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Mines

TILL GEOCHEMISTRY DATA FOR THE ST. JULIEN'S MAP AREA (NTS 2M/04), GREAT NORTHERN PENINSULA, NEWFOUNDLAND

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INTRODUCTION

A regional surficial geology mapping and till-sampling survey for the St. Julien's map area (NTS 2M/04) in western Newfoundland was completed during the 2018 and 2019 field seasons (Figure 1; Hashmi, 2020). This data release presents the analytical results for till samples collected in the map area as well as summary notes on the samples. A total of 19 B-horizon, C-horizon and BC-horizon till samples, weighing 2–3 kg, were collected, primarily along road cuts *via* truck, foot traverse, and all-terrain vehicles (ATVs), with sample collection dependent on the quality of till. Of these, 10 till samples were collected overlying and down-ice of the Sail Pond Ag–Cu–Pb–Zn–Sb prospect. The samples were collected using a shovel and geological pick. Quality control measures in the field included thorough cleaning of sampling equipment between sites to reduce cross-contamination, and written and photographic documentation at each site.

METHODS

SAMPLE PREPARATION

Initial till sample preparation was completed at the geochemical laboratory of the Geological Survey of Newfoundland and Labrador (GSNL). The samples were dried in a Hotpack® oven at 55°C, then gently crushed using a rubber mallet. The samples were then placed in a RO-TAP® to isolate the silt + clay (<63 µm) fraction for analyses. The >63 µm fraction was archived. The RO-TAP® was cleaned between each sample with ethanol and dried in the oven. Till samples were submitted to multiple laboratories for geochemical analyses. The detection limits, concentration units, maximum and minimum concentration, and the associated column header for each analysis in Appendices A and B are reported in Table 1. Quality assurance before sample submission for analyses consisted of insertion of lab duplicates to test analytical precision. The quality of the analyses has been verified prior to their release.

ANALYTICAL TECHNIQUES

The following analyses were completed at the GSNL laboratory and presented in Appendix A. A detailed description of each analytical procedure can be found in Finch *et al.* (2018).

- 1) Four-acid (hydrochloric acid, hydrofluoric acid, nitric acid and perchloric acid) digestion followed by inductively coupled plasma-optical emission spectrometry (ICP-OES) to determine concentrations of major and trace elements (Ag, Al, As, Ba, Be, Ca, Cd, Ce, Co, Cr, Cu, Dy, Fe, K, La, Li, Mg, Mn, Mo, Na, Nb, Ni, P, Pb, Rb, S, Sc, Sr, Ti, V, Y, Zn and Zr). This analysis is indicated by element suffix “2”. Note that Ag is digested by nitric acid and determined by ICP-OES and is indicated by element suffix “6”.
- 2) Alkaline fusion followed by ion-selective electrode (ISE) technique to determine fluoride ion (F-) and indicated by element suffix “9”.
- 3) Loss on ignition (LOI) *via* gravimetry to determine percentage of organic matter and written as “LOI”.

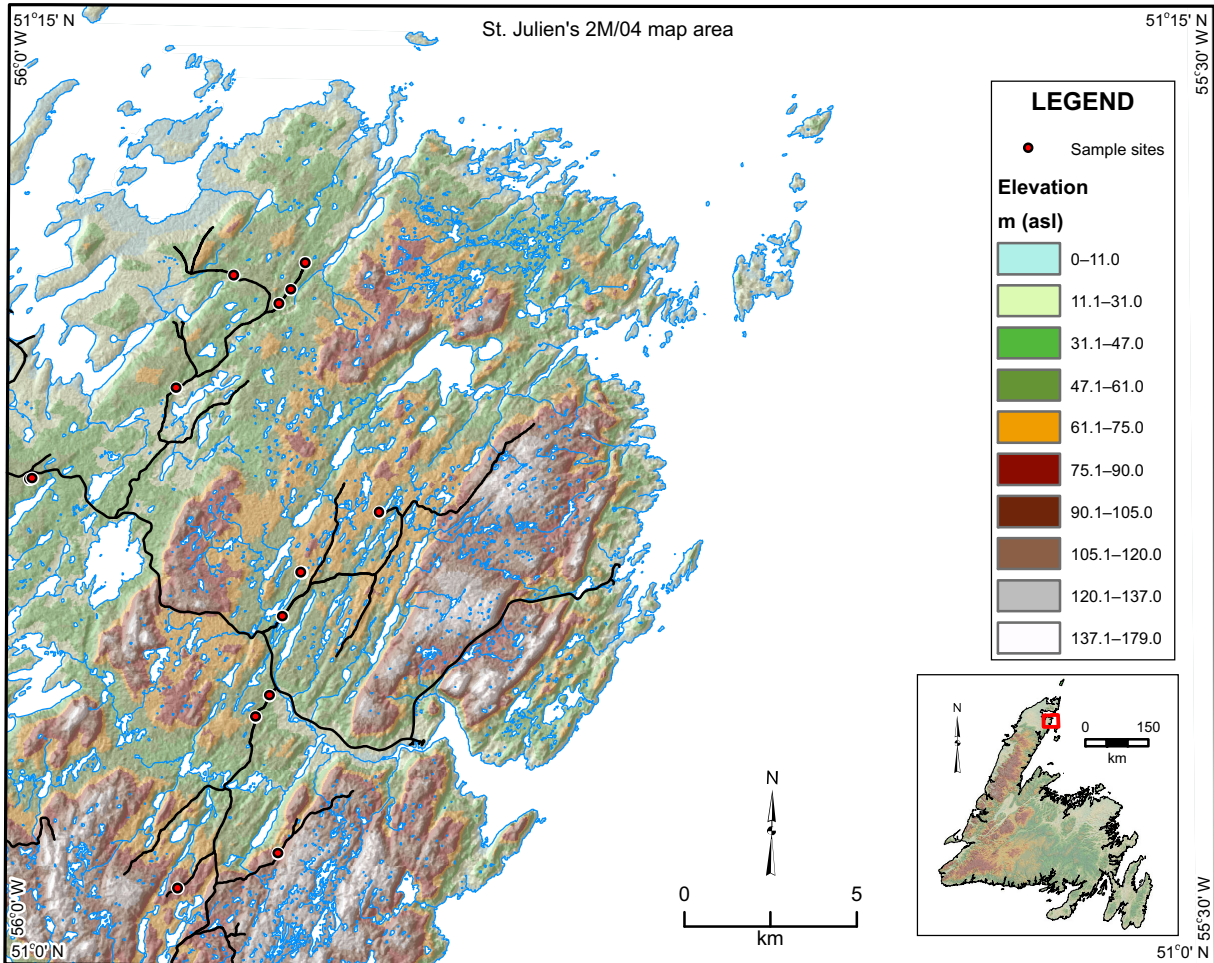


Figure 1. Till sampling sites from 2018 and 2019 field seasons in the St. Julien's map area (NTS map area 2M/04), underlain by topographic hill shade.

- 4) A 4-acid digest followed by ICP-MS to determine major and trace elements (Ag, As, Ba, Bi, Cd, Ce, Co, Cs, Cu, Dy, Er, Eu, Ga, Gd, Ge, Hf, Ho, La, Lu, Mo, Nb, Nd, Ni, Pb, Pr, Rb, Sb, Sc, Sm, Sn, Sr, Tb, Th, Tl, Tm, U, V, W, Y, Yb and Zn). This analysis is indicated by element suffix "30".
- 5) Instrumental neutron activation analysis (INAA) at Bureau Veritas (BV) to determine concentrations of 27 elements (As, Au, Ba, Br, Ce, Co, Cr, Cs, Eu, Fe, Hf, La, Lu, Mo, Na, Rb, Sb, Sc, Se, Sm, Ta, Tb, Th, U, W, Yb and Zr).

The following analyses were completed at ALS Canada Ltd. and presented in Appendix B:

- 1) Fire assay followed by inductively couple plasma-atomic emission spectroscopy (ICP-AES) on a 50 g aliquot to determine Au content. This analysis is indicated by suffix "FA" in column header in Appendix B and abbreviated as "Au-ICP22" in the ALS schedule of fees (Appendix C).

Table 1. Analytical information pertaining to till samples

Element	Laboratory	Method	Abbreviation/ Suffix	Appendix	Unit	Lower detection limit (DL)	Samples below DL	Minimum	Maximum	Samples analyzed
Ag30	GSNL	4A-ICP-MS	30	A	ppm	0.1	8	-0.1	-0.1	8
As30	GSNL	4A-ICP-MS	30	A	ppm	1	0	5	17	8
Ba30	GSNL	4A-ICP-MS	30	A	ppm	1	0	205	547	8
Bi30	GSNL	4A-ICP-MS	30	A	ppm	0.1	5	0.1	0.3	8
Cd30	GSNL	4A-ICP-MS	30	A	ppm	0.1	1	0.1	0.1	8
Ce30	GSNL	4A-ICP-MS	30	A	ppm	1	0	28	73	8
Co30	GSNL	4A-ICP-MS	30	A	ppm	1	0	8	24	8
Cs30	GSNL	4A-ICP-MS	30	A	ppm	0.1	0	1.2	4.2	8
Cu30	GSNL	4A-ICP-MS	30	A	ppm	1	0	13	61	8
Dy30	GSNL	4A-ICP-MS	30	A	ppm	0.1	0	1.6	3.8	8
Er30	GSNL	4A-ICP-MS	30	A	ppm	0.1	0	0.9	2.2	8
Eu30	GSNL	4A-ICP-MS	30	A	ppm	0.1	0	0.6	1.3	8
Ga30	GSNL	4A-ICP-MS	30	A	ppm	1	0	6	19	8
Gd30	GSNL	4A-ICP-MS	30	A	ppm	0.1	0	2.1	5.0	8
Ge30	GSNL	4A-ICP-MS	30	A	ppm	0.1	0	0.5	1.5	8
Hf30	GSNL	4A-ICP-MS	30	A	ppm	0.1	0	0.9	2.1	8
Ho30	GSNL	4A-ICP-MS	30	A	ppm	0.1	0	0.3	0.8	8
La30	GSNL	4A-ICP-MS	30	A	ppm	1	0	14	37	8
Lu30	GSNL	4A-ICP-MS	30	A	ppm	0.1	0	0.1	0.3	8
Mo30	GSNL	4A-ICP-MS	30	A	ppm	1	0	1	1	8
Nb30	GSNL	4A-ICP-MS	30	A	ppm	1	0	3	10	8
Nd30	GSNL	4A-ICP-MS	30	A	ppm	0.1	0	11.7	29.2	8
Ni30	GSNL	4A-ICP-MS	30	A	ppm	1	0	31	68	8
Pb30	GSNL	4A-ICP-MS	30	A	ppm	1	0	10	23	8
Pr30	GSNL	4A-ICP-MS	30	A	ppm	0.1	0	3.4	8.8	8
Rb30	GSNL	4A-ICP-MS	30	A	ppm	1	0	33	101	8
Sb30	GSNL	4A-ICP-MS	30	A	ppm	0.1	0	0.2	0.6	8
Sc30	GSNL	4A-ICP-MS	30	A	ppm	0.1	0	4.9	13.6	8
Sm30	GSNL	4A-ICP-MS	30	A	ppm	0.1	0	2.2	5.3	8
Sn30	GSNL	4A-ICP-MS	30	A	ppm	1	0	1	2	8
Sr30	GSNL	4A-ICP-MS	30	A	ppm	1	0	118	273	8
Tb30	GSNL	4A-ICP-MS	30	A	ppm	0.1	0	0.3	0.7	8
Th30	GSNL	4A-ICP-MS	30	A	ppm	0.1	0	3.1	8.6	8
Ti30	GSNL	4A-ICP-MS	30	A	ppm	0.1	0	0.2	0.6	8
Tm30	GSNL	4A-ICP-MS	30	A	ppm	0.1	0	0.1	0.3	8
U30	GSNL	4A-ICP-MS	30	A	ppm	0.1	0	1.0	2.1	8
V30	GSNL	4A-ICP-MS	30	A	ppm	1	0	30	102	8
W30	GSNL	4A-ICP-MS	30	A	ppm	0.1	1	0.2	0.5	8
Y30	GSNL	4A-ICP-MS	30	A	ppm	1	0	9	20	8
Yb30	GSNL	4A-ICP-MS	30	A	ppm	0.1	0	0.8	1.9	8
Zn30	GSNL	4A-ICP-MS	30	A	ppm	1	0	36	84	8
LOI	GSNL	Gravimetry	LOI	A	%	0.1	0	2.1	6.9	20
Ag6	GSNL	ICP-OES	6	A	ppm	0.1	20	-0.1	-0.1	20
Al2	GSNL	ICP-OES	2	A	%	0.01	0	1.96	7.92	20
As2	GSNL	ICP-OES	2	A	ppm	2	0	4	26	20
Ba2	GSNL	ICP-OES	2	A	ppm	1	0	192	792	20
Be2	GSNL	ICP-OES	2	A	ppm	0.1	0	0.4	2.6	20
Ca2	GSNL	ICP-OES	2	A	%	0.01	0	0.25	21.76	20
Cd2	GSNL	ICP-OES	2	A	ppm	0.1	0	0.1	0.5	20
Ce2	GSNL	ICP-OES	2	A	ppm	1	0	24	151	20
Co2	GSNL	ICP-OES	2	A	ppm	1	0	8	42	20
Cr2	GSNL	ICP-OES	2	A	ppm	1	0	40	227	20
Cu2	GSNL	ICP-OES	2	A	ppm	1	0	15	102	20
Dy2	GSNL	ICP-OES	2	A	ppm	0.1	0	1.6	6.6	20
Fe2	GSNL	ICP-OES	2	A	%	0.01	0	1.34	5.81	20
K2	GSNL	ICP-OES	2	A	%	0.01	0	1.09	3.21	20
La2	GSNL	ICP-OES	2	A	ppm	1	0	11	64	20
Li2	GSNL	ICP-OES	2	A	ppm	0.1	0	14.5	51.7	20
Mg2	GSNL	ICP-OES	2	A	%	0.01	0	1.54	3.90	20
Mn2	GSNL	ICP-OES	2	A	ppm	1	0	286	2066	20
Mo2	GSNL	ICP-OES	2	A	ppm	1	10	1	2	20
Na2	GSNL	ICP-OES	2	A	%	0.01	0	0.16	1.15	20
Nb2	GSNL	ICP-OES	2	A	ppm	1	0	3	15	20

Table 1. Continued

Element	Laboratory	Method	Abbreviation/ Suffix	Appendix	Unit	Lower detection limit (DL)	Samples below DL	Minimum	Maximum	Samples analyzed
Ni2	GSNL	ICP-OES	2	A	ppm	1	0	26	133	20
P2	GSNL	ICP-OES	2	A	ppm	1	0	260	1041	20
Pb2	GSNL	ICP-OES	2	A	ppm	1	0	8	61	20
Rb2	GSNL	ICP-OES	2	A	ppm	1	0	29	130	20
S2	GSNL	ICP-OES	2	A	ppm	5, 100	8	58	169	20
Sc2	GSNL	ICP-OES	2	A	ppm	0.1	0	4.4	21.2	20
Sr2	GSNL	ICP-OES	2	A	ppm	1	0	36	306	20
Ti2	GSNL	ICP-OES	2	A	ppm	5	0	912	6086	20
V2	GSNL	ICP-OES	2	A	ppm	1	0	28	146	20
Y2	GSNL	ICP-OES	2	A	ppm	1	0	8	38	20
Zn2	GSNL	ICP-OES	2	A	ppm	1	0	33	139	20
Zr2	GSNL	ICP-OES	2	A	ppm	1	0	26	78	20
F9	GSNL	ISE	9	A	ppm	5	0	287	1043	20
As1	BV	INAA	1	A	ppm	0.5	0	4.3	27.0	20
Au1	BV	INAA	1	A	ppb	1	12	1	5	20
Ba1	BV	INAA	1	A	ppm	50	0	190	820	20
Br1	BV	INAA	1	A	ppm	1	0	2	32	20
Ce1	BV	INAA	1	A	ppm	1	0	25	180	20
Co1	BV	INAA	1	A	ppm	1	0	6	33	20
Cr1	BV	INAA	1	A	ppm	2	0	37	240	20
Cs1	BV	INAA	1	A	ppm	0.5	0	1.2	5.4	20
Eu1	BV	INAA	1	A	ppm	0.5	2	0.5	2.4	20
Fe1	BV	INAA	1	A	%	0.1	0	1.2	5.5	20
Hf1	BV	INAA	1	A	ppm	1	0	3	9	20
La1	BV	INAA	1	A	ppm	1	0	12	67	20
Lu1	BV	INAA	1	A	ppm	0.01	0	0.12	0.52	20
Mo1	BV	INAA	1	A	ppm	1	16	1	3	20
Na1	BV	INAA	1	A	%	0.05	0	0.20	1.30	20
Rb1	BV	INAA	1	A	ppm	10	0	29	120	20
Sb1	BV	INAA	1	A	ppm	0.1	0	0.2	4.1	20
Sc1	BV	INAA	1	A	ppm	0.1	0	3.9	19.6	20
Se1	BV	INAA	1	A	ppm	1	20	-1	-1	20
Sm1	BV	INAA	1	A	ppm	0.1	0	2.3	12.5	20
Ta1	BV	INAA	1	A	ppm	0.1	0	0.3	1.5	20
Tb1	BV	INAA	1	A	ppm	0.5	4	0.5	1.5	20
Th1	BV	INAA	1	A	ppm	0.5	0	3.3	14.9	20
U1	BV	INAA	1	A	ppm	1.0	0	1.1	3.5	20
W1	BV	INAA	1	A	ppm	1	15	1	2	20
Yb1	BV	INAA	1	A	ppm	0.5	0	0.7	3.7	20
Zr1	BV	INAA	1	A	ppm	100	10	130	300	20
Ag	ALS Canada	AuME_ST44	ST4	B	ppm	0.001	0	0.008	0.511	20
Ag	ALS Canada	MS61	MS6	B	ppm	0.01	0	0.21	0.21	1
Ag	ALS Canada	MS61L	MSL	B	ppm	0.002	0	0.016	0.511	20
Al	ALS Canada	AuME_ST44	ST4	B	%	0.01	0	0.48	2.70	20
Al	ALS Canada	MS61	MS6	B	%	0.01	0	8.87	8.87	1
Al	ALS Canada	MS61L	MSL	B	%	0.01	0	2.00	8.49	20
As	ALS Canada	AuME_ST44	ST4	B	ppm	0.01	0	4.11	25.10	20
As	ALS Canada	MS61	MS6	B	ppm	0.2	0	44.4	44.4	1
As	ALS Canada	MS61L	MSL	B	ppm	0.01	0	4.39	29.20	20
Au	ALS Canada	Au_ICP22	FA	B	ppm	0.001	6	0.001	0.003	20
Au	ALS Canada	AuME_ST44	ST4	B	ppm	0.0001	2	0.0003	0.0017	20
B	ALS Canada	AuME_ST44	ST4	B	ppm	2	0	3	19	20
Ba	ALS Canada	AuME_ST44	ST4	B	ppm	0.05	0	17.85	130.50	20
Ba	ALS Canada	MS61	MS6	B	ppm	10	0	770	770	1
Ba	ALS Canada	MS61L	MSL	B	ppm	1	0	218	820	20
Be	ALS Canada	AuME_ST44	ST4	B	ppm	0.005	0	0.258	1.275	20
Be	ALS Canada	MS61	MS6	B	ppm	0.05	0	3.19	3.19	1
Be	ALS Canada	MS61L	MSL	B	ppm	0.02	0	0.54	2.29	20
Bi	ALS Canada	AuME_ST44	ST4	B	ppm	0.0005	0	0.0374	0.2380	20
Bi	ALS Canada	MS61	MS6	B	ppm	0.01	0	0.39	0.39	1
Bi	ALS Canada	MS61L	MSL	B	ppm	0.002	0	0.041	0.241	20
Ca	ALS Canada	AuME_ST44	ST4	B	%	0.01	0	0.18	21.70	20
Ca	ALS Canada	MS61	MS6	B	%	0.01	0	1.54	1.54	1

Table 1. Continued

Element	Laboratory	Method	Abbreviation/ Suffix	Appendix	Unit	Lower detection limit (LDL)	Samples below LDL	Minimum	Maximum	Samples analyzed
Ca	ALS Canada	MS61L	MSL	B	%	0.01	0	0.25	23.10	20
Cd	ALS Canada	AuME_ST44	ST4	B	ppm	0.001	0	0.042	0.423	20
Cd	ALS Canada	MS61	MS6	B	ppm	0.02	0	0.32	0.32	1
Cd	ALS Canada	MS61L	MSL	B	ppm	0.005	0	0.065	0.419	20
Ce	ALS Canada	AuME_ST44	ST4	B	ppm	0.001	0	18.200	156.500	20
Ce	ALS Canada	MS61	MS6	B	ppm	0.01	0	106.50	106.5	1
Ce	ALS Canada	MS61L	MSL	B	ppm	0.01	0	26.50	162.00	20
Co	ALS Canada	AuME_ST44	ST4	B	ppm	0.001	0	6.420	34.000	20
Co	ALS Canada	MS61	MS6	B	ppm	0.1	0	32.9	32.9	1
Co	ALS Canada	MS61L	MSL	B	ppm	0.005	0	6.320	34.200	20
Cr	ALS Canada	AuME_ST44	ST4	B	ppm	0.01	0	19.15	144.50	20
Cr	ALS Canada	MS61	MS6	B	ppm	1	0	136	136	1
Cr	ALS Canada	MS61L	MSL	B	ppm	0.3	0	28.9	209.0	20
Cs	ALS Canada	AuME_ST44	ST4	B	ppm	0.001	0	0.396	2.220	20
Cs	ALS Canada	MS61	MS6	B	ppm	0.05	0	9.04	9.04	1
Cs	ALS Canada	MS61L	MSL	B	ppm	0.01	0	1.08	5.24	20
Cu	ALS Canada	AuME_ST44	ST4	B	ppm	0.01	0	13.50	103.00	20
Cu	ALS Canada	MS61	MS6	B	ppm	0.2	0	125.0	125	1
Cu	ALS Canada	MS61L	MSL	B	ppm	0.02	0	11.95	102.00	20
Fe	ALS Canada	AuME_ST44	ST4	B	%	0.001	0	1.100	4.840	20
Fe	ALS Canada	MS61	MS6	B	%	0.01	0	8.59	8.59	1
Fe	ALS Canada	MS61L	MSL	B	%	0.002	0	1.240	5.470	20
Ga	ALS Canada	AuME_ST44	ST4	B	ppm	0.004	0	1.41	9.41	20
Ga	ALS Canada	MS61	MS6	B	ppm	0.05	0	32.00	32	1
Ga	ALS Canada	MS61L	MSL	B	ppm	0.05	0	4.47	23.50	20
Ge	ALS Canada	AuME_ST44	ST4	B	ppm	0.005	0	0.036	0.158	20
Ge	ALS Canada	MS61	MS6	B	ppm	0.05	0	0.22	0.22	1
Ge	ALS Canada	MS61L	MSL	B	ppm	0.05	0	0.08	0.28	20
Hf	ALS Canada	AuME_ST44	ST4	B	ppm	0.002	0	0.016	0.136	20
Hf	ALS Canada	MS61	MS6	B	ppm	0.1	0	3.5	3.5	1
Hf	ALS Canada	MS61L	MSL	B	ppm	0.004	0	1.445	3.980	20
Hg	ALS Canada	AuME_ST44	ST4	B	ppm	0.002	0	0.010	0.126	20
Hg	ALS Canada	MS42	MS6	B	ppm	0.005	0	0.114	0.114	1
In	ALS Canada	AuME_ST44	ST4	B	ppm	0.005	1	0.011	0.047	20
In	ALS Canada	MS61	MS6	B	ppm	0.005	0	0.112	0.112	1
In	ALS Canada	MS61L	MSL	B	ppm	0.005	20	0.013	0.065	20
K	ALS Canada	AuME_ST44	ST4	B	%	0.01	0	0.05	0.38	20
K	ALS Canada	MS61	MS6	B	%	0.01	0	3.58	3.58	1
K	ALS Canada	MS61L	MSL	B	%	0.01	20	1.06	3.64	20
La	ALS Canada	AuME_ST44	ST4	B	ppm	0.002	0	9.010	57.800	20
La	ALS Canada	MS61	MS6	B	ppm	0.5	0	36.3	36.3	1
La	ALS Canada	MS61L	MSL	B	ppm	0.005	20	12.400	62.900	20
Li	ALS Canada	AuME_ST44	ST4	B	ppm	0.1	0	7.8	45.2	20
Li	ALS Canada	MS61	MS6	B	ppm	0.2	0	78.1	78.1	1
Li	ALS Canada	MS61L	MSL	B	ppm	0.2	20	13.2	56.8	20
Mg	ALS Canada	AuME_ST44	ST4	B	%	0.01	0	1.17	3.77	20
Mg	ALS Canada	MS61	MS6	B	%	0.01	0	2.51	2.51	1
Mg	ALS Canada	MS61L	MSL	B	%	0.01	20	1.65	4.22	20
Mn	ALS Canada	AuME_ST44	ST4	B	ppm	0.1	0	250	1930	20
Mn	ALS Canada	MS61	MS6	B	ppm	5	0	933	933	1
Mn	ALS Canada	MS61L	MSL	B	ppm	0.2	20	277.0	1970.0	20
Mo	ALS Canada	AuME_ST44	ST4	B	ppm	0.002	0	0.388	2.390	20
Mo	ALS Canada	MS61	MS6	B	ppm	0.05	0	4.95	4.95	1
Mo	ALS Canada	MS61L	MSL	B	ppm	0.02	20	0.47	2.56	20
Na	ALS Canada	AuME_ST44	ST4	B	%	0.001	0	0.003	0.027	20
Na	ALS Canada	MS61	MS6	B	%	0.01	0	0.69	0.69	1
Na	ALS Canada	MS61L	MSL	B	%	0.001	20	0.179	1.250	20
Nb	ALS Canada	AuME_ST44	ST4	B	ppm	0.002	0	0.009	1.295	20
Nb	ALS Canada	MS61	MS6	B	ppm	0.1	0	15.7	15.7	1
Nb	ALS Canada	MS61L	MSL	B	ppm	0.005	20	3.380	17.300	20
Ni	ALS Canada	AuME_ST44	ST4	B	ppm	0.02	0	23.70	152.00	20
Ni	ALS Canada	MS61	MS6	B	ppm	0.2	0	124.5	124.5	1
Ni	ALS Canada	MS61L	MSL	B	ppm	0.08	20	28.10	167.50	20

Table 1. Continued

Element	Laboratory	Method	Abbreviation/ Suffix	Appendix	Unit	Lower detection limit (LDL)	Samples below LDL	Minimum	Maximum	Samples analyzed
P	ALS Canada	AuME_ST44	ST4	B	%	0.0005	0	0.0244	0.0938	20
P	ALS Canada	MS61	MS6	B	ppm	10	0	910	910	1
P	ALS Canada	MS61L	MSL	B	%	0.001	20	0.028	0.113	20
Pb	ALS Canada	AuME_ST44	ST4	B	ppm	0.005	0	11.150	71.400	20
Pb	ALS Canada	MS61	MS6	B	ppm	0.5	0	64.4	64.4	1
Pb	ALS Canada	MS61L	MSL	B	ppm	0.01	20	14.15	73.50	20
Pd	ALS Canada	AuME_ST44	ST4	B	ppm	0.001	19	-0.001	0.005	20
Pt	ALS Canada	AuME_ST44	ST4	B	ppm	0.001	0	0.001	0.009	20
Rb	ALS Canada	AuME_ST44	ST4	B	ppm	0.005	0	3.850	33.700	20
Rb	ALS Canada	MS61	MS6	B	ppm	0.1	0	103.5	103.5	1
Rb	ALS Canada	MS61L	MSL	B	ppm	0.02	20	28.20	128.50	20
Re	ALS Canada	AuME_ST44	ST4	B	ppm	0.0002	4	0.0002	0.0005	20
Re	ALS Canada	MS61	MS6	B	ppm	0.002	1	-0.002	-0.002	1
Re	ALS Canada	MS61L	MSL	B	ppm	0.0004	8	0.0004	0.0008	20
S	ALS Canada	AuME_ST44	ST4	B	%	0.002	0	0.006	0.033	20
S	ALS Canada	MS61	MS6	B	%	0.01	0	0.02	0.02	1
S	ALS Canada	MS61L	MSL	B	%	0.01	7	0.01	0.02	20
Sb	ALS Canada	AuME_ST44	ST4	B	ppm	0.002	0	0.098	3.310	20
Sb	ALS Canada	MS61	MS6	B	ppm	0.05	0	1.44	1.44	1
Sb	ALS Canada	MS61L	MSL	B	ppm	0.02	0	0.22	4.29	20
Sc	ALS Canada	AuME_ST44	ST4	B	ppm	0.005	0	2.330	10.800	20
Sc	ALS Canada	MS61	MS6	B	ppm	0.1	0	21.9	21.9	1
Sc	ALS Canada	MS61L	MSL	B	ppm	0.01	0	4.14	20.90	20
Se	ALS Canada	AuME_ST44	ST4	B	ppm	0.002	0	0.032	0.442	20
Se	ALS Canada	MS61	MS6	B	ppm	1	0	1	1	1
Se	ALS Canada	MS61L	MSL	B	ppm	0.006	0	0.033	0.453	20
Sn	ALS Canada	AuME_ST44	ST4	B	ppm	0.01	0	1.34	17.10	20
Sn	ALS Canada	MS61	MS6	B	ppm	0.2	0	5.5	5.5	1
Sn	ALS Canada	MS61L	MSL	B	ppm	0.02	0	2.07	23.50	20
Sr	ALS Canada	AuME_ST44	ST4	B	ppm	0.01	0	7.32	214.00	20
Sr	ALS Canada	MS61	MS6	B	ppm	0.2	0	104.0	104	1
Sr	ALS Canada	MS61L	MSL	B	ppm	0.02	0	37.70	312.00	20
Ta	ALS Canada	AuME_ST44	ST4	B	ppm	0.005	20	-0.005	-0.005	20
Ta	ALS Canada	MS61	MS6	B	ppm	0.05	0	0.88	0.88	1
Ta	ALS Canada	MS61L	MSL	B	ppm	0.01	0	0.20	1.08	20
Te	ALS Canada	AuME_ST44	ST4	B	ppm	0.001	0	0.013	0.083	20
Te	ALS Canada	MS61	MS6	B	ppm	0.05	0	0.11	0.11	1
Te	ALS Canada	MS61L	MSL	B	ppm	0.005	0	0.014	0.091	20
Th	ALS Canada	AuME_ST44	ST4	B	ppm	0.0005	0	1.6100	9.7600	20
Th	ALS Canada	MS61	MS6	B	ppm	0.01	0	15.7	15.7	1
Th	ALS Canada	MS61L	MSL	B	ppm	0.004	0	2.950	14.250	20
Ti	ALS Canada	AuME_ST44	ST4	B	%	0.0001	0	0.0034	0.1175	20
Ti	ALS Canada	MS61	MS6	B	%	0.005	0	0.469	0.469	1
Ti	ALS Canada	MS61L	MSL	B	%	0.001	0	0.120	0.605	20
Tl	ALS Canada	AuME_ST44	ST4	B	ppm	0.0005	0	0.0678	0.2720	20
Tl	ALS Canada	MS61	MS6	B	ppm	0.02	0	1.28	1.28	1
Tl	ALS Canada	MS61L	MSL	B	ppm	0.002	0	0.174	0.729	20
Total clay (CY) %	GeoLabs	PSA	PSA	B	Vol. %	NA	0	0.33	23.81	20
Total silt (ST) %	GeoLabs	PSA	PSA	B	Vol. %	NA	0	9.68	56.03	20
Total silt and clay (SC) %	GeoLabs	PSA	PSA	B	Vol. %	NA	0	10.01	79.84	20
U	ALS Canada	AuME_ST44	ST4	B	ppm	0.0005	0	0.4230	1.4250	20
U	ALS Canada	MS61	MS6	B	ppm	0.1	0	2.1	2.1	1
U	ALS Canada	MS61L	MSL	B	ppm	0.01	0	0.97	3.12	20
V	ALS Canada	AuME_ST44	ST4	B	ppm	0.05	0	11.15	65.40	20
V	ALS Canada	MS61	MS6	B	ppm	1	0	212	212	1
V	ALS Canada	MS61L	MSL	B	ppm	0.1	0	28.2	145.0	20
W	ALS Canada	AuME_ST44	ST4	B	ppm	0.001	0	0.009	0.072	20
W	ALS Canada	MS61	MS6	B	ppm	0.1	0	1.0	1	1
W	ALS Canada	MS61L	MSL	B	ppm	0.008	0	0.249	1.005	20

Table 1. Continued

Element	Laboratory	Method	Abbreviation/ Suffix	Appendix	Unit	Lower detection limit (LDL)	Samples below LDL	Minimum	Maximum	Samples analyzed
Y	ALS Canada	AuME_ST44	ST4	B	ppm	0.001	0	6.810	32.500	20
Y	ALS Canada	MS61	MS6	B	ppm	0.1	0	27.5	27.5	1
Y	ALS Canada	MS61L	MSL	B	ppm	0.01	0	8.81	37.30	20
Zn	ALS Canada	AuME_ST44	ST4	B	ppm	0.1	0	28.8	127.5	20
Zn	ALS Canada	MS61	MS6	B	ppm	2	0	243	243	1
Zn	ALS Canada	MS61L	MSL	B	ppm	0.2	0	32.1	147.0	20
Zr	ALS Canada	AuME_ST44	ST4	B	ppm	0.01	0	1.10	7.86	20
Zr	ALS Canada	MS61	MS6	B	ppm	0.5	0	118.5	118.5	1
Zr	ALS Canada	MS61L	MSL	B	ppm	0.1	0	46.70	140.50	20

- 2) *Aqua regia* digest on a 50 g sample, followed by inductively coupled plasma-mass spectrometry (ICP-MS) to determine the concentration of major and trace elements (Ag, Al, As, Au, B, Ba, Be, Bi, Ca, Cd, Ce, Co, Cr, Cs, Cu, Fe, Ga, Ge, Hf, Hg, In, K, La, Li, Mg, Mn, Mo, Na, Nb, Ni, P, Pb, Pd, Pt, Rb, Re, S, Sb, Sc, Se, Sn, Sr, Ta, Te, Th, Ti, Tl, U, V, W, Y, Zn and Zr). This analysis is indicated by element suffix “ST4” in Appendix B and as “AuME-ST44™” in the ALS schedule of fees (Appendix C).
- 3) A 4-acid digest on a 0.25 g aliquot, followed by ICP-MS to determine major and trace elements (Ag, Al, As, Ba, Be, Bi, Ca, Cd, Ce, Co, Cr, Cs, Cu, Fe, Ga, Ge, Hf, Hg, In, K, La, Li, Mg, Mn, Mo, Na, Nb, Ni, P, Pb, Pd, Pt, Rb, Re, S, Sb, Sc, Se, Sn, Sr, Ta, Te, Th, Ti, Tl, U, V, W, Y, Zn and Zr). This analysis was completed on the silt + clay sized fraction of 19 till samples and the clay sized fraction of one till sample. Note that the clay separation was completed at ALS. The analysis completed on the clay size fraction is indicated by element suffix “MS6” in Appendix B and as “ME-MS61™” in ALS Canada Ltd. 2022 geochemistry schedule of fees and services (Appendix C). Note that Hg by this method is indicated by element suffix “MS4” in Appendix B and “ME-MS42™” in Appendix C. The analysis completed on the silt + clay fraction is indicated by element suffix “MSL” in Appendix B and as “ME-MS61L™” in ALS schedule of fees (Appendix C).

Lastly, a 100 g aliquot was submitted to the Ontario Geological Survey’s Geoscience Lab (GeoLabs) for particle size analysis (PSA). This analysis is abbreviated as “PSA” in Appendix B.

RESULTS

The following information is presented in the data tables as comma separated value files (.csv) in Appendices A and B: sample number, year, location, elevation, horizon, depth, map unit, additional notes on location, and the elements analyzed. Major elements are reported in wt. %, whereas minor and trace elements are reported in ppm, unless otherwise specified. Negative values represent results below the reporting limit; “-9” indicates that a sample was not analyzed for that element. Different analytical procedures are indicated by suffixes; refer to Table 1 for a list of analytical methods for each element and associated abbreviations in column headers (*see above*). All location data is projected in Universal Transverse Mercator (UTM) easting and northing, zone 21, and the datum used is NAD 27.

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APPENDICES

Appendices A and B are included in the OF_002M_04_0123 zip folder as digital comma-separated value files (.csv) and Appendix C as a pdf.

APPENDIX A: GSNL Laboratory and INAA Data

APPENDIX B: ALS Canada Ltd. and Geolabs Data

APPENDIX C: ALS Canada Ltd. 2022 Geochemistry Schedule of Fees and Services