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Geochemistry of Selected Glacial and Bedrock Geologic Units, Cold Lake Area, Alberta

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Executive Summary

This study was initiated on a request by Alberta Environmental Protection (AEP) for background information to explain elevated arsenic levels in groundwater from glacial aquifers in the Cold Lake area. Specifically, the question asked was if naturally occurring arsenic levels in the glacial sediments could be contributing arsenic to the groundwater. This report presents the results of two geochemical analysis procedures performed on glacial till, clay, and bedrock samples collected by the Alberta Geological Survey (AGS) more than 20 years ago. Archival samples of till, clay, sand and bedrock claystone from a select number of auger testhole sites in the Cold Lake area were retrieved and more than 175 samples were prepared for geochemical analysis. The results show that for some elements, there are strong contrasting chemical signatures between the glacial sediments and the underlying claystone of the Colorado Group. Arsenic is present in both glacial and bedrock materials, and its values appears to show one of the strongest contrasts between glacial till and bedrock claystone. Differences in chemical signature can be observed between some of the till units, though they are not as well-defined. No comments are made as to the relationship between chemical composition of the sediment and the composition of the groundwater.

Background

In 1976 and 1977, The Alberta Geological Survey (AGS) conducted a regional surficial geology and Quaternary stratigraphy mapping program in the Cold Lake area. More than 110 solid-stem auger testholes were drilled, logged, and samples collected at 1 metre intervals. A suite of laboratory analyses was performed on these samples, including matrix grain size distribution, matrix carbonate content of the silt-clay fraction, and petrology of the 1-2 mm very coarse sand fraction. At the time, resources did not permit a geochemical analysis of these till units. Sub-samples were selected for archival purposes and stored in AGS's Mineral and Core Research Facility in Edmonton. On the basis of the lithologic parameters, as well as field observations and stratigraphic position, four major glacial till units, interpreted to represent major glacial episodes, were defined for the Cold Lake region. This till stratigraphic framework enabled the intertill, stratified units to be defined, which helped construct the hydrogeologic model of aquifers and aquitards in the region.

As part of the energy industry's groundwater monitoring and sampling program in the Cold Lake region, elevated levels of arsenic were identified in groundwater sampled from the glacial aquifers, particularly the upper aquifers, including the Beaver River Aquifer (Bonnyville Fm. Unit 1 sand, gravel, Ethel Lake Fm. sand, gravel) and the Sand River Aquifer (Sand River Fm.). AGS undertook to examine the geochemistry of archived samples of glacial and bedrock sediments to determine if anomalously high levels of arsenic may occur within the tills, and which might be potential sources of arsenic in the groundwater.

Location of Testholes and Samples

Five auger testhole sites were selected from which a total of 177 samples were prepared for geochemical analysis. Testhole sites were selected to represent a range of landscape positions, thickness of glacial drift, and position within the regional groundwater regime. Testhole SRT16 (Figure 1) is located in a low relief area within the Beaver Lowland (Andriashek and Fenton, 1989) south of Imperial's operations, and directly south of the Beaver River. It is the only hole drilled deep enough to penetrate the drift and into bedrock. Testhole SRT58 is also located in the Beaver Lowland, but on a local high relief, glacial thrust and drumlinized ridge directly south of Cold Lake. Testhole SRT27 is located directly southwest of Hilda Lake on a undulating landscape within the northern edge of the Beaver River lowland. It lies at the base and southern edge of the Medley Upland (Andriashek and Fenton, 1989). Testhole SRT22 is located on undulating to hummocky terrain within the Marguerite Upland (Andriashek and Fenton, 1989). It lies east of, and in a groundwater position, upstream of Imperial's heavy oil operation. Testhole R77SR36 is located on undulating to hummocky terrain, directly west of May Lake in the Marguerite Upland. It lies directly north of Imperial's operation.

Glacial aquifers were present in only one site, testhole SRT27, where as much as 10 m of the Sand River Fm. is present. In the other four testholes glacial till of at least three formations is present.

A total of 177 samples were collected from the five testholes, representing a sampling depth interval of about 1 m, and submitted for geochemical analyses. Only samples of fine-grained material such as till, clay or claystone were analyzed.

Methods and Procedures

The matrix fraction (<0.063 mm or <230 mesh) was recovered from AGS's archive reference samples. Each sample was dried, gently disaggregated to avoid the crushing of rock and mineral grains, and was screened using 2.00 mm and 0.063 mm mesh stainless steel sieves. About 30-40 grams of the <0.063 mm fraction were recovered from each sample. The <0.063 mm fractions were then subdivided to provide a subset for flame atomic absorption spectrometry (AA) and for instrumental neutron activation analysis (NA).   It should be noted that samples were collected in a moist, saturated state from the field. Subsequent to drying, any dissolved metals in the water component of the sample remain within the matrix, adding to the total concentration of metals within the sample. Prior to submission of the samples to the laboratories, the sample order was randomized and both duplicate and standard samples were inserted. About five per cent of the samples which were submitted, are duplicates or standards.

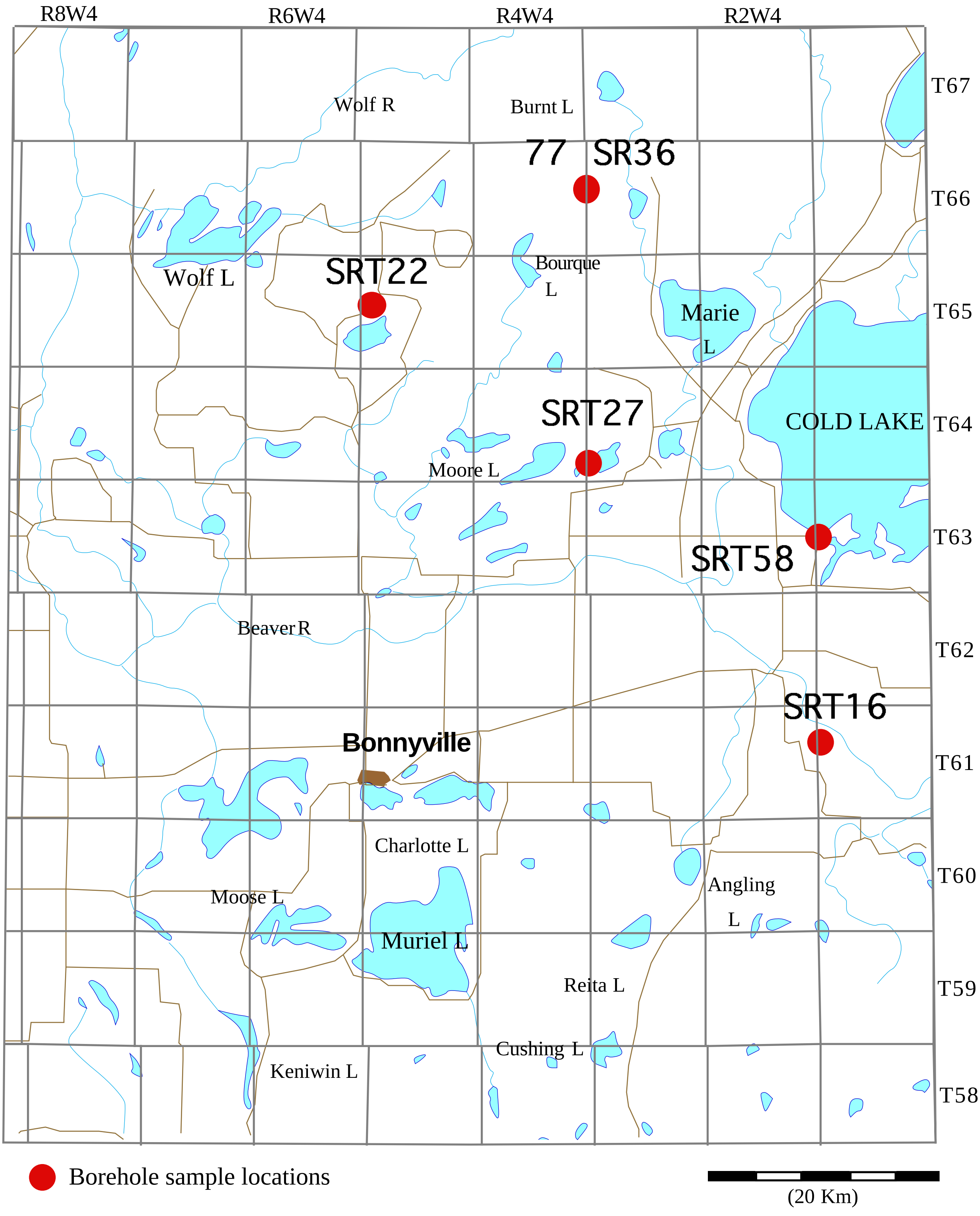


Figure 1. Locations of borehole geochemistry samples

The AA analyses were done by CanTech Laboratories Inc. A "Total Digestion" procedure was used. Following sieving through the stainless steel sieve a 1-gram subsample was selected and dissolved in a fuming HF-HClO4-HNO3 mixture and then analyzed. The procedure determined the concentration of silver (Ag), cadmium (Cd), cobalt (Co), copper (Cu), iron (Fe), lithium (Li), manganese (Mn), molybdenum (Mo), nickel (Ni), lead (Pb), vanadium (V), and zinc (Zn). These are summarized in Table 1.

The instrumental neutron activation analysis (NA) uses subsamples of about 10 grams to determine the concentrations of arsenic (As), gold (Au), barium (Ba), bromine (Br), cadmium (Cd), cerium (Ce), cesium (Ce), chromium (Cr), cobalt (Co), Europium (Eu), hafnium (Ha), iron (Fe), lanthanum (La), lutetium (Lu), molybdenum (Mo), sodium (Na), nickel (Ni), rubidium (Rb), antimony (Sb), scandium (Sc), selenium (Se), samarium (Sa), tin (Sn), tantalum (Ta), terbium (Tb), tellurium (Te), thorium (Th), uranium (U), tungsten (W), Ytterbium (Yb), zinc (Zn), and, zirconium (Zr). These are summarized in Table 2. Each sample was encapsulated by Becquerel Laboratories, Inc., sealed and irradiated with neutron flux monitors in a 2-megawatt (MW) pool type reactor. Following a 7 day decay period to remove transient decay products the gamma radiation from the samples was counted for approximately 500 seconds using a high resolution Ge detector system.

The detection limits for all of the above elements are listed in Table 3.

Table 1: Elements analyzed by Flame Atomic Absorption Spectrometry (AA) procedure for geologic samples from the Cold Lake area.

Ag (ppm)	Silver
Cd (ppm)	Cadmium
Co (ppm)	Cobalt
Cu (ppm)	Copper
Fe (ppm)	Iron
Li (ppm)	Lithium
Mn (ppm)	Manganese
Mo (ppm)	Molybdenum
Ni (ppm)	Nickel
Pb (ppm)	Lead
V (ppm)	Vanadium
Zn (ppm)	Zinc

Table 2: Elements analyzed by Neutron Activation procedure for geologic samples from the Cold Lake area (elements highlighted in bold have significant numbers of values above detection limit)

As (ppm)	Arsenic
Au (ppb)	Gold
Ba (ppm)	Barium
Br (ppm)	Bromium
Cd (ppm)	Cadmium
Ce (ppm)	Cerium
Cs (ppm)	Cesium
Cr (ppm)	Chromium
Co (ppm)	Cobalt
Eu (ppm)	Europium
Hf (ppm)	Hafnium
Ir (ppm)	Iridium
Fe (%)	Iron
La (ppm)	Lanthanum
Lu (ppm)	Lutetium
Mo (ppm)	Molybdenum
Na (%)	Sodium
Ni (ppm)	Nickel
Rb (ppm)	Rubidium
Sb (ppm)	Antimony
Sc (ppm)	Scandium
Se (ppm)	Selenium
Sm (ppm)	Samarium
Sn (ppm)	Tin
Ta (ppm)	Tantalum
Tb (ppm)	Terbium
Te (ppm)	Tellurium
Th (ppm)	Thorium
U (ppm)	Uranium
W (ppm)	Tungsten
Yb (ppm)	Ytterbium
Zn (ppm)	Zinc
Zr (ppm)	Zirconium

Table 3.Till matrix geochemistry, analytical methods and detection limits.

Element	Method	Detection Limit
Ag	AA/Total digestion	0.2 ppm Ag
Cd	AA/Total digestion	0.2 ppm Cd
Co	AA/Total digestion	2 ppm Co
Cu	AA/Total digestion	2 ppm Cu
Fe	AA/Total digestion	0.02% Fe
Li	AA/Total digestion	1.0 ppm Li
Mn	AA/Total digestion	5 ppm Mn
Mo	AA/Total digestion	2 ppm Mo
Ni	AA/Total digestion	2 ppm Ni
Pb	AA/Total digestion	2 ppm Pb
V	AA/Total digestion	5 ppm V
Zn	AA/Total digestion	2 ppm Zn
Ag	NA	2 ppm Ag
As	NA	0.5 ppm As
Au	NA	2 ppb Au
Ba	NA	50 ppm Ba
Br	NA	0.5 ppm Br
Cd	NA	5 ppm Cd
Ce	NA	5 ppm Ce
Co	NA	5 ppm Co
Cr	NA	20 ppm Cr
Cs	NA	0.5 ppm Cs
Eu	NA	1 ppm Eu
Fe	NA	0.2% Fe
Hf	NA	1 ppm Hf
Ir	NA	50 ppm Ir
La	NA	2 ppm La
Lu	NA	0.2 ppm Lu
Mo	NA	1 ppm Mo
Na	NA	0.02% Na
Ni	NA	10 ppm Ni
Rb	NA	5 ppm Rb
Sb	NA	0.1 ppm Sb
Sc	NA	0.2 ppm Sc
Se	NA	5 ppm Se
Sm	NA	0.1 ppm Sm
Sn	NA	100 ppm Sn
Ta	NA	0.5 ppm Ta
Tb	NA	0.5 ppm Tb
Te	NA	10 ppm Te
Th	NA	0.2 ppm Th
U	NA	0.2 ppm U
W	NA	1 ppm W
Yb	NA	1 ppm Yb
Zn	NA	100 ppm Zn
Zr	NA	200 ppm Zr

Geochemistry values for samples from each of the testholes were formatted in a spreadsheet, imported into a log generation program to produce a strip litholog and series of curves, and imported into a graphics software program for presentation and printing.

Discussion of Results

The results of the analyses from the NA and AA procedures are depicted in Figures 2 to 6. Sample depth locations are shown in each testhole litholog strip as a filled black circle. Also shown is the matrix grain size (% sand, % silt, %clay) for each sample. Only those elements which have values above minimum detection limits are plotted. For this reason a number of the rare earth elements are not plotted. Samples in which the value was below the detection limit were assigned a '0' value for the purposes of generating the plot diagrams, although this is strictly not correct. Normal convention is to assign a value equal to half to the minimum detection limit for those cases.

Arsenic Concentrations

Arsenic was detected in all of the samples analyzed, with values ranging from about 3 to 20 ppm. Figures 2 to 6 show that there are some interesting aspects regarding the arsenic concentrations with depth and origin of sediment. In testhole SRT16, which was drilled into the Lea Park Formation, there is a noticeable and distinct increase in arsenic in the Lea Park Fm., with values averaging about 16 ppm compared to about 8 ppm for the entire drift sequence above (Figure 2). Similarly high values of arsenic are also detected in clayey sediment within the uppermost Grand Centre till in testhole SRT58 (Figure 5). This testhole is situated on a glacially thrust and drumlinized ridge directly south of Cold Lake. Nearby road cuts show the presence of glacially thrust and displaced Lea Park Fm. claystone resting on top of glacial sediment in this area. On the basis of similar arsenic values in the clay, it seems likely that the source of clay in the Grand Centre Fm. at this site is displaced claystone of the underlying Lea Park Fm.

Arsenic values appear to increase with the lower and deeper till units, particularly the Bonnyville Fm. This is evident in testhole SRT16, and particularly so in testhole R77SR36 (Figure 6) in which arsenic levels show an abrupt and sharp increase at the contact between the Marie Creek and Bonnyville tills. Arsenic values average about 5 ppm for the Grand Centre and Marie Creek tills combined, and about 9 ppm for the Bonnyville till. It should be noted that at this site the top of the Bonnyville Fm. is also weathered and oxidized, even at a depth of about 37 m from surface. This likely reflects a weathered horizon on the paleo surface of the Bonnyville Fm. prior to burial during a subsequent glaciation. In addition, the uppermost three to four metres of the Bonnyville till at this site is less sandy and more clayey than the overlying Marie Creek till, and it is in this clayey zone that arsenic (NA), rubidium (NA), and vanadium (AA) values show an abrupt increase. With depth and decrease in clay content, vanadium values decrease whereas arsenic values remain relatively high.

Increases in arsenic concentrations are not necessarily correlative with increases in the amounts of clay in the till matrix. For example, arsenic concentrations in the Bonnyville till in testhole continued...

