXT5643
Prep Method: SW3010A
Prep Date/Time: 06/25/18 08:00
Prep Initial Wt./Vol.: 2.5 mL
Prep Extract Vol: 25 mL

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Results of **100200-DU3R**

Client Sample ID: **100200-DU3R**
Client Project ID: **HMCC Shooting Range**
Lab Sample ID: 1183056018
Lab Project ID: 1183056

Collection Date: 06/19/18 16:01
Received Date: 06/20/18 16:00
Matrix: Solid/Soil (Wet Weight)
Solids (%):
Location:

Results by **TCLP Constituents Metals**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Lead	26.7	*	0.0500	0.0155	mg/L	25	(<5)	06/25/18 15:08

Batch Information

Analytical Batch: MMS10215
Analytical Method: SW6020A TCLP
Analyst: DSH
Analytical Date/Time: 06/25/18 15:08
Container ID: 1183056018-A

Prep Batch: MXT5643
Prep Method: SW3010A
Prep Date/Time: 06/25/18 08:00
Prep Initial Wt./Vol.: 2.5 mL
Prep Extract Vol: 25 mL

Print Date: 06/28/2018 2:09:07PM

J flagging is activated

Results of **100200-DU39**

Client Sample ID: **100200-DU39**
Client Project ID: **HMCC Shooting Range**
Lab Sample ID: 1183056019
Lab Project ID: 1183056

Collection Date: 06/19/18 14:05
Received Date: 06/20/18 16:00
Matrix: Solid/Soil (Wet Weight)
Solids (%):
Location:

Results by **TCLP Constituents Metals**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Lead	15.9	*	0.0500	0.0155	mg/L	25	(<5)	06/25/18 15:13

Batch Information

Analytical Batch: MMS10215
Analytical Method: SW6020A TCLP
Analyst: DSH
Analytical Date/Time: 06/25/18 15:13
Container ID: 1183056019-A

Prep Batch: MXT5643
Prep Method: SW3010A
Prep Date/Time: 06/25/18 08:00
Prep Initial Wt./Vol.: 2.5 mL
Prep Extract Vol: 25 mL

Print Date: 06/28/2018 2:09:07PM

J flagging is activated

Results of **100200-DU3**

Client Sample ID: **100200-DU3**
Client Project ID: **HMCC Shooting Range**
Lab Sample ID: 1183056020
Lab Project ID: 1183056

Collection Date: 06/19/18 13:23
Received Date: 06/20/18 16:00
Matrix: Solid/Soil (Wet Weight)
Solids (%):
Location:

Results by **TCLP Constituents Metals**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Lead	17.7	*	0.0500	0.0155	mg/L	25	(<5)	06/25/18 15:18

Batch Information

Analytical Batch: MMS10215
Analytical Method: SW6020A TCLP
Analyst: DSH
Analytical Date/Time: 06/25/18 15:18
Container ID: 1183056020-A

Prep Batch: MXT5643
Prep Method: SW3010A
Prep Date/Time: 06/25/18 08:00
Prep Initial Wt./Vol.: 2.5 mL
Prep Extract Vol: 25 mL

Print Date: 06/28/2018 2:09:07PM

J flagging is activated

Results of **100200-DU1**

Client Sample ID: **100200-DU1**
Client Project ID: **HMCC Shooting Range**
Lab Sample ID: 1183056021
Lab Project ID: 1183056

Collection Date: 06/18/18 13:52
Received Date: 06/20/18 16:00
Matrix: Solid/Soil (Wet Weight)
Solids (%):
Location:

Results by **TCLP Constituents Metals**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Lead	0.556		0.0500	0.0155	mg/L	25	(<5)	06/25/18 15:22

Batch Information

Analytical Batch: MMS10215
Analytical Method: SW6020A TCLP
Analyst: DSH
Analytical Date/Time: 06/25/18 15:22
Container ID: 1183056021-A

Prep Batch: MXT5643
Prep Method: SW3010A
Prep Date/Time: 06/25/18 08:00
Prep Initial Wt./Vol.: 2.5 mL
Prep Extract Vol: 25 mL

Results of **100200-DU4**

Client Sample ID: **100200-DU4**
Client Project ID: **HMCC Shooting Range**
Lab Sample ID: 1183056022
Lab Project ID: 1183056

Collection Date: 06/20/18 13:00
Received Date: 06/20/18 16:00
Matrix: Solid/Soil (Wet Weight)
Solids (%):
Location:

Results by **TCLP Constituents Metals**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Lead	27.6	*	0.0500	0.0155	mg/L	25	(<5)	06/25/18 15:27

Batch Information

Analytical Batch: MMS10215
Analytical Method: SW6020A TCLP
Analyst: DSH
Analytical Date/Time: 06/25/18 15:27
Container ID: 1183056022-A

Prep Batch: MXT5643
Prep Method: SW3010A
Prep Date/Time: 06/25/18 08:00
Prep Initial Wt./Vol.: 2.5 mL
Prep Extract Vol: 25 mL

Print Date: 06/28/2018 2:09:07PM

J flagging is activated

Method Blank

Blank ID: LB1 for HBN 1781347 [TCLP/9461
Blank Lab ID: 1454237

Matrix: Solid/Soil (Wet Weight)

QC for Samples:
1183056013, 1183056014, 1183056015, 1183056016, 1183056017, 1183056018, 1183056019, 1183056020, 1183056021, 1183056022

Results by **SW6020A TCLP**

Parameter	Results	LOQ/CL	DL	Units
Lead	0.0250U	0.0500	0.0155	mg/L

Batch Information

Analytical Batch: MMS10215
Analytical Method: SW6020A TCLP
Instrument: Perkin Elmer Nexlon P5
Analyst: DSH
Analytical Date/Time: 6/25/2018 1:58:35PM

Prep Batch: MXT5643
Prep Method: SW3010A
Prep Date/Time: 6/25/2018 8:00:39AM
Prep Initial Wt./Vol.: 2.5 mL
Prep Extract Vol: 25 mL

Method Blank

Blank ID: MB for HBN 1781495 [MXT/5643]
Blank Lab ID: 1454947

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1183056013, 1183056014, 1183056015, 1183056016, 1183056017, 1183056018, 1183056019, 1183056020, 1183056021, 1183056022

Results by **SW6020A TCLP**

Parameter	Results	LOQ/CL	DL	Units
Lead	0.00250U	0.00500	0.00155	mg/L

Batch Information

Analytical Batch: MMS10215
Analytical Method: SW6020A TCLP
Instrument: Perkin Elmer Nexlon P5
Analyst: DSH
Analytical Date/Time: 6/25/2018 2:07:57PM

Prep Batch: MXT5643
Prep Method: SW3010A
Prep Date/Time: 6/25/2018 8:00:39AM
Prep Initial Wt./Vol.: 25 mL
Prep Extract Vol: 25 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1183056 [MXT5643]
Blank Spike Lab ID: 1454948
Date Analyzed: 06/25/2018 14:12

Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1183056013, 1183056014, 1183056015, 1183056016, 1183056017, 1183056018, 1183056019, 1183056020, 1183056021, 1183056022

Results by **SW6020A TCLP**

Blank Spike (mg/L)

Parameter	Spike	Result	Rec (%)	CL
Lead	1	1.03	103	(88-115)

Batch Information

Analytical Batch: **MMS10215**
Analytical Method: **SW6020A TCLP**
Instrument: **Perkin Elmer Nexion P5**
Analyst: **DSH**

Prep Batch: **MXT5643**
Prep Method: **SW3010A**
Prep Date/Time: **06/25/2018 08:00**
Spike Init Wt./Vol.: 1 mg/L Extract Vol: 25 mL
Dupe Init Wt./Vol.: Extract Vol:

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Matrix Spike Summary

Original Sample ID: 1454949
MS Sample ID: 1454953 MS
MSD Sample ID: 1454954 MSD

Analysis Date: 06/25/2018 16:19
Analysis Date: 06/25/2018 16:23
Analysis Date: 06/25/2018 16:28
Matrix: Solid/Soil (Wet Weight)

QC for Samples: 1183056013, 1183056014, 1183056015, 1183056016, 1183056017, 1183056018, 1183056019, 1183056020, 1183056021, 1183056022

Results by **SW6020A TCLP**

		Matrix Spike (mg/L)				Spike Duplicate (mg/L)					
Parameter	Sample	Spike	Result	Rec (%)		Spike	Result	Rec (%)		CL	RPD (%)	RPD CL
Lead	788	10.0	793	47	*	10.0	797	83	*	88-115	0.46	(< 20)

Batch Information

Analytical Batch: MMS10215
Analytical Method: SW6020A TCLP
Instrument: Perkin Elmer NexIon P5
Analyst: DSH
Analytical Date/Time: 6/25/2018 4:23:52PM

Prep Batch: MXT5643
Prep Method: Waters Digest for Metals by ICP-MS(TCLP)
Prep Date/Time: 6/25/2018 8:00:39AM
Prep Initial Wt./Vol.: 2.50mL
Prep Extract Vol: 25.00mL

Print Date: 06/28/2018 2:09:12PM

Original Sample ID: 1454949
MS Sample ID: 1454955 BNT
MSD Sample ID:

Analysis Date: 06/25/2018 16:19
Analysis Date: 06/25/2018 16:33
Analysis Date:
Matrix: Solid/Soil (Wet Weight)

QC for Samples: 1183056013, 1183056014, 1183056015, 1183056016, 1183056017, 1183056018, 1183056019, 1183056020, 1183056021, 1183056022

Results by **SW6020A TCLP**

		Matrix Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Lead	788	500	1280	99				80-120		

Batch Information

Analytical Batch: MMS10215
Analytical Method: SW6020A TCLP
Instrument: Perkin Elmer Nexlon P5
Analyst: DSH
Analytical Date/Time: 6/25/2018 4:33:14PM

Prep Batch: MXT5643
Prep Method: Waters Digest for Metals by ICP-MS(TCLP)
Prep Date/Time: 6/25/2018 8:00:39AM
Prep Initial Wt./Vol.: 2.50mL
Prep Extract Vol: 25.00mL

Print Date: 06/28/2018 2:09:12PM

Method Blank

Blank ID: MB for HBN 1781376 [MXX/31682]
Blank Lab ID: 1454361

Matrix: Soil/Solid (dry weight)

QC for Samples:
1183056001, 1183056002, 1183056003, 1183056004, 1183056006, 1183056007, 1183056009, 1183056010, 1183056011, 1183056012

Results by **SW6020A**

Parameter	Results	LOQ/CL	DL	Units
Lead	0.100U	0.200	0.0620	mg/Kg

Batch Information

Analytical Batch: MMS10213
Analytical Method: SW6020A
Instrument: Perkin Elmer Nexlon P5
Analyst: ACF
Analytical Date/Time: 6/24/2018 5:07:50AM

Prep Batch: MXX31682
Prep Method: SW3050B
Prep Date/Time: 6/22/2018 11:14:10AM
Prep Initial Wt./Vol.: 1 g
Prep Extract Vol: 50 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1183056 [MXX31682]
Blank Spike Lab ID: 1454362
Date Analyzed: 06/24/2018 05:12

Matrix: Soil/Solid (dry weight)

QC for Samples: 1183056001, 1183056002, 1183056003, 1183056004, 1183056006, 1183056007, 1183056009, 1183056010, 1183056011, 1183056012

Results by **SW6020A**

Blank Spike (mg/Kg)

Parameter	Spike	Result	Rec (%)	CL
Lead	50	49.8	100	(84-118)

Batch Information

Analytical Batch: **MMS10213**
Analytical Method: **SW6020A**
Instrument: **Perkin Elmer Nexion P5**
Analyst: **ACF**

Prep Batch: **MXX31682**
Prep Method: **SW3050B**
Prep Date/Time: **06/22/2018 11:14**
Spike Init Wt./Vol.: 50 mg/Kg Extract Vol: 50 mL
Dupe Init Wt./Vol.: Extract Vol:

Print Date: 06/28/2018 2:09:16PM

Matrix Spike Summary

Original Sample ID: 1454363
MS Sample ID: 1454365 MS
MSD Sample ID: 1454366 MSD

Analysis Date: 06/24/2018 5:17
Analysis Date: 06/24/2018 5:21
Analysis Date: 06/24/2018 5:26
Matrix: Solid/Soil (Wet Weight)

QC for Samples: 1183056001, 1183056002, 1183056003, 1183056004, 1183056006, 1183056007, 1183056009, 1183056010, 1183056011, 1183056012

Results by **SW6020A**

		Matrix Spike (mg/Kg)			Spike Duplicate (mg/Kg)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Lead	3.41	48.2	49.8	96	48.1	49.8	96	84-118	0.18	(< 20)

Batch Information

Analytical Batch: MMS10213
Analytical Method: SW6020A
Instrument: Perkin Elmer Nexlon P5
Analyst: ACF
Analytical Date/Time: 6/24/2018 5:21:57AM

Prep Batch: MXX31682
Prep Method: Soils/Solids Digest for Metals by ICP-MS
Prep Date/Time: 6/22/2018 11:14:10AM
Prep Initial Wt./Vol.: 1.04g
Prep Extract Vol: 50.00mL

Print Date: 06/28/2018 2:09:18PM

Method Blank

Blank ID: MB for HBN 1781364 [SPT/10511]
Blank Lab ID: 1454323

Matrix: Soil/Solid (dry weight)

QC for Samples:
1183056011, 1183056012

Results by **SM21 2540G**

Parameter	Results	LOQ/CL	DL	Units
Total Solids	100			%

Batch Information

Analytical Batch: SPT10511
Analytical Method: SM21 2540G
Instrument:
Analyst: E.M
Analytical Date/Time: 6/21/2018 5:33:00PM

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Duplicate Sample Summary

Original Sample ID: 1183052001
Duplicate Sample ID: 1454325
QC for Samples:

Analysis Date: 06/21/2018 17:33
Matrix: Soil/Solid (dry weight)

Results by **SM21 2540G**

NAME	Original	Duplicate	Units	RPD (%)	RPD CL
Total Solids	92.4	92.7	%	0.29	(< 15)

Batch Information

Analytical Batch: SPT10511
Analytical Method: SM21 2540G
Instrument:
Analyst: E.M

Print Date: 06/28/2018 2:09:25PM

Duplicate Sample Summary

Original Sample ID: 1183052014
Duplicate Sample ID: 1454326
QC for Samples:
1183056011

Analysis Date: 06/21/2018 17:33
Matrix: Soil/Solid (dry weight)

Results by **SM21 2540G**

NAME	Original	Duplicate	Units	RPD (%)	RPD CL
Total Solids	88.1	89.9	%	2.00	(< 15)

Batch Information

Analytical Batch: SPT10511
Analytical Method: SM21 2540G
Instrument:
Analyst: E.M

Print Date: 06/28/2018 2:09:25PM

Duplicate Sample Summary

Original Sample ID: 1183056011
Duplicate Sample ID: 1454327
QC for Samples:
1183056011, 1183056012

Analysis Date: 06/21/2018 17:33
Matrix: Soil/Solid (dry weight)

Results by **SM21 2540G**

NAME	Original	Duplicate	Units	RPD (%)	RPD CL
Total Solids	98.3	98.3	%	0.05	(< 15)

Batch Information

Analytical Batch: SPT10511
Analytical Method: SM21 2540G
Instrument:
Analyst: E.M

Print Date: 06/28/2018 2:09:25PM

Method Blank

Blank ID: MB for HBN 1781439 [SPT/10513]
Blank Lab ID: 1454701

Matrix: Soil/Solid (dry weight)

QC for Samples:
1183056001, 1183056002, 1183056003, 1183056004, 1183056005, 1183056006, 1183056007, 1183056008, 1183056009, 1183056010

Results by **SM21 2540G**

Parameter	Results	LOQ/CL	DL	Units
Total Solids	100			%

Batch Information

Analytical Batch: SPT10513
Analytical Method: SM21 2540G
Instrument:
Analyst: FGL
Analytical Date/Time: 6/22/2018 5:50:00PM

Print Date: 06/28/2018 2:09:28PM

Duplicate Sample Summary

Original Sample ID: 1183090001
Duplicate Sample ID: 1454702

Analysis Date: 06/22/2018 17:50
Matrix: Soil/Solid (dry weight)

QC for Samples:

1183056001, 1183056002, 1183056003, 1183056004, 1183056005, 1183056006, 1183056007, 1183056008, 1183056009, 1183056010

Results by **SM21 2540G**

NAME	Original	Duplicate	Units	RPD (%)	RPD CL
Total Solids	77.9	77.3	%	0.70	(< 15)

Batch Information

Analytical Batch: SPT10513
Analytical Method: SM21 2540G
Instrument:
Analyst: FGL

Print Date: 06/28/2018 2:09:29PM

Duplicate Sample Summary

Original Sample ID: 1183056008
Duplicate Sample ID: 1454657
QC for Samples:
1183056005, 1183056008

Analysis Date: 06/22/2018 17:00
Matrix: Soil/Solid (dry weight)

Results by **SW9045D**

NAME	Original	Duplicate	Units	RPD (%)	RPD CL
pH	6.00	6.00	pH units	0.00	(< 5)

Batch Information

Analytical Batch: TCLP9467
Analytical Method: SW9045D
Instrument: pH Meter Hanna 5221-01
Analyst: TFK

Print Date: 06/28/2018 2:09:33PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1183056 [TCLP9467]
Blank Spike Lab ID: 1454654
Date Analyzed: 06/22/2018 17:00

Matrix: Soil/Solid (dry weight)

QC for Samples: 1183056005, 1183056008

Results by **SW9045D**

Blank Spike (pH units)

Parameter	Spike	Result	Rec (%)	CL
pH	7	7.03	100	(99-101)

Batch Information

Analytical Batch: **TCLP9467**
Analytical Method: **SW9045D**
Instrument: **pH Meter Hanna 5221-01**
Analyst: **TFK**

Print Date: 06/28/2018 2:09:35PM

Method Blank

Blank ID: MB for HBN 1781515 [WXX/12394]
Blank Lab ID: 1455070

Matrix: Soil/Solid (dry weight)

QC for Samples:
1183056005, 1183056008

Results by **SW9056A**

Parameter	Results	LOQ/CL	DL	Units
Sulfate	1.00U	2.00	0.620	mg/Kg

Batch Information

Analytical Batch: WIC5786
Analytical Method: SW9056A
Instrument: 930 Metrohm compact IC flex
Analyst: AYC
Analytical Date/Time: 6/22/2018 11:19:04PM

Prep Batch: WXX12394
Prep Method: METHOD
Prep Date/Time: 6/22/2018 6:11:00PM
Prep Initial Wt./Vol.: 4 g
Prep Extract Vol: 40 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1183056 [WXX12394]
Blank Spike Lab ID: 1455071
Date Analyzed: 06/22/2018 23:38

Matrix: Soil/Solid (dry weight)

QC for Samples: 1183056005, 1183056008

Results by **SW9056A**

Blank Spike (mg/Kg)

Parameter	Spike	Result	Rec (%)	CL
Sulfate	50	50.2	100	(87-115)

Batch Information

Analytical Batch: **WIC5786**
Analytical Method: **SW9056A**
Instrument: **930 Metrohm compact IC flex**
Analyst: **AYC**

Prep Batch: **WXX12394**
Prep Method: **METHOD**
Prep Date/Time: **06/22/2018 18:11**
Spike Init Wt./Vol.: 50 mg/Kg Extract Vol: 40 mL
Dupe Init Wt./Vol.: Extract Vol:

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Matrix Spike Summary

Original Sample ID: 1183056005
MS Sample ID: 1455072 MS
MSD Sample ID: 1455073 MSD

Analysis Date: 06/22/2018 23:57
Analysis Date: 06/23/2018 0:15
Analysis Date: 06/23/2018 0:34
Matrix: Soil/Solid (dry weight)

QC for Samples: 1183056005, 1183056008

Results by **SW9056A**

		Matrix Spike (mg/Kg)			Spike Duplicate (mg/Kg)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Sulfate	11.2	69.5	78.7	97	69.4	77.5	96	87-115	1.40	(< 15)

Batch Information

Analytical Batch: WIC5786
Analytical Method: SW9056A
Instrument: 930 Metrohm compact IC flex
Analyst: AYC
Analytical Date/Time: 6/23/2018 12:15:56AM

Prep Batch: WXX12394
Prep Method: SW9056 Extraction Soil/Solids
Prep Date/Time: 6/22/2018 6:11:00PM
Prep Initial Wt./Vol.: 4.04g
Prep Extract Vol: 40.00mL

Print Date: 06/28/2018 2:09:43PM

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CHAIN OF CUSTODY RECORD

1183056

Instructions: Sections 1 - 5 must be filled out. Omissions may delay the onset of analysis.

Section 1

CLIENT: HMCC

CONTACT: PHONE NO:

PROJECT NAME: HMCC shooting range — PROJECT/ PWSID/ PERMIT#:

REPORTS TO: Stafford G, Matt Woods — E-MAIL: mww@shanwil.com

INVOICE TO: Shannon and Wilson — QUOTE #: P.O. #: 100200

Section 2

RESERVED for lab use	SAMPLE IDENTIFICATION	DATE mm/dd/yy	TIME HH:MM	MATRIX/ MATRIX CODE	Section 3: # CONTAINERS	Section 3: Type C = COMP G = GRAB MI = Multi Incremental Soils	Preservative: Total Pb	Preservative: TCLP Pb	Preservative: pH	Preservative: phosphorus	Preservative: sulfate	Preservative	Preservative	Preservative	Preservative	REMARKS/ LOC ID
1 A B	100200-IA1-0-6	6/20/18	1109	Soil	2	G	X	X								
2 A B	100200-IA1-6-12		1119	Soil	2	G	X	X								
3 A B	100200-IA1-18-24		1155	Soil	2	G	X	X								name 100200-IA1-18-24
4 A B	100200-IA1-12-18	↓	1219	Soil	2	G	X	X								
5 A	100200-IA1-12-18-NV	6/20/18	1019	Soil	1	G			X	X	X					
6 A B	100200-DU2	6/19/18	1129	Soil	2	C	X	X								1g total Pb
7 A B	100200-DU3R	6/19/18	1601	Soil	2	C	X	X								1g total Pb
8 A	100200-DU3-44	6/19/18	1403	Soil	1	G			X	X	X					
9 A B	100200-DU39	6/17/18	1405	Soil	2	C	X	X								1g total Pb
10 A B	100200-DU3	6/19/18	1323	Soil	2	C	X	X								1g total Pb

Section 5

	Date	Time	
Relinquished By: (1)	6/20/18	1545	Received By:
Relinquished By: (2)	Date	Time	Received By:
Relinquished By: (3)	Date	Time	Received By:
Relinquished By: (4)	06/20/18	16:00	Received For Laboratory By: SD

Section 4

DOD Project? Yes (No)

Cooler ID:

Data Deliverable Requirements: Level II

Requested Turnaround Time and/or Special Instructions: Standard TAT

Temp Blank °C: 3.7 D30 or Ambient [ ] (See attached Sample Receipt Form)

Chain of Custody Seal: (Circle) (INTACT) BROKEN ABSENT (See attached Sample Receipt Form)

[X] 200 W. Potter Drive Anchorage, AK 99518 Tel: (907) 562-2343 Fax: (907) 561-5301
[ ] 5500 Business Drive Wilmington, NC 28405 Tel: (910) 350-1903 Fax: (910) 350-1557

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SGS North America Inc.
CHAIN OF CUSTODY RECORD

1183056

Instructions: Sections 1 - 5 must be filled out. Omissions may delay the onset of analysis.

Section 1

CLIENT: HMCC

CONTACT: PHONE NO:

PROJECT NAME: HMCC Shooting Range PROJECT/ PWSID/ PERMIT#:

REPORTS TO: Stafford G. Matt Vaala E-MAIL: mjw@shanwil.com

INVOICE TO: Shannon & Wilson QUOTE #: P.O. #: 100200

Section 2

RESERVED for lab use	SAMPLE IDENTIFICATION	DATE mm/dd/yy	TIME HH:MM	MATRIX/ MATRIX CODE	# CONTAINERS	Type C = COMP G = GRAB MI = Multi Incremental Soils	Preservative: Total Pb	Preservative: TCLP Pb	REMARKS/ LOC ID
(1)	100200-DU1	6/18/18	1352	Soil	2	C	X	X	1g total Pb
(2)	100200-DU4	6/20/18	13:00	Soil	2	C	X	X	1g total Pb

Section 5

	Date	Time	
Relinquished By: (1)	6/20/18	1545	Received By:
Relinquished By: (2)			Received By:
Relinquished By: (3)			Received By:
Relinquished By: (4)	6/20/18	16:00	Received For Laboratory By: SD

Section 4

DOD Project? Yes (No)

Cooler ID:

Data Deliverable Requirements: level II

Requested Turnaround Time and/or Special Instructions: Standard TAT

Temp Blank °C: _____ or Ambient [ ] (See attached Sample Receipt Form)

Chain of Custody Seal: (Circle) INTACT BROKEN ABSENT (See attached Sample Receipt Form)

[X] 200 W. Potter Drive Anchorage, AK 99518 Tel: (907) 562-2343 Fax: (907) 561-5301
[ ] 5500 Business Drive Wilmington, NC 28405 Tel: (910) 350-1903 Fax: (910) 350-1557

SGS

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200 W. Potter Drive, Anchorage, AK 99518
phone (907) 562-2343, fax (907) 561-5301

