



SGS Canada Inc.

P.O. Box 4300 - 185 Concession St.
Lakefield - Ontario - K0L 2H0
Phone: 705-652-2000 FAX: 705-652-6365

City of Iqaluit

Attn : Tamilore Adeleke

PO Box 460
Iqaluit, NU
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Phone: 867-222-2950

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ABA - Modified Sobek

05-October-2023

Date Rec. : 21 August 2023
LR Report: CA19231-AUG23
Reference: Drainage Improvement Project- Iqaluit
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CERTIFICATE OF ANALYSIS

Final Report

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Completed Date	4: Analysis Completed Time	5: Sample #1- RIPRAP	6: Sample #2- 3/4 inch minus
Sample Date & Time					27-Jul-23 10:30	27-Jul-23 10:30
Paste pH [no unit]	14-Sep-23	08:45	18-Sep-23	15:10	9.51	9.27
Fizz Rate [rating]	14-Sep-23	08:45	18-Sep-23	15:10	2	2
Sample weight [g]	14-Sep-23	08:45	18-Sep-23	15:10	2.02	2.01
HCl_add [mL]	15-Sep-23	06:35	18-Sep-23	15:10	20.00	20.00
HCl [Normality]	14-Sep-23	08:45	18-Sep-23	15:10	0.10	0.10
NaOH [Normality]	14-Sep-23	08:45	18-Sep-23	15:10	0.10	0.10
Vol NaOH to pH=8.3 [mL]	15-Sep-23	08:05	18-Sep-23	15:10	15.28	9.48
Final pH [no unit]	15-Sep-23	08:05	18-Sep-23	15:10	1.28	1.97
NP [t CaCO3/1000 t]	15-Sep-23	08:05	18-Sep-23	15:10	11.7	26.2
AP [t CaCO3/1000 t]	03-Oct-23	16:13	03-Oct-23	16:14	1.25	1.25
Net NP [t CaCO3/1000 t]	03-Oct-23	16:13	03-Oct-23	16:14	10.4	25.0
NP/AP [ratio]	03-Oct-23	16:13	03-Oct-23	16:14	9.36	21.0
S [%]	03-Oct-23	08:01	03-Oct-23	16:13	0.008	0.018
Acid Leachable SO4-S [%]	03-Oct-23	16:13	03-Oct-23	16:13	< 0.04	< 0.04
Sulphide [%]	03-Oct-23	13:55	03-Oct-23	16:13	< 0.04	< 0.04

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C [%]	03-Oct-23	08:01	03-Oct-23	16:13	0.127	0.244
CO3 (HCl) as %CO3 [%]	04-Oct-23	11:36	04-Oct-23	13:20	0.51	1.00

*NP (Neutralization Potential)

= $50 \times (N \text{ of HCL} \times \text{Total HCL added} - N \text{ NaOH} \times \text{NaOH added})$

Weight of Sample

*AP (Acid Potential) = % Sulphide Sulphur $\times 31.25$

*Net NP (Net Neutralization Potential) = NP-AP

NP/AP Ratio = NP/AP

*Results expressed as tonnes CaCO3 equivalent/1000 tonnes of material

Samples with a % Sulphide value of <0.04 will be calculated using a 0.04 value.

Catharine Arnold



Catharine Arnold, B.Sc., C.Chem
Project Specialist,
Environment, Health & Safety

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13-September-2023

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Reference: Drainage Improvement
Project- Iqaluit

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Ag [µg/g]	29-Aug-23	13:31	08-Sep-23	12:27	< 0.5	< 0.5
As [µg/g]	29-Aug-23	13:31	08-Sep-23	12:27	0.8	0.9
Al [µg/g]	29-Aug-23	13:31	08-Sep-23	12:27	5000	7800
Ba [µg/g]	29-Aug-23	13:31	08-Sep-23	12:27	52	42
Be [µg/g]	29-Aug-23	13:31	08-Sep-23	12:27	0.15	0.43
Bi [µg/g]	29-Aug-23	13:31	08-Sep-23	12:27	< 0.09	< 0.09
Ca [µg/g]	29-Aug-23	13:31	08-Sep-23	12:27	3600	13000
Cd [µg/g]	29-Aug-23	13:31	08-Sep-23	12:27	0.07	0.08
Co [µg/g]	29-Aug-23	13:31	08-Sep-23	12:27	2.3	2.7
Cr [µg/g]	29-Aug-23	13:31	08-Sep-23	12:27	120	110
Cu [µg/g]	29-Aug-23	13:31	08-Sep-23	12:27	4.0	5.8
Fe [µg/g]	29-Aug-23	13:31	08-Sep-23	12:27	23000	26000
K [µg/g]	29-Aug-23	13:31	08-Sep-23	12:27	1700	1600
Li [µg/g]	29-Aug-23	13:31	08-Sep-23	12:27	5	7
Mg [µg/g]	29-Aug-23	13:31	08-Sep-23	12:27	2900	3300
Mn [µg/g]	29-Aug-23	13:31	08-Sep-23	12:27	360	410
Mo [µg/g]	29-Aug-23	13:31	08-Sep-23	12:27	1.5	1.7
Ni [µg/g]	29-Aug-23	13:31	08-Sep-23	12:27	4.0	4.0
Pb [µg/g]	29-Aug-23	13:31	08-Sep-23	12:27	8.2	4.2
Sb [µg/g]	29-Aug-23	13:31	08-Sep-23	12:27	< 6	< 6
Se [µg/g]	29-Aug-23	13:31	08-Sep-23	12:27	0.3	0.3
Sn [µg/g]	29-Aug-23	13:31	08-Sep-23	12:27	< 2	< 2
Sr [µg/g]	29-Aug-23	13:31	08-Sep-23	12:27	11	16
Ti [µg/g]	29-Aug-23	13:31	08-Sep-23	12:27	470	740
Tl [µg/g]	29-Aug-23	13:31	08-Sep-23	12:27	0.08	0.04
U [µg/g]	29-Aug-23	13:31	08-Sep-23	12:27	1.2	0.91

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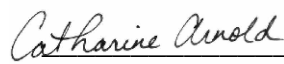
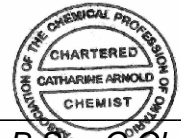
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V [µg/g]	29-Aug-23	13:31	08-Sep-23	12:27	9	14
Y [µg/g]	29-Aug-23	13:31	08-Sep-23	12:27	30	32
Zn [µg/g]	29-Aug-23	13:31	08-Sep-23	12:27	49	46



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22-September-2023

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Sample Date & Time					27-Jul-23 10:30	27-Jul-23 10:30
Sample weight [g]	11-Sep-23	06:30	12-Sep-23	16:35	250	250
Volume D.I. Water [mL]	11-Sep-23	06:30	12-Sep-23	16:35	750	750
pH [no unit]	12-Sep-23	08:30	12-Sep-23	16:35	9.39	9.25
pH [No unit]	13-Sep-23	10:22	14-Sep-23	10:35	8.14	7.77
Conductivity [uS/cm]	13-Sep-23	10:22	14-Sep-23	10:35	54	112
Alkalinity [mg/L as CaCO ₃]	13-Sep-23	10:22	14-Sep-23	10:35	26	33
SO ₄ [mg/L]	13-Sep-23	15:44	14-Sep-23	09:48	< 2	5.4
Hg [mg/L]	15-Sep-23	10:23	21-Sep-23	11:30	< 0.00001	< 0.00001
Ag (diss) [mg/L]	18-Sep-23	11:48	21-Sep-23	11:30	< 0.00005	< 0.00005
Al (diss) [mg/L]	18-Sep-23	11:48	21-Sep-23	11:30	0.544	0.214
As (diss) [mg/L]	18-Sep-23	11:48	21-Sep-23	11:30	0.0008	0.0008
Ba (diss) [mg/L]	18-Sep-23	11:48	21-Sep-23	11:30	0.00399	0.00275
B (diss) [mg/L]	18-Sep-23	11:48	21-Sep-23	11:30	0.013	0.048
Be (diss) [mg/L]	18-Sep-23	11:48	21-Sep-23	11:30	0.000007	0.000007
Bi (diss) [mg/L]	18-Sep-23	11:48	21-Sep-23	11:30	< 0.00001	< 0.00001
Ca (diss) [mg/L]	18-Sep-23	11:48	21-Sep-23	11:30	4.53	9.60
Cd (diss) [mg/L]	18-Sep-23	11:48	21-Sep-23	11:30	0.000007	0.000009
Co (diss) [mg/L]	18-Sep-23	11:48	21-Sep-23	11:30	0.000029	0.000064
Cr (diss) [mg/L]	18-Sep-23	11:48	21-Sep-23	11:30	0.00009	0.00032
Cu (diss) [mg/L]	18-Sep-23	11:48	21-Sep-23	11:30	0.0003	0.0010
Fe (diss) [mg/L]	18-Sep-23	11:48	21-Sep-23	11:30	0.181	0.210
K (diss) [mg/L]	18-Sep-23	11:48	21-Sep-23	11:30	4.40	4.88
Li (diss) [mg/L]	18-Sep-23	11:48	21-Sep-23	11:30	0.0015	0.0025
Mg (diss) [mg/L]	18-Sep-23	11:48	21-Sep-23	11:30	0.721	2.01
Mn (diss) [mg/L]	18-Sep-23	11:48	21-Sep-23	11:30	0.00546	0.00700
Mo (diss) [mg/L]	18-Sep-23	11:48	21-Sep-23	11:30	0.00145	0.00399

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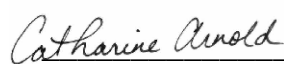
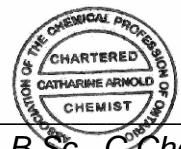
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Na (diss) [mg/L]	18-Sep-23	11:48	21-Sep-23	11:30	3.76	8.01
Ni (diss) [mg/L]	18-Sep-23	11:48	21-Sep-23	11:30	< 0.0001	0.0005
Pb (diss) [mg/L]	18-Sep-23	11:48	21-Sep-23	11:30	0.00071	0.00022
Sb (diss) [mg/L]	18-Sep-23	11:48	21-Sep-23	11:30	< 0.0009	< 0.0009
Se (diss) [mg/L]	18-Sep-23	11:48	21-Sep-23	11:30	0.00011	0.00018
Si (diss) [mg/L]	18-Sep-23	11:48	21-Sep-23	11:30	4.57	5.00
Sn (diss) [mg/L]	18-Sep-23	11:48	21-Sep-23	11:30	< 0.00006	0.00017
Sr (diss) [mg/L]	18-Sep-23	11:48	21-Sep-23	11:30	0.0178	0.0420
Ti (diss) [mg/L]	18-Sep-23	11:48	21-Sep-23	11:30	0.00293	0.00184
Tl (diss) [mg/L]	18-Sep-23	11:48	21-Sep-23	11:30	0.000006	0.000007
U (diss) [mg/L]	18-Sep-23	11:48	21-Sep-23	11:30	0.000352	0.000373
V (diss) [mg/L]	18-Sep-23	11:48	21-Sep-23	11:30	0.00210	0.00287
Zn (diss) [mg/L]	18-Sep-23	11:48	21-Sep-23	11:30	< 0.002	< 0.002



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