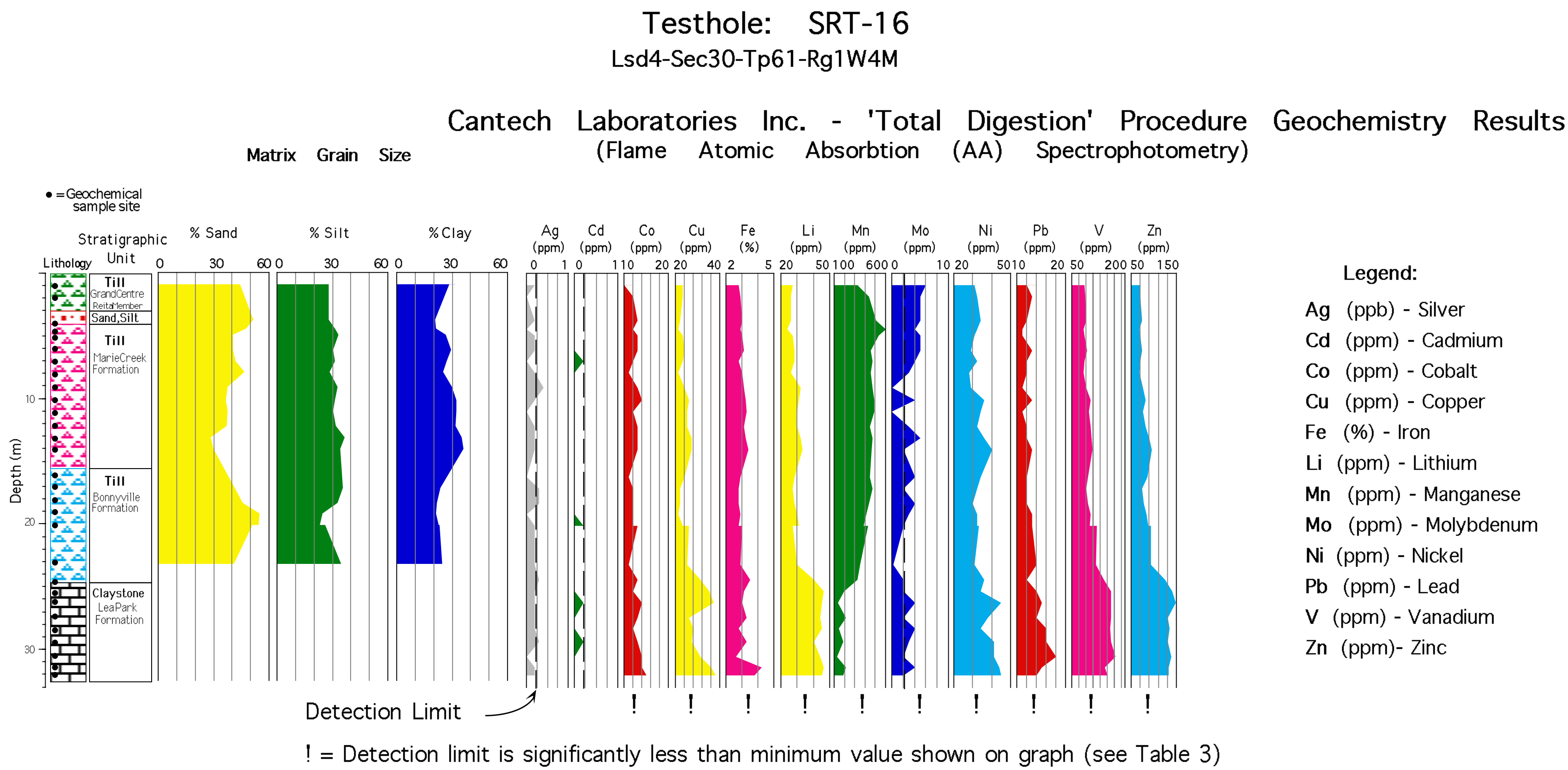
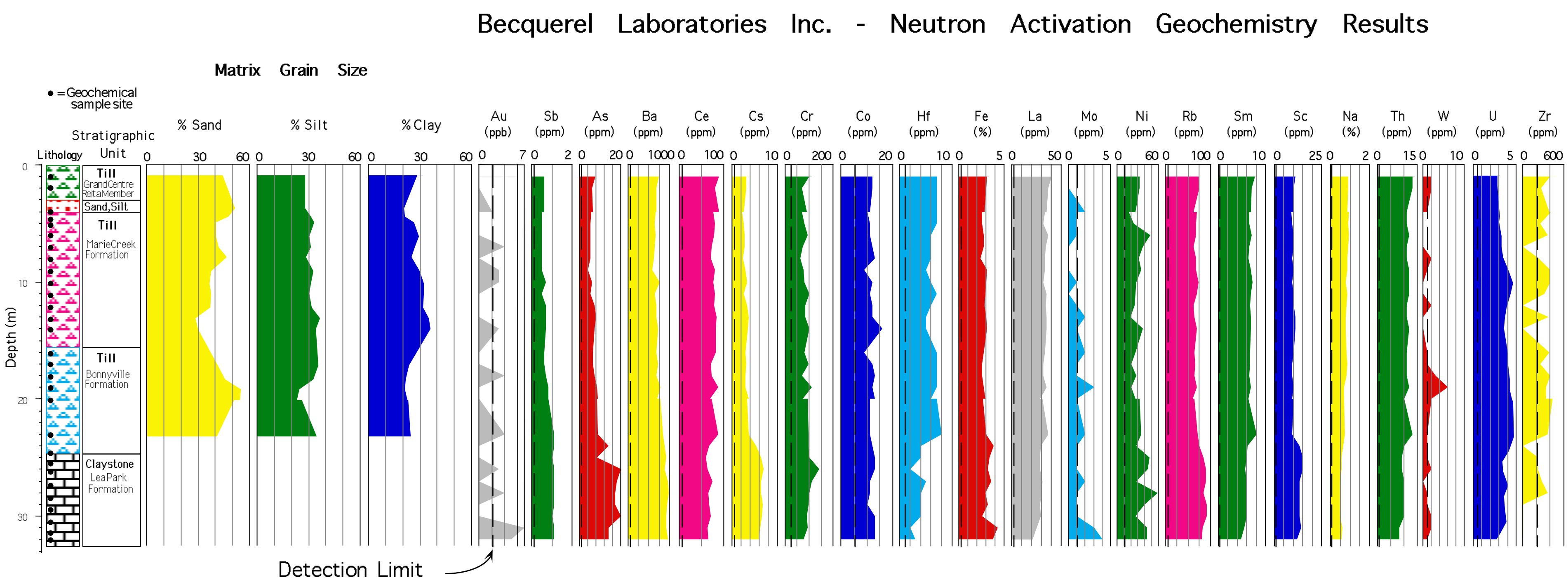


Figure 2i: Grain-size distribution and geochemistry of Quaternary glacial and Cretaceous bedrock sediments, testhole SRT-16, Cold Lake area.

Testhole: SRT-16

Lsd4-Sec30-Tp61-Rg1W4M



Legend:

Au (ppb) - Gold
As (ppm) - Arsenic
Ba (ppm) - Barium
Ce (ppm) - Cerium
Cs (ppm) - Cesium
Cr (ppm) - Chromium
Co (ppm) - Cobalt
Hf (ppm) - Hafnium
Fe (%) - Iron
La (ppm) - Lanthanum
Mo (ppm) - Molybdenum
Na (%) - Sodium
Ni (ppm) - Nickel
Rb (ppm) - Rubidium
Sb (ppm) - Antimony
Sc (ppm) - Scandium
Sm (ppm) - Samarium
Th (ppm) - Thorium
U (ppm) - Uranium
W (ppm) - Tungsten
Zr (ppm) - Zirconium

Figure 2ii: Grain-size distribution and geochemistry of Quaternary glacial and Cretaceous bedrock sediments, testhole SRT-16, Cold Lake area.

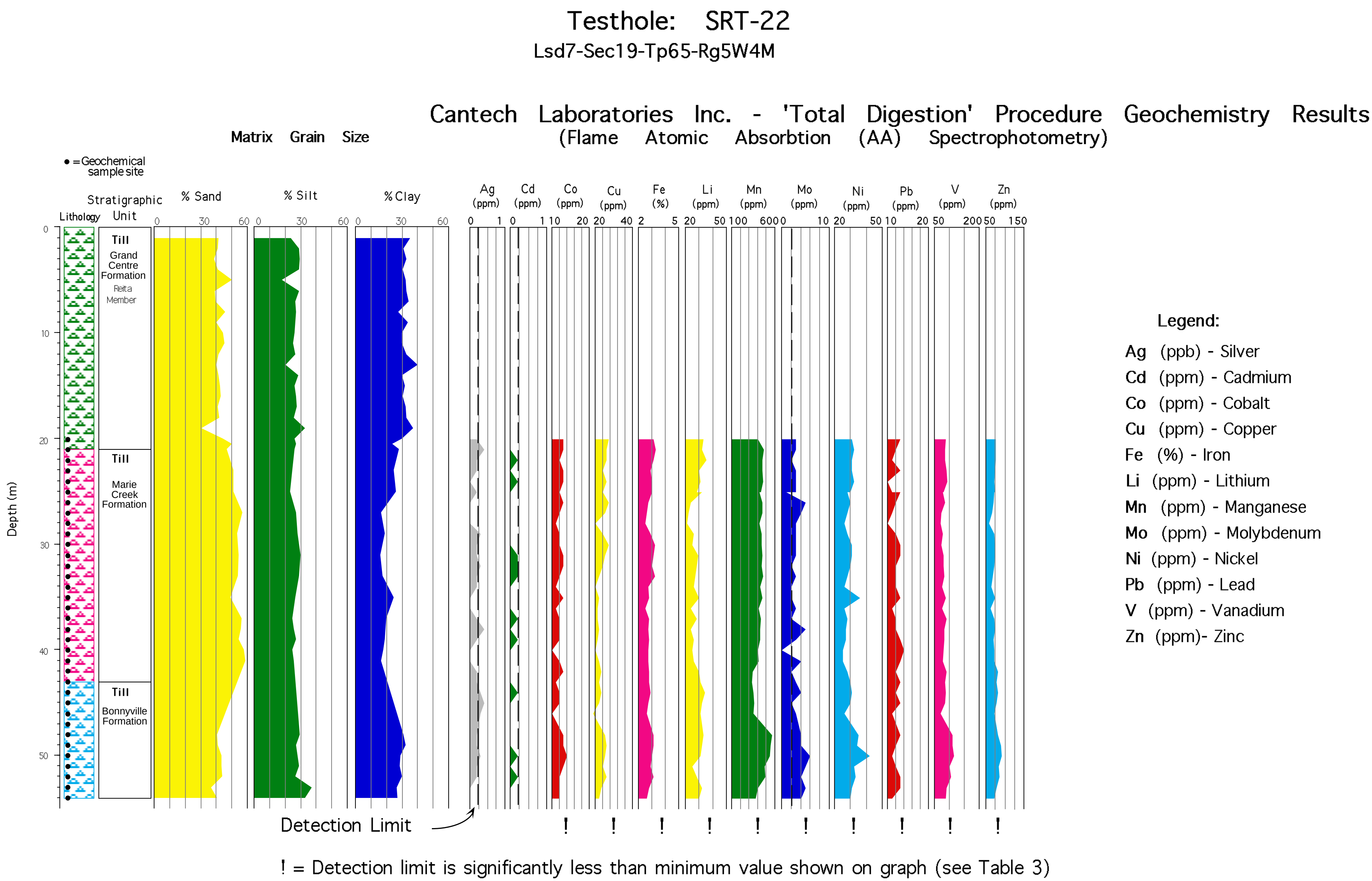
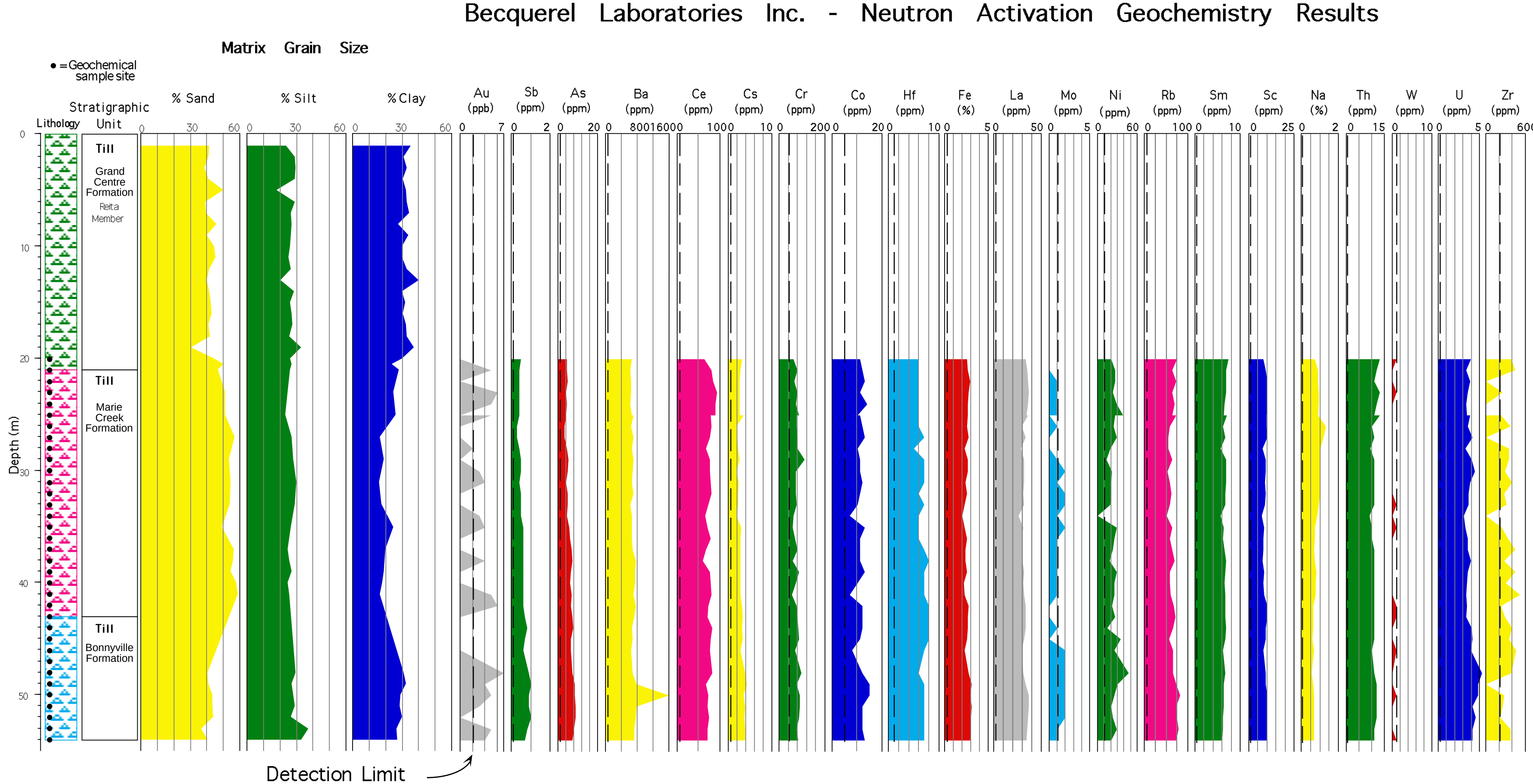


Figure 3i: Grain-size distribution and geochemistry of Quaternary glacial and Cretaceous bedrock sediments, testhole SRT-22, Cold Lake area.

Testhole: SRT-22

Lsd7-Sec19-Tp65-Rg5W4M



Legend:

Au (ppb) - Gold
As (ppm) - Arsenic
Ba (ppm) - Barium
Ce (ppm) - Cerium
Cs (ppm) - Cesium
Cr (ppm) - Chromium
Co (ppm) - Cobalt
Hf (ppm) - Hafnium
Fe (%) - Iron
La (ppm) - Lanthanum
Mo (ppm) - Molybdenum
Na (%) - Sodium
Ni (ppm) - Nickel
Rb (ppm) - Rubidium
Sb (ppm) - Antimony
Sc (ppm) - Scandium
Sm (ppm) - Samarium
Th (ppm) - Thorium
U (ppm) - Uranium
W (ppm) - Tungsten
Zr (ppm) - Zirconium

Figure 3ii: Grain-size distribution and geochemistry of Quaternary glacial and Cretaceous bedrock sediments, testhole SRT-22, Cold Lake area.

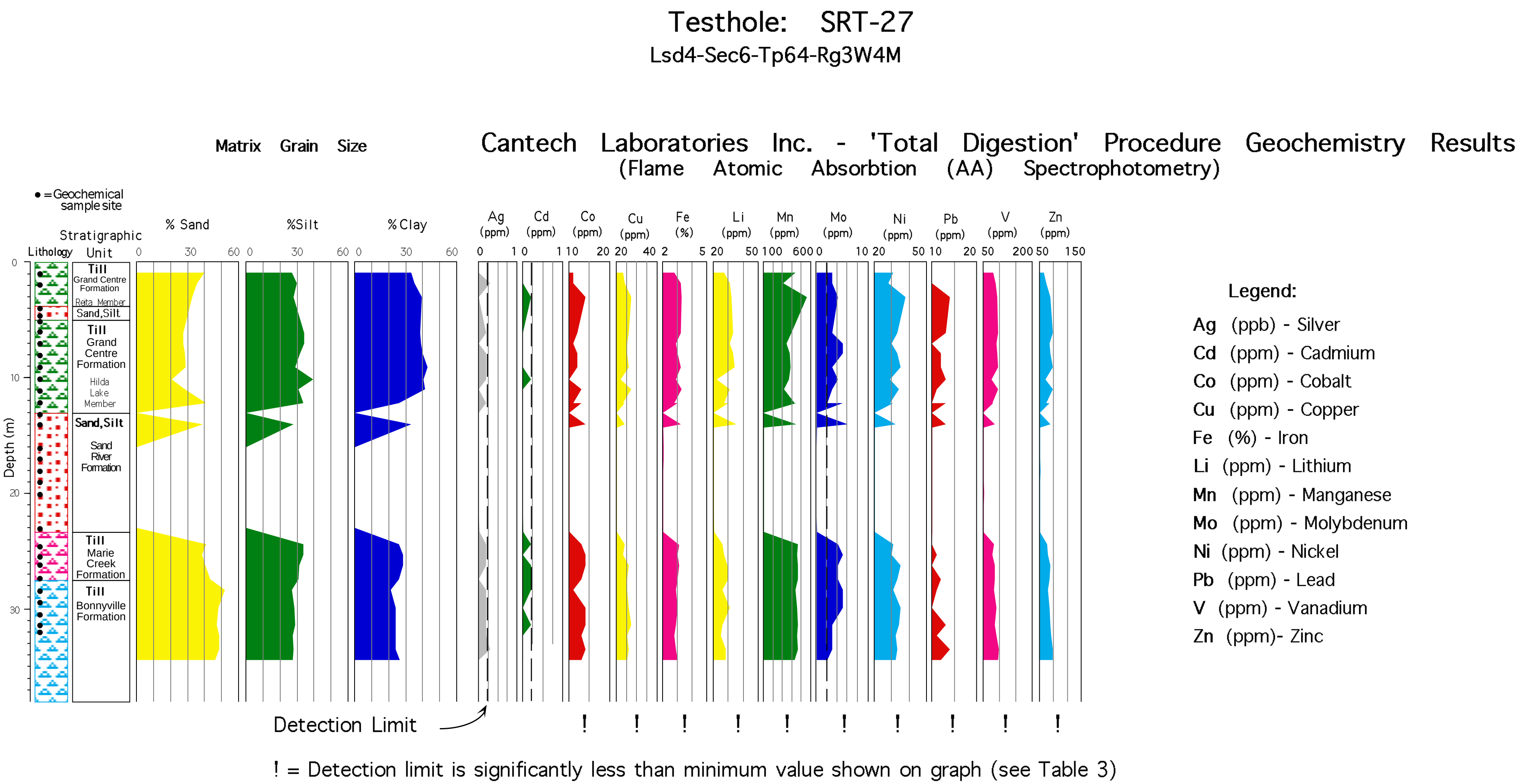


Figure 4i: Grain-size distribution and geochemistry of Quaternary glacial and Cretaceous bedrock sediments, testhole SRT-27, Cold Lake area.