Characterization of TCLP Samples for LIMS Login

Date Characterized: 6/20/18 **Analyst:** NSW

Sample Container ID:	Matrix	%	Is sufficient volume/mass available?	Notes:
1A-12A	Xylene miscible (Top layer * = matrix 3 **)		Yes / No	If multiple jars were received, were they consistent? Yes / No / NA
	Water miscible (Middle layer = matrix 6)			If biphasic, was there **only** one layer with sufficient sample ***? Yes / No / NA
	Solid (Bottom layer = matrix 7 or 2 if % solids required)	100%		Sample description/other observations: dark, rocky soil
	Xylene miscible (Top layer * = matrix 3 **)		Yes / No	If multiple jars were received, were they consistent? Yes / No / NA
	Water miscible (Middle layer = matrix 6)			If biphasic, was there **only** one layer with sufficient sample ***? Yes / No / NA
	Solid (Bottom layer = matrix 7 or 2 if % solids required)			Sample description/other observations:
	Xylene miscible (Top layer * = matrix 3 **)		Yes / No	If multiple jars were received, were they consistent? Yes / No / NA
	Water miscible (Middle layer = matrix 6)			If biphasic, was there **only** one layer with sufficient sample ***? Yes / No / NA
	Solid (Bottom layer = matrix 7 or 2 if % solids required)			Sample description/other observations:
	Xylene miscible (Top layer * = matrix 3 **)		Yes / No	If multiple jars were received, were they consistent? Yes / No / NA
	Water miscible (Middle layer = matrix 6)			If biphasic, was there **only** one layer with sufficient sample ***? Yes / No / NA
	Solid (Bottom layer = matrix 7 or 2 if % solids required)			Sample description/other observations:
	Xylene miscible (Top layer * = matrix 3 **)		Yes / No	If multiple jars were received, were they consistent? Yes / No / NA
	Water miscible (Middle layer = matrix 6)			If biphasic, was there **only** one layer with sufficient sample ***? Yes / No / NA
	Solid (Bottom layer = matrix 7 or 2 if % solids required)			Sample description/other observations:

Remember: **** = Chlorinated oils will be heavier than water and present as the bottom later.***
***** = Oils must be filterable to be logged in as matrix 3. Nonfilterable oils must be logged in as matrix 7.***
****** = Refer to F078 'Characterization of TCLP Samples for LIMS' to determine if there's sufficent volume/mass.***

e-Sample Receipt Form

SGS Workorder #: **1183056**

Review Criteria	Condition (Yes, No, N/A)	Exceptions Noted below
Chain of Custody / Temperature Requirements		N/A Exemption permitted if sampler hand carries/delivers.
Were Custody Seals intact? Note # & location	YES	1F, 1B
COC accompanied samples?	YES	
N/A **Exemption permitted if chilled & collected <8 hours ago, or for samples where chilling is not required		
Temperature blank compliant* (i.e., 0-6 °C after CF)?	YES	Cooler ID: 1 @ 3.7 °C Therm. ID: D30
	N/A	Cooler ID: @ °C Therm. ID:
	N/A	Cooler ID: @ °C Therm. ID:
	N/A	Cooler ID: @ °C Therm. ID:
	N/A	Cooler ID: @ °C Therm. ID:
If >6°C, were samples collected <8 hours ago?	N/A	
If <0°C, were sample containers ice free?	N/A	
If samples received without a temperature blank, the "cooler temperature" will be documented in lieu of the temperature blank & "**COOLER TEMP**" will be noted to the right. In cases where neither a temp blank nor cooler temp can be obtained, note "ambient" or "chilled".		
Note: Identify containers received at non-compliant temperature . Use form FS-0029 if more space is needed.		
Holding Time / Documentation / Sample Condition Requirements		Note: Refer to form F-083 "Sample Guide" for specific holding times.
Were samples received within holding time?	YES	
Do samples **match COC**** (i.e.,sample IDs,dates/times collected)?	YES	
**Note: If times differ <1hr, record details & login per COC.		
Were analyses requested unambiguous? (i.e., method is specified for analyses with >1 option for analysis)	NO	Phosphorus by SW 6020 per client-JKV.
		N/A ***Exemption permitted for metals (e.g,200.8/6020A).
Were proper containers (type/mass/volume/preservative***)used?	NO	Samples 6, 7, 9, 10-12 have 1g soil for total Pb.
Volatile / LL-Hg Requirements		
Were Trip Blanks (i.e., VOAs, LL-Hg) in cooler with samples?	N/A	
Were all water VOA vials free of headspace (i.e., bubbles ≤ 6mm)?	N/A	
Were all soil VOAs field extracted with MeOH+BFB?	N/A	

Note to Client: Any "No", answer above indicates non-compliance with standard procedures and may impact data quality.

Additional notes (if applicable):

Sample Containers and Preservatives

Container Id	Preservative	Container Condition	Container Id	Preservative	Container Condition
1183056001-A	No Preservative Required	OK			
1183056002-A	No Preservative Required	OK			
1183056003-A	No Preservative Required	OK			
1183056004-A	No Preservative Required	OK			
1183056005-A	No Preservative Required	OK			
1183056006-A	No Preservative Required	OK			
1183056006-B	No Preservative Required	OK			
1183056007-A	No Preservative Required	OK			
1183056007-B	No Preservative Required	OK			
1183056008-A	No Preservative Required	OK			
1183056009-A	No Preservative Required	OK			
1183056009-B	No Preservative Required	OK			
1183056010-A	No Preservative Required	OK			
1183056010-B	No Preservative Required	OK			
1183056011-A	No Preservative Required	OK			
1183056011-B	No Preservative Required	OK			
1183056012-A	No Preservative Required	OK			
1183056012-B	No Preservative Required	OK			
1183056013-A	No Preservative Required	OK			
1183056014-A	No Preservative Required	OK			
1183056015-A	No Preservative Required	OK			
1183056016-A	No Preservative Required	OK			
1183056017-A	No Preservative Required	OK			
1183056018-A	No Preservative Required	OK			
1183056019-A	No Preservative Required	OK			
1183056020-A	No Preservative Required	OK			
1183056021-A	No Preservative Required	OK			
1183056022-A	No Preservative Required	OK			

Container Condition Glossary

Containers for bacteriological, low level mercury and VOA vials are not opened prior to analysis and will be assigned condition code OK unless evidence indicates than an inappropriate container was submitted.

OK - The container was received at an acceptable pH for the analysis requested.
BU - The container was received with headspace greater than 6mm.
DM - The container was received damaged.
FR - The container was received frozen and not usable for Bacteria or BOD analyses.
IC - The container provided for microbiology analysis was not a laboratory-supplied, pre-sterilized container and therefore was not suitable for analysis.
PA - The container was received outside of the acceptable pH for the analysis requested. Preservative was added upon receipt and the container is now at the correct pH. See the Sample Receipt Form for details on the amount and lot # of the preservative added.
PH - The container was received outside of the acceptable pH for the analysis requested. Preservative was added upon receipt, but was insufficient to bring the container to the correct pH for the analysis requested. See the Sample Receipt Form for details on the amount and lot # of the preservative added.

LABORATORY DATA REVIEW CHECKLIST

CS Report Name: HMCC Shooting Range Characterization Eagle River, Alaska **Date:** October 2018

Laboratory Report Date: 06/29/18

Consultant Firm: Shannon & Wilson, Inc.

Completed by: Stafford Glashan
Title: Senior Engineer III
Laboratory Name: SGS North America Inc.
Laboratory Report Number: 1188056
ADEC File Number: *NA*

(**NOTE**: ***NA*** = not applicable; Text in *italics* added by Shannon & Wilson, Inc.)

1. Laboratory

a. Did an ADEC CS approved laboratory receive and perform all of the submitted sample analyses? **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 / NA (please explain)
Comments:

2. Chain of Custody (COC)

a. COC information completed, signed, and dated (including released/received by)?
Yes / No / NA (please explain)
Comments**:**

b. Correct analyses requested? **Yes / No / NA** (please explain)
Comments**:**

3. Laboratory Sample Receipt Documentation

a. Sample/cooler temperature documented and within range at receipt (4° ± 2° C)?
Yes / No / NA (please explain)
Comments: *The temperature blank was 3.7° C.*

b. Sample preservation acceptable - acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)? **Yes / No / NA** (please explain)
Comments:

c. Sample condition documented - broken, leaking (Methanol), zero headspace (VOC vials)? **Yes / No / NA** (please explain)
Comments: *No discrepancies were noted.*

d. If there were any discrepancies, were they documented? – For example, incorrect sample containers/preservation, sample temperature outside acceptance range, insufficient or missing samples, etc.? **Yes / No / NA** (please explain)
Comments: *No discrepancies documented.*

e. Data quality or usability affected? **Yes / No / NA**
Comments: *See above.*

4. Case Narrative

a. Present and understandable? **Yes / No / NA** (please explain)
Comments:

b. Discrepancies, errors or QC failures identified by the lab? **Yes / No / NA** (please explain)
Comments:

MS/MSD

- *Lead recovery does not meet QC criteria. The post digestion spike was successful.*

c. Were corrective actions documented? **Yes / No / NA** (please explain)
Comments:

d. What is the effect on data quality/usability, according to the case narrative?
Comments: *None stated.*

5. Sample Results

a. Correct analyses performed/reported as requested on COC? **Yes / No / NA** (please explain)
Comments:

b. All applicable holding times met? **Yes / No / NA** (please explain)
Comments:

c. All soils reported on a dry weight basis? **Yes / No / NA** (please explain)
Comments:

d. Are the reported LOQs less than the Cleanup Level or the minimum required detection level for the project? **Yes / No / NA** (please explain)
Comments:

e. Data quality or usability affected? **NA** Please explain.

Comments:

6. QC Samples

a. Method Blank

i. One method blank reported per matrix, analysis, and 20 samples?
Yes / No / NA (please explain)
Comments:

ii. All method blank results less than LOQ? **Yes / No / NA** (please explain)
Comments:

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

- .

iv. Do the affected sample(s) have data flags? **Yes/ No / NA** (please explain)
Comments:

If so, are the data flags clearly defined? **Yes / No / NA**
Comments:

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:

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 (RPDs) reported and less than method or laboratory limits? And project specified DQOs, if applicable. RPD reported from LCS/LCSD, MS/MSD, and or sample/sample duplicate. (AK Petroleum methods 20%, VOCs 20%; all other analyses see the laboratory QC pages) **Yes / No / NA** (please explain)
Comments:

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

iv. Data quality or usability affected? Please explain. **Yes / No / NA**
Comments:

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

i. One trip blank reported per matrix, analysis, and cooler? (If not, enter explanation below.) **Yes / No / NA** (please explain)
Comments:

ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC? **(**If not, a comment stating why must be entered below.) **Yes / No / NA** (please explain)
Comments:

iii. All results less than LOQ? **Yes / No / NA** (please explain)
Comments:

iv. If above LOQ, 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?
Yes / No / NA (please explain)
Comments: *Characterization/ISM sampling.*

ii. Submitted blind to the lab? **Yes / No / NA** (please explain)
Comments:

iii. Precision – All relative percent differences (RPDs) less than specified DQOs?
(Recommended: 30% for water, 50% for soil) **Yes / No / NA** (please explain)
Comments:

iv. Data quality or usability affected? Please explain.
Comments:

f. Decontamination or Equipment Blank (if not applicable)
Yes / No / NA (please explain)
Comments: *Soil samples were collected with clean, dedicated steel sampling spoons.*

i. All results less than LOQ? **Yes / No / NA** (please explain)
Comments:

ii. If above LOQ, what samples are affected? ***NA***
Comments:

iii. Data quality or usability affected? Please explain. ***NA***
Comments:

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

a. Defined and appropriate? **Yes / No / NA** (please explain)
Comments: *SGS defines laboratory-specific qualifiers on page 4 of their report.*

Laboratory Report of Analysis

To: Shannon & Wilson, Inc.
5430 Fairbanks St., Ste 3
Anchorage, AK 99518
(907)433-3214

Report Number: **1184053**

Client Project: **100200 HMCC**

Dear Stafford Glashan,

Enclosed are the results of the analytical services performed under the referenced project for the received samples and associated QC as applicable. The samples are certified to meet the requirements of the National Environmental Laboratory Accreditation Conference Standards. Copies of this report and supporting data will be retained in our files for a period of ten years in the event they are required for future reference. All results are intended to be used in their entirety and SGS is not responsible for use of less than the complete report. Any samples submitted to our laboratory will be retained for a maximum of fourteen (14) days from the date of this report unless other archiving requirements were included in the quote.

If there are any questions about the report or services performed during this project, please call Jillian at (907) 562-2343. We will be happy to answer any questions or concerns which you may have.

Thank you for using SGS North America Inc. for your analytical services. We look forward to working with you again on any additional analytical needs.

Sincerely,
SGS North America Inc.

_____

Jillian Vlahovich Date
Project Manager
Jillian.Vlahovich@sgs.com

Case Narrative

SGS Client: **Shannon & Wilson, Inc.**
SGS Project: **1184053**
Project Name/Site: **100200 HMCC**
Project Contact: **Stafford Glashan**

Refer to sample receipt form for information on sample condition.

100200-IA2-X (1184053005) PS

6020A - Metals analyte lead is detected in the LB above the LOQ. The associated sample concentration is 10 times greater than the concentration in the LB.

LB1 for HBN 1783814 [TCLP/9571 (1465240) LB1

6020A - Metals analyte lead is detected in the LB above the LOQ.

1184053005(1465542MS) (1465544) MS

6020A - Metals MS recovery for lead does not meet QC criteria. The post digestion spike was successful.

1184053005(1465542MSD) (1465545) MSD

6020A - Metals MSD recovery for lead does not meet QC criteria. The post digestion spike was successful.

*QC comments may be associated with the field samples found in this report. When applicable, comments will be applied to associated field samples.

SGS North America Inc.
200 West Potter Drive, Anchorage, AK 99518
t 907.562.2343 **f** 907.561.5301 www.us.sgs.com

Laboratory Qualifiers

Enclosed are the analytical results associated with the above work order. All results are intended to be used in their entirety and SGS is not responsible for use of less than the complete report. This document is issued by the Company under its General Conditions of Service accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx>. Attention is drawn to the limitation of liability, indenmification and jurisdiction issues defined therein.

Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. Any unauthorized alteration, forgery or falsification of the context or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

SGS maintains a formal Quality Assurance/Quality Control (QA/QC) program. A copy of our Quality Assurance Plan (QAP), which outlines this program, is available at your request. The laboratory certification numbers are AK00971 DW Chemistry (Provisionally Certified as of 06/11/2018 for Mercury by EPA245.1,Beryllium and Copper by EPA200.8) & Microbiology & 17-021 (CS) for ADEC and 2944.01 for DOD ELAP/ISO17025 (RCRA methods: 1020B, 1311, 3010A, 3050B, 3520C, 3550C, 5030B, 5035A, 6020A, 7470A, 7471B, 8015C, 8021B, 8082A, 8260C, 8270D, 8270D-SIM, 9040C, 9045D, 9056A, 9060A, AK101 and AK102/103). Except as specifically noted, all statements and data in this report are in conformance to the provisions set forth by the SGS QAP and, when applicable, other regulatory authorities.

The following descriptors or qualifiers may be found in your report:

*	The analyte has exceeded allowable regulatory or control limits.
!	Surrogate out of control limits.
B	Indicates the analyte is found in a blank associated with the sample.
CCV/CVA/CVB	Continuing Calibration Verification
CCCV/CVC/CVCA/CVCB	Closing Continuing Calibration Verification
CL	Control Limit
DF	Analytical Dilution Factor
DL	Detection Limit (i.e., maximum method detection limit)
E	The analyte result is above the calibrated range.
GT	Greater Than
IB	Instrument Blank
ICV	Initial Calibration Verification
J	The quantitation is an estimation.
LCS(D)	Laboratory Control Spike (Duplicate)
LLQC/LLIQC	Low Level Quantitation Check
LOD	Limit of Detection (i.e., 1/2 of the LOQ)
LOQ	Limit of Quantitation (i.e., reporting or practical quantitation limit)
LT	Less Than
MB	Method Blank
MS(D)	Matrix Spike (Duplicate)
ND	Indicates the analyte is not detected.
RPD	Relative Percent Difference
U	Indicates the analyte was analyzed for but not detected.

Note: Sample summaries which include a result for "Total Solids" have already been adjusted for moisture content. All DRO/RRO analyses are integrated per SOP.

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Sample Summary

Client Sample ID	Lab Sample ID	Collected	Received	Matrix
100200-D03-4X	1184053001	07/30/2018	07/30/2018	Solid/Soil (Wet Weight)
100200-D03-10X	1184053002	07/30/2018	07/30/2018	Solid/Soil (Wet Weight)
100200-D04-4X	1184053003	07/30/2018	07/30/2018	Solid/Soil (Wet Weight)
100200-D04-10X	1184053004	07/30/2018	07/30/2018	Solid/Soil (Wet Weight)
100200-IA2-X	1184053005	07/30/2018	07/30/2018	Solid/Soil (Wet Weight)

Method	Method Description
SW6020A TCLP	Metals by ICP-MS

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Detectable Results Summary

Client Sample ID: **100200-D03-4X**
Lab Sample ID: 1184053001

TCLP Constituents Metals	Parameter	Result	Units
	Lead	25.2	mg/L

Client Sample ID: **100200-D03-10X**
Lab Sample ID: 1184053002

TCLP Constituents Metals	Parameter	Result	Units
	Lead	29.3	mg/L

Client Sample ID: **100200-D04-4X**
Lab Sample ID: 1184053003

TCLP Constituents Metals	Parameter	Result	Units
	Lead	75.6	mg/L

Client Sample ID: **100200-D04-10X**
Lab Sample ID: 1184053004

TCLP Constituents Metals	Parameter	Result	Units
	Lead	29.5	mg/L

Client Sample ID: **100200-IA2-X**
Lab Sample ID: 1184053005

TCLP Constituents Metals	Parameter	Result	Units
	Lead	656	mg/L

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Results of **100200-D03-4X**

Client Sample ID: **100200-D03-4X**
Client Project ID: **100200 HMCC**
Lab Sample ID: 1184053001
Lab Project ID: 1184053

Collection Date: 07/30/18 10:40
Received Date: 07/30/18 12:36
Matrix: Solid/Soil (Wet Weight)
Solids (%):
Location:

Results by **TCLP Constituents Metals**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Lead	25.2	*	0.0500	0.0155	mg/L	25	(<5)	08/09/18 18:55

Batch Information

Analytical Batch: MMS10273
Analytical Method: SW6020A TCLP
Analyst: DSH
Analytical Date/Time: 08/09/18 18:55
Container ID: 1184053001-A

Prep Batch: MXT5683
Prep Method: SW3010A
Prep Date/Time: 08/07/18 11:20
Prep Initial Wt./Vol.: 2.5 mL
Prep Extract Vol: 25 mL

Print Date: 08/14/2018 11:31:46AM

J flagging is activated

Results of **100200-D03-10X**

Client Sample ID: **100200-D03-10X**
Client Project ID: **100200 HMCC**
Lab Sample ID: 1184053002
Lab Project ID: 1184053

Collection Date: 07/30/18 10:45
Received Date: 07/30/18 12:36
Matrix: Solid/Soil (Wet Weight)
Solids (%):
Location:

Results by **TCLP Constituents Metals**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Lead	29.3	*	0.0500	0.0155	mg/L	25	(<5)	08/09/18 18:59

Batch Information

Analytical Batch: MMS10273
Analytical Method: SW6020A TCLP
Analyst: DSH
Analytical Date/Time: 08/09/18 18:59
Container ID: 1184053002-A

Prep Batch: MXT5683
Prep Method: SW3010A
Prep Date/Time: 08/07/18 11:20
Prep Initial Wt./Vol.: 2.5 mL
Prep Extract Vol: 25 mL

Print Date: 08/14/2018 11:31:46AM

J flagging is activated

Results of **100200-D04-4X**

Client Sample ID: **100200-D04-4X**
Client Project ID: **100200 HMCC**
Lab Sample ID: 1184053003
Lab Project ID: 1184053

Collection Date: 07/30/18 10:50
Received Date: 07/30/18 12:36
Matrix: Solid/Soil (Wet Weight)
Solids (%):
Location:

Results by **TCLP Constituents Metals**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Lead	75.6	*	0.0500	0.0155	mg/L	25	(<5)	08/09/18 19:18

Batch Information

Analytical Batch: MMS10273
Analytical Method: SW6020A TCLP
Analyst: DSH
Analytical Date/Time: 08/09/18 19:18
Container ID: 1184053003-A

Prep Batch: MXT5683
Prep Method: SW3010A
Prep Date/Time: 08/07/18 11:20
Prep Initial Wt./Vol.: 2.5 mL
Prep Extract Vol: 25 mL

Print Date: 08/14/2018 11:31:46AM

J flagging is activated

Results of **100200-D04-10X**

Client Sample ID: **100200-D04-10X**
Client Project ID: **100200 HMCC**
Lab Sample ID: 1184053004
Lab Project ID: 1184053

Collection Date: 07/30/18 10:55
Received Date: 07/30/18 12:36
Matrix: Solid/Soil (Wet Weight)
Solids (%):
Location:

Results by **TCLP Constituents Metals**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Lead	29.5	*	0.0500	0.0155	mg/L	25	(<5)	08/09/18 19:23

Batch Information

Analytical Batch: MMS10273
Analytical Method: SW6020A TCLP
Analyst: DSH
Analytical Date/Time: 08/09/18 19:23
Container ID: 1184053004-A

Prep Batch: MXT5683
Prep Method: SW3010A
Prep Date/Time: 08/07/18 11:20
Prep Initial Wt./Vol.: 2.5 mL
Prep Extract Vol: 25 mL

Print Date: 08/14/2018 11:31:46AM

J flagging is activated

Results of **100200-IA2-X**

Client Sample ID: **100200-IA2-X**
Client Project ID: **100200 HMCC**
Lab Sample ID: 1184053005
Lab Project ID: 1184053

Collection Date: 07/30/18 11:10
Received Date: 07/30/18 12:36
Matrix: Solid/Soil (Wet Weight)
Solids (%):
Location:

Results by **TCLP Constituents Metals**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Lead	656	*	0.400	0.124	mg/L	200	(<5)	08/09/18 04:49

Batch Information

Analytical Batch: MMS10272
Analytical Method: SW6020A TCLP
Analyst: DSH
Analytical Date/Time: 08/09/18 04:49
Container ID: 1184053005-A

Prep Batch: MXT5684
Prep Method: SW3010A
Prep Date/Time: 08/08/18 11:55
Prep Initial Wt./Vol.: 2.5 mL
Prep Extract Vol: 25 mL

Print Date: 08/14/2018 11:31:46AM

J flagging is activated

Method Blank

Blank ID: LB1 for HBN 1783735 [TCLP/9568
Blank Lab ID: 1464924

Matrix: Solid/Soil (Wet Weight)

QC for Samples:
1184053001, 1184053002, 1184053003, 1184053004

Results by **SW6020A TCLP**

Parameter	Results	LOQ/CL	DL	Units
Lead	0.0250U	0.0500	0.0155	mg/L

Batch Information

Analytical Batch: MMS10273
Analytical Method: SW6020A TCLP
Instrument: Perkin Elmer Nexlon P5
Analyst: DSH
Analytical Date/Time: 8/9/2018 1:48:16PM

Prep Batch: MXT5683
Prep Method: SW3010A
Prep Date/Time: 8/7/2018 11:20:05AM
Prep Initial Wt./Vol.: 2.5 mL
Prep Extract Vol: 25 mL

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Method Blank

Blank ID: MB for HBN 1783800 [MXT/5683]
Blank Lab ID: 1465194

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1184053001, 1184053002, 1184053003, 1184053004

Results by **SW6020A TCLP**

Parameter	Results	LOQ/CL	DL	Units
Lead	0.00250U	0.00500	0.00155	mg/L

Batch Information

Analytical Batch: MMS10273
Analytical Method: SW6020A TCLP
Instrument: Perkin Elmer Nexlon P5
Analyst: DSH
Analytical Date/Time: 8/9/2018 5:26:02PM

Prep Batch: MXT5683
Prep Method: SW3010A
Prep Date/Time: 8/7/2018 11:20:05AM
Prep Initial Wt./Vol.: 25 mL
Prep Extract Vol: 25 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1184053 [MXT5683]
Blank Spike Lab ID: 1465195
Date Analyzed: 08/09/2018 17:30

Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1184053001, 1184053002, 1184053003, 1184053004

Results by **SW6020A TCLP**

Blank Spike (mg/L)

Parameter	Spike	Result	Rec (%)	CL
Lead	1	1.04	104	(88-115)

Batch Information

Analytical Batch: **MMS10273**
Analytical Method: **SW6020A TCLP**
Instrument: **Perkin Elmer Nexion P5**
Analyst: **DSH**

Prep Batch: **MXT5683**
Prep Method: **SW3010A**
Prep Date/Time: **08/07/2018 11:20**
Spike Init Wt./Vol.: 1 mg/L Extract Vol: 25 mL
Dupe Init Wt./Vol.: Extract Vol:

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Matrix Spike Summary

Original Sample ID: 1465196
MS Sample ID: 1465198 MS
MSD Sample ID: 1465199 MSD

Analysis Date: 08/09/2018 17:35
Analysis Date: 08/09/2018 17:40
Analysis Date: 08/09/2018 17:44
Matrix: Solid/Soil (Wet Weight)

QC for Samples: 1184053001, 1184053002, 1184053003, 1184053004

Results by **SW6020A TCLP**

		Matrix Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Lead	0.0500	10.0	10.1	100	10.0	10.1	101	88-115	0.63	(< 20)

Batch Information

Analytical Batch: MMS10273
Analytical Method: SW6020A TCLP
Instrument: Perkin Elmer Nexlon P5
Analyst: DSH
Analytical Date/Time: 8/9/2018 5:40:07PM

Prep Batch: MXT5683
Prep Method: Waters Digest for Metals by ICP-MS(TCLP)
Prep Date/Time: 8/7/2018 11:20:05AM
Prep Initial Wt./Vol.: 2.50mL
Prep Extract Vol: 25.00mL

Print Date: 08/14/2018 11:31:50AM

Method Blank

Blank ID: LB1 for HBN 1783814 [TCLP/9571
Blank Lab ID: 1465240

Matrix: Solid/Soil (Wet Weight)

QC for Samples:
1184053005

Results by **SW6020A TCLP**

Parameter	Results	LOQ/CL	DL	Units
Lead	0.113*	0.0500	0.0155	mg/L

Batch Information

Analytical Batch: MMS10273
Analytical Method: SW6020A TCLP
Instrument: Perkin Elmer Nexlon P5
Analyst: DSH
Analytical Date/Time: 8/9/2018 1:57:39PM

Prep Batch: MXT5684
Prep Method: SW3010A
Prep Date/Time: 8/8/2018 11:55:30AM
Prep Initial Wt./Vol.: 2.5 mL
Prep Extract Vol: 25 mL

Print Date: 08/14/2018 11:31:51AM

Method Blank

Blank ID: MB for HBN 1783891 [MXT/5684]
Blank Lab ID: 1465540

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1184053005

Results by **SW6020A TCLP**

Parameter	Results	LOQ/CL	DL	Units
Lead	0.00250U	0.00500	0.00155	mg/L

Batch Information

Analytical Batch: MMS10273
Analytical Method: SW6020A TCLP
Instrument: Perkin Elmer Nexlon P5
Analyst: DSH
Analytical Date/Time: 8/9/2018 1:52:58PM

Prep Batch: MXT5684
Prep Method: SW3010A
Prep Date/Time: 8/8/2018 11:55:30AM
Prep Initial Wt./Vol.: 25 mL
Prep Extract Vol: 25 mL

SGS North America Inc.
200 West Potter Drive Anchorage, AK 95518
t 907.562.2343 **f** 907.561.5301 www.us.sgs.com

Blank Spike Summary

Blank Spike ID: LCS for HBN 1184053 [MXT5684]
Blank Spike Lab ID: 1465541
Date Analyzed: 08/08/2018 19:23

Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1184053005

Results by **SW6020A TCLP**

Blank Spike (mg/L)

Parameter	Spike	Result	Rec (%)	CL
Lead	1	0.976	98	(88-115)

Batch Information

Analytical Batch: **MMS10272**
Analytical Method: **SW6020A TCLP**
Instrument: **Perkin Elmer Nexion P5**
Analyst: **DSH**

Prep Batch: **MXT5684**
Prep Method: **SW3010A**
Prep Date/Time: **08/08/2018 11:55**
Spike Init Wt./Vol.: 1 mg/L Extract Vol: 25 mL
Dupe Init Wt./Vol.: Extract Vol:

SGS North America Inc.
200 West Potter Drive Anchorage, AK 95518
t 907.562.2343 f 907.561.5301 www.us.sgs.com

Matrix Spike Summary

Original Sample ID: 1465542
MS Sample ID: 1465544 MS
MSD Sample ID: 1465545 MSD

QC for Samples: 1184053005

Analysis Date: 08/09/2018 4:49
Analysis Date: 08/09/2018 4:54
Analysis Date: 08/09/2018 4:59
Matrix: Solid/Soil (Wet Weight)

Results by **SW6020A TCLP**

		Matrix Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Lead	656	10.0	669	137 *	10.0	657	11 *	88-115	1.90	(< 20)

Batch Information

Analytical Batch: MMS10272
Analytical Method: SW6020A TCLP
Instrument: Perkin Elmer NexIon P5
Analyst: DSH
Analytical Date/Time: 8/9/2018 4:54:27AM

Prep Batch: MXT5684
Prep Method: Waters Digest for Metals by ICP-MS(TCLP)
Prep Date/Time: 8/8/2018 11:55:30AM
Prep Initial Wt./Vol.: 2.50mL
Prep Extract Vol: 25.00mL

Print Date: 08/14/2018 11:31:54AM

Original Sample ID: 1465542
MS Sample ID: 1465543 BNT
MSD Sample ID:

QC for Samples: 1184053005

Analysis Date: 08/09/2018 4:49
Analysis Date: 08/09/2018 5:03
Analysis Date:
Matrix: Solid/Soil (Wet Weight)

Results by **SW6020A TCLP**

		Matrix Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Lead	656	500	1170	103				80-120		

Batch Information

Analytical Batch: MMS10272
Analytical Method: SW6020A TCLP
Instrument: Perkin Elmer Nexlon P5
Analyst: DSH
Analytical Date/Time: 8/9/2018 5:03:50AM

Prep Batch: MXT5684
Prep Method: Waters Digest for Metals by ICP-MS(TCLP)
Prep Date/Time: 8/8/2018 11:55:30AM
Prep Initial Wt./Vol.: 2.50mL
Prep Extract Vol: 25.00mL

Print Date: 08/14/2018 11:31:54AM

1184053

REVIEWED S.D

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

400 N. 34th Street, Suite 100
Seattle, WA 98103
(206) 632-8020

2355 Hill Road
Fairbanks, AK 99709
(907) 479-0600

3990 Collins Way, Suite 100
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5430 Fairbanks Street, Suite 3
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~~1321 Bannock Street, Suite 200~~
Denver, CO 80204
(303) 825-3800

2705 Saint Andrews Loop, Suite A
Pasco, WA 99301-3378
(509) 946-6309

CHAIN-OF-CUSTODY RECORD

Page 1 of 1

Laboratory SGS
Attn: Jillian

Analysis Parameters/Sample Container Description
(include preservative if used)

Sample Identity	Lab No.	Time	Date Sampled	Comp.	Grab	NLP Lead EPA 1311/6020	Total Number of Containers	Remarks/Matrix
100200-DU3-4X	① A	1040	7/30/18		X	X	1	Soil
DU3-10X	② A	1045						
DU4-4X	③ A	1050						
DU4-10X	④ A	1055						
IA2-X	⑤ A	1110						Soil/phosphate

Project Information		Sample Receipt	
Project Number:	100200	Total Number of Containers	
Project Name:	HNCC	COC Seals/Intact? Y/N/NA	NA HD
Contact:	SJG	Received Good Cond./Cold	Y
Ongoing Project? Yes ☒ No ☐		Delivery Method:	HD
Sampler:	SJG	(attach shipping bill, if any)	

Instructions	
Requested Turnaround Time:	Standard
Special Instructions:	

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: Time: 1240	Signature: Time:	Signature: Time:
Printed Name: Stafford Glashan Date: 7/30/18	Printed Name: Date:	Printed Name: Date:
Company: S:w	Company:	Company:

Received By: 1.	Received By: 2.	Received By: 3.
Signature: Time:	Signature: Time:	Signature: Time: 12:36
Printed Name: Date:	Printed Name: Date:	Printed Name: Jillian Vlahovich Date: 7/30/18
Company:	Company:	Company: SGS

Distribution: White - w/shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/shipment - for consignee files
Pink - Shannon & Wilson - Job File

200124

F-19-91/UR

TB 5.3°C D45

No. 35416

SGS North America Inc.

200 W. Potter Dr., Anchorage, AK 99518 (ph) 907-562-2343, (fax) 907-561-5301

3180 Peger Rd. Ste. 190, Fairbanks, AK 99709 (ph) 907-474-8656

Sample Kit Request

☑ **Client pickup Date:** 7/18/2018 **Time:** 15:30

Be sure to ask if client will ship by ground (DOT) or air carrier (IATA)

☐ **Deliver to client:**

☐ **Ship by/Air Carrier:**

Airbill Number:

Date to ship by:

Notes:

Does a Profile exist in LIMS? **If not, please send a request for new profile build.**

Client Name: Shannon & Wilson

Ordered By: Stafford **Phone #:**

Email: SJG@shanwil.com

Project Name: Highland Mt. **Project/Permit#:**

Quote #: **Profile #:**

Delivery Address:

Kit request taken by: CGH **Date:** July 18, 2018

Kit prepared by: **Date:**

Kit *(including lid tightness for pres'd bottles)* checked by: **Date:**

Kit packed & shipped by: **Date:**

Filename: SKIT_Shannon & Wilson_Highland Mt._2018-07-18 *Required Items

No. Samples	Matrix	Analysis	Container Size & Type		Pres.			Hold Time	# QC Bottles	Total Bottles
8	soil	TCLP Lead	1 x 4-oz	amber glass				6M		8

☐ Pack for Shipping via ***ground*** (DOT)

☐ Pack for Shipping via ***air carrier*** (IATA)

☑ Temperature Blank (***circle one:*** 120-ml OR 500-ml)

☐ Soil VOA Trip Blank - Lot#:

☐ Water VOA Trip Blank - Lot#:

☐ 524 VOA Trip Blank - Lot#:

☐ Low Level Mercury Trip Blank- Lot#:

☑ Coolers

☑ Gel Ice

☑ Bubble Wrap

☑ Labels

☑ Custody Seals

☐ SGS COCs - ***Circle req'd format:*** ☐ Blank COC ☐ DW COC ☐ COC initiated by PM (attached)

☐ Send additional instructions/documents ***(Note to PM:*** *Be sure to attach copy of requested form.)*

☐ Total # includes bottles for % Solids

☐ Track all Lot#? (Required for DOD)

☐ Foreign Soil

Other Notes/Reminders for Kit Prep:

Attention Client/Sampler:

1. Do not rinse container; be aware of any acid preservative in container.
2. Fill container, but do not overfill (except volatile waters).
3. Label the container with your sample ID as well as the date/time of collection.
4. Fill out the Chain of Custody.
5. Add frozen gel packs or ice to your cooler & pack to prevent breakage.

Charges may be invoiced for bottles which are unused or improperly used.

If you have any questions concerning this sample kit, please contact your Project Manager for assistance. *Thank you.*

***This will email a copy of this form for confirmation to the client email and save the form to the network. This should not be**

SGS

1184053

Characterization of TCLP Samples f

Date Characterized: 7/30/18   Analyst: NLC

Sample Container ID:	Matrix	%	Is sufficient volume/mass available?	Notes:
1-5 A	Xylene miscible (Top layer * = matrix 3 **)	0%	Yes / No (circled: No)	If multiple jars were received, were they consistent? Yes / No / NA (circled: NA)
	Water miscible (Middle layer = matrix 6)	0%		If biphasic, was there **only** one layer with sufficient sample ***? Yes / No / NA (circled: NA)
	Solid (Bottom layer = matrix 7 or 2 if % solids required)	100%		Sample description/other observations: Soil
	Xylene miscible (Top layer * = matrix 3 **)		Yes / No	If multiple jars were received, were they consistent? Yes / No / NA
	Water miscible (Middle layer = matrix 6)			If biphasic, was there **only** one layer with sufficient sample ***? Yes / No / NA
	Solid (Bottom layer = matrix 7 or 2 if % solids required)			Sample description/other observations:
	Xylene miscible (Top layer * = matrix 3 **)		Yes / No	If multiple jars were received, were they consistent? Yes / No / NA
	Water miscible (Middle layer = matrix 6)			If biphasic, was there **only** one layer with sufficient sample ***? Yes / No / NA
	Solid (Bottom layer = matrix 7 or 2 if % solids required)			Sample description/other observations:
	Xylene miscible (Top layer * = matrix 3 **)		Yes / No	If multiple jars were received, were they consistent? Yes / No / NA
	Water miscible (Middle layer = matrix 6)			If biphasic, was there **only** one layer with sufficient sample ***? Yes / No / NA
	Solid (Bottom layer = matrix 7 or 2 if % solids required)			Sample description/other observations:
	Xylene miscible (Top layer * = matrix 3 **)		Yes / No	If multiple jars were received, were they consistent? Yes / No / NA
	Water miscible (Middle layer = matrix 6)			If biphasic, was there **only** one layer with sufficient sample ***? Yes / No / NA
	Solid (Bottom layer = matrix 7 or 2 if % solids required)			Sample description/other observations:

Remember: **** = Chlorinated oils will be heavier than water and present as the bottom later.***
***** = Oils must be filterable to be logged in as matrix 3. Nonfilterable oils must be logged in as matrix 7.***
****** = Refer to F078 'Characterization of TCLP Samples for LIMS' to determine if there's sufficent volume/mass.***

e-Sample Receipt Form

SGS Workorder #: **1184053**

1184053

Review Criteria	Condition (Yes, No, N/A)	Exceptions Noted below
Chain of Custody / Temperature Requirements		YES Exemption permitted if sampler hand carries/delivers.
Were Custody Seals intact? Note # & location	N/A	ABSENT
COC accompanied samples?	YES	
N/A **Exemption permitted if chilled & collected <8 hours ago, or for samples where chilling is not required		
Temperature blank compliant* (i.e., 0-6 °C after CF)?	YES	Cooler ID: 1 @ 5.3 °C Therm. ID: D45
	N/A	Cooler ID: @ °C Therm. ID:
	N/A	Cooler ID: @ °C Therm. ID:
	N/A	Cooler ID: @ °C Therm. ID:
	N/A	Cooler ID: @ °C Therm. ID:
If >6°C, were samples collected <8 hours ago?	N/A	
If <0°C, were sample containers ice free?	N/A	
If samples received without a temperature blank, the "cooler temperature" will be documented in lieu of the temperature blank & "**COOLER TEMP**" will be noted to the right. In cases where neither a temp blank nor cooler temp can be obtained, note "ambient" or "chilled".		
Note: Identify containers received at non-compliant temperature . Use form FS-0029 if more space is needed.		
Holding Time / Documentation / Sample Condition Requirements		Note: Refer to form F-083 "Sample Guide" for specific holding times.
Were samples received within holding time?	YES	
Do samples **match COC**** (i.e.,sample IDs,dates/times collected)?	YES	
**Note: If times differ <1hr, record details & login per COC.		
Were analyses requested unambiguous? (i.e., method is specified for analyses with >1 option for analysis)	YES	
	N/A	***Exemption permitted for metals (e.g,200.8/6020A).
Were proper containers (type/mass/volume/preservative***)used?	YES	
Volatile / LL-Hg Requirements		
Were Trip Blanks (i.e., VOAs, LL-Hg) in cooler with samples?	N/A	
Were all water VOA vials free of headspace (i.e., bubbles ≤ 6mm)?	N/A	
Were all soil VOAs field extracted with MeOH+BFB?	N/A	

Note to Client: Any "No", answer above indicates non-compliance with standard procedures and may impact data quality.

Additional notes (if applicable):

Sample Containers and Preservatives

Container Id	Preservative	Container Condition	Container Id	Preservative	Container Condition
1184053001-A	No Preservative Required	OK			
1184053002-A	No Preservative Required	OK			
1184053003-A	No Preservative Required	OK			
1184053004-A	No Preservative Required	OK			
1184053005-A	No Preservative Required	OK			

Container Condition Glossary

Containers for bacteriological, low level mercury and VOA vials are not opened prior to analysis and will be assigned condition code OK unless evidence indicates than an inappropriate container was submitted.

OK - The container was received at an acceptable pH for the analysis requested.
BU - The container was received with headspace greater than 6mm.
DM - The container was received damaged.
FR - The container was received frozen and not usable for Bacteria or BOD analyses.
IC - The container provided for microbiology analysis was not a laboratory-supplied, pre-sterilized container and therefore was not suitable for analysis.
PA - The container was received outside of the acceptable pH for the analysis requested. Preservative was added upon receipt and the container is now at the correct pH. See the Sample Receipt Form for details on the amount and lot # of the preservative added.
PH - The container was received outside of the acceptable pH for the analysis requested. Preservative was added upon receipt, but was insufficient to bring the container to the correct pH for the analysis requested. See the Sample Receipt Form for details on the amount and lot # of the preservative added.

LABORATORY DATA REVIEW CHECKLIST

CS Report Name: HMCC Shooting Range Characterization Eagle River, Alaska **Date:** October 2018

Laboratory Report Date: 08/14/18

Consultant Firm: Shannon & Wilson, Inc.

Completed by: Stafford Glashan
Title: Senior Engineer III
Laboratory Name: SGS North America Inc.
Laboratory Report Number: 1184053
ADEC File Number: *NA*

(**NOTE**: ***NA*** = not applicable; Text in *italics* added by Shannon & Wilson, Inc.)

1. Laboratory

a. Did an ADEC CS approved laboratory receive and perform all of the submitted sample analyses? **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 / NA (please explain)
Comments:

2. Chain of Custody (COC)

a. COC information completed, signed, and dated (including released/received by)?
Yes / No / NA (please explain)
Comments**:**

b. Correct analyses requested? **Yes / No / NA** (please explain)
Comments**:**

3. Laboratory Sample Receipt Documentation

a. Sample/cooler temperature documented and within range at receipt (4° ± 2° C)?
Yes / No / NA (please explain)
Comments: *The temperature blank was 5.3° C.*

b. Sample preservation acceptable - acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)? **Yes / No / NA** (please explain)
Comments:

c. Sample condition documented - broken, leaking (Methanol), zero headspace (VOC vials)? **Yes / No / NA** (please explain)
Comments: *No discrepancies were noted.*

d. If there were any discrepancies, were they documented? – For example, incorrect sample containers/preservation, sample temperature outside acceptance range, insufficient or missing samples, etc.? **Yes / No / NA** (please explain)
Comments: *No discrepancies documented.*

e. Data quality or usability affected? **Yes / No / NA**
Comments: *See above.*

4. Case Narrative

a. Present and understandable? **Yes / No / NA** (please explain)
Comments:

b. Discrepancies, errors or QC failures identified by the lab? **Yes / No / NA** (please explain)
Comments:

MS/MSD

- *Lead recovery does not meet QC criteria. The post digestion spike was successful.*

LB1

- *Lead detected in lab blank associated with 100200-IA2-X.*

c. Were corrective actions documented? **Yes / No / NA** (please explain)
Comments:

d. What is the effect on data quality/usability, according to the case narrative?
Comments: *None as blank concentration is 10x less than sample result.*

5. Sample Results

a. Correct analyses performed/reported as requested on COC? **Yes / No / NA** (please explain)
Comments:

b. All applicable holding times met? **Yes / No / NA** (please explain)
Comments:

c. All soils reported on a dry weight basis? **Yes / No / NA** (please explain)
Comments:

d. Are the reported LOQs less than the Cleanup Level or the minimum required detection level for the project? **Yes / No / NA** (please explain)

Comments:

e. Data quality or usability affected? **NA** Please explain.
Comments:

6. QC Samples

a. Method Blank

i. One method blank reported per matrix, analysis, and 20 samples?
Yes / No / NA (please explain)
Comments:

ii. All method blank results less than LOQ? **Yes / No / NA** (please explain)
Comments:

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

iv. Do the affected sample(s) have data flags? **Yes/ No / NA** (please explain)
Comments:

If so, are the data flags clearly defined? **Yes / No / NA**
Comments:

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:

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 (RPDs) reported and less than method or laboratory limits? And project specified DQOs, if applicable. RPD reported from LCS/LCSD, MS/MSD, and or sample/sample duplicate. (AK Petroleum methods 20%, VOCs 20%; all other analyses see the laboratory QC pages) **Yes / No / NA**

(please explain)
Comments:

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

iv. Data quality or usability affected? Please explain. **Yes / No / NA**
Comments:

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

i. One trip blank reported per matrix, analysis, and cooler? (If not, enter explanation below.) **Yes / No / NA** (please explain)
Comments:

ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC? **(**If not, a comment stating why must be entered below.) **Yes / No / NA** (please explain)
Comments:

iii. All results less than LOQ? **Yes / No / NA** (please explain)
Comments:

iv. If above LOQ, 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?
Yes / No / NA (please explain)
Comments: *Characterization/ISM sampling.*

ii. Submitted blind to the lab? **Yes / No / NA** (please explain)
Comments:

iii. Precision – All relative percent differences (RPDs) less than specified DQOs?
(Recommended: 30% for water, 50% for soil) **Yes / No / NA** (please explain)
Comments:

iv. Data quality or usability affected? Please explain.
Comments:

f. Decontamination or Equipment Blank (if not applicable)
Yes / No / NA (please explain)
Comments: *Soil samples were collected with clean, dedicated steel sampling spoons.*

i. All results less than LOQ? **Yes / No / NA** (please explain)
Comments:

ii. If above LOQ, what samples are affected? ***NA***
Comments:

iii. Data quality or usability affected? Please explain. ***NA***
Comments:

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

a. Defined and appropriate? **Yes / No / NA** (please explain)
Comments: *SGS defines laboratory-specific qualifiers on page 4 of their report.*

Laboratory Report of Analysis

To: Shannon & Wilson, Inc.
5430 Fairbanks St., Ste 3
Anchorage, AK 99518
(907)433-3214

Report Number: **1184610**

Client Project: **100200 HMCC**

Dear Stafford Glashan,

Enclosed are the results of the analytical services performed under the referenced project for the received samples and associated QC as applicable. The samples are certified to meet the requirements of the National Environmental Laboratory Accreditation Conference Standards. Copies of this report and supporting data will be retained in our files for a period of ten years in the event they are required for future reference. All results are intended to be used in their entirety and SGS is not responsible for use of less than the complete report. Any samples submitted to our laboratory will be retained for a maximum of fourteen (14) days from the date of this report unless other archiving requirements were included in the quote.

If there are any questions about the report or services performed during this project, please call Jillian at (907) 562-2343. We will be happy to answer any questions or concerns which you may have.

Thank you for using SGS North America Inc. for your analytical services. We look forward to working with you again on any additional analytical needs.

Sincerely,
SGS North America Inc.

_____

Jillian Vlahovich Date
Project Manager
Jillian.Vlahovich@sgs.com

Case Narrative

SGS Client: **Shannon & Wilson, Inc.**
SGS Project: **1184610**
Project Name/Site: **100200 HMCC**
Project Contact: **Stafford Glashan**

Refer to sample receipt form for information on sample condition.

*QC comments may be associated with the field samples found in this report. When applicable, comments will be applied to associated field samples.

SGS North America Inc.
200 West Potter Drive, Anchorage, AK 99518
t 907.562.2343 **f** 907.561.5301 www.us.sgs.com

Laboratory Qualifiers

Enclosed are the analytical results associated with the above work order. All results are intended to be used in their entirety and SGS is not responsible for use of less than the complete report. This document is issued by the Company under its General Conditions of Service accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx>. Attention is drawn to the limitation of liability, indenmification and jurisdiction issues defined therein.

Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. Any unauthorized alteration, forgery or falsification of the context or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

SGS maintains a formal Quality Assurance/Quality Control (QA/QC) program. A copy of our Quality Assurance Plan (QAP), which outlines this program, is available at your request. The laboratory certification numbers are AK00971 (DW Chemistry & Microbiology) & 17-021 (CS) for ADEC and 2944.01 for DOD ELAP/ISO17025 (RCRA methods: 1020B, 1311, 3010A, 3050B, 3520C, 3550C, 5030B, 5035A, 6020A, 7470A, 7471B, 8015C, 8021B, 8082A, 8260C, 8270D, 8270D-SIM, 9040C, 9045D, 9056A, 9060A, AK101 and AK102/103). Except as specifically noted, all statements and data in this report are in conformance to the provisions set forth by the SGS QAP and, when applicable, other regulatory authorities.

The following descriptors or qualifiers may be found in your report:

*	The analyte has exceeded allowable regulatory or control limits.
!	Surrogate out of control limits.
B	Indicates the analyte is found in a blank associated with the sample.
CCV/CVA/CVB	Continuing Calibration Verification
CCCV/CVC/CVCA/CVCB	Closing Continuing Calibration Verification
CL	Control Limit
DF	Analytical Dilution Factor
DL	Detection Limit (i.e., maximum method detection limit)
E	The analyte result is above the calibrated range.
GT	Greater Than
IB	Instrument Blank
ICV	Initial Calibration Verification
J	The quantitation is an estimation.
LCS(D)	Laboratory Control Spike (Duplicate)
LLQC/LLIQC	Low Level Quantitation Check
LOD	Limit of Detection (i.e., 1/2 of the LOQ)
LOQ	Limit of Quantitation (i.e., reporting or practical quantitation limit)
LT	Less Than
MB	Method Blank
MS(D)	Matrix Spike (Duplicate)
ND	Indicates the analyte is not detected.
RPD	Relative Percent Difference
U	Indicates the analyte was analyzed for but not detected.

Note: Sample summaries which include a result for "Total Solids" have already been adjusted for moisture content. All DRO/RRO analyses are integrated per SOP.

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200 West Potter Drive, Anchorage, AK 99518
t 907.562.2343 **f** 907.561.5301 www.us.sgs.com
Member of SGS Group

Sample Summary

Client Sample ID	Lab Sample ID	Collected	Received	Matrix
100200-DU3-10X2	1184610001	08/20/2018	08/20/2018	Solid/Soil (Wet Weight)
100200-DU4-10X2	1184610002	08/20/2018	08/20/2018	Solid/Soil (Wet Weight)
100200-IA2-X2	1184610003	08/20/2018	08/20/2018	Solid/Soil (Wet Weight)

Method	Method Description
SW6020A TCLP	Metals by ICP-MS

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Detectable Results Summary

Client Sample ID: **100200-DU3-10X2**
Lab Sample ID: 1184610001
TCLP Constituents Metals

Parameter	Result	Units
Lead	22.1	mg/L

Client Sample ID: **100200-DU4-10X2**
Lab Sample ID: 1184610002
TCLP Constituents Metals

Parameter	Result	Units
Lead	85.8	mg/L

Client Sample ID: **100200-IA2-X2**
Lab Sample ID: 1184610003
TCLP Constituents Metals

Parameter	Result	Units
Lead	455	mg/L

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Results of **100200-DU3-10X2**

Client Sample ID: **100200-DU3-10X2**
Client Project ID: **100200 HMCC**
Lab Sample ID: 1184610001
Lab Project ID: 1184610

Collection Date: 08/20/18 12:15
Received Date: 08/20/18 13:20
Matrix: Solid/Soil (Wet Weight)
Solids (%):
Location:

Results by **TCLP Constituents Metals**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Lead	22.1	*	0.0500	0.0155	mg/L	25	(<5)	08/27/18 15:21

Batch Information

Analytical Batch: MMS10293
Analytical Method: SW6020A TCLP
Analyst: DSH
Analytical Date/Time: 08/27/18 15:21
Container ID: 1184610001-A

Prep Batch: MXT5694
Prep Method: SW3010A
Prep Date/Time: 08/22/18 12:00
Prep Initial Wt./Vol.: 2.5 mL
Prep Extract Vol: 25 mL

Print Date: 08/31/2018 3:24:28PM

J flagging is activated

Results of **100200-DU4-10X2**

Client Sample ID: **100200-DU4-10X2**
Client Project ID: **100200 HMCC**
Lab Sample ID: 1184610002
Lab Project ID: 1184610

Collection Date: 08/20/18 12:20
Received Date: 08/20/18 13:20
Matrix: Solid/Soil (Wet Weight)
Solids (%):
Location:

Results by **TCLP Constituents Metals**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Lead	85.8	*	0.0500	0.0155	mg/L	25	(<5)	08/27/18 15:39

Batch Information

Analytical Batch: MMS10293
Analytical Method: SW6020A TCLP
Analyst: DSH
Analytical Date/Time: 08/27/18 15:39
Container ID: 1184610002-A

Prep Batch: MXT5694
Prep Method: SW3010A
Prep Date/Time: 08/22/18 12:00
Prep Initial Wt./Vol.: 2.5 mL
Prep Extract Vol: 25 mL

Print Date: 08/31/2018 3:24:28PM

J flagging is activated

Results of **100200-IA2-X2**

Client Sample ID: **100200-IA2-X2**
Client Project ID: **100200 HMCC**
Lab Sample ID: 1184610003
Lab Project ID: 1184610

Collection Date: 08/20/18 12:25
Received Date: 08/20/18 13:20
Matrix: Solid/Soil (Wet Weight)
Solids (%):
Location:

Results by **TCLP Constituents Metals**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Lead	455	*	0.400	0.124	mg/L	200	(<5)	08/27/18 20:09

Batch Information

Analytical Batch: MMS10293
Analytical Method: SW6020A TCLP
Analyst: DSH
Analytical Date/Time: 08/27/18 20:09
Container ID: 1184610003-A

Prep Batch: MXT5694
Prep Method: SW3010A
Prep Date/Time: 08/22/18 12:00
Prep Initial Wt./Vol.: 2.5 mL
Prep Extract Vol: 25 mL

Method Blank

Blank ID: LB1 for HBN 1784662 [TCLP/9607
Blank Lab ID: 1469099

Matrix: Solid/Soil (Wet Weight)

QC for Samples:
1184610001, 1184610002, 1184610003

Results by **SW6020A TCLP**

Parameter	Results	LOQ/CL	DL	Units
Lead	0.0196J	0.0500	0.0155	mg/L

Batch Information

Analytical Batch: MMS10293
Analytical Method: SW6020A TCLP
Instrument: Perkin Elmer Nexlon P5
Analyst: DSH
Analytical Date/Time: 8/27/2018 2:39:05PM

Prep Batch: MXT5694
Prep Method: SW3010A
Prep Date/Time: 8/22/2018 12:00:00PM
Prep Initial Wt./Vol.: 2.5 mL
Prep Extract Vol: 25 mL

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Method Blank

Blank ID: MB for HBN 1784753 [MXT/5694]
Blank Lab ID: 1469457

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1184610001, 1184610002, 1184610003

Results by **SW6020A TCLP**

Parameter	Results	LOQ/CL	DL	Units
Lead	0.00250U	0.00500	0.00155	mg/L

Batch Information

Analytical Batch: MMS10293
Analytical Method: SW6020A TCLP
Instrument: Perkin Elmer Nexlon P5
Analyst: DSH
Analytical Date/Time: 8/27/2018 2:43:47PM

Prep Batch: MXT5694
Prep Method: SW3010A
Prep Date/Time: 8/22/2018 12:00:00PM
Prep Initial Wt./Vol.: 25 mL
Prep Extract Vol: 25 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1184610 [MXT5694]
Blank Spike Lab ID: 1469458
Date Analyzed: 08/27/2018 14:48

Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1184610001, 1184610002, 1184610003

Results by **SW6020A TCLP**

Blank Spike (mg/L)

Parameter	Spike	Result	Rec (%)	CL
Lead	1	1.09	109	(88-115)

Batch Information

Analytical Batch: **MMS10293**
Analytical Method: **SW6020A TCLP**
Instrument: **Perkin Elmer Nexion P5**
Analyst: **DSH**

Prep Batch: **MXT5694**
Prep Method: **SW3010A**
Prep Date/Time: **08/22/2018 12:00**
Spike Init Wt./Vol.: 1 mg/L Extract Vol: 25 mL
Dupe Init Wt./Vol.: Extract Vol:

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Matrix Spike Summary

Original Sample ID: 1469459
MS Sample ID: 1469461 MS
MSD Sample ID: 1469462 MSD

Analysis Date: 08/27/2018 14:53
Analysis Date: 08/27/2018 14:57
Analysis Date: 08/27/2018 15:02
Matrix: Solid/Soil (Wet Weight)

QC for Samples: 1184610001, 1184610002, 1184610003

Results by **SW6020A TCLP**

		Matrix Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Lead	0.0265J	10.0	10.8	108	10.0	10.7	107	88-115	0.67	(< 20)

Batch Information

Analytical Batch: MMS10293
Analytical Method: SW6020A TCLP
Instrument: Perkin Elmer NexIon P5
Analyst: DSH
Analytical Date/Time: 8/27/2018 2:57:52PM

Prep Batch: MXT5694
Prep Method: Waters Digest for Metals by ICP-MS(TCLP)
Prep Date/Time: 8/22/2018 12:00:00PM
Prep Initial Wt./Vol.: 2.50mL
Prep Extract Vol: 25.00mL

Print Date: 08/31/2018 3:24:31PM

REVIEWED

1184610

CHAIN-OF-CUSTODY RECORD

Page 1 of 1

Laboratory SGS

Attn: Jillian

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

400 N. 34th Street, Suite 100
Seattle, WA 98103
(206) 632-8020

2355 Hill Road
Fairbanks, AK 99709
(907) 479-0600

3990 Collins Way, Suite 100
Lake Oswego, OR 97035
(503) 223-6147

2043 Westport Center Drive
St. Louis, MO 63146-3564
(314) 699-9660

5430 Fairbanks Street, Suite 3
Anchorage, AK 99518
(907) 561-2120

1321 Bannock Street, Suite 200
Denver, CO 80204
(303) 825-3800

2705 Saint Andrews Loop, Suite A
Pasco, WA 99301-3378
(509) 946-6309

Analysis Parameters/Sample Container Description
(include preservative if used)

Sample Identity	Lab No.	Time	Date Sampled	Comp.	Grab	EPA 311/6020 TCLP Lead	Total Number of Containers	Remarks/Matrix
100200-DU3-10x2	1A	1215	8/20/18		X	X	1	Soil
DU4-10x2	2A	1220	↓		↓	↓	↓	↓
↓ IA2-x2	3A	1225	↓		↓	↓	↓	↓

Project Information		Sample Receipt	
Project Number:	100200	Total Number of Containers	
Project Name:	HMCC	COC Seals/Intact? Y/N/NA	
Contact:	SSC	Received Good Cond./Cold	
Ongoing Project? Yes ☒ No ☐		Delivery Method:	
Sampler:	SSC	(attach shipping bill, if any)	

Instructions	
Requested Turnaround Time:	Standard
Special Instructions:	

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: Time: 1320	Signature: Time:	Signature: Time:
Printed Name: Stafford Gkashm Date: 8/15/18	Printed Name: Date:	Printed Name: Date:
Company: S:W	Company:	Company:

Received By: 1.	Received By: 2.	Received By: 3.
Signature: Time:	Signature: Time:	Signature: Time: 13:20
Printed Name: Date:	Printed Name: Date:	Printed Name: LLET Date: 8/20/18
Company:	Company:	Company: SGS

Distribution: White - w/shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/shipment - for consignee files
Pink - Shannon & Wilson - Job File

12 of 17

F-19-91/UR

TEMP: 9.3 D35

No. 35428

1184610

SGS North America Inc.

200 W. Potter Dr., Anchorage, AK 99518 (ph) 907-562-2343, (fax) 907-561-5301

3180 Peger Rd. Ste. 190, Fairbanks, AK 99709 (ph) 907-474-8656

☑ est

Client pickup Date: 8/20/2018 **Time:** 10:00

Be sure to ask if client will ship by ground (DOT) or air carrier (IATA)

Does a Profile exist in LIMS? If not, please send a request for new profile build.

Client Name: Shannon & Wilson

Ordered By: Stafford Glashan **Phone #:**

Email: SJG@shanwil.com

Project Name: TCLP Lead **Project/Permit#:**

Quote #: **Profile #:**

Delivery Address:

☐ **Deliver to client:**

☐ **Ship by/Air Carrier:**

Airbill Number:

Date to ship by:

Notes:

Kit request taken by: JKV **Date:** August 17, 2018

Kit prepared by: **Date:**

Kit *(including lid tightness for pres'd bottles)* checked by: JKV **Date:**

Kit packed & shipped by: **Date:** 8/20/18

Filename: SKIT_Shannon & Wilson _TCLP Lead_2018-08-17 *Required Items

No. Samples	Matrix	Analysis	Container Size & Type		Pres.	Bottle Lot #	Preservative Lot #	Hold Time	# QC Bottles	Total Bottles
3	soil	TCLP Lead	1 x 8-oz	amber glass	none			180 days		3

☐ Pack for Shipping via ***ground*** (DOT)

☐ Pack for Shipping via ***air carrier*** (IATA)

☑ Temperature Blank (***circle one:*** 120-ml OR 500-ml)

☐ Soil VOA Trip Blank - Lot#:

☐ Water VOA Trip Blank - Lot#:

☐ 524 VOA Trip Blank - Lot#:

☐ Low Level Mercury Trip Blank- Lot#:

☑ Coolers

☑ Gel Ice

☑ Bubble Wrap

☑ Labels

☐ Custody Seals

☑ SGS COCs - ***Circle req'd format:*** ☑ Blank COC ☐ DW COC ☐ COC initiated by PM (attached)

☐ Send additional instructions/documents *(**Note to PM:** Be sure to attach copy of requested form.)*

☐ Total # includes bottles for % Solids

☐ Track all Lot#? (Required for DOD)

☐ Foreign Soil

Other Notes/Reminders for Kit Prep:

Attention Client/Sampler:

1. Do not rinse container; be aware of any acid preservative in container.
2. Fill container, but do not overfill (except volatile waters).
3. Label the container with your sample ID as well as the date/time of collection.
4. Fill out the Chain of Custody.
5. Add frozen gel packs or ice to your cooler & pack to prevent breakage.

Charges may be invoiced for bottles which are unused or improperly used.
If you have any questions concerning this sample kit, please contact your Project Manager for assistance. *Thank you.*

***This will email a copy of this form for confirmation to the client email and save the form to the network. This should not be**

SGS

SGS North Ame
200 W. Potter Drive
phone (907) 562-23

1184610

Characterization of TCLP Samples for LIMS Logi

Date Characterized: 8/20 **Analyst:** S.D

Sample Container ID:	Matrix	%	Is sufficient volume/mass available?	Notes:
①A-③A	Xylene miscible (Top layer * = matrix 3 **)		(Yes) / No	If multiple jars were received, were they consistent? Yes / No / (NA)
	Water miscible (Middle layer = matrix 6)			If biphasic, was there **only** one layer with sufficient sample ***? Yes / No / (NA)
	(Solid) (Bottom layer = matrix 7 or 2 if % solids required)	100%		Sample description/other observations: Soil
	Xylene miscible (Top layer * = matrix 3 **)		Yes / No	If multiple jars were received, were they consistent? Yes / No / NA
	Water miscible (Middle layer = matrix 6)			If biphasic, was there **only** one layer with sufficient sample ***? Yes / No / NA
	Solid (Bottom layer = matrix 7 or 2 if % solids required)			Sample description/other observations:
	Xylene miscible (Top layer * = matrix 3 **)		Yes / No	If multiple jars were received, were they consistent? Yes / No / NA
	Water miscible (Middle layer = matrix 6)			If biphasic, was there **only** one layer with sufficient sample ***? Yes / No / NA
	Solid (Bottom layer = matrix 7 or 2 if % solids required)			Sample description/other observations:
	Xylene miscible (Top layer * = matrix 3 **)		Yes / No	If multiple jars were received, were they consistent? Yes / No / NA
	Water miscible (Middle layer = matrix 6)			If biphasic, was there **only** one layer with sufficient sample ***? Yes / No / NA
	Solid (Bottom layer = matrix 7 or 2 if % solids required)			Sample description/other observations:
	Xylene miscible (Top layer * = matrix 3 **)		Yes / No	If multiple jars were received, were they consistent? Yes / No / NA
	Water miscible (Middle layer = matrix 6)			If biphasic, was there **only** one layer with sufficient sample ***? Yes / No / NA
	Solid (Bottom layer = matrix 7 or 2 if % solids required)			Sample description/other observations:

Remember: ** = Chlorinated oils will be heavier than water and present as the bottom later.*
*** = Oils must be filterable to be logged in as matrix 3. Nonfilterable oils must be logged in as matrix 7.*
**** = Refer to F078 'Characterization of TCLP Samples for LIMS' to determine if there's suffcient volume/mass.*

e-Sample Receipt Form

SGS Workorder #: **1184610**

Review Criteria	Condition (Yes, No, N/A)	Exceptions Noted below
Chain of Custody / Temperature Requirements		yes Exemption permitted if sampler hand carries/delivers.
Were Custody Seals intact? Note # & location	n/a	hand delivered
COC accompanied samples?	yes	
n/a **Exemption permitted if chilled & collected <8 hours ago, or for samples where chilling is not required		
Temperature blank compliant* (i.e., 0-6 °C after CF)?	yes	Cooler ID: 1 @ 9.3 °C Therm. ID: D35
		Cooler ID: @ °C Therm. ID:
		Cooler ID: @ °C Therm. ID:
		Cooler ID: @ °C Therm. ID:
		Cooler ID: @ °C Therm. ID:
If >6°C, were samples collected <8 hours ago?	yes	
If <0°C, were sample containers ice free?	n/a	
If samples received without a temperature blank, the "cooler temperature" will be documented in lieu of the temperature blank & "**COOLER TEMP**" will be noted to the right. In cases where neither a temp blank nor cooler temp can be obtained, note "ambient" or "chilled".		
Note: Identify containers received at non-compliant temperature . Use form FS-0029 if more space is needed.		
Holding Time / Documentation / Sample Condition Requirements		Note: Refer to form F-083 "Sample Guide" for specific holding times.
Were samples received within holding time?	yes	
Do samples **match COC**** (i.e.,sample IDs,dates/times collected)?	yes	
**Note: If times differ <1hr, record details & login per COC.		
Were analyses requested unambiguous? (i.e., method is specified for analyses with >1 option for analysis)	yes	
	n/a	***Exemption permitted for metals (e.g,200.8/6020A).
Were proper containers (type/mass/volume/preservative***)used?	yes	
Volatile / LL-Hg Requirements		
Were Trip Blanks (i.e., VOAs, LL-Hg) in cooler with samples?	n/a	
Were all water VOA vials free of headspace (i.e., bubbles ≤ 6mm)?	n/a	
Were all soil VOAs field extracted with MeOH+BFB?	n/a	

Note to Client: Any "No", answer above indicates non-compliance with standard procedures and may impact data quality.

Additional notes (if applicable):

Sample Containers and Preservatives

Container Id	Preservative	Container Condition	Container Id	Preservative	Container Condition
1184610001-A	No Preservative Required	OK			
1184610002-A	No Preservative Required	OK			
1184610003-A	No Preservative Required	OK			

Container Condition Glossary

Containers for bacteriological, low level mercury and VOA vials are not opened prior to analysis and will be assigned condition code OK unless evidence indicates than an inappropriate container was submitted.

OK - The container was received at an acceptable pH for the analysis requested.
BU - The container was received with headspace greater than 6mm.
DM - The container was received damaged.
FR - The container was received frozen and not usable for Bacteria or BOD analyses.
IC - The container provided for microbiology analysis was not a laboratory-supplied, pre-sterilized container and therefore was not suitable for analysis.
PA - The container was received outside of the acceptable pH for the analysis requested. Preservative was added upon receipt and the container is now at the correct pH. See the Sample Receipt Form for details on the amount and lot # of the preservative added.
PH - The container was received outside of the acceptable pH for the analysis requested. Preservative was added upon receipt, but was insufficient to bring the container to the correct pH for the analysis requested. See the Sample Receipt Form for details on the amount and lot # of the preservative added.

LABORATORY DATA REVIEW CHECKLIST

CS Report Name: HMCC Shooting Range Characterization Eagle River, Alaska **Date:** October 2018

Laboratory Report Date: 08/31/18

Consultant Firm: Shannon & Wilson, Inc.

Completed by: Stafford Glashan
Title: Senior Engineer III
Laboratory Name: SGS North America Inc.
Laboratory Report Number: 1184610
ADEC File Number: *NA*

(**NOTE**: ***NA*** = not applicable; Text in *italics* added by Shannon & Wilson, Inc.)

1. Laboratory

a. Did an ADEC CS approved laboratory receive and perform all of the submitted sample analyses? **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 / NA (please explain)
Comments:

2. Chain of Custody (COC)

a. COC information completed, signed, and dated (including released/received by)?
Yes / No / NA (please explain)
Comments**:**

b. Correct analyses requested? **Yes / No / NA** (please explain)
Comments**:**

3. Laboratory Sample Receipt Documentation

a. Sample/cooler temperature documented and within range at receipt (4° ± 2° C)?
Yes / No / NA (please explain)
Comments: *The temperature blank was 9.3° C. Samples were on ice and submitted within an hour of collection.*

b. Sample preservation acceptable - acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)? **Yes / No / NA** (please explain)
Comments:

c. Sample condition documented - broken, leaking (Methanol), zero headspace (VOC vials)? **Yes / No / NA** (please explain)
Comments: *No discrepancies were noted.*

d. If there were any discrepancies, were they documented? – For example, incorrect sample containers/preservation, sample temperature outside acceptance range, insufficient or missing samples, etc.? **Yes / No / NA** (please explain)
Comments: *No discrepancies documented.*

e. Data quality or usability affected? **Yes / No / NA**
Comments: *See above.*

4. Case Narrative

a. Present and understandable? **Yes / No / NA** (please explain)
Comments:

b. Discrepancies, errors or QC failures identified by the lab? **Yes / No / NA** (please explain)
Comments:

c. Were corrective actions documented? **Yes / No / NA** (please explain)
Comments:

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

5. Sample Results

a. Correct analyses performed/reported as requested on COC? **Yes / No / NA** (please explain)
Comments:

b. All applicable holding times met? **Yes / No / NA** (please explain)
Comments:

c. All soils reported on a dry weight basis? **Yes / No / NA** (please explain)
Comments:

d. Are the reported LOQs less than the Cleanup Level or the minimum required detection level for the project? **Yes / No / NA** (please explain)
Comments:

e. Data quality or usability affected? **NA** Please explain.
Comments:

6. QC Samples

a. Method Blank

i. One method blank reported per matrix, analysis, and 20 samples?
Yes / No / NA (please explain)
Comments:

ii. All method blank results less than LOQ? **Yes / No / NA** (please explain)
Comments:

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

iv. Do the affected sample(s) have data flags? **Yes/ No / NA** (please explain)
Comments:

If so, are the data flags clearly defined? **Yes / No / NA**
Comments:

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:

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 (RPDs) reported and less than method or laboratory limits? And project specified DQOs, if applicable. RPD reported from LCS/LCSD, MS/MSD, and or sample/sample duplicate. (AK Petroleum methods 20%, VOCs 20%; all other analyses see the laboratory QC pages) **Yes / No / NA** (please explain)
Comments:

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

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. ***NA***
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:

iv. Data quality or usability affected? Please explain. **Yes / No / NA**
Comments:

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

i. One trip blank reported per matrix, analysis, and cooler? (If not, enter explanation below.) **Yes / No / NA** (please explain)
Comments:

ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC? **(**If not, a comment stating why must be entered below.) **Yes / No / NA** (please explain)
Comments:

iii. All results less than LOQ? **Yes / No / NA** (please explain)
Comments:

iv. If above LOQ, 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?
Yes / No / NA (please explain)
Comments: *Characterization/ISM sampling.*

ii. Submitted blind to the lab? **Yes / No / NA** (please explain)
Comments:

iii. Precision – All relative percent differences (RPDs) less than specified DQOs?
(Recommended: 30% for water, 50% for soil) **Yes / No / NA** (please explain)
Comments:

iv. Data quality or usability affected? Please explain.
Comments:

f. Decontamination or Equipment Blank (if not applicable)
Yes / No / NA (please explain)
Comments: *Soil samples were collected with clean, dedicated steel sampling spoons.*

i. All results less than LOQ? **Yes / No / NA** (please explain)
Comments:

ii. If above LOQ, what samples are affected? ***NA***
Comments:

iii. Data quality or usability affected? Please explain. ***NA***
Comments:

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

a. Defined and appropriate? **Yes / No / NA** (please explain)
Comments: *SGS defines laboratory-specific qualifiers on page 4 of their report.*

APPENDIX D

IMPORTANT INFORMATION ABOUT YOUR GEOTECHNICAL/ENVIRONMENTAL REPORT

IMPORTANT INFORMATION ABOUT YOUR ENVIRONMENTAL SITE ASSESSMENT/EVALUATION REPORT

ENVIRONMENTAL SITE ASSESSMENTS/EVALUATIONS ARE PERFORMED FOR SPECIFIC PURPOSES AND FOR SPECIFIC CLIENTS.

This report was prepared to meet the needs you specified with respect to your specific site and your risk management preferences. Unless indicated otherwise, we prepared your report expressly for you and for the purposes you indicated. No one other than you should use this report for any purpose without first conferring with us. No one is authorized to use this report for any purpose other than that originally contemplated without our prior written consent.

The findings and conclusions documented in this site assessment/evaluation have been prepared for specific application to this project and have been developed in a manner consistent with that level of care and skill normally exercised by members of the environmental science profession currently practicing under similar conditions in this area. The conclusions presented are based on interpretation of information currently available to us and are made within the operational scope, budget, and schedule constraints of this project. No warranty, express or implied, is made.

OUR REPORT IS BASED ON PROJECT-SPECIFIC FACTORS.

Our environmental site assessment is based on several factors and may include (but not be limited to): reviewing public documents to chronicle site ownership for the past 30, 40, or more years; investigating the site's regulatory history to learn about permits granted or citations issued; determining prior uses of the site and those adjacent to it; reviewing available topographic and real estate maps, historical aerial photos, geologic information, and hydrologic data; reviewing readily available published information about surface and subsurface conditions; reviewing federal and state lists of known and potentially contaminated sites; evaluating the potential for naturally occurring hazards; and interviewing public officials, owners/operators, and/or adjacent owners with respect to local concerns and environmental conditions.

Except as noted within the text of the report, no sampling or quantitative laboratory testing was performed by us as part of this site assessment. Where such analyses were conducted by an outside laboratory, Shannon & Wilson relied upon the data provided and did not conduct an independent evaluation regarding the reliability of the data.

CONDITIONS CAN CHANGE.

Site conditions, both surface and subsurface, may be affected as a result of natural processes or human influence. An environmental site assessment/evaluation is based on conditions that existed at the time of the evaluation. Because so many aspects of a historical review rely on third party information, most consultants will refuse to certify (warrant) that a site is free of contaminants, as it is impossible to know with absolute certainty if such a condition exists. Contaminants may be present in areas that were not surveyed or sampled, or may migrate to areas that showed no signs of contamination at the time they were studied.

Unless your consultant indicates otherwise, your report should not be construed to represent geotechnical subsurface conditions at or adjacent to the site and does not provide sufficient information for construction-related activities. Your report also should not be used following floods, earthquakes, or other acts of nature; if the size or configuration of the site is altered; if the location of the site is modified; or if there is a change of ownership and/or use of the property.

INCIDENTAL DAMAGE MAY OCCUR DURING SAMPLING ACTIVITIES.

Incidental damage to a facility may occur during sampling activities. Asbestos and lead-based paint sampling often require destructive sampling of pipe insulation, floor tile, walls, doors, ceiling tile, roofing, and other building materials. Shannon & Wilson does not provide for paint repair. Limited repair of asbestos sample locations are provided. However, Shannon & Wilson neither warranties repairs made by our field personnel, nor are we held liable for injuries or damages as a result of those repairs. If you desire a specific form of repair, such as those provided by a licensed roofing contractor, you need to request the specific repair at the time of the proposal. The owner is responsible for repair methods that are not specified in the proposal.

READ RESPONSIBILITY CLAUSES CAREFULLY.

Environmental site assessments/evaluations are less exact than other design disciplines because they are based extensively on judgment and opinion, and there may not have been any (or very limited) investigation of actual subsurface conditions. Wholly unwarranted claims have been lodged against consultants. To limit this exposure, consultants have developed a number of clauses for use in their contracts, reports, and other documents. These responsibility clauses are not exculpatory clauses designed to transfer the consultant's liabilities to other parties; rather, they are definitive clauses that identify where responsibilities begin and end. Their use helps all parties involved recognize their individual responsibilities and take appropriate action. Some of these definitive clauses may appear in this report, and you are encouraged to read them closely. Your consultant will be pleased to give full and frank answers to your questions.

Consultants cannot accept responsibility for problems that may develop if they are not consulted after factors considered in their reports have changed, or conditions at the site have changed. Therefore, it is incumbent upon you to notify your consultant of any factors that may have changed prior to submission of the final assessment/evaluation.

An assessment/evaluation of a site helps reduce your risk, but does not eliminate it. Even the most rigorous professional assessment may fail to identify all existing conditions.

ONE OF THE OBLIGATIONS OF YOUR CONSULTANT IS TO PROTECT THE SAFETY, HEALTH, PROPERTY, AND WELFARE OF THE PUBLIC.

If our environmental site assessment/evaluation discloses the existence of conditions that may endanger the safety, health, property, or welfare of the public, we may be obligated under rules of professional conduct, statutory law, or common law to notify you and others of these conditions.

The preceding paragraphs are based on information provided by the
ASFE/Association of Engineering Firms Practicing in the Geosciences, Silver Spring, Maryland