24-Jun-2014

Amy Keranen
Michigan Department of Environmental Quality
3350 N. Martin Luther King Jr. Blvd.
Building #44, 3rd Floor
Lansing, MI 48906

Re: **Abandoned Mining Waste - Torch Lake** Work Order: **14061049**

Dear Amy,

ALS Environmental received 4 samples on 20-Jun-2014 for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested.

Sample results are compliant with NELAP standard requirements and QC results achieved laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 13.

If you have any questions regarding this report, please feel free to contact me.

Sincerely,

Alex Csaszar

Electronically approved by: Alex Csaszar

Alex Csaszar
Project Manager

Certificate No: MI: 0022

ADDRESS 3352 128th Avenue Holland, Michigan 49424-9263 | PHONE (616) 399-6070 | FAX (616) 399-6185
ALS GROUP USA, CORP Part of the ALS Laboratory Group A Campbell Brothers Limited Company

ALS Group USA, Corp

Date: 24-Jun-14

Client: Michigan Department of Environmental Quality
Project: Abandoned Mining Waste - Torch Lake
Work Order: **14061049**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
14061049-01	CHLL-SB26 6"-30"	Soil		6/13/2014 11:40	6/20/2014 08:30	☐
14061049-02	CHLL-SB21 3"-9"	Soil		6/14/2014 11:15	6/20/2014 08:30	☐
14061049-03	CHLL-SB16 6"-6'	Soil		6/16/2014 09:30	6/20/2014 08:30	☐
14061049-04	CHLL-SB07 6"-12'	Soil		6/16/2014 15:25	6/20/2014 08:30	☐

Client: Michigan Department of Environmental Quality
Project: Abandoned Mining Waste - Torch Lake
Work Order: 14061049

Case Narrative

Sample Comments:

Batch R143227, Method MOISTURE, Sample 14061049-01A and -02A: Sample holding times expired prior to analysis.

ALS Group USA, Corp

Date: 24-Jun-14

Client: Michigan Department of Environmental Quality
Project: Abandoned Mining Waste - Torch Lake
WorkOrder: **14061049**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte is present at an estimated concentration between the MDL and Report Limit
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL

Acronym	Description
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
LOD	Limit of Detection (see MDL)
LOQ	Limit of Quantitation (see PQL)
MBLK	Method Blank
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
TDL	Target Detection Limit
TNTC	Too Numerous To Count
A	APHA Standard Methods
D	ASTM
E	EPA
SW	SW-846 Update III

Units Reported	Description
% of sample	Percent of Sample
mg/Kg-dry	Milligrams per Kilogram Dry Weight

ALS Group USA, Corp

Date: *24-Jun-14*

Client: Michigan Department of Environmental Quality
Project: Abandoned Mining Waste - Torch Lake
Work Order: 14061049
Sample ID: CHLL-SB26 6"-30"
Lab ID: 14061049-01
Collection Date: 6/13/2014 11:40 AM
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
CHROMIUM, HEXAVALENT			**SW7196A**		Prep: SW3060A / 6/21/14	Analyst: **JI**
Chromium, Hexavalent	ND		0.55	mg/Kg-dry	1	6/21/2014 01:00 PM
MOISTURE			**A2540 G**			Analyst: **TM**
Moisture	**10**	H	**0.050**	**% of sample**	1	6/23/2014 03:30 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *24-Jun-14*

Client: Michigan Department of Environmental Quality
Project: Abandoned Mining Waste - Torch Lake
Work Order: 14061049
Sample ID: CHLL-SB21 3"-9"
Lab ID: 14061049-02
Collection Date: 6/14/2014 11:15 AM
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
CHROMIUM, HEXAVALENT			**SW7196A**		Prep: SW3060A / 6/21/14	Analyst: **JI**
Chromium, Hexavalent	ND		0.52	mg/Kg-dry	1	6/21/2014 01:00 PM
MOISTURE			**A2540 G**			Analyst: **TM**
Moisture	**7.4**	H	**0.050**	**% of sample**	1	6/23/2014 03:30 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *24-Jun-14*

Client: Michigan Department of Environmental Quality
Project: Abandoned Mining Waste - Torch Lake
Work Order: 14061049
Sample ID: CHLL-SB16 6"-6'
Lab ID: 14061049-03
Collection Date: 6/16/2014 09:30 AM
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
CHROMIUM, HEXAVALENT			**SW7196A**		Prep: SW3060A / 6/21/14	Analyst: **JI**
Chromium, Hexavalent	ND		0.55	mg/Kg-dry	1	6/21/2014 01:00 PM
MOISTURE			**A2540 G**			Analyst: **TM**
Moisture	**10**		**0.050**	**% of sample**	1	6/23/2014 03:30 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *24-Jun-14*

