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TILL-GEOCHEMISTRY DATA, SILVER MOUNTAIN MAP AREA, NEWFOUNDLAND (NTS 12H/11)

S. Hashmi

Open File 012H/11/2330

St. John's, Newfoundland
November, 2020

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INTRODUCTION

A regional surficial geology mapping and till-sampling survey for the Silver Mountain map area (NTS 12H/11) in western Newfoundland was completed for the 2017 and 2018 field seasons (Figure 1). 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 88 B-, C- and BC-horizon till samples were collected, primarily along road cuts *via* truck, foot traverse, all-terrain vehicles (ATVs) and with limited helicopter support; sample spacing was 1 sample every 2 kilometres. Of these, 11 were follow up samples collected in 2018 in close proximity to samples that have elevated levels of Au. These will be discussed further in the detailed report for this area. The samples were collected using a shovel and geological pick. Quality control measures in the field included thorough cleaning of sampling equipment between sample sites to reduce cross-contamination and written and photographic documentation at each site. A 2 to 3 kg till sample was collected for geochemical analyses and field duplicates were collected every 12 to 15 sample sites. Larger till samples (10–15 kg) were also collected for heavy mineral separation; however, these samples have not been analyzed, at the time of writing this report.

METHODS

Till samples were submitted to the laboratory of the Geological Survey of Newfoundland and Labrador (GSNL) for preparation and analyses. The till samples were dried and sieved to -63 μm (230 mesh) to recover the silt and clay fraction. Quality assurance in the lab consisted of insertion of lab duplicates to test analytical precision and the insertion of Canadian certified reference materials (CCRMs) to test analytical accuracy. The quality of the analyses has been verified prior to their release. Standard and duplicate data will be released with geochemical distribution maps at a later date.

Samples were submitted for the following analyses:

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 31 elements (Al, As, Ba, Be, Ca, Cd, Ce, Co, Cr, Cu, Dy, Fe, K, La, Li, Mg, Mn, Mo, Na, Nb, Ni, P, Pb, Rb, Sc, Sr, Ti, V, Y, Zn and Zr). Additionally, S analysis was also performed on the samples collected in 2018. The 4-acid digestion is a near total leach that can dissolve oxides, sulphides and some silicates; however, the most resistant minerals (*e.g.*, zircon) may not be completely dissolved (C. Finch, personal communication, 2019).

2) Instrumental neutron activation analysis (INAA) to determine concentrations of 26 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 and Yb).

3) Nitric acid digestion followed by ICP-OES to determine Ag concentration.

4) Alkaline fusion followed by ion-selective electrode (ISE) technique to determine fluoride ion (F-).

5) Loss on ignition (LOI) *via* gravimetry to determine percentage of organic matter.

Except for INAA, all analyses were completed at the GSNL laboratory in St. John's, NL: INAA was completed at Bureau Veritas, Mississauga, ON. A detailed description of each analytical procedure can be found in Finch *et al.* (2018). The detection limits, concentration units and maximum and minimum data values for each analysis are reported in Table 1.

RESULTS

The following information is presented in a comma separated file (.csv) in Appendix A: sample number, year, location, elevation, horizon, depth, map unit, additional notes on location and till textures, and the elements analyzed. Major elements are reported in wt. %, whereas trace ele-

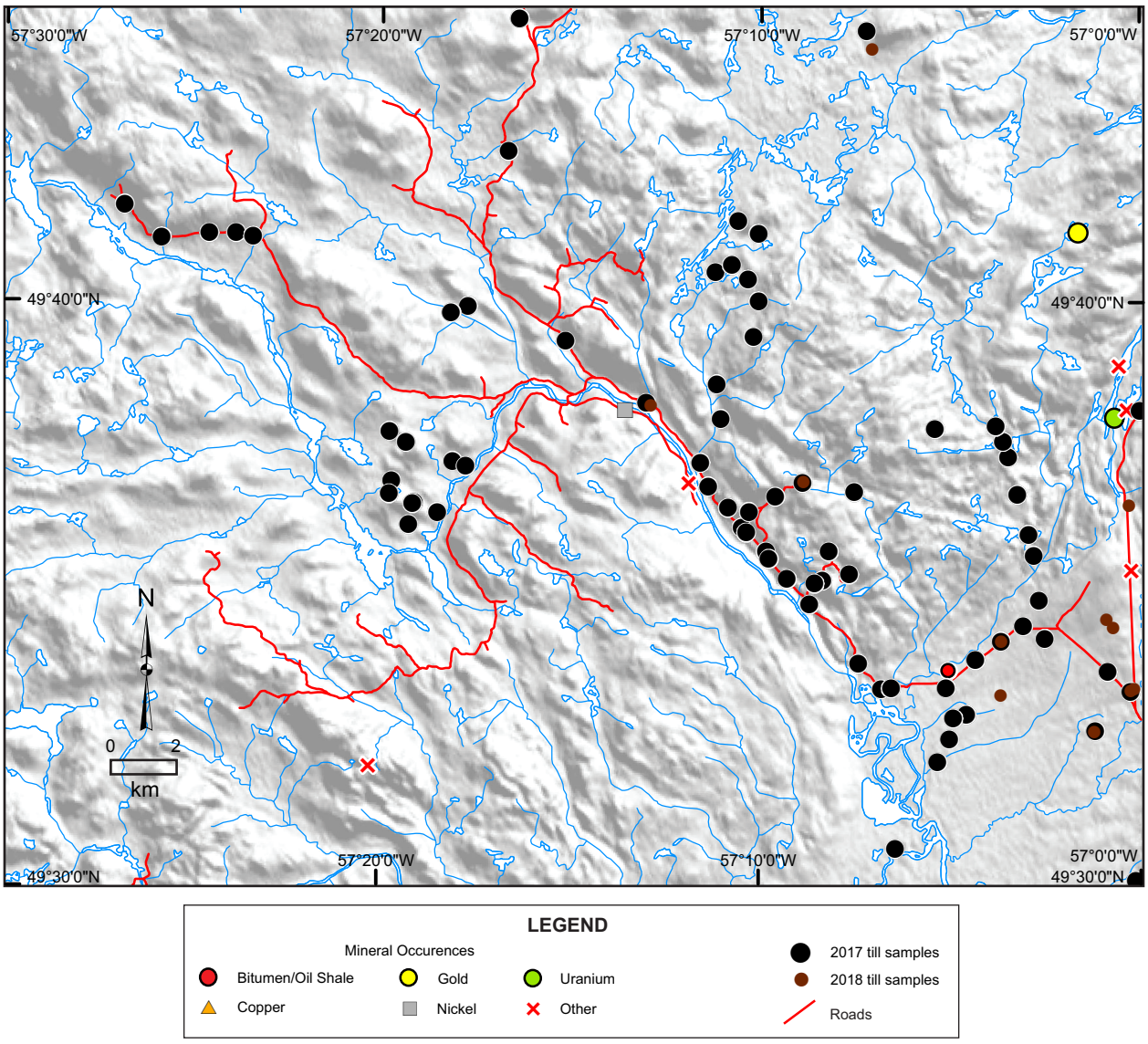

Figure 1. Till sample sites for the 2017 and 2018 field seasons in the Silver Mountain map area (NTS 12H/11).

Table 1. Analytical results for elements, methods of analyses, measurement units, detection limit (DL), number of samples with concentration less than DL and minimum and maximum concentrations

Element	Method	Unit	DL	No. < DL	Minimum	Maximum
Ag6	ICP-OES	ppm	0.1	87	<0.1	0.1
Al2	ICP-OES	%	0.01	0	6.27	8.33
As1	INAA	ppm	0.5	17	<0.5	40.0
As2	ICP-OES	ppm	1	2	<1	40
Au1	INAA	ppb	1	59	<1	46
Ba1	INAA	ppm	50	0	250	630
Ba2	ICP-OES	ppm	1	0	261	660
Be2	ICP-OES	ppm	0.1	0	0.8	1.8
Br1	INAA	ppm	1	2	<1	42
Ca2	ICP-OES	%	0.01	0	0.18	4.43
Cd2	ICP-OES	ppm	0.1	0	0.1	0.7
Ce1	INAA	ppm	3	0	59	290
Ce2	ICP-OES	ppm	5	0	62	259
Co1	INAA	ppm	2	0	13	72
Co2	ICP-OES	ppm	1	0	15	79
Cr1	INAA	ppm	1	0	34	280
Cr2	ICP-OES	ppm	1	0	43	256
Cs1	INAA	ppm	0.5	38	<0.5	2.3
Cu2	ICP-OES	ppm	1	0	15	121
Dy2	ICP-OES	ppm	0.5	0	5.1	17.3
Eu1	INAA	ppm	0.5	12	<0.5	4.2
F9	ISE	ppm	5	0	293	841
Fe1	INAA	%	0.1	0	5.0	10.3
Fe2	ICP-OES	%	0.01	0	4.90	9.81
Hf1	INAA	ppm	1	0	7	32
K2	ICP-OES	%	0.01	0	0.69	2.29
La1	INAA	ppm	1	0	26	119
La2	ICP-OES	ppm	1	0	24	122
Li2	ICP-OES	ppm	0.1	0	5.1	58.0
LOI	Gravimetry	%	0.1	0	0.8	6.3
Lu1	INAA	ppm	0.05	0	0.44	1.50
Mg2	ICP-OES	%	0.01	0	1.01	3.52
Mn2	ICP-OES	ppm	1	0	785	2176
Mo1	INAA	ppm	1	88	<1	<1
Mo2	ICP-OES	ppm	1	86	<1	1
Na1	INAA	%	0.05	0	1.20	2.70
Na2	ICP-OES	%	0.01	0	1.15	2.67
Nb2	ICP-OES	ppm	1	0	8	26

Table 1. Continued

Element	Method	Unit	DL	No. < DL	Minimum	Maximum
Ni2	ICP-OES	ppm	1	0	19	95
P2	ICP-OES	ppm	1	0	600	3687
Pb2	ICP-OES	ppm	1	4	<1	99
Rb1	INAA	ppm	5	0	10	120
Rb2	ICP-OES	ppm	5	0	26	128
S2	ICP-OES	ppm	5	0	23	205
Sb1	INAA	ppm	0.1	55	<0.1	1.2
Sc1	INAA	ppm	0.1	0	16.6	41.2
Sc2	ICP-OES	ppm	0.1	0	17.9	44.8
Se1	INAA	ppm	1	88	<1	<1
Sm1	INAA	ppm	0.1	0	7.2	22.1
Sr2	ICP-OES	ppm	1	0	49	435
Ta1	INAA	ppm	0.2	0	0.4	2.0
Tb1	INAA	ppm	0.5	0	1.1	3.2
Th1	INAA	ppm	0.5	0	2.6	33.5
Ti2	ICP-OES	ppm	5	0	5186	17133
U1	INAA	ppm	0.1	0	0.7	6.3
V2	ICP-OES	ppm	1	0	108	332
W1	INAA	ppm	1	74	<1	6
Y2	ICP-OES	ppm	1	0	24	95
Yb1	INAA	ppm	0.5	0	3.4	11.0
Zn2	ICP-OES	ppm	1	0	60	708
Zr2	ICP-OES	ppm	1	0	34	182

Note: With the exception of S, for which only 11 samples were analyzed, the rest of the elements were analyzed for all 88 samples. Also, note that some elements showed a higher DL in some samples. In this case, the total number of samples under the variable detection limits is reported. For example, the DL for Au *via* INAA is 1 ppb; however, the DL may be reported as 2 ppb in some samples due to low sample weight or matrix effect.

ments are reported in ppm except for gold, which is reported in ppb. Negative detection limit values represent analyses below the detection limit, and -9 represents samples that were not analyzed for that element. Different analytical procedures are indicated by numerical suffix after the element determined, whereby INAA is labelled as “1”, 4 acid digestion ICP-OES is “2”, nitric acid digestion ICP-OES is “6” and alkaline fusion, ion-selective electrode is “9”; for example, AU1_PPB stands for Au concentration in ppb, analyzed by INAA. All location data is projected in Universal Transverse Mercator (UTM) easting and northing and the datum used is NAD 27, Zone 21.

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2018: Analytical methods for chemical analysis of geological materials. Government of Newfoundland and Labrador, Department of Natural Resources, Geological Survey, Open File NFLD/3316, 67 pages.

APPENDIX

Appendix A is available as a digital comma-separated file (.csv) through this link.

Appendix A: Till-Geochemistry Data