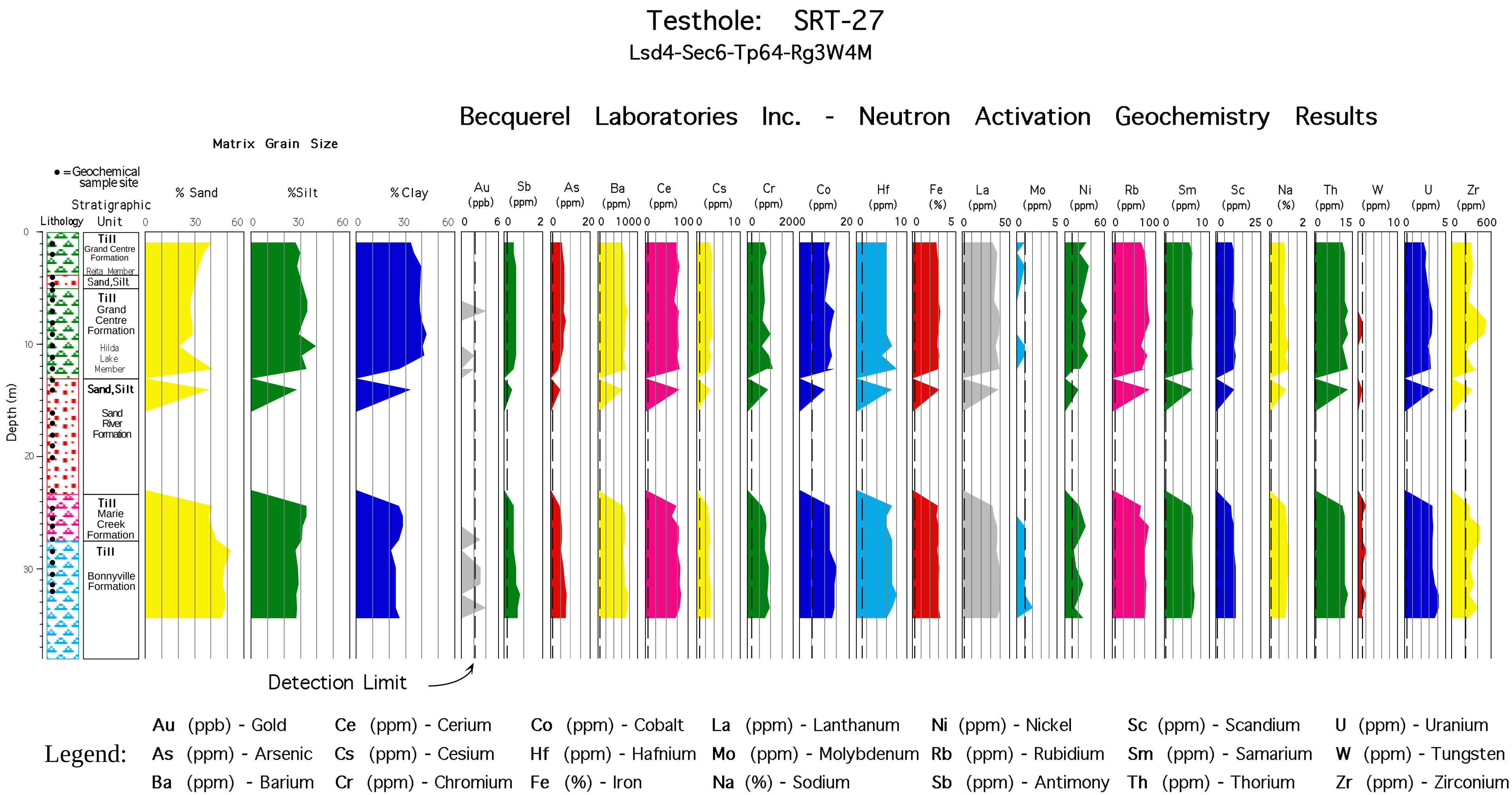


Figure 4ii: Grain-size distribution and geochemistry of Quaternary glacial and Cretaceous bedrock sediments, testhole SRT-27, Cold Lake area.

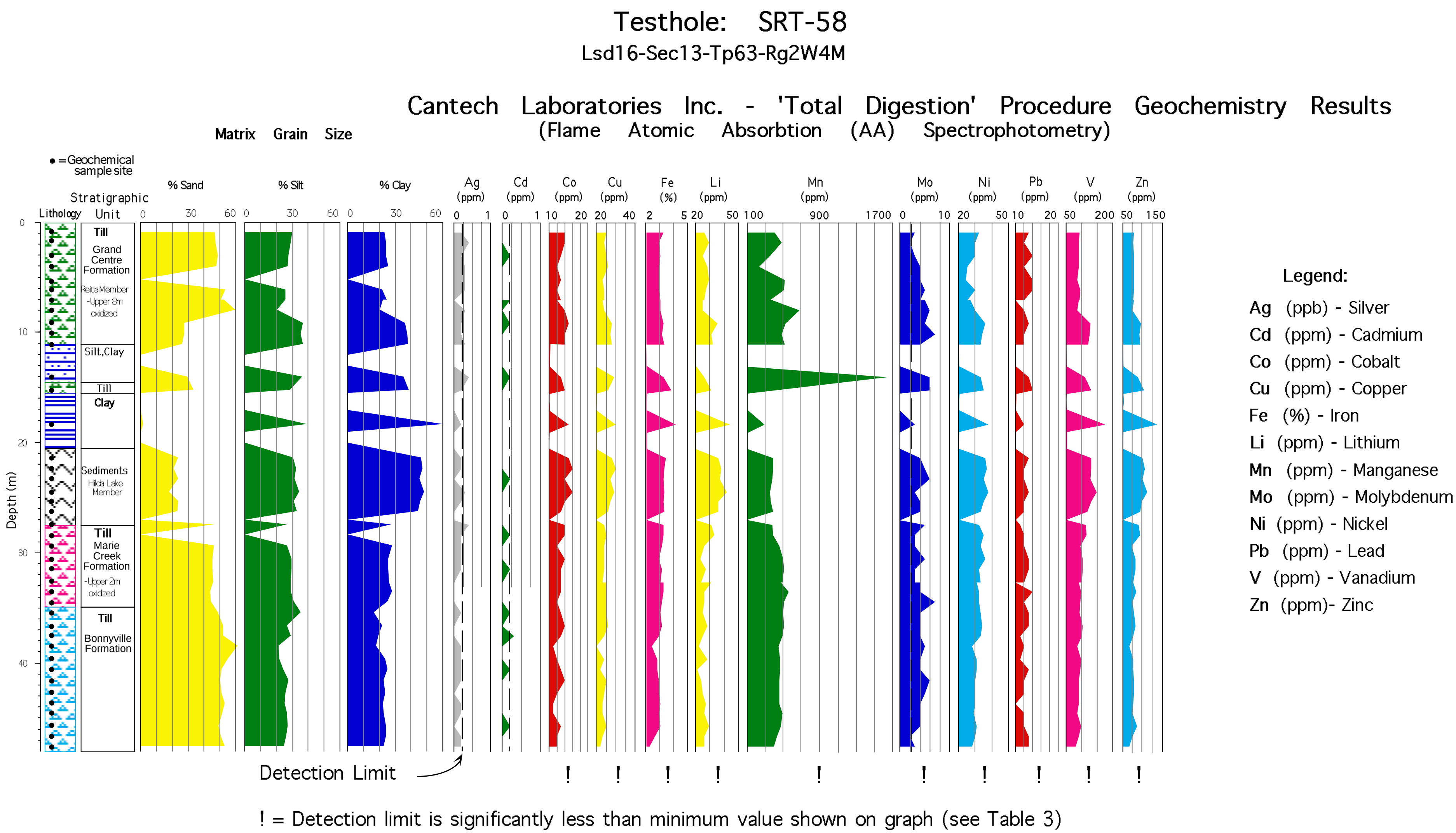
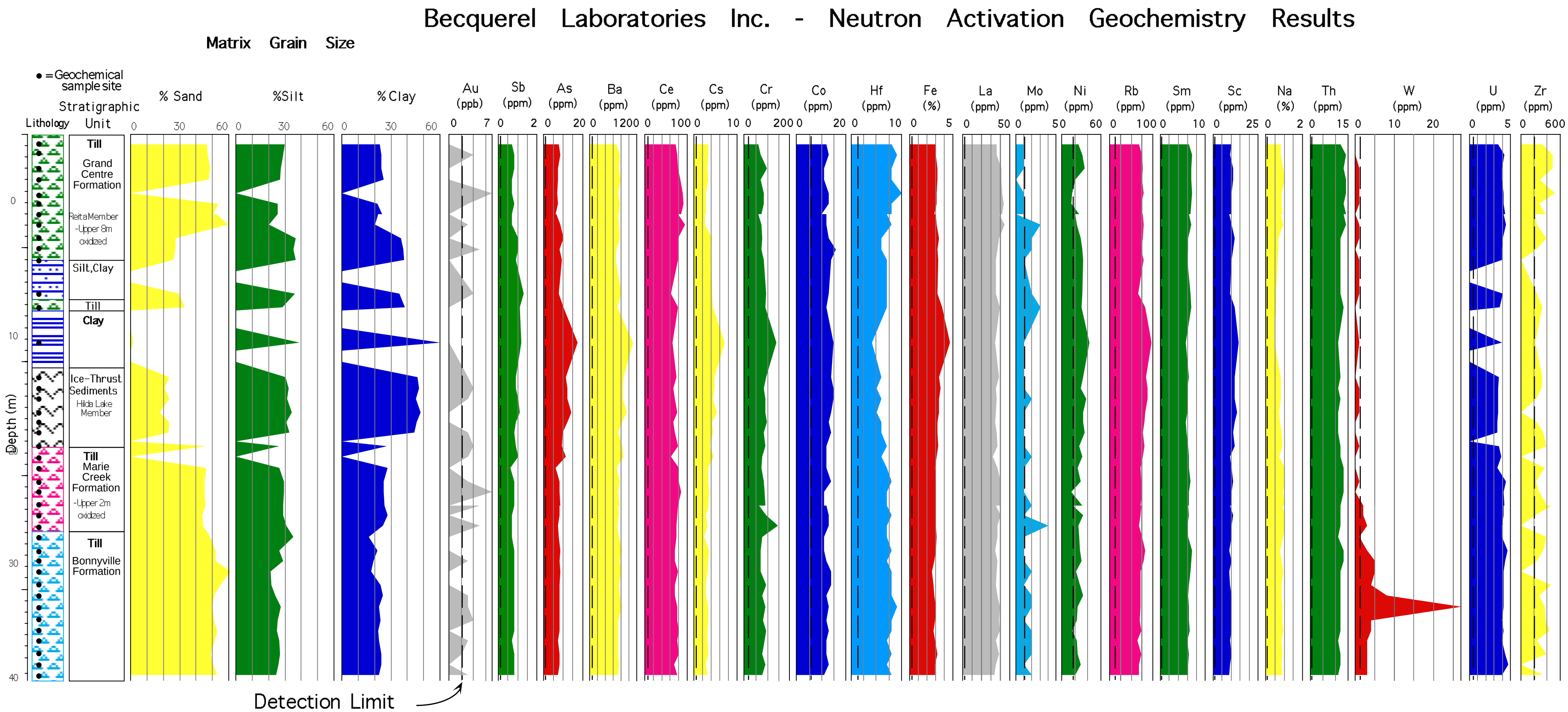


Figure 5i: Grain-size distribution and geochemistry of Quaternary glacial and Cretaceous bedrock sediments, testhole SRT-58, Cold Lake area.

Testhole: SRT-58

Lsd16-Sec13-Tp63-Rg2W4M



Legend:

Au (ppb) - Gold	**Ce** (ppm) - Cerium	**Co** (ppm) - Cobalt	**La** (ppm) - Lanthanum	**Ni** (ppm) - Nickel	**Sc** (ppm) - Scandium	**U** (ppm) - Uranium
As (ppm) - Arsenic	**Cs** (ppm) - Cesium	**Hf** (ppm) - Hafnium	**Mo** (ppm) - Molybdenum	**Rb** (ppm) - Rubidium	**Sm** (ppm) - Samarium	**W** (ppm) - Tungsten
Ba (ppm) - Barium	**Cr** (ppm) - Chromium	**Fe** (%) - Iron	**Na** (%) - Sodium	**Sb** (ppm) - Antimony	**Th** (ppm) - Thorium	**Zr** (ppm) - Zirconium

Figure 5ii: Grain-size distribution and geochemistry of Quaternary glacial and Cretaceous bedrock sediments, testhole SRT-58, Cold Lake area.

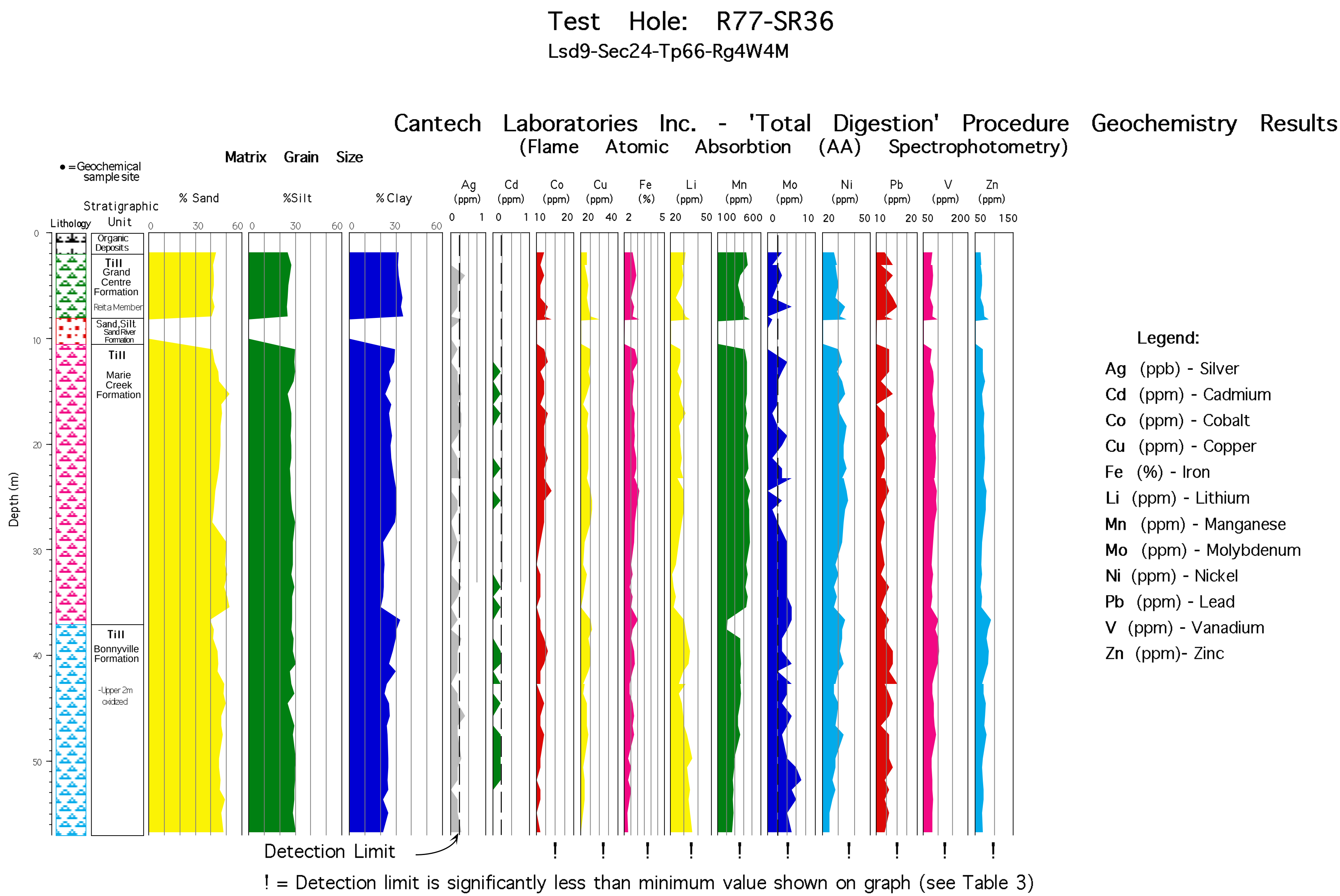


Figure 6i: Grain-size distribution and geochemistry of Quaternary glacial and Cretaceous bedrock sediments, testhole R77SR-36, Cold Lake area.

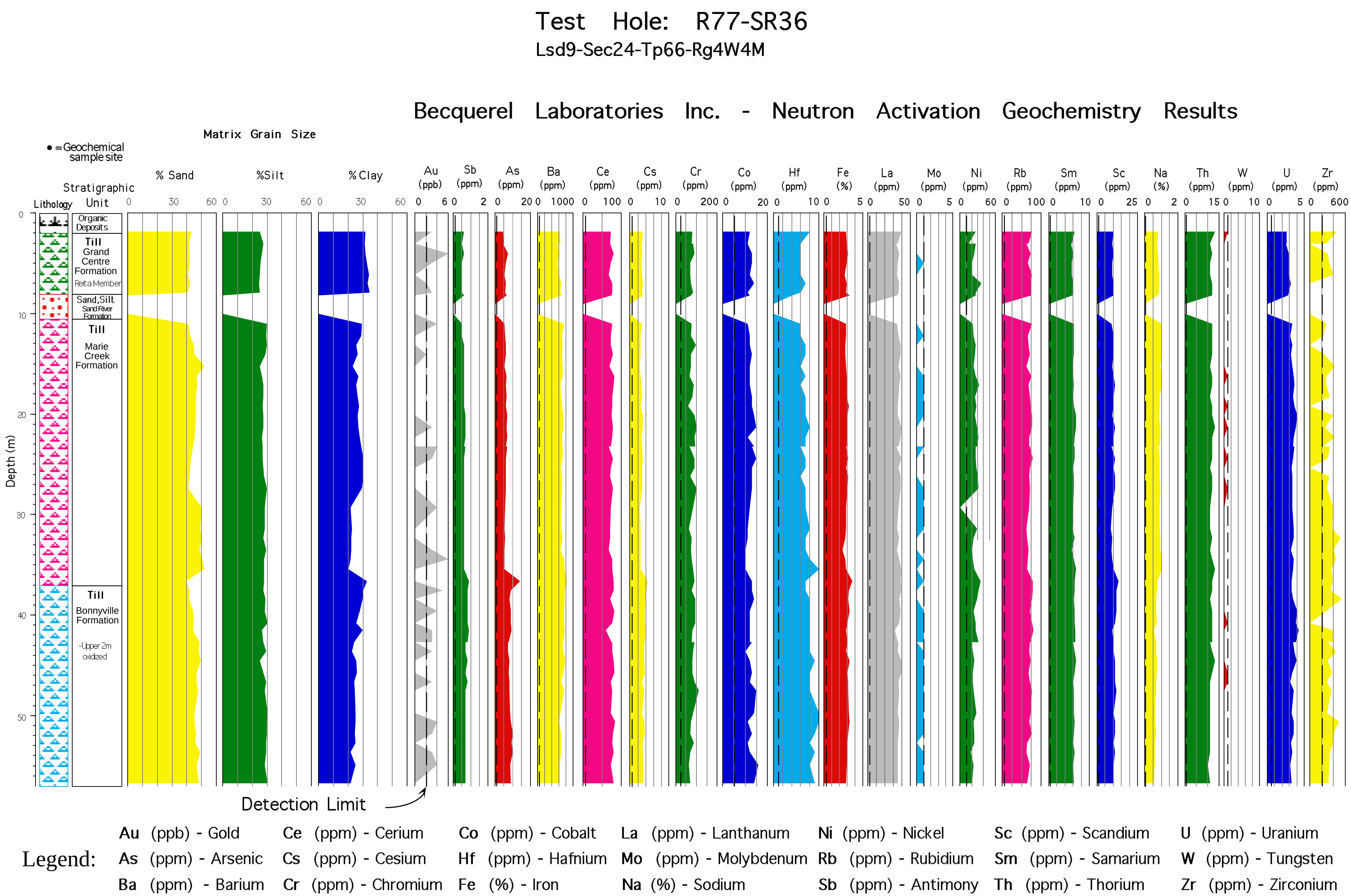


Figure 6ii: Grain-size distribution and geochemistry of Quaternary glacial and Cretaceous bedrock sediments, testhole R77SR-36, Cold Lake area.

SRT16 show a gradual increase with depth, even though at this site the Bonnyville till is the most sandy and least clayey.

Other Indicative Elements

In addition to arsenic, there are a number of other elements which show differences between glacial and bedrock sediment. barium (NA), cesium (NA), lead (NA, AA), lithium (AA), rubidium (NA), scandium (NA), vanadium (AA), and zinc (AA) all show patterns similar to those of arsenic in that concentrations increase in claystone of the Lea Park Formation (Figure 2, testhole SRT16, and Figure 5, testhole SRT58). Of these, vanadium appears to most closely match the arsenic trends.

Conversely, there are a suite of elements which show mirror images to that of arsenic, that is, their values are higher in the drift than in the bedrock. These include cerium (NA), sodium (NA), hafnium (NA), and particularly manganese (AA) (Figure 2, SRT16). Sodium values appear anomalous in that one might expect sodium to be higher in marine claystone than in glacial sediments.

Summary

Arsenic is present in concentrations of parts per million in both glacial and bedrock sediments. Samples from one testhole, SRT16, indicate that arsenic values in the silt-clay fraction of Lea Park Fm. claystone are about twice that of the overlying tills. Arsenic values also appear to be slightly higher in the Bonnyville till, compared to other tills. A suite of other metals show similar patterns as arsenic in that they are also higher in the claystone. These include barium, cesium, lead, lithium, rubidium, scandium, vanadium, and zinc. Elements which show higher concentrations in the glacial sediments include cerium, sodium, hafnium, and manganese. No inferences are made as to what the chemistry values might be from groundwater sampled at respective depths in these units.

References

Andriashek, L.D. And M.M. Fenton, 1989: Quaternary stratigraphy and surficial geology of the Sand River area 73L. Alberta Geological Survey Bulletin 57, 154 pages.

Appendix 1. Geochemistry data from Becquerel Laboratories - Instrumental Neutron Activation Analysis (NA) Method

Appendix 1: Becquerel Laboratory Inc. Geochemistry Data

Testhole	Sratigraphic Unit	Depth (m)	Wt	Au	Sb	As	Ba	Br	Cd	Ce	Cs	Cr	Co	Eu	Hf	Ir	Fe	La	Lu
			grams	ppb	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppb	%	ppm	ppm
"<" values denote that the values are below the detection limit for that element																			Note
SRT-16	Grand Centre	0.9	29.15	6	0.6	7.5	820	3.3	<5	89	3.8	110	12	1	6	<50	3.3	38	<0.2
SRT-16	Grand Centre	0.9	28.48	<2	0.6	7.5	730	3.3	<5	88	3.0	99	12	<1	7	<50	3.1	40	0.3
SRT-16	Grand Centre	1.8	29.93	<2	0.6	6.0	670	1.2	<5	80	3.1	69	12	1	7	<50	3.0	37	0.3
SRT-16	Marie Creek	3.7	30.05	2	0.6	6.4	680	1.5	<5	88	2.6	89	11	<1	7	<50	2.8	35	0.3
SRT-16	Marie Creek	4.4	30.20	<2	0.5	5.4	660	1.7	<5	75	2.2	70	10	1	7	<50	2.5	33	0.3
SRT-16	Marie Creek	4.9	28.36	<2	0.5	5.2	630	1.4	<5	79	2.6	81	11	<1	7	<50	2.5	32	<0.2
SRT-16	Marie Creek	6.1	28.58	<2	0.5	5.3	660	1.6	<5	77	2.8	93	11	1	6	<50	2.7	37	<0.2
SRT-16	Marie Creek	7.0	28.63	4	0.5	5.0	630	1.4	<5	72	2.7	72	12	<1	6	<50	2.7	34	0.2
SRT-16	Marie Creek	7.9	29.34	<2	0.5	5.3	610	1.4	<5	70	2.4	63	13	1	6	<50	2.4	33	<0.2
SRT-16	Marie Creek	9.1	17.83	3	0.5	4.2	570	1.2	<5	80	2.9	77	9	<1	5	<50	3.1	33	<0.2
SRT-16	Marie Creek	10.1	29.93	3	0.7	6.0	760	2.0	<5	76	3.3	80	12	<1	6	<50	3.0	32	<0.2
SRT-16	Marie Creek	11.0	30.27	<2	0.5	5.1	640	1.7	<5	80	2.5	100	11	1	7	<50	2.9	35	<0.2
SRT-16	Marie Creek	12.2	29.59	<2	0.7	7.0	680	1.9	<5	78	3.3	83	12	1	6	<50	2.8	34	0.2
SRT-16	Marie Creek	13.1	28.70	<2	0.7	7.8	670	1.7	<5	84	3.6	82	12	1	5	<50	3.0	35	<0.2
SRT-16	Marie Creek	14.0	30.32	3	0.7	7.0	720	2.0	<5	81	3.4	100	16	1	5	<50	3.1	35	0.2
SRT-16	Bonnyville	16.2	28.93	<2	0.6	6.6	680	1.7	<5	81	2.9	80	9	1	7	<50	2.7	33	0.2
SRT-16	Bonnyville	17.1	29.46	<2	0.6	6.4	710	1.8	<5	71	3.0	96	12	1	7	<50	2.5	32	<0.2
SRT-16	Bonnyville	18.3	29.43	4	0.7	7.2	670	1.4	<5	73	2.9	70	13	<1	7	<50	2.5	32	<0.2
SRT-16	Bonnyville	19.2	29.27	<2	0.8	8.3	780	1.7	<5	87	2.9	110	12	1	7	<50	2.7	35	<0.2
SRT-16	Bonnyville	20.1	29.39	<2	0.8	8.7	700	1.5	<5	69	3.7	74	13	<1	6	<50	2.9	28	<0.2
SRT-16	Bonnyville	20.1	28.34	<2	0.8	8.4	770	1.5	<5	73	3.2	94	11	<1	7	<50	2.6	31	<0.2
SRT-16	Bonnyville	23.2	30.02	4	1.1	8.6	840	2.1	<5	87	3.7	96	11	<1	8	<50	3.0	37	<0.2
SRT-16	Bonnyville	24.4	28.30	<2	1.1	14.0	880	1.3	<5	67	5.3	97	12	<1	4	<50	3.8	29	<0.2
SRT-16	Lea Park	25.3	29.22	<2	1.0	8.4	920	1.9	<5	60	6.4	100	13	1	4	<50	3.4	28	0.3
SRT-16	Lea Park	26.2	28.71	3	1.1	20.0	880	1.5	<5	63	6.9	140	13	<1	2	<50	3.2	28	<0.2
SRT-16	Lea Park	27.4	30.57	<2	1.1	18.0	960	1.2	<5	74	6.3	110	11	1	5	<50	3.5	31	0.2
SRT-16	Lea Park	28.3	29.69	4	1.1	17.0	970	1.8	<5	65	6.4	100	11	<1	4	<50	2.9	30	0.3
SRT-16	Lea Park	29.3	29.72	<2	1.1	17.0	930	1.6	<5	67	6.7	97	10	1	4	<50	3.2	28	0.3
SRT-16	Lea Park	30.5	29.39	<2	1.0	20.0	910	1.6	<5	70	6.5	90	13	1	4	<50	2.5	29	<0.2
SRT-16	Lea Park	31.4	29.51	7	1.1	14.0	920	1.6	<5	63	6.2	94	13	1	2	<50	4.3	25	<0.2
SRT-16	Lea Park	32.0	29.13	5	1.1	14.0	950	1.8	<5	65	5.8	77	13	<1	3	<50	3.7	21	<0.2
SRT-22	Marie Creek	20.0	30.15	<2	0.5	4.3	650	1.3	<5	63	3.0	63	11	1	6	<50	2.5	33	<0.2
SRT-22	Marie Creek	21.0	29.90	5	0.4	4.3	610	1.4	<5	80	2.8	81	12	1	6	<50	2.6	35	<0.2
SRT-22	Marie Creek	22.0	30.18	<2	0.4	4.7	640	1.5	<5	83	2.5	67	13	<1	6	<50	2.9	36	<0.2
SRT-22	Marie Creek	23.0	29.91	6	0.4	4.2	640	1.6	<5	92	2.6	80	11	1	6	<50	2.7	37	0.2
SRT-22	Marie Creek	24.0	29.69	5	0.4	4.6	610	1.5	<5	88	2.5	71	14	<1	6	<50	2.6	36	0.2
SRT-22	Marie Creek	25.0	29.12	<2	0.4	4.1	650	1.3	<5	88	2.5	86	10	1	6	<50	2.6	34	<0.2
SRT-22	Marie Creek	25.0	28.85	5	0.4	4.2	700	1.5	<5	77	3.4	76	11	1	6	<50	2.6	36	<0.2
SRT-22	Marie Creek	26.0	19.54	<2	0.3	3.2	630	1.2	<5	79	1.8	75	12	1	6	<50	2.5	29	<0.2
SRT-22	Marie Creek	27.0	28.95	<2	0.3	3.3	690	0.7	<5	76	2.0	81	13	<1	7	<50	2.7	33	<0.2
SRT-22	Marie Creek	28.0	30.11	2	0.4	4.4	650	1.4	<5	66	2.1	81	10	<1	5	<50	2.3	28	<0.2
SRT-22	Marie Creek	29.0	29.69	<2	0.5	5.2	700	1.5	<5	75	2.6	110	11	1	7	<50	2.6	32	<0.2
SRT-22	Marie Creek	30.0	29.80	3	0.5	4.8	670	1.3	<5	75	1.9	71	11	<1	7	<50	2.6	32	<0.2
SRT-22	Marie Creek	31.0	29.62	4	0.4	4.0	660	1.3	<5	77	2.4	71	12	1	7	<50	2.4	32	<0.2
SRT-22	Marie Creek	32.0	29.46	<2	0.5	4.9	700	1.4	<5	80	2.2	73	11	<1	6	<50	2.5	31	<0.2
SRT-22	Marie Creek	33.0	30.00	<2	0.5	4.8	610	1.4	<5	73	2.2	76	10	1	7	<50	2.3	32	0.3
SRT-22	Marie Creek	34.0	28.56	3	0.5	4.3	650	1.1	<5	64	1.8	62	7	1	6	<50	2.0	26	<0.2
SRT-22	Marie Creek	35.0	28.76	4	0.6	5.5	660	1.4	<5	71	2.9	57	13	1	6	<50	2.3	31	<0.2
SRT-22	Marie Creek	36.0	29.86	<2	0.6	5.9	650	1.3	<5	77	2.8	69	11	<1	6	<50	2.5	29	<0.2
SRT-22	Marie Creek	37.0	29.45	<2	0.6	6.7	680	1.6	<5	67	2.8	78	11	1	7	<50	2.4	30	<0.2
SRT-22	Marie Creek	38.0	29.64	4	0.6	7.1	750	1.1	<5	59	2.7	59	11	1	8	<50	2.4	30	<0.2
SRT-22	Marie Creek	39.0	29.56	<2	0.6	6.5	740	1.5	<5	76	2.8	87	13	1	7	<50	2.5	32	0.2
SRT-22	Marie Creek	40.0	29.30	<2	0.6	6.1	740	1.4	<5	78	2.8	71	10	<1	7	<50	2.2	31	<0.2
SRT-22	Marie Creek	41.0	29.61	5	0.6	6.7	690	1.5	<5	79	2.7	55	7	1	7	<50	2.3	32	<0.2
SRT-22	Marie Creek	42.0	29.21	6	0.6	6.6	750	1.0	<5	72	3.1	77	12	<1	8	<50	2.7	33	0.3
SRT-22	Marie Creek	43.0	29.14	<2	0.7	7.2	710	1.5	<5	71	3.3	79	12	1	8	<50	2.6	33	<0.2

Appendix 1: Becquerel Laboratory Inc. Geochemistry Data

Testhole	Sratigraphic Unit	Depth (m)	Wt	Au	Sb	As	Ba	Br	Cd	Ce	Cs	Cr	Co	Eu	Hf	Ir	Fe	La	Lu
			grams	ppb	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppb	%	ppm	ppm
"<" values denote that the values are below the detection limit for that element																			Note
SRT-22	Bonnyville	44.0	29.71	<2	0.8	7.4	650	1.3	<5	81	3.1	82	12	1	8	<50	2.6	33	<0.2
SRT-22	Bonnyville	45.0	29.29	<2	0.7	6.6	670	1.0	<5	77	3.2	86	11	<1	8	<50	2.5	32	0.2
SRT-22	Bonnyville	46.0	24.79	<2	0.6	6.3	630	1.1	<5	76	2.7	70	8	1	7	<50	2.3	29	<0.2
SRT-22	Bonnyville	48.0	29.31	7	0.9	7.3	680	2.0	<5	81	3.9	96	12	<1	6	<50	2.7	31	<0.2
SRT-22	Bonnyville	49.0	29.34	4	1.0	8.4	770	1.9	<5	67	4.1	75	15	1	7	<50	3.1	33	<0.2
SRT-22	Bonnyville	50.0	29.80	5	0.9	8.5	1600	2.2	<5	72	3.4	88	15	<1	7	<50	2.9	37	<0.2
SRT-22	Bonnyville	51.0	28.71	3	0.9	8.6	770	2.2	<5	70	3.8	89	12	<1	7	<50	3.1	37	<0.2
SRT-22	Bonnyville	52.0	29.32	<2	1.0	8.7	760	2.1	<5	74	3.6	86	12	1	7	<50	3.0	36	<0.2
SRT-22	Bonnyville	53.0	29.12	5	0.8	7.9	720	1.3	<5	70	3.8	77	12	<1	7	<50	3.0	35	<0.2
SRT-22	Bonnyville	54.0	29.40	4	0.7	7.0	720	1.3	<5	71	3.8	82	13	1	7	<50	3.0	34	<0.2
SRT-27	Grand Centre Reita Mem.	0.9	29.56	<2	0.5	5.5	580	3.5	<5	72	2.9	73	12	1	6	<50	2.7	32	<0.2
SRT-27	Grand Centre Reita Mem.	1.8	29.81	<2	0.5	5.8	650	2.1	<5	73	3.4	84	11	1	6	<50	2.8	37	<0.2
SRT-27	Grand Centre Reita Mem.	3.0	29.88	<2	0.6	6.7	650	1.4	<5	80	3.4	64	12	1	6	<50	3.0	36	<0.2
SRT-27	Grand Centre Hilda Mem	6.1	29.74	<2	0.6	6.8	670	1.4	<5	66	3.2	75	10	1	6	<50	3.0	33	<0.2
SRT-27	Grand Centre Hilda Mem	7.0	29.51	4	0.6	6.6	730	1.1	<5	77	3.4	70	14	1	6	<50	3.2	38	<0.2
SRT-27	Grand Centre Hilda Mem	7.9	29.58	<2	0.6	7.4	690	1.4	<5	76	3.5	67	13	1	6	<50	3.1	39	<0.2
SRT-27	Grand Centre Hilda Mem	9.1	30.11	<2	0.6	6.6	670	1.1	<5	76	3.7	100	12	1	6	<50	2.9	38	<0.2
SRT-27	Grand Centre Hilda Mem	10.1	29.65	<2	0.6	6.5	680	1.4	<5	77	2.8	63	12	1	7	<50	2.8	35	<0.2
SRT-27	Grand Centre Hilda Mem	11.0	29.46	2	0.6	5.6	640	1.6	<5	74	3.3	94	13	<1	5	<50	3.1	37	<0.2
SRT-27	Grand Centre Hilda Mem	12.2	29.59	<2	0.5	3.8	690	1.4	<5	79	2.7	110	11	<1	8	<50	2.9	39	<0.2
SRT-27	Grand Centre Hilda Mem	12.2	30.76	2	0.5	4.2	730	1.4	<5	82	3.0	82	14	<1	8	<50	3.0	39	<0.2
SRT-27	Grand Centre Hilda Mem	14.0	30.27	<2	0.4	4.7	620	1.1	<5	79	3.1	88	10	1	7	<50	3.1	38	<0.2
SRT-27	Marie Creek	24.4	30.68	<2	0.5	4.6	620	1.6	<5	72	2.6	63	12	1	7	<50	2.9	32	<0.2
SRT-27	Marie Creek	25.3	29.78	<2	0.5	5.1	670	2.1	<5	62	2.8	81	12	1	6	<50	2.7	33	<0.2
SRT-27	Marie Creek	26.2	30.32	<2	0.5	5.5	680	1.8	<5	77	2.9	84	12	2	6	<50	3.0	37	<0.2
SRT-27	Marie Creek	27.4	29.82	3	0.5	5.4	670	1.9	<5	78	3.0	77	12	<1	7	<50	3.0	37	<0.2
SRT-27	Bonnyville	28.3	30.59	<2	0.5	5.2	640	1.9	<5	74	2.8	75	12	1	7	<50	2.8	36	<0.2
SRT-27	Bonnyville	29.9	30.11	3	0.6	6.4	660	1.7	<5	81	2.8	92	15	<1	7	<50	3.1	39	<0.2
SRT-27	Bonnyville	31.4	30.35	3	0.6	7.0	680	1.7	<5	80	3.1	89	14	1	7	<50	3.0	39	<0.2
SRT-27	Bonnyville	32.3	30.65	<2	0.8	7.8	760	1.8	<5	84	3.3	85	14	1	8	<50	3.0	40	<0.2
SRT-27	Bonnyville	33.5	30.4	4.0	0.7	7.5	730.0	1.7	<5	80.0	3.0	95.0	14.0	<1	7.0	<50	3.0	40.0	<0.2
SRT-27	Bonnyville	34.4	30.58	<2	0.7	7.5	690	1.6	<5	70	3.3	77	13	<1	6	<50	3.2	37	<0.2
SRT-58	Grand Centre Hilda Mem	0.9	30.54	<2	0.7	7.5	680	1.2	<5	73	3.2	63	12	<1	8	<50	3.0	36	<0.2
SRT-58	Grand Centre Hilda Mem	1.8	30.33	4	0.8	8.5	760	2.3	<5	75	3.2	74	13	<1	9	<50	3.0	36	<0.2
SRT-58	Grand Centre Hilda Mem	3.0	30.51	<2	0.8	7.3	740	2.4	<5	77	3.1	100	11	<1	8	<50	3.2	41	<0.2
SRT-58	Grand Centre Hilda Mem	4.0	30.67	<2	0.7	7.3	770	2.3	<5	84	3.3	73	11	<1	8	<50	3.2	41	<0.2
SRT-58	Grand Centre Hilda Mem	5.2	29.87	7	0.7	6.9	720	1.6	<5	88	2.8	87	13	1	10	<50	3.1	42	<0.2
SRT-58	Grand Centre Hilda Mem	6.1	30.00	3	0.8	7.0	750	2.1	<5	91	2.8	85	13	<1	8	<50	3.1	43	<0.2
SRT-58	Grand Centre Hilda Mem	7.0	30.48	<2	0.7	6.2	730	1.8	<5	86	2.8	75	10	1	8	<50	2.8	42	<0.2
SRT-58	Grand Centre Hilda Mem	7.0	28.56	<2	0.7	6.4	720	1.9	<5	77	2.5	63	12	1	7	<50	3.0	38	<0.2
SRT-58	Grand Centre Hilda Mem	7.9	30.57	3	0.7	8.4	730	1.9	<5	94	2.6	77	12	1	8	<50	3.1	44	<0.2
SRT-58	Grand Centre Hilda Mem	9.1	28.43	<2	1.0	10.0	750	1.8	<5	78	4.2	81	13	1	6	<50	3.4	38	<0.2
SRT-58	Grand Centre Hilda Mem	10.1	28.61	5	1.0	8.1	680	1.8	<5	78	3.8	76	16	1	6	<50	3.2	37	<0.2
SRT-58	Grand Centre Hilda Mem	11.0	29.72	<2	0.9	9.2	660	1.8	<5	77	4.0	86	14	1	7	<50	3.3	35	<0.2
SRT-58	Grand Centre Hilda Mem	14.0	29.74	4	1.3	7.5	800	2.2	<5	61	4.2	96	13	<1	7	<50	3.2	35	<0.2
SRT-58	Grand Centre Hilda Mem	15.2	30.17	<2	1.1	10.0	700	1.2	<5	78	4.4	92	12	1	7	<50	3.7	39	<0.2
SRT-58	Grand Centre Hilda Mem	18.3	29.81	<2	1.2	17.0	1100	1.9	<5	65	7.0	140	15	1	4	<50	4.6	34	<0.2
SRT-58	Grand Centre Hilda Mem	21.3	30.09	3	0.9	11.0	860	2.2	<5	74	4.8	96	14	1	6	<50	3.4	38	<0.2
SRT-58	Grand Centre Hilda Mem	22.3	29.91	4	0.9	12.0	840	1.9	<5	66	4.7	86	15	1	5	<50	3.5	35	<0.2
SRT-58	Grand Centre Hilda Mem	23.2	30.04	3	1.0	12.0	840	1.8	<5	71	4.3	92	15	1	6	<50	3.4	36	<0.2
SRT-58	Grand Centre Hilda Mem	24.4	30.69	<2	1.1	14.0	940	1.7	<5	76	5.3	92	14	<1	5	<50	3.4	35	<0.2
SRT-58	Grand Centre Hilda Mem	25.3	30.16	<2	0.9	12.0	810	1.6	<5	66	4.2	100	13	<1	6	<50	3.2	34	<0.2
SRT-58	Grand Centre Hilda Mem	26.2	30.18	3	0.8	9.5	710	1.7	<5	71	4.3	87	14	1	6	<50	3.2	36	<0.2
SRT-58	Marie Creek	27.4	29.94	4	0.9	9.4	820	1.4	<5	77	3.6	93	12	1	7	<50	3.3	37	<0.2
SRT-58	Marie Creek	28.3	30.22	3	1.0	11.0	850	1.7	<5	61	4.6	80	12	<1	6	<50	3.1	32	<0.2

Appendix 1: Becquerel Laboratory Inc. Geochemistry Data

Testhole	Sratigraphic Unit	Depth (m)	Wt	Au	Sb	As	Ba	Br	Cd	Ce	Cs	Cr	Co	Eu	Hf	Ir	Fe	La	Lu
			grams	ppb	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppb	%	ppm	ppm
"<" values denote that the values are below the detection limit for that element																			Note
SRT-58	Marie Creek	29.3	30.56	<2	0.6	6.0	670	1.9	<5	79	3.2	75	12	1	7	<50	2.9	37	<0.2
SRT-58	Marie Creek	30.5	30.68	3	0.8	8.1	750	1.9	<5	80	3.3	87	14	1	8	<50	3.0	40	<0.2
SRT-58	Marie Creek	31.4	29.83	7	0.8	7.8	710	1.9	<5	86	3.4	89	11	1	7	<50	3.0	39	<0.2
SRT-58	Marie Creek	32.6	29.42	<2	0.8	8.4	750	1.8	<5	78	3.2	93	11	1	7	<50	3.0	39	<0.2
SRT-58	Marie Creek	32.6	29.54	5	0.8	8.0	710	2.0	<5	77	3.5	64	12	2	7	<50	3.0	35	<0.2
SRT-58	Marie Creek	33.5	29.86	<2	0.7	8.1	730	1.7	<5	75	2.8	97	13	<1	8	<50	3.0	40	<0.2
SRT-58	Marie Creek	34.4	29.16	5	0.7	7.0	700	1.6	<5	74	3.1	150	13	<1	7	<50	3.0	37	<0.2
SRT-58	Bonnyville	35.4	30.62	<2	0.7	7.5	730	1.7	<5	74	2.3	81	11	2	7	<50	3.1	37	<0.2
SRT-58	Bonnyville	36.6	30.49	<2	0.8	8.4	810	2.1	<5	70	3.5	74	11	1	8	<50	3.0	34	<0.2
SRT-58	Bonnyville	37.5	30.38	3	0.8	8.1	750	2.1	<5	71	3.3	71	12	1	7	<50	2.8	37	<0.2
SRT-58	Bonnyville	38.4	28.58	<2	0.8	8.4	800	1.9	<5	77	3.0	74	14	<1	8	<50	2.5	36	<0.2
SRT-58	Bonnyville	39.6	30.65	<2	0.8	8.0	740	1.8	<5	70	2.8	95	14	1	8	<50	2.7	35	<0.2
SRT-58	Bonnyville	40.5	30.23	3	0.8	8.2	750	2.0	<5	71	2.8	79	12	1	8	<50	2.8	37	<0.2
SRT-58	Bonnyville	41.5	30.20	3	0.8	8.2	810	2.0	<5	75	3.2	93	13	1	9	<50	3.0	39	<0.2
SRT-58	Bonnyville	42.7	29.99	4	0.8	8.0	710	1.8	<5	76	3.3	82	12	1	8	<50	2.9	38	<0.2
SRT-58	Bonnyville	43.6	30.88	<2	0.8	8.0	720	1.9	<5	80	3.0	95	13	1	8	<50	2.7	39	<0.2
SRT-58	Bonnyville	44.5	30.24	3	0.7	7.0	720	1.9	<5	75	3.1	90	12	1	7	<50	2.9	35	<0.2
SRT-58	Bonnyville	45.7	30.35	2	0.8	8.0	720	2.0	<5	79	3.3	80	12	<1	8	<50	3.2	38	<0.2
SRT-58	Bonnyville	46.6	30.20	<2	0.8	8.1	740	2.0	<5	69	2.7	93	13	1	7	<50	2.9	35	<0.2
SRT-58	Bonnyville	47.5	29.37	3	0.8	7.1	710	1.8	<5	75	3.0	80	11	1	8	<50	2.9	33	<0.2
R77-SR36	Grand Centre Reita Mem.	1.8	29.55	3	0.6	4.4	620	1.6	<5	73	3.2	81	12	1	8	<50	2.8	39	<0.2
R77-SR36	Grand Centre Reita Mem.	3.0	29.51	<2	0.5	4.8	630	1.1	<5	71	3.1	77	11	1	6	<50	2.9	35	<0.2
R77-SR36	Grand Centre Reita Mem.	3.0	28.53	<2	0.5	4.3	550	1.3	<5	70	2.9	83	11	1	6	<50	2.9	33	<0.2
R77-SR36	Grand Centre Reita Mem.	4.0	30.69	6	0.6	7.3	620	1.3	<5	79	3.1	90	13	1	6	<50	3.1	37	<0.2
R77-SR36	Grand Centre Reita Mem.	4.9	29.68	3	0.5	6.2	560	1.6	<5	73	2.9	69	13	1	6	<50	2.9	35	<0.2
R77-SR36	Grand Centre Reita Mem.	6.1	33.60	<2	0.5	5.2	590	1.4	<5	66	3.0	69	12	<1	6	<50	2.6	34	<0.2
R77-SR36	Grand Centre Reita Mem.	7.0	29.81	2	0.5	6.1	650	1.6	<5	76	3.2	74	14	<1	7	<50	2.9	37	<0.2
R77-SR36	Grand Centre Reita Mem.	7.9	29.51	3	0.5	5.6	630	1.6	<5	75	3.1	83	11	1	6	<50	2.8	36	<0.2
R77-SR36	Grand Centre Reita Mem.	8.2	30.33	<2	0.6	6.6	670	1.6	<5	74	3.5	71	12	<1	4	<50	3.3	34	<0.2
R77-SR36	Marie Creek	11.0	29.83	4	0.5	5.2	730	1.9	<5	75	3.0	76	11	<1	6	<50	2.8	34	<0.2
R77-SR36	Marie Creek	12.2	29.87	<2	0.5	5.6	680	1.8	<5	72	2.8	74	12	1	6	<50	2.8	36	<0.2
R77-SR36	Marie Creek	13.1	29.46	<2	0.6	6.1	700	2.0	<5	72	2.8	95	12	1	7	<50	2.7	38	<0.2
R77-SR36	Marie Creek	14.0	30.05	2	0.6	6.1	680	2.1	<5	77	2.7	71	13	<1	7	<50	2.7	38	<0.2
R77-SR36	Marie Creek	15.2	30.31	<2	0.6	5.3	690	1.6	<5	68	2.6	71	12	<1	6	<50	2.8	36	<0.2
R77-SR36	Marie Creek	16.2	29.33	<2	0.6	6.3	690	2.0	<5	81	2.8	67	12	<1	7	<50	2.9	38	<0.2
R77-SR36	Marie Creek	17.1	29.74	<2	0.6	5.9	640	1.6	<5	79	2.9	85	12	<1	6	<50	2.9	37	<0.2
R77-SR36	Marie Creek	18.3	30.01	<2	0.6	6.3	660	1.6	<5	75	3.0	81	13	<1	7	<50	2.9	36	<0.2
R77-SR36	Marie Creek	19.2	29.75	<2	0.6	6.1	670	1.9	<5	76	2.7	60	13	1	7	<50	3.2	35	<0.2
R77-SR36	Marie Creek	20.1	29.72	<2	0.7	6.9	720	1.7	<5	74	3.3	89	14	1	7	<50	3.0	35	<0.2
R77-SR36	Marie Creek	21.3	29.16	3	0.7	6.5	720	1.9	<5	77	3.3	99	15	1	8	<50	3.0	39	<0.2
R77-SR36	Marie Creek	22.3	29.72	<2	0.7	6.7	670	2.0	<5	76	2.9	88	11	<1	7	<50	3.0	38	<0.2
R77-SR36	Marie Creek	23.2	29.06	<2	0.6	6.1	690	1.6	<5	73	3.1	93	14	1	7	<50	3.0	36	<0.2
R77-SR36	Marie Creek	23.2	29.20	4	0.7	6.8	700	1.6	<5	66	3.1	67	13	1	6	<50	2.8	33	<0.2
R77-SR36	Marie Creek	24.4	28.77	3	0.6	6.1	690	1.9	<5	77	3.3	91	15	1	7	<50	3.1	39	<0.2
R77-SR36	Marie Creek	25.3	29.21	<2	0.6	5.8	630	1.5	<5	73	3.0	88	13	1	7	<50	2.8	36	<0.2
R77-SR36	Marie Creek	26.2	29.67	<2	0.6	5.9	670	1.5	<5	71	3.1	69	13	1	6	<50	3.1	38	<0.2
R77-SR36	Marie Creek	27.4	29.85	<2	0.6	5.8	680	1.5	<5	78	3.1	100	13	<1	7	<50	3.0	38	<0.2
R77-SR36	Marie Creek	29.3	28.65	4	0.6	5.6	650	1.7	<5	72	2.5	84	12	1	7	<50	2.8	36	<0.2
R77-SR36	Marie Creek	31.4	31.19	<2	0.6	5.1	660	1.7	<5	71	2.8	63	11	1	8	<50	2.8	34	<0.2
R77-SR36	Marie Creek	32.3	29.99	<2	0.6	5.5	700	1.8	<5	71	2.8	77	11	<1	7	<50	2.7	37	<0.2
R77-SR36	Marie Creek	33.5	29.58	3	0.6	5.1	640	1.7	<5	66	2.7	72	10	1	7	<50	2.4	34	<0.2
R77-SR36	Marie Creek	34.4	29.71	6	0.6	5.2	740	1.8	<5	76	2.7	75	10	<1	8	<50	2.7	37	<0.2
R77-SR36	Marie Creek	35.4	30.23	<2	0.6	5.0	750	1.6	<5	75	2.8	83	10	1	10	<50	2.8	39	<0.2
R77-SR36	Marie Creek	36.6	29.98	<2	0.9	14.0	810	1.1	<5	80	4.6	91	13	1	7	<50	3.6	38	0.2
R77-SR36	Bonnyville	37.5	29.33	5	0.8	8.8	750	1.2	<5	79	4.2	77	13	1	7	<50	3.2	39	<0.2
R77-SR36	Bonnyville	38.4	28.42	<2	0.8	8.1	760	1.2	<5	71	4.0	92	14	1	8	<50	3.1	37	<0.2

Appendix 1: Becquerel Laboratory Inc. Geochemistry Data

Testhole	Sratigraphic Unit	Depth (m)	Wt	Au	Sb	As	Ba	Br	Cd	Ce	Cs	Cr	Co	Eu	Hf	Ir	Fe	La	Lu
			grams	ppb	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppb	%	ppm	ppm
"<" values denote that the values are below the detection limit for that element																			Note
R77-SR36	Bonnyville	39.6	30.32	4	0.8	8.8	730	1.4	<5	82	3.9	94	12	1	8	<50	3.3	38	<0.2
R77-SR36	Bonnyville	40.8	29.39	<2	0.8	8.7	740	1.3	<5	75	3.9	92	12	1	8	<50	3.0	37	<0.2
R77-SR36	Bonnyville	41.5	29.83	3	0.9	9.1	750	1.4	<5	59	4.0	81	12	<1	8	<50	2.8	32	<0.2
R77-SR36	Bonnyville	42.7	30.78	3	0.8	7.7	720	1.3	<5	74	3.8	77	12	1	8	<50	3.0	35	<0.2
R77-SR36	Bonnyville	43.6	30.47	3	0.7	7.1	720	1.0	<5	76	3.6	83	10	1	8	<50	2.8	35	<0.2
R77-SR36	Bonnyville	44.5	30.08	<2	0.8	8.0	770	1.3	<5	80	3.7	81	12	1	9	<50	3.3	39	0.2
R77-SR36	Bonnyville	45.7	29.64	<2	0.7	7.6	720	1.2	<5	82	3.8	80	13	1	8	<50	3.0	39	0.2
R77-SR36	Bonnyville	46.6	30.35	3	0.8	8.2	660	1.3	<5	72	3.1	89	12	1	8	<50	3.1	36	0.2
R77-SR36	Bonnyville	47.5	29.46	<2	0.7	7.9	730	1.3	<5	75	3.6	110	15	<1	8	<50	3.1	37	<0.2
R77-SR36	Bonnyville	42.7	29.64	<2	0.7	7.2	690	1.1	<5	75	3.6	91	13	1	8	<50	3.0	36	<0.2
R77-SR36	Bonnyville	49.7	29.85	<2	0.7	8.5	640	1.1	<5	73	3.1	82	14	1	10	<50	3.2	35	<0.2
R77-SR36	Bonnyville	50.6	30.02	4	0.7	8.9	590	0.9	<5	84	3.6	74	11	1	10	<50	3.3	37	0.3
R77-SR36	Bonnyville	51.8	29.53	3	0.7	10.0	660	1.1	<5	78	3.9	70	13	1	9	<50	3.1	36	<0.2
R77-SR36	Bonnyville	52.7	30.02	<2	0.7	9.4	660	1.0	<5	76	3.3	85	11	1	8	<50	3.0	35	<0.2
R77-SR36	Bonnyville	53.6	29.28	3	0.7	10.0	650	1.1	<5	79	3.3	70	12	1	9	<50	3.0	35	<0.2
R77-SR36	Bonnyville	54.9	29.63	4	0.7	8.4	620	1.3	<5	73	3.4	62	16	1	8	<50	2.9	35	<0.2
R77-SR36	Bonnyville	56.7	29.77	<2	0.7	8.7	620	1.3	<5	79	3.5	68	14	1	9	<50	2.8	35	0.3

Appendix 1: Becquerel Laboratory Inc. Geochemistry Data

Testhole	Sratigraphic Unit	Depth (m)	Wt	Mo	Ni	Rb	Sm	Sc	Se	Ag	Na	Ta	Te	Tb	Th	Sn	W	U	Yb	Zn	Zr
			grams	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
! "<" values denote that the values are below the detection limit for that element																					
SRT-16	Grand Centre	0.9	29.15	<1	31	74	8.1	10.0	<5	<2	0.83	1.0	<10	0.7	14.0	<100	2	3.1	1	<100	480
SRT-16	Grand Centre	0.9	28.48	<1	32	72	7.8	11.0	<5	<2	0.88	0.7	<10	1.0	13.0	<100	2	2.8	1	<100	390
SRT-16	Grand Centre	1.8	29.93	<1	32	75	7.1	10.0	<5	<2	0.91	0.6	<10	0.7	13.0	<100	2	2.8	1	<100	260
SRT-16	Marie Creek	3.7	30.05	2	27	61	6.8	10.0	<5	<2	0.87	0.8	<10	0.8	11.0	<100	1	3.0	2	<100	380
SRT-16	Marie Creek	4.4	30.20	1	17	69	6.5	8.8	<5	<2	0.95	0.7	<10	0.7	11.0	<100	<1	3.1	1	<100	410
SRT-16	Marie Creek	4.9	28.36	1	24	67	6.5	9.3	<5	<2	0.88	0.6	<10	0.7	11.0	<100	<1	3.0	1	<100	250
SRT-16	Marie Creek	6.1	28.58	1	48	67	7.0	10.0	<5	<2	0.94	0.8	<10	0.9	12.0	<100	<1	3.3	1	<100	360
SRT-16	Marie Creek	7.0	28.63	<1	37	62	6.5	10.0	<5	<2	0.89	0.5	<10	0.9	11.0	<100	<1	3.3	1	<100	<200
SRT-16	Marie Creek	7.9	29.34	<1	31	67	6.4	9.1	<5	<2	0.87	0.8	<10	0.6	11.0	<100	2	3.5	1	<100	230
SRT-16	Marie Creek	9.1	17.83	<1	35	68	6.8	10.0	<5	<2	0.84	0.8	<10	0.6	12.0	<100	1	4.1	1	<100	400
SRT-16	Marie Creek	10.1	29.93	1	28	72	7.2	9.2	<5	<2	0.75	1.0	<10	0.7	12.0	<100	<1	4.6	1	<100	400
SRT-16	Marie Creek	11.0	30.27	<1	26	69	6.9	10.0	<5	<2	0.85	0.8	<10	0.7	12.0	<100	<1	4.3	1	<100	310
SRT-16	Marie Creek	12.2	29.59	1	25	62	6.7	10.0	<5	<2	0.81	<0.5	<10	0.7	11.0	<100	2	3.8	1	<100	<200
SRT-16	Marie Creek	13.1	28.70	2	19	64	6.8	11.0	<5	<2	0.78	0.7	<10	0.8	11.0	<100	<1	3.7	2	<100	370
SRT-16	Marie Creek	14.0	30.32	1	37	69	6.9	11.0	<5	<2	0.76	0.8	<10	0.9	12.0	<100	<1	3.6	1	<100	<200
SRT-16	Bonnyville	16.2	28.93	2	26	64	6.6	10.0	<5	<2	0.81	0.7	<10	0.9	11.0	<100	1	4.0	1	<100	380
SRT-16	Bonnyville	17.1	29.46	1	21	66	6.6	9.2	<5	<2	0.83	0.7	<10	0.7	11.0	<100	1	4.0	1	<100	250
SRT-16	Bonnyville	18.3	29.43	1	28	64	6.5	9.3	<5	<2	0.80	0.8	<10	0.8	11.0	<100	3	4.2	1	<100	400
SRT-16	Bonnyville	19.2	29.27	3	21	69	6.8	10.0	<5	<2	0.70	0.8	<10	0.8	12.0	<100	6	4.2	2	<100	340
SRT-16	Bonnyville	20.1	29.39	1	26	60	6.3	9.3	<5	<2	0.67	0.8	<10	0.6	10.0	<100	2	4.5	1	<100	330
SRT-16	Bonnyville	20.1	28.34	1	32	64	6.3	10.0	<5	<2	0.68	0.7	<10	0.7	10.0	<100	2	4.6	1	<100	430
SRT-16	Bonnyville	23.2	30.02	2	35	71	8.0	9.0	<5	<2	0.72	0.8	<10	0.8	13.0	<100	1	4.7	1	<100	360
SRT-16	Bonnyville	24.4	28.30	1	28	74	6.1	13.0	<5	<2	0.65	0.8	<10	0.9	10.0	<100	1	4.1	1	<100	<200
SRT-16	Lea Park	25.3	29.22	1	47	84	6.0	15.0	<5	<2	0.54	0.8	<10	0.8	9.0	<100	1	3.4	1	120	220
SRT-16	Lea Park	26.2	28.71	1	44	89	5.7	15.0	<5	<2	0.55	0.6	<10	0.7	9.0	<100	2	3.5	1	100	220
SRT-16	Lea Park	27.4	30.57	2	28	89	6.0	13.0	<5	2	0.46	0.6	<10	0.7	10.0	<100	<1	4.0	1	<100	280
SRT-16	Lea Park	28.3	29.69	1	59	84	5.9	13.0	<5	<2	0.45	1.0	<10	0.7	10.0	<100	1	3.6	1	<100	360
SRT-16	Lea Park	29.3	29.72	1	40	91	5.9	13.0	<5	<2	0.45	0.6	<10	0.7	10.0	<100	1	3.7	2	<100	<200
SRT-16	Lea Park	30.5	29.39	1	27	91	5.9	13.0	<5	2	0.46	0.6	<10	0.8	10.0	<100	2	3.8	2	<100	<200
SRT-16	Lea Park	31.4	29.51	3	43	82	5.4	14.0	<5	<2	0.60	0.6	<10	0.7	8.1	<100	2	3.2	1	<100	<200
SRT-16	Lea Park	32.0	29.13	4	43	80	4.8	12.0	<5	<2	0.56	0.6	<10	0.6	8.2	<100	1	2.7	1	<100	<200
SRT-22	Marie Creek	20.0	30.15	<1	20	74	7.3	8.1	<5	<2	0.74	0.8	<10	0.9	13.0	<100	1	3.9	<1	<100	380
SRT-22	Marie Creek	21.0	29.90	<1	26	64	6.9	9.1	<5	<2	0.91	0.9	<10	0.8	12.0	<100	<1	3.4	1	<100	440
SRT-22	Marie Creek	22.0	30.18	1	26	72	6.9	10.0	<5	<2	0.90	0.8	<10	0.6	11.0	<100	<1	3.8	1	<100	<200
SRT-22	Marie Creek	23.0	29.91	1	23	63	6.9	10.0	<5	<2	0.93	0.7	<10	0.8	13.0	<100	1	3.6	1	<100	250
SRT-22	Marie Creek	24.0	29.69	1	29	69	6.5	10.0	<5	<2	0.92	0.8	<10	0.8	12.0	<100	<1	3.4	1	<100	<200
SRT-22	Marie Creek	25.0	29.12	1	39	63	6.4	9.5	<5	<2	0.90	0.7	<10	0.6	11.0	<100	<1	3.5	1	<100	<200
SRT-22	Marie Creek	25.0	28.85	<1	27	72	7.0	9.5	<5	<2	0.88	0.8	<10	0.8	13.0	<100	<1	3.8	1	<100	230
SRT-22	Marie Creek	26.0	19.54	1	24	59	6.2	9.5	<5	<2	1.30	0.6	<10	0.7	10.0	<100	<1	3.6	1	<100	370
SRT-22	Marie Creek	27.0	28.95	<1	29	54	6.7	10.0	<5	<2	1.20	0.7	<10	0.8	11.0	<100	<1	4.1	1	<100	<200
SRT-22	Marie Creek	28.0	30.11	<1	19	55	5.6	7.6	<5	<2	1.00	0.5	<10	0.6	9.3	<100	<1	3.3	1	<100	350
SRT-22	Marie Creek	29.0	29.69	1	13	64	6.9	9.4	<5	<2	1.00	0.7	<10	0.8	11.0	<100	<1	4.0	1	<100	350
SRT-22	Marie Creek	30.0	29.80	2	22	52	6.8	9.2	<5	<2	1.00	0.9	<10	0.9	11.0	<100	<1	4.4	1	<100	290
SRT-22	Marie Creek	31.0	29.62	1	20	59	6.8	8.8	<5	<2	1.00	0.6	<10	0.8	11.0	<100	<1	3.8	1	<100	400
SRT-22	Marie Creek	32.0	29.46	2	20	61	6.7	9.0	<5	<2	1.00	0.8	<10	0.8	11.0	<100	<1	3.7	1	<100	280
SRT-22	Marie Creek	33.0	30.00	2	19	58	6.6	8.7	<5	<2	0.92	0.6	<10	0.8	11.0	<100	1	3.7	1	<100	310
SRT-22	Marie Creek	34.0	28.56	1	<10	51	5.6	7.0	<5	<2	0.86	0.7	<10	0.7	9.0	<100	<1	3.1	1	<100	<200
SRT-22	Marie Creek	35.0	28.76	2	29	63	6.3	8.5	<5	<2	0.73	0.7	<10	0.7	10.0	<100	1	3.3	1	<100	240
SRT-22	Marie Creek	36.0	29.86	1	25	59	6.1	8.0	<5	<2	0.73	0.5	<10	0.5	10.0	<100	<1	3.6	1	<100	330
SRT-22	Marie Creek	37.0	29.45	1	23	63	6.5	7.9	<5	<2	0.68	0.8	<10	0.8	11.0	<100	<1	3.6	1	<100	440
SRT-22	Marie Creek	38.0	29.64	1	18	69	6.8	7.4	<5	<2	0.72	0.8	<10	0.8	11.0	<100	<1	3.9	1	<100	280
SRT-22	Marie Creek	39.0	29.56	1	29	59	6.7	8.5	<5	<2	0.81	0.8	<10	0.8	11.0	<100	<1	3.6	1	<100	440
SRT-22	Marie Creek	40.0	29.30	1	25	59	6.5	8.1	<5	<2	0.76	0.6	<10	0.8	11.0	<100	<1	3.5	1	<100	300
SRT-22	Marie Creek	41.0	29.61	1	25	60	6.6	8.4	<5	<2	0.77	1.0	<10	0.9	11.0	<100	<1	3.4	1	<100	520
SRT-22	Marie Creek	42.0	29.21	<1	22	67	6.6	10.0	<5	<2	0.62	0.8	<10	0.8	11.0	<100	1	3.5	1	<100	230
SRT-22	Marie Creek	43.0	29.14	<1	26	70	6.6	10.0	<5	<2	0.64	0.7	<10	0.8	11.0	<100	1	3.4	1	<100	290

Appendix 1: Becquerel Laboratory Inc. Geochemistry Data

Testhole	Sratigraphic Unit	Depth (m)	Wt	Mo	Ni	Rb	Sm	Sc	Se	Ag	Na	Ta	Te	Tb	Th	Sn	W	U	Yb	Zn	Zr
			grams	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
! "<" values denote that the values are below the detection limit for that element																					
SRT-22	Bonnyville	44.0	29.71	1	14	65	6.8	9.2	<5	<2	0.62	0.8	<10	0.8	11.0	<100	<1	4.0	1	100	400
SRT-22	Bonnyville	45.0	29.29	<1	35	57	6.7	9.2	<5	<2	0.60	0.8	<10	0.8	11.0	<100	<1	4.1	1	<100	350
SRT-22	Bonnyville	46.0	24.79	2	25	65	6.1	7.9	<5	<2	0.66	0.9	<10	0.8	10.0	<100	1	3.9	1	<100	460
SRT-22	Bonnyville	48.0	29.31	2	47	66	6.6	9.1	<5	<2	0.57	0.8	<10	0.9	11.0	<100	<1	5.3	1	<100	380
SRT-22	Bonnyville	49.0	29.34	2	30	73	6.3	9.4	<5	2	0.64	1.0	<10	1.0	12.0	<100	<1	4.8	1	<100	<200
SRT-22	Bonnyville	50.0	29.80	2	25	81	6.3	10.0	<5	2	0.69	0.8	<10	0.9	12.0	<100	1	4.8	1	<100	270
SRT-22	Bonnyville	51.0	28.71	2	21	73	6.3	10.0	<5	<2	0.68	1.0	<10	0.9	12.0	<100	<1	4.1	1	<100	250
SRT-22	Bonnyville	52.0	29.32	2	23	74	6.2	10.0	<5	<2	0.69	0.7	<10	0.8	12.0	<100	<1	4.5	1	<100	220
SRT-22	Bonnyville	53.0	29.12	1	29	78	6.2	10.0	<5	<2	0.67	1.0	<10	0.8	11.0	<100	<1	4.1	1	110	370
SRT-22	Bonnyville	54.0	29.40	1	21	72	6.0	10.0	<5	<2	0.67	0.9	<10	0.8	11.0	<100	1	4.1	1	<100	370
SRT-27	Grand Centre Reita Mem.	0.9	29.56	1	32	65	5.4	8.6	<5	<2	0.75	0.6	<10	0.7	11.0	<100	<1	2.3	1	<100	300
SRT-27	Grand Centre Reita Mem.	1.8	29.81	<1	22	74	6.1	10.0	<5	<2	0.85	0.9	<10	0.7	12.0	<100	<1	2.6	1	<100	300
SRT-27	Grand Centre Reita Mem.	3.0	29.88	1	36	78	6.0	10.0	<5	<2	0.81	0.8	<10	1.0	12.0	<100	<1	2.5	1	<100	320
SRT-27	Grand Centre Hilda Mem	6.1	29.74	<1	24	80	5.8	9.0	<5	<2	0.76	1.0	<10	0.8	12.0	<100	<1	3.1	1	<100	250
SRT-27	Grand Centre Hilda Mem	7.0	29.51	<1	34	81	6.3	11.0	<5	<2	0.91	1.0	<10	0.7	13.0	<100	<1	3.4	1	<100	400
SRT-27	Grand Centre Hilda Mem	7.9	29.58	<1	25	86	6.2	11.0	<5	<2	0.87	0.8	<10	0.9	12.0	<100	1	3.4	1	120	530
SRT-27	Grand Centre Hilda Mem	9.1	30.11	<1	31	75	6.1	11.0	<5	3	0.87	0.9	<10	1.0	13.0	<100	1	3.3	1	<100	490
SRT-27	Grand Centre Hilda Mem	10.1	29.65	1	27	65	5.9	10.0	<5	<2	1.00	0.9	<10	0.7	11.0	<100	<1	2.8	1	<100	260
SRT-27	Grand Centre Hilda Mem	11.0	29.46	1	35	80	5.9	11.0	5	<2	0.83	0.9	<10	0.6	12.0	<100	<1	3.1	1	<100	220
SRT-27	Grand Centre Hilda Mem	12.2	29.59	<1	23	67	6.2	10.0	<5	<2	1.00	1.0	<10	0.8	13.0	<100	<1	3.2	1	<100	340
SRT-27	Grand Centre Hilda Mem	12.2	30.76	<1	13	77	6.6	10.0	<5	<2	1.00	1.0	<10	0.7	13.0	<100	<1	3.2	1	100	410
SRT-27	Grand Centre Hilda Mem	14.0	30.27	<1	20	85	6.2	10.0	<5	<2	0.88	0.5	<10	0.9	13.0	<100	1	3.6	1	<100	310
SRT-27	Marie Creek	24.4	30.68	<1	22	65	5.7	8.5	<5	<2	0.87	0.9	<10	0.5	11.0	<100	2	3.4	1	<100	270
SRT-27	Marie Creek	25.3	29.78	<1	26	61	6.3	8.9	<5	<2	0.88	0.9	<10	0.8	12.0	<100	1	3.4	1	210	260
SRT-27	Marie Creek	26.2	30.32	1	31	84	6.4	10.0	<5	<2	0.95	1.0	<10	0.7	12.0	<100	1	3.5	1	<100	430
SRT-27	Marie Creek	27.4	29.82	1	22	79	6.2	10.0	<5	<2	0.94	0.9	<10	0.8	12.0	<100	1	3.4	1	<100	430
SRT-27	Bonnyville	28.3	30.59	1	13	75	6.1	10.0	<5	<2	1.00	0.9	<10	0.8	12.0	<100	2	3.4	1	<100	330
SRT-27	Bonnyville	29.9	30.11	1	17	73	6.4	11.0	<5	3	1.00	0.7	<10	0.9	12.0	<100	1	3.4	2	<100	270
SRT-27	Bonnyville	31.4	30.35	1	28	79	6.4	11.0	<5	2	0.93	0.9	<10	0.8	12.0	<100	1	3.7	1	<100	330
SRT-27	Bonnyville	32.3	30.65	1	23	76	6.7	11.0	<5	<2	0.93	0.7	<10	1.0	13.0	<100	2	4.1	2	<100	260
SRT-27	Bonnyville	33.5	30.41	2	15	77.0	6.5	11.0	<5	2	0.9	0.6	<10	1.0	12.0	<100	1	4.1	2	<100	400
SRT-27	Bonnyville	34.4	30.58	<1	28	74	6.0	11.0	<5	<2	0.85	1.1	<10	0.8	12.0	<100	1	3.7	1	<100	260
SRT-58	Grand Centre Hilda Mem	0.9	30.54	1	25	67	6.3	10.0	<5	<2	0.82	0.9	<10	0.8	12.0	<100	<1	3.5	1	<100	320
SRT-58	Grand Centre Hilda Mem	1.8	30.33	1	31	74	7.1	9.3	<5	<2	0.81	0.8	<10	0.9	14.0	<100	<1	4.2	1	<100	480
SRT-58	Grand Centre Hilda Mem	3.0	30.51	1	35	76	6.8	11.0	<5	<2	0.93	1.1	<10	0.9	13.0	<100	1	3.9	2	100	480
SRT-58	Grand Centre Hilda Mem	4.0	30.67	<1	20	75	6.9	11.0	<5	<2	1.00	1.0	<10	0.9	14.0	<100	1	3.9	1	100	290
SRT-58	Grand Centre Hilda Mem	5.2	29.87	1	16	78	7.1	10.0	<5	<2	0.84	1.2	<10	1.0	14.0	<100	1	4.1	2	<100	510
SRT-58	Grand Centre Hilda Mem	6.1	30.00	1	15	73	6.8	10.0	<5	<2	0.86	1.2	<10	0.8	13.0	<100	1	4.1	2	<100	280
SRT-58	Grand Centre Hilda Mem	7.0	30.48	1	26	72	6.7	10.0	<5	<2	0.88	1.0	<10	0.8	14.0	<100	<1	4.3	2	<100	370
SRT-58	Grand Centre Hilda Mem	7.0	28.56	<1	21	76	6.4	8.6	<5	<2	0.79	0.7	<10	0.9	13.0	<100	<1	4.1	1	<100	210
SRT-58	Grand Centre Hilda Mem	7.9	30.57	3	23	79	6.9	10.0	<5	<2	0.94	0.9	<10	0.8	14.0	<100	1	4.4	1	140	240
SRT-58	Grand Centre Hilda Mem	9.1	28.43	2	29	77	6.2	12.0	<5	<2	0.70	0.9	<10	0.8	12.0	<100	1	4.0	1	<100	380
SRT-58	Grand Centre Hilda Mem	10.1	28.61	2	31	72	6.2	11.0	<5	<2	0.67	1.0	<10	0.8	12.0	<100	<1	3.9	1	<100	230
SRT-58	Grand Centre Hilda Mem	11.0	29.72	1	33	78	6.0	10.0	<5	<2	0.65	1.0	<10	0.9	12.0	<100	1	3.9	1	<100	<200
SRT-58	Grand Centre Hilda Mem	14.0	29.74	2	31	65	6.7	9.3	<5	<2	0.57	0.9	<10	0.9	12.0	<100	1	4.0	1	<100	240
SRT-58	Grand Centre Hilda Mem	15.2	30.17	3	30	82	6.9	12.0	<5	<2	0.57	1.3	<10	1.0	13.0	<100	<1	3.7	1	<100	320
SRT-58	Grand Centre Hilda Mem	18.3	29.81	1	42	97	5.7	14.0	<5	<2	0.48	0.7	<10	0.7	11.0	<100	1	3.9	1	150	220
SRT-58	Grand Centre Hilda Mem	21.3	30.09	1	32	84	6.3	12.0	<5	<2	0.80	1.1	<10	0.7	12.0	<100	<1	3.6	1	<100	320
SRT-58	Grand Centre Hilda Mem	22.3	29.91	1	29	87	5.9	12.0	<5	<2	0.80	0.8	<10	0.6	11.0	<100	1	3.5	2	150	310
SRT-58	Grand Centre Hilda Mem	23.2	30.04	2	37	87	6.0	12.0	<5	<2	0.82	0.8	<10	0.7	12.0	<100	1	3.5	1	110	230
SRT-58	Grand Centre Hilda Mem	24.4	30.69	1	33	81	5.9	13.0	<5	<2	0.72	1.1	<10	0.6	11.0	<100	1	3.5	1	140	<200
SRT-58	Grand Centre Hilda Mem	25.3	30.16	1	33	80	5.7	12.0	<5	<2	0.77	1.0	<10	0.8	11.0	<100	<1	3.4	1	<100	240
SRT-58	Grand Centre Hilda Mem	26.2	30.18	1	35	76	5.8	11.0	<5	<2	0.83	1.0	<10	0.8	11.0	<100	<1	3.4	1	<100	330
SRT-58	Marie Creek	27.4	29.94	1	27	80	6.1	12.0	<5	<2	0.88	1.0	<10	0.9	12.0	<100	1	3.6	1	<100	380
SRT-58	Marie Creek	28.3	30.22	2	31	76	6.4	9.0	<5	<2	0.72	0.9	<10	0.8	12.0	<100	<1	3.8	1	110	<200

Appendix 1: Becquerel Laboratory Inc. Geochemistry Data

Testhole	Sratigraphic Unit	Depth (m)	Wt	Mo	Ni	Rb	Sm	Sc	Se	Ag	Na	Ta	Te	Tb	Th	Sn	W	U	Yb	Zn	Zr
			grams	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
! "<" values denote that the values are below the detection limit for that element																					
SRT-58	Marie Creek	29.3	30.56	1	24	70	6.4	10.0	<5	<2	1.00	0.6	<10	0.8	13.0	<100	<1	3.4	1	<100	360
SRT-58	Marie Creek	30.5	30.68	1	29	72	6.7	11.0	<5	2	1.00	1.0	<10	0.9	13.0	<100	1	4.4	1	<100	230
SRT-58	Marie Creek	31.4	29.83	1	14	74	6.4	10.0	<5	<2	0.93	0.8	<10	0.8	13.0	<100	<1	4.1	2	120	270
SRT-58	Marie Creek	32.6	29.42	2	31	71	6.4	10.0	<5	<2	1.00	0.9	<10	0.9	12.0	<100	2	4.2	1	110	390
SRT-58	Marie Creek	32.6	29.54	2	17	73	6.1	9.4	<5	<2	0.88	0.7	<10	0.7	12.0	<100	2	4.1	1	120	470
SRT-58	Marie Creek	33.5	29.86	1	32	70	6.4	11.0	<5	<2	1.00	0.6	<10	0.8	12.0	<100	2	4.1	2	<100	220
SRT-58	Marie Creek	34.4	29.16	4	25	68	6.0	10.0	<5	<2	1.00	0.6	<10	0.6	12.0	<100	3	3.9	2	<100	<200
SRT-58	Bonnyville	35.4	30.62	1	26	74	6.1	10.0	<5	<2	0.95	0.8	<10	0.7	11.0	<100	1	3.9	1	100	380
SRT-58	Bonnyville	36.6	30.49	1	28	81	7.1	8.7	<5	<2	0.77	0.9	<10	0.9	13.0	<100	3	4.6	1	<100	330
SRT-58	Bonnyville	37.5	30.38	1	30	78	6.8	10.0	<5	<2	0.86	0.9	<10	0.9	13.0	<100	5	4.3	1	<100	240
SRT-58	Bonnyville	38.4	28.58	2	22	70	6.6	8.6	<5	<2	0.94	1.1	<10	1.0	12.0	<100	5	4.1	1	130	<200
SRT-58	Bonnyville	39.6	30.65	1	28	71	6.3	9.1	<5	<2	0.83	1.0	<10	0.8	12.0	<100	4	4.1	1	<100	460
SRT-58	Bonnyville	40.5	30.23	2	32	70	6.2	10.0	<5	<2	0.86	1.0	<10	0.8	12.0	<100	8	4.1	1	<100	280
SRT-58	Bonnyville	41.5	30.20	2	24	70	6.4	10.0	<5	2	0.91	1.1	<10	0.9	12.0	<100	27	4.1	1	<100	360
SRT-58	Bonnyville	42.7	29.99	1	23	69	6.4	10.0	<5	<2	0.89	0.8	<10	0.8	12.0	<100	4	3.9	1	110	370
SRT-58	Bonnyville	43.6	30.88	2	16	73	6.5	10.0	<5	2	0.93	0.8	<10	1.0	12.0	<100	4	4.1	1	<100	430
SRT-58	Bonnyville	44.5	30.24	2	23	64	5.9	9.3	<5	<2	0.84	0.7	<10	0.7	11.0	<100	3	3.9	1	<100	240
SRT-58	Bonnyville	45.7	30.35	2	24	72	6.4	10.0	<5	<2	0.88	1.1	<10	0.8	12.0	<100	3	4.3	1	130	380
SRT-58	Bonnyville	46.6	30.20	1	29	67	6.1	9.4	<5	<2	0.84	0.8	<10	0.7	12.0	<100	3	4.7	1	<100	<200
SRT-58	Bonnyville	47.5	29.37	2	20	67	6.1	8.9	<5	<2	0.88	0.7	<10	0.9	11.0	<100	3	3.9	1	<100	340
R77-SR36	Grand Centre Reita Mem.	1.8	29.55	<1	26	77	6.4	10.0	<5	<2	0.81	0.9	<10	0.8	13.0	<100	1	2.6	1	<100	450
R77-SR36	Grand Centre Reita Mem.	3.0	29.51	<1	15	67	5.7	9.3	<5	<2	0.78	0.8	<10	0.7	11.0	<100	<1	2.6	1	<100	270
R77-SR36	Grand Centre Reita Mem.	3.0	28.53	<1	27	62	5.4	9.1	<5	<2	0.74	0.7	<10	0.7	11.0	<100	<1	2.5	1	<100	<200
R77-SR36	Grand Centre Reita Mem.	4.0	30.69	<1	24	72	6.0	10.0	<5	<2	0.82	0.7	<10	0.6	12.0	<100	<1	2.9	1	120	300
R77-SR36	Grand Centre Reita Mem.	4.9	29.68	1	20	65	5.6	9.2	<5	<2	0.79	1.0	<10	0.7	11.0	<100	<1	2.9	1	<100	320
R77-SR36	Grand Centre Reita Mem.	6.1	33.60	<1	21	77	5.6	9.3	<5	<2	0.85	0.9	<10	0.7	11.0	<100	<1	2.9	1	<100	390
R77-SR36	Grand Centre Reita Mem.	7.0	29.81	<1	36	73	5.9	10.0	<5	<2	0.87	0.8	<10	0.9	12.0	<100	<1	3.2	1	<100	<200
R77-SR36	Grand Centre Reita Mem.	7.9	29.51	<1	26	74	5.9	10.0	<5	<2	0.86	0.9	<10	0.8	12.0	<100	<1	2.9	1	<100	<200
R77-SR36	Grand Centre Reita Mem.	8.2	30.33	<1	27	74	5.8	10.0	<5	<2	0.76	0.9	<10	0.8	12.0	<100	<1	2.8	1	<100	<200
R77-SR36	Marie Creek	11.0	29.83	<1	22	76	6.2	8.9	<5	<2	1.00	0.8	<10	0.9	12.0	<100	<1	3.4	1	130	280
R77-SR36	Marie Creek	12.2	29.87	1	23	66	6.1	10.0	<5	<2	1.00	0.8	<10	0.8	12.0	<100	<1	3.1	1	<100	230
R77-SR36	Marie Creek	13.1	29.46	<1	27	68	6.2	10.0	<5	<2	1.00	0.8	<10	0.7	12.0	<100	<1	3.4	1	<100	<200
R77-SR36	Marie Creek	14.0	30.05	<1	25	71	6.1	10.0	<5	<2	1.00	0.9	<10	0.7	12.0	<100	<1	3.2	1	110	240
R77-SR36	Marie Creek	15.2	30.31	<1	23	61	5.8	9.4	<5	<2	0.94	0.8	<10	0.8	11.0	<100	<1	3.4	1	<100	420
R77-SR36	Marie Creek	16.2	29.33	1	27	74	6.0	10.0	<5	<2	1.00	0.7	<10	0.8	12.0	<100	1	3.6	1	<100	280
R77-SR36	Marie Creek	17.1	29.74	1	32	67	6.1	11.0	<5	<2	1.00	0.6	<10	0.7	12.0	<100	<1	3.7	1	<100	270
R77-SR36	Marie Creek	18.3	30.01	1	25	70	5.9	10.0	<5	2	0.90	0.7	<10	1.0	11.0	<100	<1	3.5	1	<100	330
R77-SR36	Marie Creek	19.2	29.75	1	28	73	6.2	10.0	<5	<2	0.89	0.8	<10	1.0	12.0	<100	1	3.7	1	<100	<200
R77-SR36	Marie Creek	20.1	29.72	1	25	76	6.6	9.1	<5	<2	0.83	0.9	<10	0.8	12.0	<100	<1	4.0	1	110	400
R77-SR36	Marie Creek	21.3	29.16	<1	29	76	6.7	11.0	<5	<2	0.92	1.0	<10	0.9	13.0	<100	1	3.8	1	<100	250
R77-SR36	Marie Creek	22.3	29.72	<1	31	69	6.3	10.0	<5	<2	0.94	1.1	<10	0.9	12.0	<100	<1	3.6	1	<100	420
R77-SR36	Marie Creek	23.2	29.06	<1	29	69	6.2	10.0	<5	<2	0.90	0.8	<10	0.8	12.0	<100	<1	3.5	1	<100	220
R77-SR36	Marie Creek	23.2	29.20	1	27	71	6.3	8.8	<5	<2	0.81	0.9	<10	0.9	12.0	<100	<1	3.7	1	<100	330
R77-SR36	Marie Creek	24.4	28.77	<1	26	78	6.3	11.0	<5	<2	0.91	0.9	<10	0.9	12.0	<100	1	3.5	1	<100	300
R77-SR36	Marie Creek	25.3	29.21	<1	28	70	6.0	10.0	<5	<2	0.89	0.8	<10	0.8	11.0	<100	<1	3.3	1	<100	<200
R77-SR36	Marie Creek	26.2	29.67	<1	30	69	6.1	11.0	<5	<2	0.89	0.9	<10	0.8	12.0	<100	<1	3.4	1	<100	320
R77-SR36	Marie Creek	27.4	29.85	1	31	70	6.2	11.0	<5	<2	0.94	0.9	<10	0.8	12.0	<100	1	3.4	1	<100	290
R77-SR36	Marie Creek	29.3	28.65	1	<10	69	6.0	9.3	<5	<2	0.90	0.8	<10	0.9	11.0	<100	<1	3.4	1	<100	390
R77-SR36	Marie Creek	31.4	31.19	1	29	62	5.8	8.3	<5	<2	0.88	0.6	<10	0.7	11.0	<100	<1	3.6	1	<100	370
R77-SR36	Marie Creek	32.3	29.99	<1	23	64	6.4	9.3	<5	2	0.92	0.9	<10	0.9	12.0	<100	<1	3.6	1	<100	510
R77-SR36	Marie Creek	33.5	29.58	<1	20	67	5.7	8.7	<5	<2	0.92	0.9	<10	0.8	11.0	<100	<1	3.2	1	<100	390
R77-SR36	Marie Creek	34.4	29.71	1	22	65	6.2	9.4	<5	<2	1.00	0.6	<10	0.8	12.0	<100	<1	3.6	1	<100	440
R77-SR36	Marie Creek	35.4	30.23	<1	24	64	6.6	10.0	<5	<2	1.00	0.9	<10	0.9	13.0	<100	<1	3.5	1	<100	360
R77-SR36	Marie Creek	36.6	29.98	1	35	78	6.3	13.0	<5	<2	0.76	0.8	<10	0.8	12.0	<100	<1	3.3	1	<100	380
R77-SR36	Bonnyville	37.5	29.33	<1	31	79	6.3	12.0	<5	<2	0.72	1.0	<10	0.8	12.0	<100	<1	3.3	1	<100	350
R77-SR36	Bonnyville	38.4	28.42	<1	29	76	6.2	12.0	<5	<2	0.70	0.9	<10	0.9	11.0	<100	<1	3.5	2	<100	540

Appendix 1: Becquerel Laboratory Inc. Geochemistry Data

Testhole	Sratigraphic Unit	Depth (m)	Wt	Mo	Ni	Rb	Sm	Sc	Se	Ag	Na	Ta	Te	Tb	Th	Sn	W	U	Yb	Zn	Zr
			grams	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
"<" values denote that the values are below the detection limit for that element																					
R77-SR36	Bonnyville	39.6	30.32	1	23	70	6.3	12.0	<5	<2	0.70	0.9	<10	0.8	12.0	<100	<1	4.0	2	<100	270
R77-SR36	Bonnyville	40.8	29.39	1	27	77	6.3	11.0	<5	<2	0.72	0.8	<10	0.9	12.0	<100	1	3.8	2	<100	<200
R77-SR36	Bonnyville	41.5	29.83	1	26	80	6.5	9.1	<5	<2	0.57	0.9	<10	0.9	12.0	<100	<1	4.2	1	<100	380
R77-SR36	Bonnyville	42.7	30.78	1	31	72	6.5	10.0	<5	<2	0.67	1.0	<10	0.9	12.0	<100	<1	3.8	1	<100	390
R77-SR36	Bonnyville	43.6	30.47	1	22	69	6.3	10.0	<5	<2	0.66	1.0	<10	0.9	12.0	<100	<1	3.7	1	<100	440
R77-SR36	Bonnyville	44.5	30.08	1	24	72	6.7	11.0	<5	<2	0.73	1.0	<10	0.9	13.0	<100	<1	3.9	1	<100	300
R77-SR36	Bonnyville	45.7	29.64	1	22	68	6.4	11.0	<5	<2	0.71	0.8	<10	0.8	12.0	<100	1	3.4	1	<100	370
R77-SR36	Bonnyville	46.6	30.35	1	22	71	5.9	11.0	<5	<2	0.69	0.9	<10	0.8	11.0	<100	1	3.1	2	<100	290
R77-SR36	Bonnyville	47.5	29.46	1	23	76	6.1	12.0	<5	<2	0.69	0.8	<10	0.7	11.0	<100	<1	3.6	1	110	360
R77-SR36	Bonnyville	42.7	29.64	<1	19	70	5.9	10.0	<5	<2	0.69	0.9	<10	0.7	11.0	<100	<1	3.5	1	<100	300
R77-SR36	Bonnyville	49.7	29.85	1	28	72	6.2	10.0	<5	<2	0.58	1.0	<10	0.7	11.0	<100	<1	3.3	1	<100	290
R77-SR36	Bonnyville	50.6	30.02	1	23	69	6.3	11.0	<5	<2	0.64	0.8	<10	1.1	11.0	<100	<1	3.6	2	<100	490
R77-SR36	Bonnyville	51.8	29.53	1	24	76	6.2	11.0	<5	<2	0.67	1.0	<10	0.9	11.0	<100	<1	3.6	2	110	390
R77-SR36	Bonnyville	52.7	30.02	<1	24	64	6.0	10.0	<5	<2	0.61	0.7	<10	0.9	11.0	<100	<1	3.2	2	<100	390
R77-SR36	Bonnyville	53.6	29.28	1	18	62	6.3	11.0	<5	<2	0.61	1.0	<10	1.0	11.0	<100	<1	3.4	2	<100	330
R77-SR36	Bonnyville	54.9	29.63	1	23	71	5.9	10.0	<5	<2	0.61	0.8	<10	0.8	10.0	<100	<1	3.1	1	<100	320
R77-SR36	Bonnyville	56.7	29.77	1	20	64	6.1	10.0	<5	<2	0.57	1.1	<10	0.9	11.0	<100	<1	3.3	2	<100	310

Appendix 2. Geochemistry data from CanTech Laboratories - “Total Digestion” Flame Atomic Absorption Spectrometry (AA) Method

Appendix2: CanTech Laboratories Inc. Geochemistry Data

Testhole	Sratigraphic Unit	Depth (m)	Ag	Cd	Co	Cu	Fe	Li	Mn	Mo	Ni	Pb	V	Zn
			ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm
			Note! "<" values denote that the values are below the detection limit for that element											
SRT-16	Grand Centre	0.9	0	<0.2	12	22	2.90	28	340	5	29	14	87	73
SRT-16	Grand Centre	0.9	0	<0.2	10	23	2.80	27	325	6	31	12	84	70
SRT-16	Grand Centre	1.8	<0.2	<0.2	12	23	2.90	26	440	5	32	13	87	70
SRT-16	Marie Creek	3.7	0	<0.2	13	22	3.00	26	503	5	34	12	91	73
SRT-16	Marie Creek	4.4	<0.2	<0.2	12	21	2.90	24	597	4	32	11	82	67
SRT-16	Marie Creek	4.9	0	<0.2	13	23	3.00	27	530	5	31	11	84	70
SRT-16	Marie Creek	6.1	0	<0.2	13	24	3.10	28	452	5	29	13	92	74
SRT-16	Marie Creek	7.0	<0.2	0.2	12	23	2.80	28	470	4	32	12	85	69
SRT-16	Marie Creek	7.9	0	<0.2	11	21	3.00	26	455	3	28	12	82	68
SRT-16	Marie Creek	9.1	0	<0.2	13	24	3.10	32	467	1	29	11	91	76
SRT-16	Marie Creek	10.1	0	<0.2	14	26	3.20	31	485	4	36	13	103	81
SRT-16	Marie Creek	11.0	<0.2	<0.2	12	25	3.30	30	490	1	34	11	97	75
SRT-16	Marie Creek	12.2	0	<0.2	13	25	3.10	30	447	3	32	12	102	82
SRT-16	Marie Creek	13.1	0	<0.2	13	27	3.20	32	471	5	36	12	105	90
SRT-16	Marie Creek	14.0	0	<0.2	13	27	3.40	33	466	2	40	13	107	95
SRT-16	Bonnyville	16.2	<0.2	<0.2	11	24	2.90	28	442	4	34	12	94	85
SRT-16	Bonnyville	17.1	0	<0.2	12	22	2.80	27	470	2	32	12	91	73
SRT-16	Bonnyville	18.3	0	<0.2	12	22	2.80	28	432	4	30	12	96	77
SRT-16	Bonnyville	19.2	<0.2	<0.2	12	21	2.90	30	410	3	32	13	102	83
SRT-16	Bonnyville	20.1	0	0.2	12	23	2.80	31	384	2	32	13	101	88
SRT-16	Bonnyville	23.2	0	<0.2	11	25	2.90	30	350	1	31	14	117	93
SRT-16	Bonnyville	24.4	0	<0.2	13	31	3.50	40	320	2	36	12	139	125
SRT-16	Lea Park	25.3	0	<0.2	12	35	3.10	46	194	2	34	14	161	141
SRT-16	Lea Park	26.2	0	0.2	14	37	3.00	45	137	4	45	15	159	148
SRT-16	Lea Park	27.4	0	<0.2	13	26	3.30	44	210	2	38	14	160	130
SRT-16	Lea Park	28.3	0	<0.2	12	28	2.80	45	145	4	34	16	158	135
SRT-16	Lea Park	29.3	0	0.2	13	27	3.30	40	184	3	41	16	160	131
SRT-16	Bonnyville	20.1	0	<0.2	13	26	3.00	27	430	2	33	13	119	94
SRT-16	Lea Park	30.5	<0.2	<0.2	14	31	2.60	44	126	2	41	18	172	138
SRT-16	Lea Park	31.4	0	<0.2	14	36	4.20	46	210	4	44	15	143	132
SRT-16	Lea Park	32.0	0	<0.2	15	38	3.80	45	187	2	45	14	150	133
SRT-22	Marie Creek	20.0	0	<0.2	13	27	3.10	33	400	3	31	13	87	76
SRT-22	Marie Creek	21.0	0	<0.2	13	26	3.30	32	474	3	32	12	86	76
SRT-22	Marie Creek	22.0	0	0.2	12	26	3.10	35	453	2	31	11	85	76
SRT-22	Marie Creek	23.0	0	<0.2	13	24	2.90	30	457	3	31	13	91	73
SRT-22	Marie Creek	24.0	<0.2	0.2	13	26	3.00	31	460	3	32	10	92	72
SRT-22	Marie Creek	26.0	<0.2	<0.2	13	27	2.70	24	453	5	30	12	84	69
SRT-22	Marie Creek	27.0	<0.2	<0.2	12	25	2.60	22	450	4	28	11	72	65
SRT-22	Marie Creek	25.0	0	<0.2	12	24	3.00	28	435	3	30	11	79	73
SRT-22	Marie Creek	28.0	<0.2	<0.2	11	20	2.50	21	420	3	26	10	69	58
SRT-22	Marie Creek	29.0	0	<0.2	12	24	2.90	26	447	3	28	12	78	72
SRT-22	Marie Creek	30.0	0	<0.2	12	27	3.20	25	443	3	31	13	73	73
SRT-22	Marie Creek	31.0	0	0.2	13	25	3.10	29	450	3	31	13	80	74
SRT-22	Marie Creek	32.0	0	0.2	13	24	3.00	28	446	2	30	12	79	71
SRT-22	Marie Creek	33.0	0	0.2	12	22	3.20	27	460	3	28	12	82	67
SRT-22	Marie Creek	25.0	0	<0.2	12	24	3.00	32	420	1	28	13	78	72
SRT-22	Marie Creek	34.0	0	<0.2	11	20	2.70	26	430	2	26	12	76	63
SRT-22	Marie Creek	35.0	<0.2	<0.2	13	22	2.80	30	450	2	36	13	87	73

Appendix2: CanTech Laboratories Inc. Geochemistry Data

Testhole	Sratigraphic Unit	Depth (m)	Ag	Cd	Co	Cu	Fe	Li	Mn	Mo	Ni	Pb	V	Zn
			ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm
			Note! "<" values denote that the values are below the detection limit for that element											
SRT-22	Marie Creek	36.0	<0.2	<0.2	11	21	2.50	24	410	3	26	11	75	61
SRT-22	Marie Creek	37.0	0	0.2	12	21	2.80	28	440	2	28	12	91	72
SRT-22	Marie Creek	38.0	0	<0.2	12	22	2.70	24	427	5	27	12	83	73
SRT-22	Marie Creek	39.0	0	0.2	12	21	2.80	26	430	3	27	13	82	69
SRT-22	Marie Creek	40.0	<0.2	<0.2	10	20	2.70	25	406	<1	25	14	79	71
SRT-22	Marie Creek	41.0	<0.2	<0.2	12	22	2.70	26	413	4	25	13	78	71
SRT-22	Marie Creek	42.0	0	<0.2	13	23	2.80	30	340	2	28	12	91	81
SRT-22	Marie Creek	43.0	0	<0.2	11	22	2.80	31	330	3	30	13	85	77
SRT-22	Bonnyville	44.0	0	0.2	12	23	2.90	34	353	4	31	12	87	81
SRT-22	Bonnyville	45.0	0	<0.2	12	22	2.70	32	360	2	30	13	84	78
SRT-22	Bonnyville	46.0	0	<0.2	10	19	2.60	31	352	3	26	11	71	71
SRT-22	Bonnyville	48.0	0	<0.2	13	25	3.10	33	565	4	35	13	110	81
SRT-22	Bonnyville	49.0	0	<0.2	13	26	3.10	32	550	4	34	12	110	89
SRT-22	Bonnyville	50.0	0	0.2	14	25	3.00	31	537	6	42	11	115	91
SRT-22	Bonnyville	51.0	0	<0.2	13	24	2.90	25	480	5	32	12	100	84
SRT-22	Bonnyville	52.0	0	0.2	12	26	3.10	28	492	4	33	13	105	86
SRT-22	Bonnyville	53.0	<0.2	<0.2	12	23	2.80	32	404	5	31	13	89	77
SRT-22	Bonnyville	54.0	<0.2	<0.2	12	22	2.60	30	373	4	30	11	87	72
SRT-27	Grand Centre Reita Mem	0.9	<0.2	<0.2	11	23	2.80	27	440	3	31	10	79	59
SRT-27	Grand Centre Reita Mem	1.8	0	<0.2	11	24	3.20	31	310	3	28	10	88	66
SRT-27	Grand Centre Reita Mem	3.0	<0.2	0.2	14	27	3.30	32	558	4	38	14	93	75
SRT-27	Grand Centre Hilda Mem	6.1	0	<0.2	12	26	3.20	33	390	3	33	13	94	81
SRT-27	Grand Centre Hilda Mem	7.0	<0.2	<0.2	11	25	2.90	31	345	5	30	10	90	74
SRT-27	Grand Centre Hilda Mem	7.9	0	<0.2	12	25	3.00	33	378	5	33	12	92	76
SRT-27	Grand Centre Hilda Mem	9.1	0	<0.2	12	26	3.20	34	384	3	35	12	94	81
SRT-27	Grand Centre Hilda Mem	10.1	0	0.2	10	22	2.90	22	370	4	29	13	76	64
SRT-27	Grand Centre Hilda Mem	11.0	<0.2	<0.2	13	27	3.30	31	314	3	34	11	94	81
SRT-27	Grand Centre Hilda Mem	12.2	0	<0.2	11	23	2.80	27	424	2	29	10	77	66
SRT-27	Grand Centre Hilda Mem	14.0	<0.2	<0.2	14	24	3.20	35	448	6	32	13	84	76
SRT-27	Marie Creek	24.4	0	0.2	13	24	3.10	26	463	4	31	10	82	68
SRT-27	Marie Creek	25.3	0	<0.2	14	23	3.00	27	450	5	30	11	78	70
SRT-27	Marie Creek	26.2	0	0.2	14	26	3.10	29	465	4	35	10	85	75
SRT-27	Marie Creek	27.4	<0.2	0.2	13	25	3.00	30	461	4	33	12	86	74
SRT-27	Bonnyville	28.3	0	0.2	11	25	2.90	26	440	5	31	11	83	69
SRT-27	Grand Centre Hilda Mem	12.2	0	<0.2	13	24	3.00	30	442	5	31	13	81	73
SRT-27	Bonnyville	29.9	0	<0.2	14	26	3.00	31	453	5	35	10	89	74
SRT-27	Bonnyville	31.4	0	0.2	14	27	2.90	26	459	3	34	13	86	76
SRT-27	Bonnyville	32.3	0	<0.2	13	25	2.80	25	453	3	32	11	91	77
SRT-27	Bonnyville	33.5	0	<0.2	14	26	2.90	28	465	3	33	14	97	82
SRT-27	Bonnyville	34.4	<0.2	<0.2	13	25	3.00	28	428	2	32	12	95	81
SRT-58	Grand Centre Hilda Mem	0.9	0	<0.2	14	25	3.20	26	401	3	32	13	92	78
SRT-58	Grand Centre Hilda Mem	1.8	0	<0.2	14	24	2.90	29	476	2	30	12	91	76
SRT-58	Grand Centre Hilda Mem	3.0	0	0.2	13	25	3.00	25	350	3	30	14	90	78
SRT-58	Grand Centre Hilda Mem	4.0	0	<0.2	12	26	2.90	28	227	4	25	12	91	77
SRT-58	Grand Centre Hilda Mem	5.2	0	<0.2	13	23	2.90	29	514	4	24	14	84	77
SRT-58	Grand Centre Hilda Mem	6.1	0	<0.2	12	24	2.90	27	504	5	30	14	94	78
SRT-58	Grand Centre Hilda Mem	7.0	<0.2	<0.2	13	24	3.00	26	350	4	25	12	92	75

Appendix2: CanTech Laboratories Inc. Geochemistry Data

Testhole	Sratigraphic Unit	Depth (m)	Ag	Cd	Co	Cu	Fe	Li	Mn	Mo	Ni	Pb	V	Zn
			ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm
			Note! "<" values denote that the values are below the detection limit for that element											
SRT-58	Grand Centre Hilda Men	7.9	0	<0.2	14	24	3.00	25	675	6	30	12	86	74
SRT-58	Grand Centre Hilda Men	9.1	0	0.2	15	28	3.20	35	524	5	36	13	127	95
SRT-58	Grand Centre Hilda Men	10.1	0	<0.2	14	27	3.10	31	480	7	34	12	124	92
SRT-58	Grand Centre Hilda Men	11.0	0	<0.2	14	28	3.30	32	517	4	33	12	120	94
SRT-58	Grand Centre Hilda Men	14.0	0	0.2	13	29	3.20	26	1650	6	33	13	111	87
SRT-58	Grand Centre Hilda Men	15.2	0	<0.2	14	26	3.80	31	402	6	35	14	130	103
SRT-58	Grand Centre Hilda Men	18.3	0	<0.2	15	30	4.10	44	290	3	38	12	175	137
SRT-58	Grand Centre Hilda Men	21.3	0	<0.2	15	28	3.40	36	385	4	36	13	131	100
SRT-58	Grand Centre Hilda Men	22.3	0	<0.2	16	30	3.30	38	382	5	37	12	129	104
SRT-58	Grand Centre Hilda Men	23.2	<0.2	0.2	14	27	3.20	37	380	6	35	12	127	99
SRT-58	Grand Centre Hilda Men	24.4	0	<0.2	16	29	3.30	42	351	3	38	13	147	111
SRT-58	Grand Centre Hilda Men	25.3	0	<0.2	14	27	3.20	36	359	4	35	12	130	98
SRT-58	Grand Centre Hilda Men	26.2	<0.2	<0.2	13	26	3.30	36	384	4	33	12	118	93
SRT-58	Marie Creek	27.4	0	<0.2	14	24	3.20	31	380	5	32	11	113	90
SRT-58	Grand Centre Hilda Men	7.0	<0.2	0.2	12	23	3.00	25	378	5	27	10	91	77
SRT-58	Marie Creek	28.3	0	0.2	14	25	3.20	33	383	3	35	12	114	93
SRT-58	Marie Creek	29.3	0	<0.2	12	24	3.10	26	451	3	33	12	96	71
SRT-58	Marie Creek	30.5	0	<0.2	14	24	2.90	23	494	5	36	13	102	81
SRT-58	Marie Creek	32.6	<0.2	<0.2	13	23	3.00	24	490	3	33	12	99	76
SRT-58	Marie Creek	31.4	0	0.2	13	24	3.10	27	504	3	32	13	103	82
SRT-58	Marie Creek	33.5	<0.2	<0.2	13	25	3.20	26	560	4	32	14	97	83
SRT-58	Marie Creek	34.4	<0.2	<0.2	12	25	3.10	26	503	7	32	12	94	73
SRT-58	Marie Creek	32.6	<0.2	<0.2	13	25	3.20	31	475	4	31	10	90	75
SRT-58	Bonnyville	35.4	0	0.2	13	25	3.00	25	496	4	33	13	93	77
SRT-58	Bonnyville	36.6	<0.2	<0.2	14	26	3.10	28	502	4	34	13	102	81
SRT-58	Bonnyville	37.5	<0.2	0.3	13	24	2.90	25	490	4	33	11	100	76
SRT-58	Bonnyville	38.4	0	<0.2	11	20	2.40	22	441	5	28	12	85	65
SRT-58	Bonnyville	39.6	0	<0.2	12	24	2.80	28	460	4	31	11	98	75
SRT-58	Bonnyville	40.5	0	0.2	13	22	2.80	21	463	4	31	13	96	76
SRT-58	Bonnyville	41.5	0	<0.2	14	25	2.90	24	452	6	30	12	91	77
SRT-58	Bonnyville	42.7	<0.2	<0.2	12	24	2.90	25	450	5	30	12	90	77
SRT-58	Bonnyville	43.6	0	<0.2	11	23	3.00	27	454	4	30	10	89	75
SRT-58	Bonnyville	44.5	0	<0.2	11	23	2.90	26	486	4	29	12	85	73
SRT-58	Bonnyville	45.7	<0.2	0.2	13	25	3.00	29	467	4	31	12	97	86
SRT-58	Bonnyville	46.6	0	<0.2	12	23	2.60	26	425	2	30	13	89	73
SRT-58	Bonnyville	47.5	0	<0.2	12	22	2.20	26	390	3	28	13	79	66
R77-SR36	Grand Centre Reita Men	1.8	<0.2	<0.2	12	23	2.60	31	424	3	27	12	80	64
R77-SR36	Grand Centre Reita Men	3.0	<0.2	<0.2	11	23	2.80	30	446	1	29	14	74	66
R77-SR36	Grand Centre Reita Men	4.0	0	<0.2	12	23	2.90	29	360	3	29	14	82	68
R77-SR36	Grand Centre Reita Men	4.9	0	<0.2	11	24	2.70	28	330	2	30	12	80	67
R77-SR36	Grand Centre Reita Men	6.1	0	<0.2	11	23	2.50	24	370	1	28	14	73	64
R77-SR36	Grand Centre Reita Men	7.0	0	<0.2	13	24	2.70	28	408	5	34	15	82	72
R77-SR36	Grand Centre Reita Men	7.9	<0.2	<0.2	12	25	2.60	31	410	<1	31	12	81	74
R77-SR36	Grand Centre Reita Men	8.2	0	<0.2	14	30	3.10	34	473	1	35	14	97	86
R77-SR36	Marie Creek	11.0	0	<0.2	12	25	2.80	27	409	<1	30	13	78	69
R77-SR36	Marie Creek	12.2	<0.2	<0.2	13	25	3.00	27	436	4	32	13	73	69
R77-SR36	Marie Creek	13.1	0	0.2	11	24	2.60	25	440	3	29	13	82	70
R77-SR36	Marie Creek	14.0	0	<0.2	12	25	2.70	28	432	2	32	11	85	75

Appendix2: CanTech Laboratories Inc. Geochemistry Data

Testhole	Sratigraphic Unit	Depth (m)	Ag	Cd	Co	Cu	Fe	Li	Mn	Mo	Ni	Pb	V	Zn
			ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm
			Note! "<" values denote that the values are below the detection limit for that element											
R77-SR36	Marie Creek	15.2	0	0.2	12	23	2.60	26	435	2	34	14	80	67
R77-SR36	Marie Creek	16.2	0	<0.2	11	21	2.60	28	420	2	30	10	83	69
R77-SR36	Marie Creek	17.1	0	0.2	13	24	2.80	31	438	1	31	12	87	74
R77-SR36	Marie Creek	18.3	0	<0.2	12	23	2.70	26	420	2	35	12	85	72
R77-SR36	Grand Centre Reita Mem	3.0	<0.2	<0.2	11	22	2.80	28	445	2	28	11	81	64
R77-SR36	Marie Creek	19.2	0	<0.2	12	24	2.80	27	452	4	34	13	93	73
R77-SR36	Marie Creek	20.1	<0.2	<0.2	12	24	2.70	27	436	3	33	11	91	74
R77-SR36	Marie Creek	21.3	0	<0.2	13	24	2.90	28	443	1	33	12	92	76
R77-SR36	Marie Creek	22.3	0	<0.2	12	23	2.70	29	410	3	32	11	88	72
R77-SR36	Marie Creek	23.2	0	0.2	12	24	2.90	27	450	3	35	12	90	74
R77-SR36	Marie Creek	24.4	<0.2	<0.2	14	25	3.10	30	468	<1	35	13	95	79
R77-SR36	Marie Creek	25.3	0	0.2	12	26	3.00	29	442	3	36	12	92	78
R77-SR36	Marie Creek	26.2	0	<0.2	12	26	2.90	30	463	1	34	11	94	78
R77-SR36	Marie Creek	27.4	<0.2	<0.2	12	25	2.80	28	460	2	33	12	87	74
R77-SR36	Marie Creek	29.3	0	<0.2	11	22	2.70	26	467	4	32	11	82	67
R77-SR36	Marie Creek	31.4	<0.2	<0.2	10	21	2.50	24	424	4	28	12	77	66
R77-SR36	Marie Creek	23.2	<0.2	<0.2	12	23	2.80	25	420	5	33	12	85	72
R77-SR36	Marie Creek	32.3	<0.2	<0.2	11	23	2.60	21	446	4	30	11	82	67
R77-SR36	Marie Creek	33.5	0	0.2	11	22	2.40	22	421	4	27	13	78	63
R77-SR36	Marie Creek	34.4	0	<0.2	11	21	2.60	24	446	4	29	12	79	68
R77-SR36	Marie Creek	35.4	<0.2	0.2	10	20	2.50	22	429	5	27	11	74	65
R77-SR36	Marie Creek	36.6	0	<0.2	11	25	3.00	30	210	5	34	13	101	91
R77-SR36	Bonnyville	37.5	<0.2	<0.2	11	26	2.60	31	207	4	32	12	90	83
R77-SR36	Bonnyville	38.4	0	<0.2	12	24	2.50	32	360	3	32	12	99	80
R77-SR36	Bonnyville	39.6	0	0.2	13	25	2.70	34	358	3	31	14	102	85
R77-SR36	Bonnyville	40.8	0	0.2	12	25	2.80	33	371	5	33	14	98	83
R77-SR36	Bonnyville	41.5	0	<0.2	11	24	2.60	29	360	2	30	13	90	77
R77-SR36	Bonnyville	42.7	<0.2	0.2	11	21	2.40	26	364	5	28	15	81	67
R77-SR36	Bonnyville	43.6	0	<0.2	11	21	2.40	26	370	4	27	13	80	71
R77-SR36	Bonnyville	44.5	0	0.2	12	23	2.60	28	362	3	30	14	85	77
R77-SR36	Bonnyville	45.7	0	<0.2	11	23	2.70	29	334	5	29	13	85	75
R77-SR36	Bonnyville	46.6	0	<0.2	11	23	2.60	30	336	4	28	11	87	74
R77-SR36	Bonnyville	47.5	0	0.2	12	24	2.70	32	361	3	33	13	93	79
R77-SR36	Bonnyville	42.7	<0.2	<0.2	10	22	2.40	31	357	4	27	12	81	71
R77-SR36	Bonnyville	49.7	0	0.2	11	22	2.30	36	288	4	28	13	77	69
R77-SR36	Bonnyville	50.6	0	0.2	11	21	2.50	32	286	6	28	14	78	68
R77-SR36	Bonnyville	51.8	0	0.2	10	22	2.30	33	271	7	26	12	79	69
R77-SR36	Bonnyville	52.7	<0.2	<0.2	11	22	2.50	34	280	5	28	13	80	72
R77-SR36	Bonnyville	53.6	0	<0.2	11	22	2.40	33	274	6	26	12	82	71
R77-SR36	Bonnyville	54.9	0	<0.2	10	21	2.20	34	277	4	24	13	81	67
R77-SR36	Bonnyville	56.7	0	<0.2	11	20	2.30	36	263	5	24	12	80	70