Client: Michigan Department of Environmental Quality
Project: Abandoned Mining Waste - Torch Lake
Work Order: 14061049
Sample ID: CHLL-SB07 6"-12'
Lab ID: 14061049-04
Collection Date: 6/16/2014 03:25 PM
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
CHROMIUM, HEXAVALENT			**SW7196A**		Prep: SW3060A / 6/21/14	Analyst: **JI**
Chromium, Hexavalent	ND		0.54	mg/Kg-dry	1	6/21/2014 01:00 PM
MOISTURE			**A2540 G**			Analyst: **TM**
Moisture	**7.9**		**0.050**	**% of sample**	1	6/23/2014 03:30 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: 24-Jun-14

Client: Michigan Department of Environmental Quality

Work Order: 14061049

Project: Abandoned Mining Waste - Torch Lake

QC BATCH REPORT

Batch ID: **59932** Instrument ID **WETCHEM** Method: **SW7196A**

MBLK Sample ID: **MBLK-59932-59932** Units: Analysis Date: **6/21/2014 01:00 PM**

Client ID: Run ID: **WETCHEM_140621B** SeqNo: **2818493** Prep Date: **6/21/2014** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium, Hexavalent	ND	0.49								

LCS Sample ID: **LCS-59932-59932** Units: **mg/Kg** Analysis Date: **6/21/2014 01:00 PM**

Client ID: Run ID: **WETCHEM_140621B** SeqNo: **2818494** Prep Date: **6/21/2014** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium, Hexavalent	1.717	0.50	1.992	0	86.2	80-120	0			

MS Sample ID: **14061060-01B MS** Units: Analysis Date: **6/21/2014 01:00 PM**

Client ID: Run ID: **WETCHEM_140621B** SeqNo: **2818495** Prep Date: **6/21/2014** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium, Hexavalent	0.1294	0.49	1.961	0	6.6	75-125	0			JS

MS Sample ID: **14061060-01B MSI** Units: **mg/Kg** Analysis Date: **6/21/2014 01:00 PM**

Client ID: Run ID: **WETCHEM_140621B** SeqNo: **2818497** Prep Date: **6/21/2014** DF: **100**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium, Hexavalent	453.5	49	981.9	0	46.2	75-125	0			S

MSD Sample ID: **14061060-01B MSD** Units: Analysis Date: **6/21/2014 01:00 PM**

Client ID: Run ID: **WETCHEM_140621B** SeqNo: **2818496** Prep Date: **6/21/2014** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium, Hexavalent	0.232	0.50	2	0	11.6	75-125	0.1294	0	20	JS

The following samples were analyzed in this batch:

14061049-01A	14061049-02A	14061049-03A
14061049-04A		

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Michigan Department of Environmental Quality
Work Order: 14061049
Project: Abandoned Mining Waste - Torch Lake

QC BATCH REPORT

Batch ID: **R143227** Instrument ID **MOIST** Method: **A2540 G**

MBLK Sample ID: **WBLKS-R143227** Units: **% of sample** Analysis Date: **6/23/2014 03:30 PM**
Client ID: Run ID: **MOIST_140623B** SeqNo: **2821564** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	ND	0.050								

LCS Sample ID: **LCS-R143227** Units: **% of sample** Analysis Date: **6/23/2014 03:30 PM**
Client ID: Run ID: **MOIST_140623B** SeqNo: **2821562** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	100	0.050	100	0	100	99.5-100.5	0			

DUP Sample ID: **14061121-01A DUP** Units: **% of sample** Analysis Date: **6/23/2014 03:30 PM**
Client ID: Run ID: **MOIST_140623B** SeqNo: **2821546** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	30.81	0.050	0	0	0	0-0	28.3	8.49	20	H

DUP Sample ID: **14061172-02A DUP** Units: **% of sample** Analysis Date: **6/23/2014 03:30 PM**
Client ID: Run ID: **MOIST_140623B** SeqNo: **2821557** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	64	0.050	0	0	0	0-0	64.01	0.0156	20	

The following samples were analyzed in this batch:

14061049-01A	14061049-02A	14061049-03A
14061049-04A		

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Chain of Custody Form

ALS Environmental

Page 1 of 1

COC ID: 123456

☐ Cincinnati, OH +1 513 733 5336 ☐ Holland, MI +1 616 399 6070 ☐ Salt Lake City, UT +1 801 266 7700
☐ Everett, WA +1 425 356 2600 ☐ Houston, TX +1 281 530 5656 ☐ Spring City, PA +1 610 948 4903
☐ Fort Collins, CO +1 970 490 1511 ☐ Middletown, PA +1 717 944 5541 ☐ York, PA +1 717 505 5280

ALS Project Manager: RL Work Order #: 1406109

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order		Project Name	Abandoned Mining Wastes Torch Lake	A	hexavalent chrome
Work Order		Project Number	19 44031 30740 456990	B	
Company Name	MDEQ	Bill To Company	-	C	
Send Report To	Amy Keranen	Invoice Attn:		D	
Address	55195 US 41	Address		E	
				F	
City/State/Zip	Calumet, MI 49913	City/State/Zip		G	
Phone	906 337 0389	Phone	email also to:	H	
Fax	906 337 0673	Fax	j-binkley@westonsolutions.com		
e-Mail Address	Keranena@michigan.gov	e-Mail Address	pincumbej@michigan.gov		

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	CHL-SB26 6"-30"	6-13-14	1140	Soil	ice	1	X										
2	CHL-SB21 3"-9"	6/14/14	1115	SOIL	ice	1	X										
3	CHL-SB16 6"-6'	6/16/14	0930	Soil	ice	1	X										
4	CHL-SB07 6"-12"	6/16/14	1525	Soil	ice	1	X										
5																	
6																	
7																	
8																	
9																	
10																	

Sampler(s): Please Print & Sign

Shipment Method:

Required Turnaround Time: ☐ Other ☐ STD 10 Wk Days ☐ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour

Results Due Date:

	Date:	Time:		
Relinquished by:	6-18-14	10:[illegible]	Received by:	6/18/14
Relinquished by:	6/19/14	1035	Received by (Laboratory):	Cooler Temp. 3.2°C
Logged by (Laboratory):	6/20/14	0900	Checked by (Laboratory): RL	

Notes: 1000 Rec'd 6/20/14 0830 JZ RL

Preservative Key: 1-HCL 2-HNO3 3-H2SO4 4-NaOH 5-Na2S2O3 6-NaHSO4 7-Other 8-4 degrees C 9-5035

QC Package: (Check Box Below)
- ☐ Level II: Standard QC
- ☐ Level III: Std QC + Raw Data
- ☐ Level IV: SW846 CLP-Like
- ☐ Other: _____

Note: Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.

6/20/14 0830 [signature] PB

ALS Environmental
3352 128th Avenue
Holland, Michigan 49424
Tel. +1 616 399 6070
Fax. +1 616 399 6185

CUSTODY SEAL

Date: 6-19 Time:
Name: CJ
Company:

Seal Broken By:
Date:

ALS Environmental
3352 128th Avenue
Holland, Michigan 49424
Tel. +1 616 399 6070
Fax. +1 616 399 6185

CUSTODY SEAL

Date: 6-19 Time:
Name: CJ
Company:

Seal Broken By:
Date:

ALS Environmental
3352 128th Avenue
Holland, Michigan 49424
Tel. +1 616 399 6070
Fax. +1 616 399 6185

CUSTODY SEAL

Date: 6-19 Time:
Name: CJ
Company:

Seal Broken By:
Date:

ALS Environmental
3352 128th Avenue
Holland, Michigan 49424
Tel. +1 616 399 6070
Fax. +1 616 399 6185

CUSTODY SEAL

Date: Time: 180
Name:
Company:

Seal Broken By:
Date:

ALS Environmental
3352 128th Avenue
Holland, Michigan 49424
Tel. +1 616 399 6070
Fax. +1 616 399 6185

CUSTODY SEAL

Date: 6-19 CJ
Name:
Company:

Seal Broken By:
Date:

ALS Group USA, Corp

Sample Receipt Checklist

Client Name: **MDEQ** Date/Time Received: **20-Jun-14 08:30**

Work Order: **14061049** Received by: **DS**

Checklist completed by Baylan Bosworth (eSignature) 20-Jun-14 (Date) Reviewed by: Alex Csaszar (eSignature) 24-Jun-14 (Date)

Matrices: soil

Carrier name: City Transfer

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Sample(s) received on ice?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	3.2	C	
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	6/20/2014 9:03:45 AM		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:	-		

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

CorrectiveAction: