'79-#48-#7160

REPORT ON

[LED RECONNAISSANCE STREAM SEDIMENT SURV

?LE RIVER AREA, BRITISH COLUMBIA

FOR KELVIN ENERGY LIMITED

CALGARY, ALBERTA

'79-#48-# 7160

REPORT ON
THE SEMI-DETAILED RECONNAISSANCE STREAM SEDIMENT SURVEY
KETTLE RIVER AREA, BRITISH COLUMBIA
FOR KELVIN ENERGY LIMITED
CALGARY, ALBERTA

Claims: Ch 4, 8 and 9; Al 4 and 5; Leo 4, 5, 9 and 10; Vic 1 to 10; Sim 1 to 7; Jim 1 to 13; Ren and Ren 1; Win 1 to 19; Val; Quartz

Location: Located on Maps 82E/10, 82E/15E, 82E/15W and 82L/2 bounded approximately by longitudes 118° 47', 118° 29' and latitudes 49° 42', 49° 51' in Vernon and Greenwood Mining Districts.

PREPARED BY
Howard R. Lahti
BARRINGER MAGENTA LIMITED
304 CARLINGVIEW DRIVE
REXDALE, ONTARIO
M9W 5G2

OCTOBER, 1978

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SUMMARY

During the period June 8th to July 31st, 1978, Barringer Magenta supervised the collection of 492 semi-detailed reconnaissance stream sediment samples on a claim block owned by Kelvin Energy Limited. Composite samples were collected at 500 metre intervals in all but the largest streams. About 20 per cent of the area was accessible by road, the rest of the area necessitated the use of a Bell 206-B Jet Ranger. All samples were analysed in the Barringer Magenta Laboratory, Calgary for U, Cu, Pb, Zn, Mo and Ag. Interpretation of data was based on maps of individual elements and the calculation of threshold values by making histograms. The resultant target areas were outlined on an interpretation map and classified according to amplitude, size and geological setting of the anomaly.

Three first order uranium anomalies were discovered along with one second order uranium, two third order uranium and one copper anomaly. Several other geochemical features were outlined but did not warrant a specific ranking number.

Stream sediment sampling about the defunct Lightning Peak base metal silver mine identified its mineralized zone with anomalous lead, zinc, and silver values and slightly higher than background copper values. Molybdenum and uranium values did not exceed local background levels.

It is recommended that the uranium anomalies be followed up by detailed (100 metre intervals) stream sediment sampling and semi-detailed soil grids (500 metre line spacing with sampling at 40 metre intervals). These samples should be analysed for U, Cu, Pb, Zn, Mo and Ag.

1. INTRODUCTION

1.1 GENERAL STATEMENT

The mineral claims referred to in this report (Dwg. 1, see back cover of report) were staked or optioned by Kelvin Energy Limited during 1978. About an equal number of claims occur in the Vernon Mining Division and the Greenwood Mining Division. The mineral claims contained in this report are listed in Table 1 (pages 4 and 5).

A semi-detailed reconnaissance stream sediment program was initiated on June 3rd, 1978 to map the distribution of uranium within the claim block. The structure and geology were considered favourable to host Tyee Lake and Hydraulic Lake type uranium deposits. In addition, copper, lead, zinc, molybdenum and silver were determined to assist in interpretation. Generally a multi-element approach can be more definitive than a single element and may also give indications of base metal deposits. A total of 492 stream sediment samples were collected. Gamma radiation was monitored using scintillometers (Exploranium Model 9R-101A) during the collection of all samples.

Five uranium anomalies were found, one of which extends out of the staked area just north of Mount Arthurs. Stream sediment sampling also delineated the old base metal mine near Lightning Peak and identified a strong copper anomaly south of Anomaly 1A, a large uranium anomaly.

1.2 LOCATION AND ACCESS

The Kelvin Energy Limited claims can be conveniently divided into two large claim blocks. The northern one is in the Vernon

Mining Division and the southern is in the Greenwood Mining Division. The northern claim block is approximately bounded by longitudes 118° 31' and 118° 45' and latitudes 49° 49' and 50° 00' 30". The southern claim block is approximately bounded by longitudes 118° 49' to 118° 30' and latitudes 49° 49' to 49° 42'.

Only the extreme north part of the northern claim block and the western part of the southern claim block can be reached by gravel road which runs up the Christian Valley in which the Kettle River flows. The Christian Valley road can be reached from the north by turning south about 300 m. east of the Spruce Grove Gas Station on the paved road (Highway 6) between Vernon and Fauquier. The other route to the Christian Valley road is to turn east at Beaverdell (short-cut from Kelowna) or to turn up the Christian Valley road at Westridge. The defunct base metal-silver mine (Ren 1) can be reached by road either from Highway 6 to the northeast or from a gravel road which follows the Winnifred Creek and joins up with the mine road.

TABLE 1

1.3 CLAIM STATISTICS FOR KETTLE RIVER CLAIM BLOCK

Kettle River Staking

Claim Name	Units	Tag No.	Date of Record	Record No.	Mining Division
CH 3	15	31850	Feb. 13, 1978	996	Greenwood
[illegible] 3	20	31653	"	967	"
[illegible] 4	20	31837	"	968	"
AL 5	20	31844	"	969	"
[illegible]O 5	20	31828	"	970	"
[illegible]O 9	10	31849	"	971	"
LEO 10	20	31854	"	972	"
AL 4	16	31845	"	994	"
[illegible]O 4	20	31827	"	993	"
VIC 1	18	31826	June 9, 1978	1013	"
VIC 2	9	31829	"	1014	"
[illegible]C 3	20	31839	"	1015	"
[illegible]C 4	10	31840	"	1016	"
VIC 5	20	31843	"	1017	"
[illegible]C 6	10	31846	"	1018	"
[illegible]C 7	15	31889	"	1019	"
VIC 8	15	31890	"	1020	"
VIC 9	15	31891	"	1021	"
[illegible]C 10	1	31900	"	1022	"
SIM 1	20	31824	"	1106	"
SIM 2	20	31825	"	1107	"
[illegible]M 3	20	31841	"	1108	"
[illegible]M 4	10	31842	"	1109	"
SIM 5	20	31886	"	1110	"
[illegible]M 6	20	31887	"	1111	"
[illegible]M 7	20	31888	"	1112	"
JIM 1	1	31830	"	1123	"
[illegible]IM 2	1	31831	"	1124	"
[illegible]M 3	1	31832	Staked but not yet recorded	-	"
JIM 4	1	31833	June 9, 1978	1125	"
[illegible]IM 5	1	31834	"	1126	"
[illegible]M 6	1	31835	"	1127	"
[illegible]M 7	16	31836	"	1128	"
JIM 8	20	31838	"	1129	"
[illegible]M 9	4	31847	"	1130	"
[illegible]M 12	6	31848	"	1131	"
JIM 11	20	31828	"	1132	"
[illegible]M 12	20	31837	"	1133	"
[illegible]M 13	20	31856	"	1134	"

Kettle River Staking

Claim Name	Units	Record No.	Tag No.	Date of Record	Mining Div.
Paul	12	439	37638	May 24/78	Vernon
Win 1	20	1062	37639	May 24/78	Greenwood
2	20	1063	37640	"	Greenwood
3	20	440	37641	"	Vernon
4	"	441	37642	"	"
5	"	442	37643	"	"
6	"	443	37644	"	"
7	"	444	37645	"	"
8	"	445	37646	"	"
9	"	446	37647	"	"
10	"	447	37648	"	"
11	"	448	37649	"	"
12	"	449	37650	"	"
13	"	450	37651	"	"
14	"	451	37652	"	"
15	"	452	37653	"	"
16	"	453	37654	"	"
17	"	454	37655	"	"
18	"	455	37655	"	"
19	10	456	37657	"	"
Val	20			Oct. 24/77	
Jon	9			July 19/78	
Quartz	20			Dec. 8/77	

2. GEOLOGY

2.1 REGIONAL GEOLOGY

The regional geology of the area is well shown in a compilation map published by the Province of British Columbia Department of Mines and Petroleum Resources, Minerals Resources Branch, and the Geological Survey of Canada. (Open file 409, Maps 5-1976, by H.W. Little. The geology was compiled at a scale of 1:250,000.)

The principal rocks occurring in the claim blocks belong to Units 1 and 4. The former are Proterozoic rocks consisting of gneiss, minor schists, sedimentary and metasedimentary rocks. Unit 4 consists of the Nelson and Valhalla granitic plutonic rocks of Jurassic to Cretaceous age. Other important rock units are Unit 7, Tertiary plateau and olivine basalts and Unit 2, Paleozoic (including Upper Proterozoic and Triassic) basaltic and andesetic lavas, greenstone, other sedimentary and metasedimentary rocks.

Although geological mapping was not stressed during the stream sediment reconnaissance phase of work, several new occurrences of plateau basalts were discovered during helicopter reconnaissance of the claims. One columnar plateau basalt outcrop was discovered just north of Nevertouch Lake and the other north of Goatskin Creek near the head waters. There may be other small Tertiary plateau basalt caps which still have not been found in this area. The most recent uranium discoveries, Hydraulic Lake, Tyee Lake, Deer Creek, etc., occur (in unconsolidated Miocene-Pliocene sediments) under the Tertiary plateau basalts or under an impervious layer of glacial till.

2.2 DETAILED GEOLOGY RELATED TO URANIUM DEPOSITS

A program of regional mapping (Christopher) between Beaverdell and Lumby at a scale of 1:20,000 was carried out to define geological settings of known deposits to provide an improved geological base for lithogeochemical study of potential source rocks and to clarify the distribution of plateau basalts and favourable underlying sediments. Preliminary work at Blizzard, Lassie Lake and Fuki-Donen has demonstrated that the deposits occur in areas with high background uranium values in basement granitic rocks. (It was also found by Christopher that the devitrification of volcanic rocks along fault zones release uranium into streams. Therefore, sediments associated with volcanic rocks would be a potential target area.) Coryell syenitic rocks and leurocrotic, often pegmatitic phases of quartz monzonite composition are the key rocks. Near the Tyee Lake uranium deposits, the basalt and underlying sediments have been sub-divided into three units (Table 2).

The geology underlying the plateau basalt is poorly understood and the aforementioned stratigraphic column is only a tentative interpretation based on a few drill holes.

The uranium deposits are found along the flanks of a paleo-basin at an approximate elevation of 1270 metres. Although the geology is poorly known in the claim blocks, it is quite possible that conditions exist similar to those found at the Tyee Lake, Blizzard or Lassie Lake deposits.

TABLE 2

STRATIGRAPHIC COLUMN IN BEAVERDELL AREA
BRITISH COLUMBIA
(after David G. Mark, Report 6217 Pluto 1)

Recent	Gravels, Sands, Silts	Quaternary
Plateau Basalt	Olivine Basalt Kallus Creek Basalt	Miocene
	Coaly Mudstone, Mudstone Shale	Pliocene
	Conglomerate Coaly Sandstone Sandstone with Uranium	
Kettle River Formation	Tuff-Tuffaceous Sandstone Black Shale and Conglomerate	Oligocene
Valhalla and Nelson Intrusives	Pegmatatic Granite and Granodiorite	Cretaceous
Monashee Group	Layer Gneiss	Proterozic

3. TOPOGRAPHY, CLIMATE, DRAINAGE, VEGETATION

3.1 TOPOGRAPHY

The North Claim Group extends along the west side of the Monashee Mountains and the South Claim Group extends in an east-west direction from the Okanogan Highlands in the west across the Kettle River valley into the Midway Mountains on the west. The area covers an old peneplain, represented by broad flat interflues and a general accordance of summits, deeply dissected by the main drainage systems and modified by glacial erosion and deposition. Mount Arthurs, just south of the claim block, rises above the peneplain forming an area of higher, very rugged, ground. Average elevation over most of the claim block is 1360 - 1670 m. The principal drainages are incised into the old peneplain surface with the Kettle River and Rendell Creek valleys now at an elevation about 850 m. and the Winnifred Creek valley at about 1090 m.

The microtopography is severe in some areas with steep sided gulleys controlled by north-south faulting and small streams on hillsides cut deeply into the overburden and underlying rock.

3.2 CLIMATE

The climate is, for the most part, wet and humid although not as severe as the coastal areas of British Columbia. During the period June 1st to September 15th, there were almost 40 days of significant precipitation (this includes isolated thunderstorms within the claim block). Hail and snow fell on Mount Arthurs in June and August. Summer temperatures are generally cool, 10-20° C, with frost occurring in June and late August. For a short period during July, temperatures exceeded 30° C.

Fog is also common during early and late summer. Snow remains above 1600 m. until late June.

3.3 DRAINAGE

The major streams have a strong northeast-southwest pattern. In general, the area has an adequate density of streams for reconnaissance stream sediment surveys. There are notable exceptions; the headwaters of the Goatskin Creek has a very high density of streams while the west side of the Kettle River valley has very few streams.

The water flow exhibits extreme seasonal flucuations. The streams are torrential in the spring and early summer carrying large amounts of fine sediment in suspension. In the summer most of the smaller streams almost cease to flow while the very small streams dry up completely. The streams increase in volume again in September when the fall rains commence.

There are very few lakes in the area and those that are found are small and shallow (Nevertouch Lake excepted). The small lakes and swamps are found primarily in the central part of the North Claim Block.

3.4 VEGETATION

The Rendell Creek, Goatskin and Winnifred Creek valleys have large stands of cedar, hemlock and fir; species that require copious moisture. There is also a dense underbrush of western alder and the notorious devil's club plant. The well drained

land surface below 1360 m. has good stands of pine. Above that, up to the tree line (2120 m.), the predominant species are firs. Large burnt-over areas have created dense stands of small trees of various species. Most of the area along the west side of the Kettle River valley has sparce pine over the rocky knolls and mixed conifers along the few streams.

4. GEOCHEMISTRY

4.1 OBJECTIVE

The purpose of the semi-detailed reconnaissance stream sediment survey was to outline areas of high uranium values that might indicate the presence of nearby uranium mineralization and also reliably eliminate areas with little or no potential.

4.2 RESULTS AND INTERPRETATION

4.2.1 Results

The results for uranium, copper, lead, zinc, molybdenum and silver are listed in Appendix IV and are plotted on single element maps which are found in the back of the report. In addition, the location points with their sample numbers are plotted on a separate map. Claim boundaries are found on all maps.

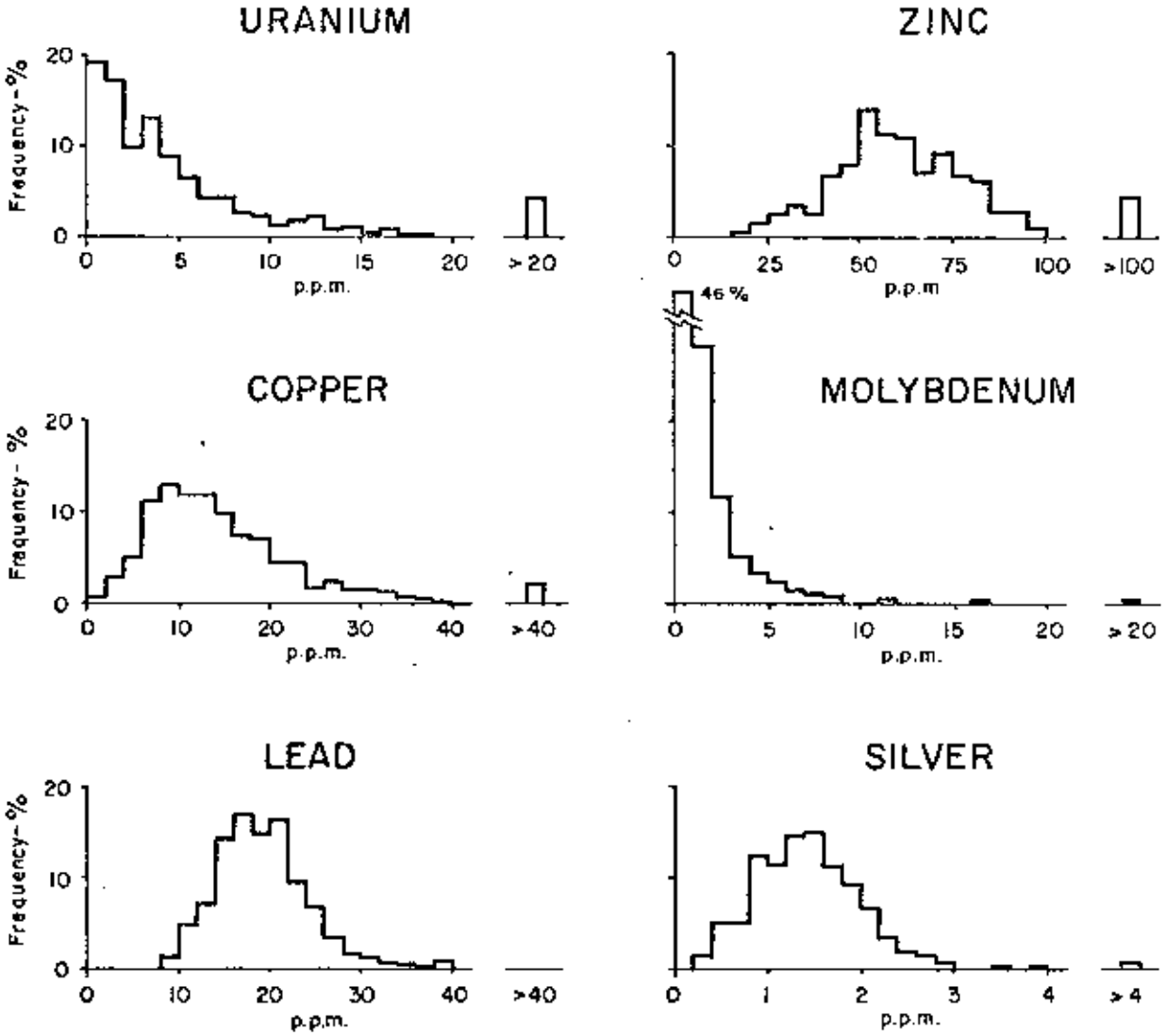
A total of 492 samples were collected. This includes about 10 duplicate samples to check sampling error. Some samples were collected to compare results with G.S.C.* sample values. However, because the G.S.C. used a total analysis (neutron activation) and Barringer Magenta Limited used a hot nitric acid partial extraction (fluorimetric), a direct comparison cannot be made. The neutron activation method "sees" the uranium in resistate minerals such as monazite, sphene, etc. The nitric acid partial extraction method releases only the

* Geological Survey of Canada

uranium that is weakly bonded in clays, organic matters, and in micas, chlorites, etc. The hot nitric acid only slightly attacks mafic minerals and feldspars and does not attack resistate minerals at all. Similarly, for copper, lead, zinc, silver and molybdenum, the nitric/perchloric acid attack is only about 85 per cent efficient. Therefore, the values present in the report represent less than the total amount present in the samples but for exploration purposes, the amount extracted is adequate.

4.2.2 Interpretation

First, histograms (Fig. 1) were compiled to determine the threshold values for uranium, copper, lead, zinc, molybdenum and silver. The values which exceed the threshold were then sub-divided into 2 or 3 groups representing third order, second order and first order anomalous, respectively. This division of anomalous values was made in an attempt to separate natural populations related to a particular rock type or an unusual environmental condition which may have a natural high background and which may exceed the threshold value determined for all samples. The lower anomalous values were examined for geographical continuity and if there was one, an attempt was made to relate the high values to a rock type or some other factor. The thresholds and anomalous values selected for the interpretation are given in Table 3. Anomalous areas were then outlined (Dwg. 8) and ranked according to the geochemical values, spatial correlation and geological setting.



FREQUENCY DISTRIBUTION OF URANIUM, ZINC, COPPER, MOLYBDENUM, LEAD AND SILVER IN STREAM SEDIMENT SAMPLES

FIG. 1

TABLE 3

THRESHOLD AND ANOMALOUS VALUES FOR
Cu, Pb, Zn, Ag, Mo and U

	Threshold	First Order Anomalous (ppm)	Second Order Anomalous (ppm)	Third Order Anomalous (ppm)
Cu	21	> 40	25 - 40	21 - 24
Pb	29	> 40	29 - 40	--
Zn	66	> 100	86 - 100	66 - 85
Ag	2.3	> 3	2.3 - 3	--
Mo	5	> 9	5 - 9	--
U	8.1	> 20.0	13.1 - 20.0	8.1-13.0

The threshold and the choice of different classes of anomalous values was determined empirically from the histograms.

The uranium histogram (Fig. 1) is positively skewed. There appears to be several background populations .2 - 10.0 ppm and 11.0 - 15.0. The group of values between 11.0 and 15.0 may indicate uranium values from a high background area. The anomalous population is fairly large (4.22%) and probably represents the highest values found in a high background area and/or uranium related to some type of unusual uranium concentration, hopefully of economic significance.

The copper histogram (Fig. 1) has three populations. There is an almost normal distribution of copper values between 1 - 26 ppm. with a smaller secondary population developed between 27 - 40 ppm. Values greater than 40 ppm are considered first order anomalous and represent 2.12% of the total samples.

The lead histogram (Fig. 1) represents an approximate normal distribution with very few (0.85%) first order anomalous values. Almost all of the anomalous values are related to known mineralization.

The zinc histogram (Fig. 1) is a very complex group with at least three different populations below 100 ppm with modal values at 31 - 35, 51 - 55 and 71 - 75 ppm. There is probably a further subgroup with values 90 - 100 ppm. Above 100 ppm, there are a fair number of samples (4.27%) that are considered to be first order anomalous.

The molybdenum histogram (Fig. 1) is strongly positively skewed. This is primarily a function of the limit of detection (1 ppm). It appears that only three values can be considered first order anomalous.

The silver histogram (Fig. 1) has an almost perfect normal distribution. Only 1.06% of the values are considered to be first order anomalous.

Anomalies were recognized on the basis of number of anomalous values, their absolute value, the spatial relationship and the geological environment. Each anomaly has been labelled by a number and letter; i.e., 1A. The number indicates the order in which the anomalies should be followed up. The letter portion of the label refers to the strength of the anomaly with respect to geological environment, metal content and number of anomalous values related to the anomaly. In general, "C" class anomalies would be followed up depending on the results obtained from "A" or "B" class anomalies or if other information becomes available. On the interpretation map

(Fig. 8) the designated anomaly areas are marked by solid and dashed lines. The solid line indicates a strong and coherent anomaly and the dashed line, a weaker less coherent anomaly.

4.2.2.1 Anomaly 1A

This anomaly has been given the highest priority because of the very favourable geologic environment and the highly anomalous values. The two streams draining into the Kettle River are highly anomalous in uranium, lead and copper and slightly anomalous in silver. It is thought most significant that the streams drain away from a plateau basaltic cap similar to those found at Hydraulic Creek and Tyee Lake. However, due to extensive overburden and dense vegetation, it is not known with certainty whether Miocene or Pliocene sediments occur beneath the volcanic rocks.

The reconnaissance stream sediment samples give maximum results of 84, 68 and 66 ppm which are 8 to 10 times the threshold value (8.0 ppm). The multi-element association probably indicates several sources for the metals. Considering all factors, this anomaly is thought to offer the best potential for uranium mineralization.

4.2.2.2 Anomaly 2A

The anomaly is located in a stream draining north from Mount Arthurs into Goatskin Creek. The maximum value of 138 ppm uranium is in a small tributary draining from the east to the main anomalous stream. Other streams draining away from Mount Arthurs do not have the high values associated with the main anomalous streams but do indicate a high background in uranium (8.0 ppm). Two streams to the west of the anomalous stream (see Dwg. 2) have moderately anomalous values which range from 5.4 to 26 ppm uranium.

There are no high copper, lead, zinc, molybdenum or silver values associated with the uranium although there is one lead value of 50 ppm on the anomalous streams. The anomalous values extend to the headwaters of the streams and the south area of the uranium is not yet defined. The magnitude of the uranium values and the length of the dispersion train indicates a very potent source.

4.2.2.3 Anomaly 3A

This anomaly occurs about 2 km. southwest of Nevertouch Lake and east of the gravel road which extends to the lake. Sample sites with values of 34 and 52 ppm uranium on one stream and 56 ppm on a stream 0.5 km. to the north indicate the probable source area for the uranium. These two streams occur in a layered gneiss sequence which has a high background in uranium. Several other streams south and east of the anomalous area have uranium values up to 20.8 ppm. The source may be a natural high uranium background in the gneiss or uranium associated with strong north-south shearing and jointing. Scintillometer and Gad-6 tests substantiate the later hypothesis. At several locations the scintillometer and especially the Gad-6 spectrometer identified above average total gamma radiation and about 8 times the normal radiation on the uranium channel.

One short traverse over the anomalous area was made to see if there were any plateau type basalts and to locate other sources of abnormal gamma radiation. No basalts were found in the area drained by the stream with anomalous uranium values but high total gamma (280 c.p.s.) radiation was found in areas with jointing and shearing. (The average background for total gamma radiation in this area is about 70 c.p.s.)

This area requires a follow-up program to accurately locate the source of the uranium.

4.2.2.4 Anomaly 4B

This anomaly is given a lower rating because the anomalous uranium values are found only on one small branch of a short stream and the values do not approach those of the other previously mentioned uranium anomalies. There are no significantly anomalous values in copper, lead, zinc or molybdenum. Silver (2.8 ppm) is slightly higher in this area than the average background silver values.

A possibly significant factor is that the anomaly drains an area bracketing the 1270 m. contour, an elevation at which the Tyee Lake and Hydraulic Lake uranium deposits are located (personal communication, Peter Christopher). Although this anomaly is not as large or strong as 1A, 2A or 3A, the source of the uranium should be determined by a follow-up program.

4.2.2.5 Anomaly 5C

This anomaly consists of one first order anomalous value which occurs about 600 metres from the source of the small stream. Contrary to what is shown on the topographic map, the small lake drains to the northwest into the Rendell Creek: the anomalous stream originates as a spring about 200 m. south of the lake.

This sample verifies the anomalous uranium value determined during the reconnaissance survey conducted by the G.S.C. The spot high occurs just east of a stream draining to the west which has a local high background in uranium. The anomalous stream and tributaries also have a local high background in uranium.

There are associated high background values of molybdenum, silver and copper. There are also high background lead values further downstream and on some other tributaries south of the anomalous stream sample. Considering all stream sediment samples in the vicinity of NLR-61, about 16 km.^{2} of high background values of uranium, copper, lead, silver and molybdenum are indicated. The anomalous stream drains an area located at an elevation of 1670 m. well above the elevation of the Tyee Lake type uranium deposits.

This anomaly is given a low priority because it occurs at an elevation greater than 1270 m. (however, other plateau basalts are known to occur at similar elevations elsewhere in this area), and comprises a single moderately high value of uranium. Nevertheless, this single point anomaly may be related to mineralization or high background source; i.e., pegmatite, and should be investigated by a follow-up program.

The local geology consists of Unit 4, Nelson and Valhalla granitic plutonic rocks with some quartz, feldspar pegmatites. Although the high uranium values may be related to uraniferous pegmatites, it is stressed that with the limited data it is impossible, at this time, to give an unequivocal answer as to the source of the uranium.

4.2.2.6 Anomaly 6C

Anomaly 6C is located at the northern extremity of the claim block. It is poorly defined by several anomalous uranium values with occasional associated high background values of molybdenum, silver (one sample) and copper (one sample). The discontinuous nature of the anomalous area and the lack of dispersion trains reduces the importance of the anomaly.

However, there are plateau basalts just to the north at a higher elevation and thus the occasional high values could be related to a uranium source hidden under an unmapped basaltic cap or from uranium trapped under a blanket of glacial till. This anomaly should be followed up if time and funding is available and should be continuously re-evaluated using information obtained from the follow-up of higher priority anomalies.

4.2.2.7 Anomaly 7C

Anomaly 7C (copper anomaly) occurs immediately south of anomaly 1A in streams draining west from the same basaltic cap that extends past the headwaters of the streams located in Anomaly 1A. The streams in this anomaly have very steep gradients and are deeply incised into the hillside. The streams cut across volcanic-sedimentary rocks of Unit 6 and the acid-plutonic rocks of the Nelson and Valhalla Group. The copper is thought to originate from a source somewhere in the volcanic-sedimentary rocks of Unit 6 (see map 6-1957 by T.E. Kalnins and 15-1961 by H.W. Little).

This anomaly has low priority because it is a base metal feature rather than uranium characterized by coincident moderately high values in silver, uranium and lead. It should be noted that this copper anomaly is by far the best base metal anomaly discovered in the claim block. If interest changes to base metals then this anomaly should be up-graded and given a first order priority.

4.2.2.8 Anomaly 8C

Stream sediment sampling around the old base metal-silver mine gives a very strong and definitive response to the known mineralization. Zinc, lead, silver and, to a lesser degree, copper, give a very strong anomaly at the point where the stream cuts the base metal mineralized carbonate rocks and about 500 m. downstream. The length of the dispersion train could not be determined as the sampling terminated just west of the west claim boundary. At this point, the drainage is still highly anomalous in zinc, lead and silver. Copper is only anomalous at the junction of the stream with the mineralized zone.

In addition to identifying the zone of mineralization, the sampling also indicates anomalous silver, zinc and to a lesser degree copper values to the east of the mine. The highest copper value is found in a small stream draining from the north and may indicate a new area with potential copper mineralization. Additional sampling would have to be carried out to confirm the anomaly and to justify any subsequent follow-up work.

4.2.2.9 Other Geochemical Features

Three geochemical features are identified (see Dwg. 8) and are labeled A, B and C. These areas have not been given a priority rating. However, if additional information becomes available, i.e., airborne E.M. or other geophysical surveys, then these low order and, in many cases, loosely coherent anomalies should be re-evaluated.

Geochemical feature A is located in the extreme northeast corner of the south claim block at the headwaters of the

Goatskin Creek. It is characterized by high background in molybdenum with a smaller copper trend within the molybdenum feature. Within this extensive feature are several single point anomalous values of molybdenum, copper, zinc, lead and silver.

With the limited information available, it is not possible to identify the source of the metals but it is speculated that the high molybdenum may relate to a different phase of the Valhalla basement granitic rocks.

The geochemical feature trends in a northwest-southeast direction oblique to the large regional linements and smaller scale faults which strike approximately north-south. One possible explanation could be that the geochemical trend follows a specific rock type which cuts across the large faults.

Geochemical feature B is located about six km. northwest of geochemical feature A. This large northwest-southeast trending geochemical feature extends from Rendell Creek to the headwaters of Mohr Creek and to within two km. of Winnifred Creek. The area has a high background in zinc and lead with isolated moderately high values of uranium, molybdenum and silver. This area is large and poorly defined and the boundaries marked on the interpretation map (Dwg. 8) are tentative.

The most startling aspect of this large area of high background is the strong northwest-southeast trend. Although the trends of both geochemical features A and B are based on few data points, the northwest-southeast trend appears to be real. Much more sampling would have to be done to fully define the source and limits of these features.

Geochemical feature C is a diffuse moderately high copper feature just to the south of geochemical feature B. It is small (parts of two streams) and only slightly anomalous. Two high background molybdenum values are found in one of the streams. It is not possible to speculate at this time as to the source of the elevated copper values. With the limited information and geochemical data available, the copper feature is not considered important.

Of the three geochemical features, that part of geochemical feature B with anomalous uranium is recommended for limited geochemical follow-up work. The main purpose of this work would be to confirm the high uranium at this location and estimate its extent.

5. CONCLUSIONS

1. Stream sediment sampling was effective in delineating three first order uranium (1A, 2A, 3A), one second order uranium (4B), two third order uranium (5C, 6C) and one first order copper (7C) anomalies, respectively.
2. Stream sediment sampling was effective in identifying the mineralized zone related to an old base metal-silver (Anomaly 8C). This is marked by coincident high lead, zinc, silver and, to a lesser degree, copper values.
3. Most of anomalous uranium values were found in short 1-3 km. long streams except at 2A where a large approximately 8 km. long stream was highly anomalous in uranium.
4. Anomalies 1A, 3A and 4B have associated raised base metal values and also silver. Anomalies 5C and 6C are very small or of an incoherent nature with an erratic association of base metals or molybdenum. Anomaly 2A is almost exclusively a uranium anomaly while 7C is primarily a copper anomaly.
5. Other large diffuse base metal anomalies were located. These have second to third order anomalous values and do not appear to be related to mineralization. The anomalous areas (high background) have been identified on the interpretation map but have not been classified. These areas may become more important if the priorities of the present program are altered.
6. Further interpretation of the stream sediment data can only be made if additional geological, geophysical or other data becomes available.

6. RECOMMENDATIONS

1. Anomalies 1A, 2A, 3A and 4B should be followed up by stream sediment sampling at 100 m. intervals. All streams within the designated anomalous area and adjacent streams should be sampled (if time permits). In areas with a poorly developed drainage or where streams are widely spaced, soil traverses should be made across the area of interest at 500 m. intervals with samples collected at 40 m. intervals. Soil samples should be collected at a depth of 20 cm. Both stream sediment and soil samples should be analysed for uranium, copper, lead, zinc, silver and nickel. Because molybdenum did not give very valuable results during the reconnaissance phase of work, it is suggested that molybdenum be dropped in favour of nickel. Elsewhere it has been found that nickel provides a powerful aid in mapping the occurrence and extent of mafic to ultramafic rocks.

2. Follow-up work should be initiated on anomalies 5C and 6C subject to budget and time constraints.

3. Except for a limited amount of follow-up work at the uranium anomaly in geochemical feature B, no further geochemical work on geochemical features A, B or C is recommended until additional geological, geophysical or other pertinent information becomes available.

REFERENCES

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Ballantyne, S.B. et al (1976): National Geochemical Reconnaissance Maps 5-1976, Open File 409, published by Resource Geophysics and Geochemistry Division, Geological Survey of Canada, Ottawa.

Department of Energy, Mines and Resources and B.C. Ministry of Mines and Petroleum Resources (1971): Regional Stream Sediment and Water Geochemical Reconnaissance Data, Southeastern British Columbia (NTS 82E, L, M) Open File 409 410 and 411 (NGR 5-76, 6-76 and 7-76).

Little, H.W. (1957): Geology of Kettle River (East Half), Geological Survey of Canada, Map 6-1957.

Little, H.W. (1961): Geology of Kettle River (West Half), Geological Survey of Canada, Map 15-1961.

Mark, D.G. (1977): Assessment Report 6217, Pluto 1, Private Report. Gold Commissioner's Office, Vernon, B.C.

APPENDIX I

STATEMENT OF QUALIFICATIONS

I, Howard Reino Lahti of Toronto, do certify that:

1. I graduated from the University of New Brunswick, Fredericton, New Brunswick in May, 1978 with a Doctor of Philosophy in Geology (Applied Geochemistry).

2. I graduated from the University of New Brunswick with a B.Sc. in Geology in 1968 and M.Sc. in Geology (Applied Geochemistry) 1971.

3. I have worked with Barringer Magenta Limited of Toronto, Ontario since June 1975 as a geochemist.

4. I have worked as a geologist, geochemist or attended college since 1964.

5. I am a member of the Association of Exploration Geochemists.

Howard Lahti

H.R. Lahti, Ph.D.
Geologist-Geochemist
Barringer Magenta Limited

APPENDIX II

ASSESSMENT REPORT

STATEMENT OF COST

a) Days Worked

Supervisor: H.R. Lahti, Ph.D.	
June 1 to July 31 =	57 days
Geochemical Technician: Geoff White	
June 6 to July 31 =	46 days
Senior Sampling Assistant: Craig Shearer	
June 4 to July 31 =	50 days
Junior Sampling Assistant: Kerry Wisser	
June 4 to July 31 =	50 days
Junior Sampling Assistant: Reg Balford	
June 4 to July 31 =	50 days

b) Cost of Wages

Supervisor, $220. x 57 =	$12,540.
Geochemical Technician, $119. x 46 =	5,474.
Senior Sampling Assistant, $108. x 50 =	5,400.
Junior Sampling Assistant, $ 96. x 50 x 2 =	9,600.
TOTAL	$33,014.

c) Food and Accommodation

Charges - $ 7.00 per person per day for food
$13.00 per person per day for rental of tents, cooking utensils, etc.
TOTAL $20.00 per person per day

5 man crew x 20 =	$ 100. per day
for all crew, 42 days x $100. =	$4,200.
4 man crew, 4 days x $80. =	$ 320.
3 man crew, 4 days x $60. =	$ 240.
	$4,760.

d) Instrument Rental

2 Exploranium Model GR-101A @ $225. per month	$ 450.
June/July = 2 months x $450.	$ 900.

e) Geochemical Analyses

Number of stream sediment samples collected - 492	
Cost for 6 elements: Cu, Pb, Zn, Ag, Mo, U =	$ 7.30
Total cost for samples, 492 x $7.30 =	$ 3,591.60

f) Transportation Costs

i) Truck rental, $51./day x 61 days =	$ 3,111.
(Airways Rental, Calgary - Chev Blazer)	
ii) Supplementary Truck rentals =	$ 146.95
(Bowmac and Budget Rentals, Vernon, B.C.)	
iii) Truck rental from Calgary to set-up camp	$ 200.
iv) Helicopter Support, 42.4 hrs.x$343./hr.	$14,543.20
(Okanogan Helicopter Ltd., Penticton, B.C.)	
TOTAL	$18,001.15

g) Cost of Report Preparation

i) Drafting and Compilation

Drafting: Rod Marcroft	$ 470.06
Compilation: Paul Lawrence	
@ $80./day x 5 days =	$ 400.
Compilation: Howard Lahti	
@ $220./day x 1 day =	$ 220.
Reproduction =	$ 50.
	$ 1,140.06

ii) Report Writing: Howard Lahti,

@ $220./day x 5 days =	$ 1,100.
TOTAL	$ 2,240.06

h) Mobile Telephone Rental

2 months @ $360.=	$ 720.

i) Miscellaneous Costs

Sample shipment, telephone calls xerox costs, etc.=	$ 2,500.

j) Shipping and Travel	$2,096.39
Total cost incurred from June 3rd to July 31st =	$67,823.28

APPENDIX III

Field and Laboratory Techniques

1. Field Methods

Only about 25 per cent of the claims could be sampled by using bush raods. In other areas a Bell 206B helicopter was used to fly in sampling crews.

Most streams have a steep gradient with little fine sediment available for sampling. In order to obtain enough sample (500 grams), the sampler had to collect material from 3 to 5 locations. The sample bags used were high, wet-strength, Kraft paper bags with dimensions 9 mm. x 16 mm. All samples were collected by hand rather than spoons or any other mechanical devices. Samples were collected at 500 m. intervals with the distance calculated by pacing using airphotos at a scale of 1:50,000. Where the stream gradient was very severe, a pocket altimeter was used.

2. Laboratory Techniques

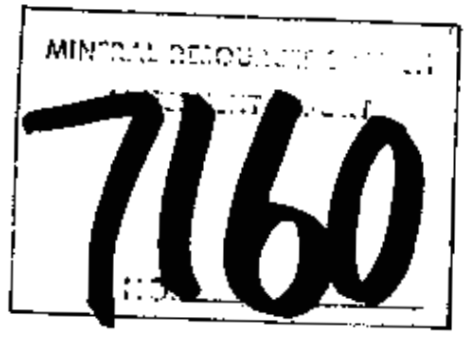
All of the stream sediment analyses were done at the Barringer Magenta Limited Laboratory in Calgary, Alberta. The samples were first oven dried at a temperature of 45° C. The samples were then sieved through an 80 mesh nylon screen. A .500 gm. portion of this was placed in a glass test tube and perchloric-nitric acid was added. The test tube was then placed in an aluminum heating jocket and heated for 4 hours. After cooling and diluting to the final volume, the solution then was directly aspirated into a Varian Techtron atomic absorption spectrophotometer and Cu, Pb, Zn, Ag and Mo were read directly in ppm. The uranium was determined fluorimetrically by using the following procedure. A .250 gm. sample was weighed into a glass test tube and 5 ml. of nitric acid was added. The samples were digested on a sand bath for 2-1/2 hours. After cooling and diluting to the final volume, an aliquot of

solution was pipetted onto a platinum dish and evaporated to dryness. Flux was added to the dish and then fused with the sample. After cooling, the disc was then compared with fresh standards using a Jarrell-Ash Fluorometer.

The limit of detection for Cu, Pb, Zn, Ag, Mo and U are 1, 1, 1, .2, 1 and .2 respectively.

APPENDIX IV

Listing of Raw Data for U, Cu, Pb, Zn, Mo and Ag



BARRINGER RESEARCH LIMITED

304 CARLINGVIEW DRIVE
REXDALE, ONTARIO, CANADA
PHONE: 416-677-2491
CABLE: BARESEARCH

Geochemical Laboratory Report

DATE

Barringer Research Ltd.
304 Carlingview Dr.
Rexdale Ont. M9W 5G2

REPORT NUMBER

SAMPLE NUMBER Sediments	U ppm	Cu ppm	Pb ppm	Zn ppm	Mo ppm	Ag ppm				
NLR- 1	2.0	4	11	27	1	.6				
2	3.6	7	20	52	2	1.0				
3	5.2	7	17	61	3	1.0				
4	3.2	10	23	57	3	1.2				
5	1.8	5	15	49	1	1.0				
6	5.6	5	13	36	1	.9				
7	10.0	9	17	41	1	1.2				
8	7.2	8	15	42	1	1.1				
9	12.4	11	18	36	1	1.3				
10	16.8	11	16	44	3	1.6				
11	4.8	8	20	65	5	1.5				
12	6.4	7	18	83	6	1.6				

Geochemical Laboratory Report /

Sample Number:	U ppm	Cu ppm	Pb ppm	Zn ppm	Mo ppm	Ag ppm				
NLR- 13	10.8	9	18	79	6	1.3				
14	9.6	10	19	72	2	1.4				
15	7.2	8	17	56	1	.9				
16	7.2	8	15	53	2	.8				
17	7.6	9	17	62	2	1.5				
18	4.8	8	14	41	1	1.2				
19	.2	9	13	56	1	1.1				
20	.8	8	13	54	1	.9				
21	.2	4	12	41	1	.8				
22	2.4	5	12	45	1	.9				
23	10.4	11	14	43	2	1.2				
24	12.4	17	17	49	1	2.1				
25	4.8	5	12	41	1	.8				
26	3.4	4	18	52	1	1.3				
27	3.6	7	13	46	1	.8				
28	3.4	12	15	59	1	1.1				
29	3.6	8	13	53	1	.8				
30	4.8	8	15	51	1	1.2				
31	4.8	7	12	47	1	.9				

Geochemical Laboratory Report /

Sample Number:	U ppm	Cu ppm	Pb ppm	Zn ppm	Mo ppm	Ag ppm				
MLR- 32	5.6	6	11	40	1	.9				
33	8.8	6	14	54	1	1.1				
34	3.8	5	10	31	1	.6				
35	3.0	5	10	34	1	.6				
36	6.4	6	11	43	1	.8				
37	4.8	4	10	30	1	.6				
38	18.4	10	17	62	1	1.6				
39	31.2	19	21	55	2	2.4				
40	8.8	11	16	53	1	1.4				
41	4.0	9	19	72	1	1.1				
42	3.2	10	18	64	2	1.1				
43	3.6	8	17	79	1	.9				
44	6.0	7	20	140	1	1.1				
45	4.8	11	18	70	1	1.3				
46	6.4	12	18	75	2	1.4				

Geochemical Laboratory Report /

SAMPLE NUMBER	U ppm	Cu ppm	Pb ppm	Zn ppm	Mo ppm	Ag ppm
ILR- 47	12.0	14	17	49	1	1.5
48	8.4	15	19	61	1	2.1
49	2.8	11	18	56	1	1.9
50	1.3	13	21	84	2	1.6
51	2.6	16	25	130	2	1.6
52	8.0	14	18	59	1	1.9
53	.6	10	36	74	2	1.7
54	.9	21	22	89	2	2.1
55	2.0	15	26	91	2	1.8
56	3.2	17	25	85	1	1.9
57	3.4	18	18	76	1	2.1
58	5.0	14	22	91	1	2.1
59	4.8	10	29	170	25	2.2
60	4.8	11	29	77	6	1.9
61	24.0	21	22	48	1	2.7
62	3.8	9	13	29	1	2.1
63	3.2	15	21	130	2	2.4
64	5.2	19	25	120	3	2.5
65	1.0	15	21	93	2	1.8

Geochemical Laboratory Report

Sample Number	U ppm	Cu ppm	Pn ppm	Zn ppm	Mo ppm	Ag ppm				
66	2.4	13	20	94	1	1.4				
67	.7	13	23	135	1	1.3				
68	.5	15	25	265	4	1.9				
69	.2	7	27	79	1	1.4				
70	.6	10	15	55	1	1.2				
71	1.8	14	19	83	2	1.6				
72	.2	24	23	87	2	1.4				
73	.7	16	16	54	1	1.8				
74	.4	22	20	69	1	1.7				
75	.7	18	18	59	1	1.6				
76	1.4	13	16	56	1	1.4				
77	1.0	15	18	64	2	1.5				
78	1.2	15	16	57	2	1.6				
79	.6	13	14	53	1	1.6				
80	1.1	14	14	52	1	1.4				
81	.4	14	13	46	1	1.1				
82	.2	16	15	56	1	1.2				
83	1.2	19	15	51	1	1.8				
84	.6	20	14	51	1	1.3				
85	1.1	32	19	66	3	1.6				
86	2.4	28	17	59	2	1.7				
87	.4	28	19	55	2	2.1				
88	.2	18	20	170	1	1.9				
89	.4	19	22	170	1	2.1				

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SAMPLE NUMBER	U ppm	Cu ppm	Pb ppm	Zn ppm	Mo ppm	Ag ppm				
NLR- 90	.2	6	31	71	12	1.3				
91	4.0	11	19	54	4	.8				
92	6.4	11	21	57	2	1.0				
93	4.6	11	19	53	2	.9				
94	6.6	9	16	43	2	.9				
95	5.4	11	18	54	2	.9				
96	5.2	11	18	52	2	1.1				
97	3.8	9	16	49	1	.6				
98	5.8	11	19	53	1	.9				
99	4.4	11	18	51	1	1.0				
100	3.6	15	16	32	1	.5				
101	4.4	13	16	33	1	.6				
102	5.6	26	22	91	3	1.9				
103	14.4	16	22	83	2	1.4				
104	2.6	14	18	61	1	.9				
105	12.4	12	15	32	1	.8				
106	9.0	7	15	31	2	.5				
107	8.0	7	17	28	3	.8				
108	7.2	6	15	22	2	.6				

Geochemical Laboratory Report /

Sample Number	U ppm	Cu ppm	Pb ppm	Zn ppm	Mo ppm	Ag ppm				
NLR- 109	1.6	6	15	40	2	.6				
110	4.0	11	21	74	3	1.0				
111	5.0	10	23	72	4	1.0				
112	5.2	10	25	69	8	1.1				
113	7.6	15	26	73	4	1.3				
114	1.2	15	22	71	2	1.6				
115	14.6	11	20	49	2	1.0				
116	4.4	13	23	61	2	1.0				
117	5.8	15	23	77	1	1.4				
118	4.8	14	23	80	2	1.4				
119	4.4	16	22	74	3	1.3				
120	3.2	18	26	73	1	2.0				
121	I.S.	15	19	86	4	1.3				
122	1.0	14	21	78	2	1.3				
123	5.0	24	24	86	1	1.2				
124	.2	21	24	58	1	.9				
125	11.0	17	20	70	3	1.0				
126	1.6	19	23	65	2	.9				
127	5.0	18	22	60	1	1.0				
NLR- 128	5.8	17	21	58	2	.9				
129	2.0	19	24	67	1	1.0				
130	4.6	19	24	62	2	1.1				
131	.9	19	21	57	1	1.0				
132	1.0	16	20	53	1	.6				

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SAMPLE NUMBER	U ppm	Cu ppm	Pb ppm	Zn ppm	Mo ppm	Ag ppm
NLR- 133	1.9	12	26	55	4	1.2
134	3.6	18	33	77	6	1.3
135	2.8	13	32	70	9	1.6
136	2.6	28	33	95	7	1.9
137	4.0	9	21	48	5	1.1
138	2.8	11	24	64	9	1.4
139	.5	6	19	34	3	1.2
140	1.5	9	23	58	4	1.3
141	1.8	9	17	47	4	1.2
142	2.0	11	21	54	5	1.4
143	3.2	11	21	55	3	1.4
144	2.4	15	23	84	4	1.7
145	3.6	15	26	72	4	1.8
146	1.8	10	24	63	4	1.4
147	1.9	9	21	66	5	1.3
148	4.0	9	18	54	3	1.3
149	3.4	9	18	69	2	1.2
150	4.4	9	19	62	2	1.2
151	7.2	11	20	51	3	1.7

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Sample Number	U ppm	Cu ppm	Pb ppm	Zn ppm	Mo ppm	Ag ppm				
NLR 152	4.0	10	18	53	2	1.2				
153	3.6	13	22	86	4	1.7				
154	1.3	13	21	95	3	1.8				
155	6.8	15	22	88	3	1.8				
156	3.0	16	22	94	3	1.6				
157	2.4	14	21	72	5	1.5				
158	1.9	16	22	84	4	1.7				
159	.5	12	20	67	4	1.6				
160	2.6	18	21	76	6	2.0				
161	5.8	15	21	60	4	2.0				
162	4.8	11	18	57	2	1.5				
163	3.2	15	20	55	2	1.6				
164	3.8	13	19	58	2	1.5				
165	1.9	18	15	40	2	1.3				
166	2.4	7	13	35	2	1.2				
167	.4	13	17	70	2	1.5				
168	1.7	17	20	58	2	2.2				
169	1.3	20	21	65	2	2.1				
170	4.4	18	22	63	2	2.1				
NLR- 171	12.4	23	24	74	2	2.4				
172	6.4	7	25	71	2	1.5				
173	26.0	8	21	49	1	1.4				
174	5.4	8	36	100	2	2.6				
175	6.6	8	22	64	2	1.7				
176	9.6	8	20	49	2	1.6				
177	5.6	7	22	70	2	1.4				
178	8.4	8	20	53	2	1.4				

Geochemical Laboratory Report /

Sample Number	U ppm	Cu ppm	Pb ppm	Zn ppm	Mo ppm	Ag ppm				
179	3.0	34	22	74	3	2.1				
180	3.6	22	20	60	1	1.6				
181	6.4	-	-	-	-	-				
182	5.0	15	24	64	3	1.8				
183	3.6	17	26	78	1	1.9				
184	4.8	18	30	95	3	2.1				
185	5.6	16	28	58	2	2.4				
186	4.0	14	30	56	2	2.0				
187	3.8	13	21	76	3	1.8				
188	5.4	25	25	58	2	2.1				
189	12.2	8	14	35	2	1.3				
190	11.2	17	20	51	2	2.0				
191	1.8	18	30	60	2	2.8				
192	3.2	9	16	40	2	1.6				
193	9.4	12	19	56	3	1.9				
194	2.6	9	22	150	3	1.5				
195	3.6	11	24	81	3	1.7				
196	4.8	9	18	60	2	1.3				
197	1.4	8	17	58	2	1.2				
198	68.0	38	33	83	3	2.8				
199	66.0	31	32	78	3	2.6				
200	84.0	30	27	56	3	2.2				
201	4.6	20	23	60	2	1.8				
202	15.6	31	22	83	3	2.5				
203	1.6	7	14	47	2	1.0				
204	1.6	8	15	48	1	.9				
205	.9	8	17	34	1	.9				

Geochemical Laboratory Report /

Sample Number	U ppm	Cu ppm	Pb ppm	Zn ppm	Mo ppm	Ag ppm				
222	28.0	24	37	60	1	1.2				
223	.9	10	16	40	1	1.1				
224	.9	16	23	53	1	1.2				
NLR- 225	1.4	12	17	40	2	1.0				

Geochemical Laboratory Report

Sample Number	U ppm	Cu ppm	Pb ppm	Zn ppm	Mo ppm	Ag ppm
ILR - 501	.8	4	9	20	1	.5
502	14.0	10	31	50	1	1.3
503	14.4	12	20	45	1	1.4
504	11.2	12	22	46	3	1.7
505	12.0	18	15	31	2	1.6
506	18.0	8	16	34	1	1.2
507	20.8	11	20	41	1	1.4
508	16.2	10	17	32	1	1.2
509	12.0	8	19	53	1	1.5
510	5.6	12	24	66	1	2.1
511	4.0	14	22	69	1	2.4
512	12.0	12	18	43	1	1.6
513	12.4	13	18	46	1	1.6
514	7.6	10	17	48	1	1.4
515	12.8	30	22	72	1	2.1
516	8.0	19	20	75	1	1.6
517	12.4	14	21	58	1	2.8
518	5.6	22	20	50	1	1.5
519	2.4	4	12	41	1	.4

Geochemical Laboratory Report

Sample Number	U ppm	Cu ppm	Pb ppm	Zn ppm	Mo ppm	Ag ppm				
ILR - 520	6.4	8	16	51	1	4.0				
521	5.6	8	17	64	1	1.2				
522	3.6	12	18	59	1	1.4				
523	5.2	12	16	51	1	1.5				
524	1.8	9	14	57	1	1.5				
525	23.2	13	15	54	6	1.4				
526	11.2	10	15	47	7	1.3				
527	6.8	8	20	58	17	1.1				
528	6.4	10	12	27	3	1.6				
529	13.6	8	18	50	1	1.3				
530	7.2	5	17	38	1	.6				
531	2.8	3	11	23	1	.4				
532	2.4	3	11	23	1	.3				
533	2.0	3	11	18	1	.3				
534	.8	3	12	23	1	.4				
535	2.8	3	11	33	1	.4				
536	7.2	5	15	43	1	1.1				
537	1.6	2	10	22	1	.4				
538	1.8	2	12	24	1	.6				
539	3.2	5	15	44	1	.9				

Geochemical Laboratory Report

Sample Number:	U ppm	Cu ppm	Pb ppm	Zn ppm	Mo ppm	Ag ppm				
NLR- 540	1.8	6	14	47	1	.9				
541	3.6	16	18	61	1	1.2				
542	6.0	25	15	49	2	1.7				
543	4.8	9	19	55	1	1.3				
544	2.8	9	17	43	1	.9				
545	2.6	11	18	47	1	1.2				
546	3.8	19	22	77	2	1.8				
NLR- 547	8.2	23	20	85	5	2.3				
548	5.2	17	21	66	2	2.5				
549	9.0	20	18	66	2	2.3				
550	1.7	13	18	71	1	2.0				
551	1.0	8	16	57	1	1.8				
552	6.0	23	13	47	1	1.2				
553	.8	11	12	29	1	.9				
554	.2	12	12	25	1	.9				
555	.2	9	12	26	1	.8				
556	.3	11	13	30	1	.9				
557	4.0	17	17	51	1	2.6				
558	4.0	5	13	42	1	1.1				
559	14.0	10	15	43	2	1.5				
560	7.0	18	16	55	1	2.4				

Geochemical Laboratory Report /

Sample Number	U ppm	Cu ppm	Pb ppm	Zn ppm	Mo ppm	Ag ppm				
561	6.4	13	13	29	1*	1.4				
562	4.8	12	26	78	2	1.7				
563	.8	11	23	87	1	1.5				
564	.3	9	15	54	2	1.2				
565	.9	14	19	63	1	1.7				
566	.2	24	15	68	2	1.8				
567	1.5	17	21	78	3	1.6				
568	.2	13	16	56	2	1.4				
569	.6	19	16	55	1	1.4				
570	.8	11	16	62	2	1.5				
571	2.4	11	14	57	2	1.4				
572	.2	4	14	65	1	1.1				
573	2.4	13	18	72	3	1.6				
574	6.4	21	25	83	3	2.2				
575	1.6	15	20	64	2	1.3				
576	3.0	22	20	63	1	2.1				
577	1.4	14	19	64	1	1.4				
578	.9	13	17	57	1	1.2				
579	1.3	13	18	67	1	1.4				

Geochemical Laboratory Report

Sample Number	U ppm	Cu ppm	Pb ppm	Zn ppm	Mo ppm	Ag ppm				
580	.8	14	19	94	2	1.7				
581	1.5	12	15	83	1	1.8				
582	.5	16	18	67	1	1.7				
583	.5	13	14	74	1	1.5				
584	4.0	13	18	81	5	1.4				
585	8.0	8	17	52	1	1.6				
586	10.4	9	16	56	1	1.6				
587	4.0	13	20	77	1	1.8				
588	1.9	14	17	63	1	1.9				
589	.2	12	16	65	1	1.2				
590	.2	14	15	57	1	1.4				
591	1.3	13	16	57	1	1.3				
592	.2	7	12	34	1	.9				
593	.6	19	36	260	1	2.9				
594	.2	16	24	65	1	1.4				
595	.2	16	17	130	1	1.6				
596	.5	22	15	72	1	2.5				
597	.3	17	20	60	1	1.5				
598	.9	27	20	61	1	1.9				
599	1.7	18	18	75	2	1.9				

Geochemical Laboratory Report /

Sample Number	U ppm	Cu ppm	Pb ppm	Zn ppm	Mo ppm	Ag ppm				
600	.2	14	17	63	1	1.5				
601	.8	18	17	65	1	1.9				
602	.6	32	17	62	1	2.0				
603	1.0	30	17	61	1	1.8				
604	.2	25	16	58	1	1.6				
605	1.0	12	12	40	1	.9				
606	.6	12	12	39	1	.8				
607	.2	15	16	81	1	1.1				
NLR- 608	.4	17	18	52	1	.6				
609	1.0	20	19	54	1	.7				
610	1.7	22	21	59	1	.8				
611	.4	10	19	52	1	.6				
612	2.0	18	20	55	1	.9				
613	.2	9	18	44	1	.7				
614	2.6	11	20	54	1	.8				
615	4.8	16	20	43	1	.9				
616	2.8	14	19	51	1	.7				
617	3.2	29	39	82	2	1.2				
618	4.4	11	26	63	3	.9				
619	8.0	17	27	81	1	.9				
620	9.6	23	23	74	2	1.2				
621	8.0	25	27	72	2	1.3				

Geochemical Laboratory Report /

Sample Number	U ppm	Cu ppm	Pb ppm	Zn ppm	Mo ppm	Ag ppm				
"LR- 622	8.8	14	17	49	1	.9				
623	3.0	23	20	69	1	1.0				
624	4.0	15	19	67	1	1.0				
625	1.5	8	11	31	1	.7				
626	2.4	9	13	39	1	.8				
627	2.8	13	16	50	1	1.0				
628	.5	6	16	42	6	.6				
629	8.8	11	14	44	3	.8				
630	1.6	9	26	53	8	1.0				
631	1.7	18	25	75	7	1.1				
632	8.4	45	21	81	5	1.4				
633	1.8	21	15	66	2	.9				
634	1.3	28	16	65	6	.9				
635	3.4	24	26	76	6	1.0				
636	3.6	23	21	82	7	1.2				
637	2.6	17	15	69	4	.8				
638	3.8	21	17	72	3	1.1				
639	3.8	19	16	76	2	.9				
640	1.7	14	15	68	1	.8				

Geochemical Laboratory Report /

Sample Number	U ppm	Cu ppm	Pb ppm	Zn ppm	Mo ppm	Ag ppm				
AR- 641	.9	14	16	64	1	.6				
642	.9	10	12	41	1	.5				
643	1.5	11	16	41	3	.7				
644	.5	19	29	75	2	1.8				
645	1.5	27	24	91	5	2.2				
AR- 646	1.7	20	24	79	5	1.7				
647	3.2	24	24	81	5	2.0				
648	5.0	29	26	87	8	1.9				
649	7.2	50	21	63	5	2.7				
650	3.2	22	21	74	5	1.7				
651	1.7	23	21	86	5	1.8				
652	1.4	21	26	125	8	1.9				
653	2.4	20	21	84	5	1.6				
654	2.8	24	22	89	6	2.4				
655	3.2	21	19	69	5	1.6				
656	4.2	-	-	-	-	-				
657	2.6	9	14	40	1	1.1				
658	3.6	9	14	38	2	1.3				
659	1.8	12	17	47	3	1.3				
660	2.4	20	18	54	3	1.6				
661	.8	14	21	74	8	1.5				
662	.7	41	25	185	5	2.3				
663	4.2	19	22	85	4	2.2				
664	2.4	16	23	72	3	1.7				

Geochemical Laboratory Report /

Sample Number	U ppm	Cu ppm	Pb ppm	Zn ppm	Mo ppm	Ag ppm				
NLR- 665	3.0	17	23	70	2	1.8				
666	3.0	17	23	92	2	2.2				
667	2.6	17	24	73	2	1.9				
668	1.5	22	27	80	3	1.9				
669	1.4	16	22	64	2	1.6				
670	4.4	26	32	155	4	2.9				
671	22.0	11	28	77	2	1.6				
672	110.0	9	22	58	3	1.4				
673	46.0	13	29	73	3	1.9				
674	60.0	9	23	62	3	1.6				
675	30.0	12	54	94	4	2.0				
676	72.0	9	22	53	4	1.5				
677	36.0	7	16	49	2	1.1				
678	24.0	5	13	42	1	.8				
679	3.2	12	19	53	2	1.3				
680	4.8	28	19	71	2	1.9				
681	1.7	25	20	65	2	6.1				
682	.9	35	21	76	1	2.4				
683	3.2	39	28	82	1	2.3				

Geochemical Laboratory Report /

Sample Number	U ppm	Cu ppm	Pb ppm	Zn ppm	Mo ppm	Ag ppm				
NLR- 684	2.2	34	22	87	1	1.9				
685	.5	34	76	1425	1	9.4				
686	1.2	33	91	1700	1	10.4				
687	.2	46	22	76	2	2.3				
688	.2	33	87	900	2	3.5				
689	1.3	27	21	64	2	1.8				
690	.7	22	21	82	1	1.6				
691	1.5	37	27	130	2	2.2				
692	1.8	35	30	140	2	2.0				
693	2.4	31	22	72	2	1.7				
694	1.9	27	21	65	2	1.7				
695	.7	20	22	69	2	1.6				
696	1.8	23	24	76	1	1.9				
697	2.6	20	27	66	2	2.0				
698	1.1	22	25	71	1	1.8				
699	5.0	32	27	74	2	2.1				
700	7.6	27	22	85	3	1.8				
701	6.4	20	25	93	3	1.9				
702	9.8	19	22	87	2	1.9				
NLR- 703	7.8	24	23	75	1	1.9				
704	8.6	23	19	66	2	1.8				
705	7.6	16	19	52	2	1.5				
706	4.4	19	19	59	2	1.5				
707	4.2	9	13	26	2	1.1				

Geochemical Laboratory Report /

SAMPLE NUMBER	U ppm	Cu ppm	Pb ppm	Zn ppm	Mo ppm	Ag ppm
NLR 708	14.8	29	24	69	2	2.5
709	14.4	22	22	68	2	2.4
710	10.4	21	20	60	2	2.1
711	11.8	19	24	67	4	2.4
712	4.8	17	22	63	3	2.3
713	9.0	34	25	82	4	2.7
714	1.4	25	22	82	2	2.3
715	1.8	23	25	88	2	2.2
716	3.0	20	21	81	3	2.2
717	2.0	24	26	84	7	2.1
718	3.4	32	18	76	6	2.6
719	2.4	29	17	81	7	3.1
720	10.4	20	25	76	4	2.8
721	11.8	19	23	72	2	2.2
722	10.0	15	22	65	1	1.8
723	12.8	14	24	68	1	1.8
724	6.6	9	18	52	1	1.4
725	6.0	14	17	62	1	1.5
726	5.2	52	19	47	1	1.6
NLR- 727	3.0	65	25	53	1	1.6
728	15.6	135	28	54	2	2.1
729	4.4	92	27	61	3	1.9
730	4.6	30	24	53	2	2.0
731	3.2	52	27	63	1	2.0
732	7.6	24	24	52	2	1.9
733	9.8	23	25	54	2	2.2

Geochemical Laboratory Report /

SAMPLE NUMBER SEDIMENTS	U ppm	Cu ppm	Pb ppm	Zn ppm	Mo ppm	Ag ppm				
NLR 734	1.5	7	15	49	1	1.1				
735	.7	15	18	72	2	1.6				
736	.7	15	21	64	2	1.6				
737	3.4	12	20	51	3	1.7				
738	1.8	6	17	53	3	1.3				
739	1.4	7	17	57	7	1.3				
740	10.0	10	16	52	4	1.4				
741	6.0	16	26	64	9	1.9				
743	24.0	35	28	80	3	2.9				
744	9.2	13	19	55	2	1.6				
745	5.6	11	19	52	1	1.4				
746	3.2	8	28	98	1	1.8				
747	12.8	15	24	76	1	1.7				
748	5.2	16	28	110	1	1.8				
749	5.2	16	32	96	1	1.6				
750	1.4	5	15	45	1	.9				
751	4.4	9	21	55	3	1.1				
(rock chip) 752	26.0	6	14	41	34	.7				

Geochemical Laboratory Report /

Sample Number SEDIMENTS	U ppm	Cu ppm	Pb ppm	Zn ppm	Mo ppm	Ag ppm				
NLR 780	1.7	17	19	57	2	1.3				
781	.6	16	22	58	1	1.0				
782	.2	20	21	51	1	1.0				
783	.9	28	19	52	1	1.2				
784	1.1	27	21	46	1	1.1				
785	1.0	30	21	49	1	1.1				
786	1.6	33	21	66	1	1.2				
787	1.1	16	18	43	1	1.0				
788	2.0	20	18	48	1	1.2				
789	1.6	19	18	46	1	.9				
790	.9	17	17	46	1	.8				
791	.4	72	20	54	2	1.5				
792	1.5	95	21	45	1	2.0				

Geochemical Laboratory Report

Sample Number	U ppm	Cu ppm	Pb ppm	Zn ppm	Mo ppm	Ag ppm
NTR- 900	1.4	7	18	59	1	.6
901	.4	8	15	42	1	.6
902	.2	9	15	47	1	.5
903	.2	9	18	49	1	.6
904	1.0	6	14	46	1	.6
905	2.4	7	18	58	1	.9
906	1.7	7	19	65	1	1.1
907	1.7	7	21	76	1	1.0
908	6.4	9	26	79	1	1.3
909	3.2	8	22	72	2	1.2
910	34.0	15	23	51	2	1.9
911	56.0	45	24	72	2	1.8
912	3.4	4	13	25	1	.8
913	9.8	10	18	45	2	1.5
914	52.0	19	24	58	3	2.5
915	6.4	14	19	46	3	1.6
916	1.5	8	15	51	2	1.2
917	6.4	14	17	42	2	1.7
918	16.4	14	19	27	2	1.7
919	3.2	9	15	45	1	1.0
920	1.2	12	20	58	1	1.2
921	1.2	9	15	50	1	1.0
922	.9	9	14	50	1	1.0
923	2.4	16	25	96	1	.4

DWG. 208-42-1

118°45'

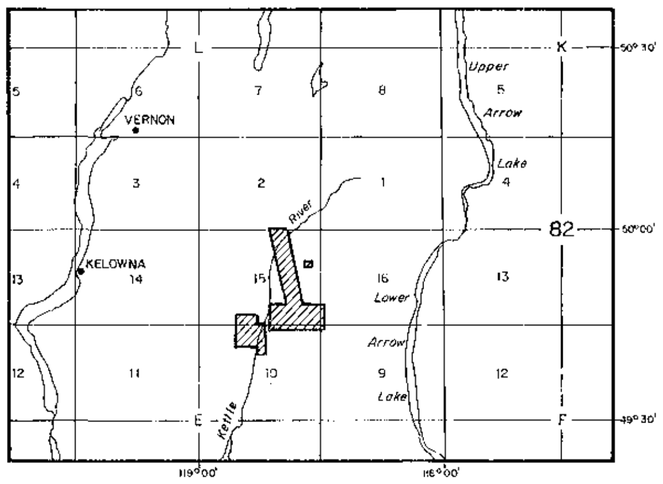
118°30'

50°00'

49°45'

49°30'

VERNON MINING DISTRICT
GREENWOOD MINING DISTRICT



LOCATION MAP
SCALE - 1:1,267,200
25 0 25 kilometers
20 10 0 20 miles

NOTE - ALL SAMPLES HAVE PREFIX NLR

N

LEGEND

- 732 — Sample location and number
- JIM 6 — Claim boundary and name
- X 752 — Rock chip location and number

SCALE - 1:50,000
1000 0 1000 2000 3000 METRES
1 0 1 2 MILES

Work performed by
BARRINGER MAGENTA LTD, Toronto, Canada.

PART 1 OF 9

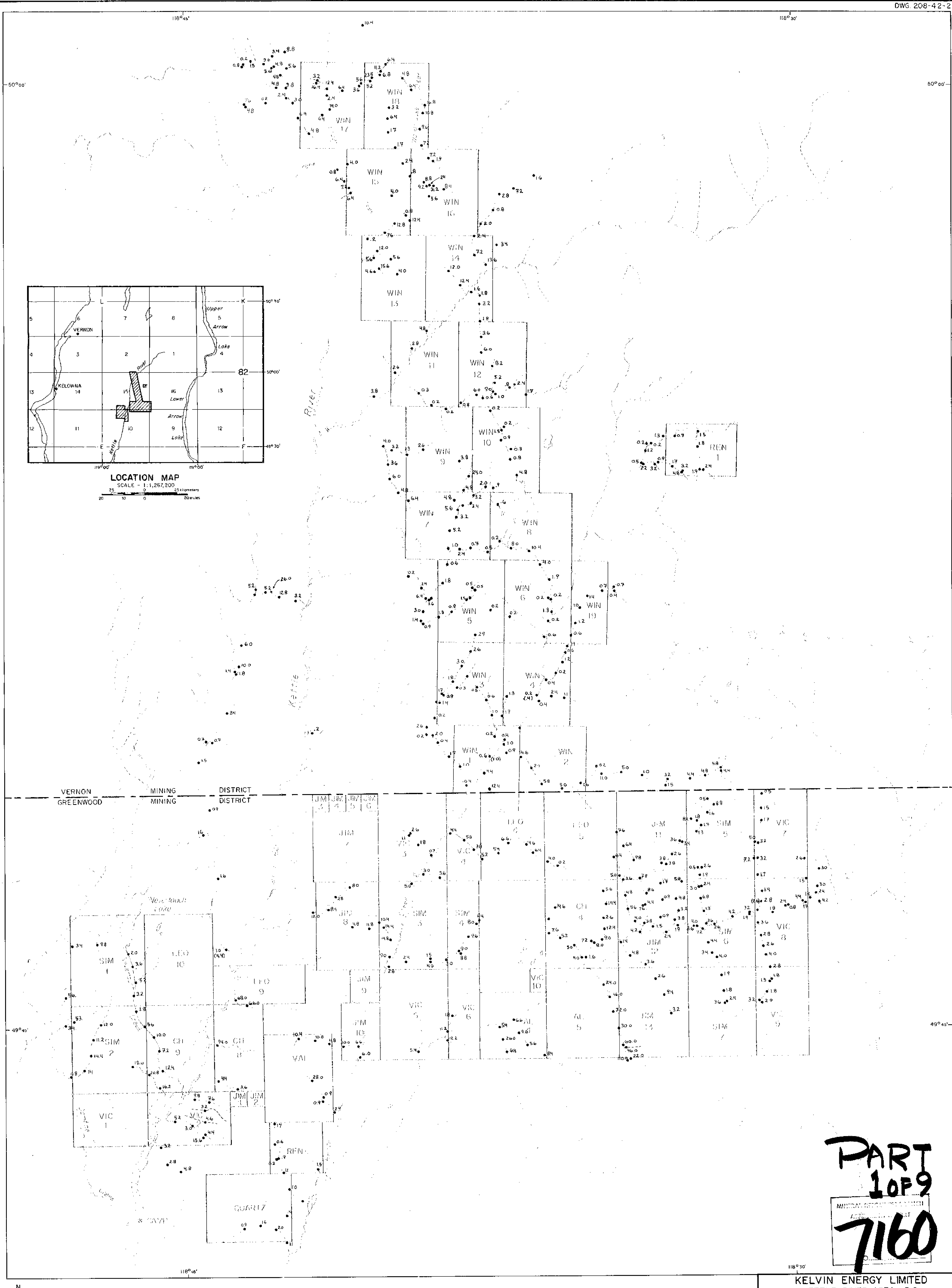
MINERAL RESOURCES BRANCH
ASSESSMENT REPORT
7160

KELVIN ENERGY LIMITED
KETTLE RIVER AREA, B.C.

DRAINAGE GEOCHEMICAL SURVEY

SAMPLE LOCATION AND NUMBER

JUNE-JULY 1978	N.T.S. 82E/9,10,15 82L/2	DWG. 208-42-1



PART 1 OF 9

MINERAL RESOURCES BRANCH ASSESSMENT REPORT

7160

LEGEND

• 15 Sample location and value in p.p.m.

JIM 6 Claim boundary and name

× 14 Rock chip and value in p.p.m.

SCALE - 1: 50,000

1 0 1 2 MILES

1000 0 1000 2000 3000 METRES

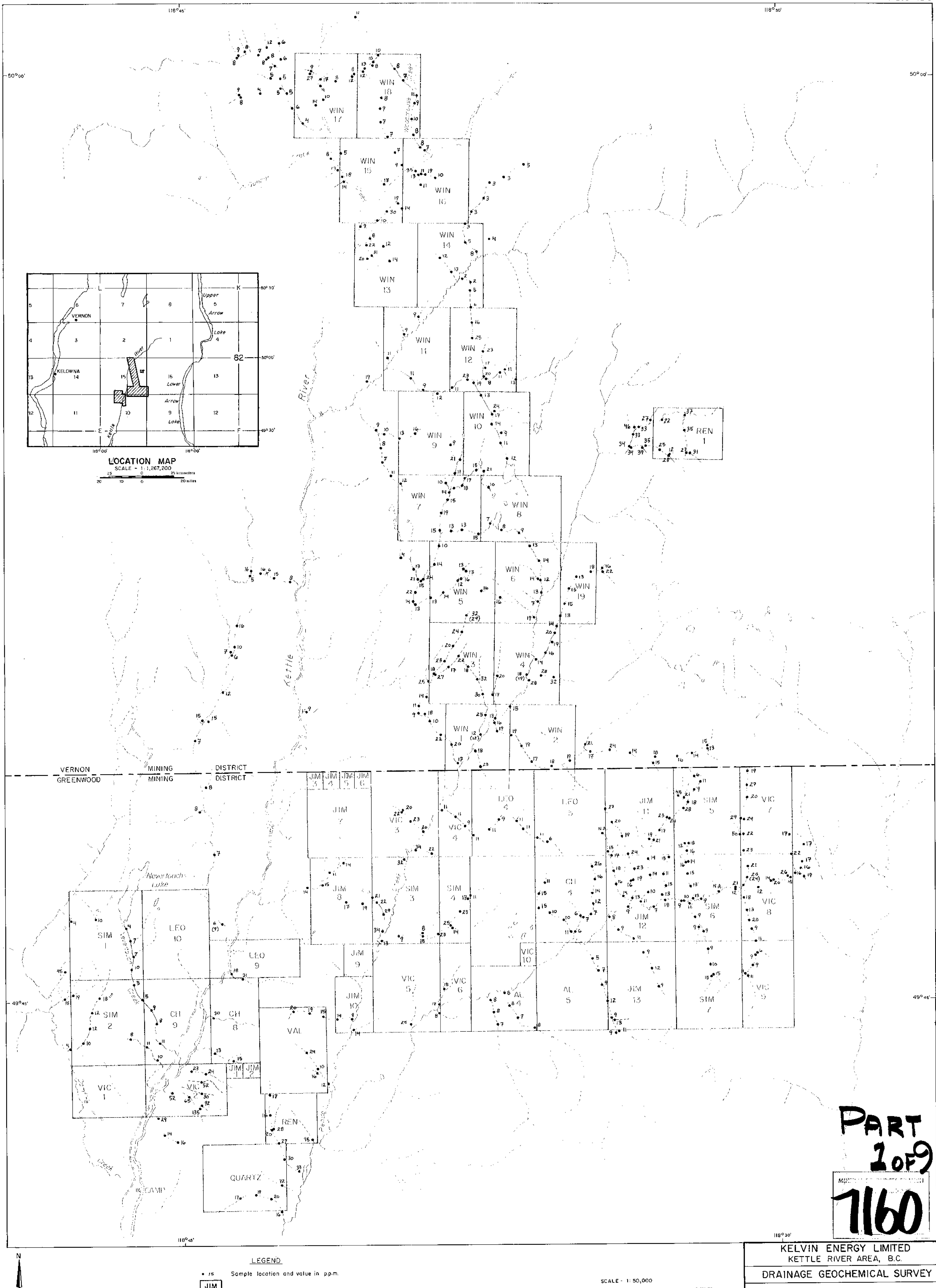
Work performed by
BARRINGER MAGENTA LTD, Toronto, Canada.

KELVIN ENERGY LIMITED
KETTLE RIVER AREA, B.C.

DRAINAGE GEOCHEMICAL SURVEY

URANIUM
IN
STREAM SEDIMENTS

JUNE-JULY 1978	N.T.S.	82E/9,10,15 82L/2	DWG. 208-42-2



N

A

LEGEND

• 15 Sample location and value in p.p.m.

JIM 6 Claim boundary and name

x 14 Rock chip and value in p.p.m.

SCALE - 1:50,000

2 MILES

1000 0 1000 2000 3000 METRES

Work performed by
BARRINGER MAGENTA LTD, Toronto, Canada.

KELVIN ENERGY LIMITED
KETTLE RIVER AREA, B.C.

DRAINAGE GEOCHEMICAL SURVEY

COPPER
IN
STREAM SEDIMENTS

JUNE-JULY 1978	N.T.S. 82E/9,10,15 82L/2	DWG. 208-42-3

DWG. 208-42-4

118°45'

118°30'

50°00'

WIN 17

WIN 18

WIN 15

WIN 16

WIN 14

WIN 13

WIN 11

WIN 12

WIN 9

WIN 10

WIN 7

WIN 8

WIN 5

WIN 6

WIN 19

WIN 3

WIN 4

WIN 1

WIN 2

REN 1

JIM 3 | JIM 4 | JIM 5 | JIM 6

JIM 7

JIM 8

JIM 9

JIM 10

JIM 11

JIM 12

JIM 13

JIM 1 | JIM 2

SIM 3

SIM 4

SIM 5

SIM 6

SIM 7

SIM 1

SIM 2

LEO 4

LEO 5

LEO 10

LEO 9

VIC 3

VIC 4

VIC 10

VIC 5

VIC 6

VIC 7

VIC 8

VIC 1

CH 4

CH 9

CH 8

AL 4

AL 5

VAL

QUARTZ

REN

Upper Arrow Lake

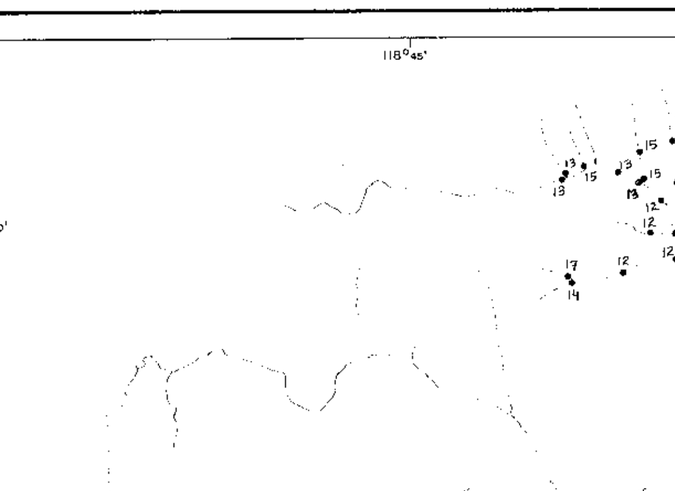
Lower Arrow Lake

Kettle River

McCAMP Creek

VERNON MINING DISTRICT

GREENWOOD MINING DISTRICT



LOCATION MAP

SCALE - 1 1,267,200

25 0 25 kilometers

20 10 0 20 miles

N

—A—

LEGEND

• 15 Sample location and value in p.p.m.

JIM 6 Claim boundary and name

× 14 Rock chip and value in p.p.m.

SCALE - 1: 50,000

1 0 1 2 MILES

1000 0 1000 2000 3000 METRES

Work performed by

BARRINGER MAGENTA LTD, Toronto, Canada.

KELVIN ENERGY LIMITED

KETTLE RIVER AREA, B.C.

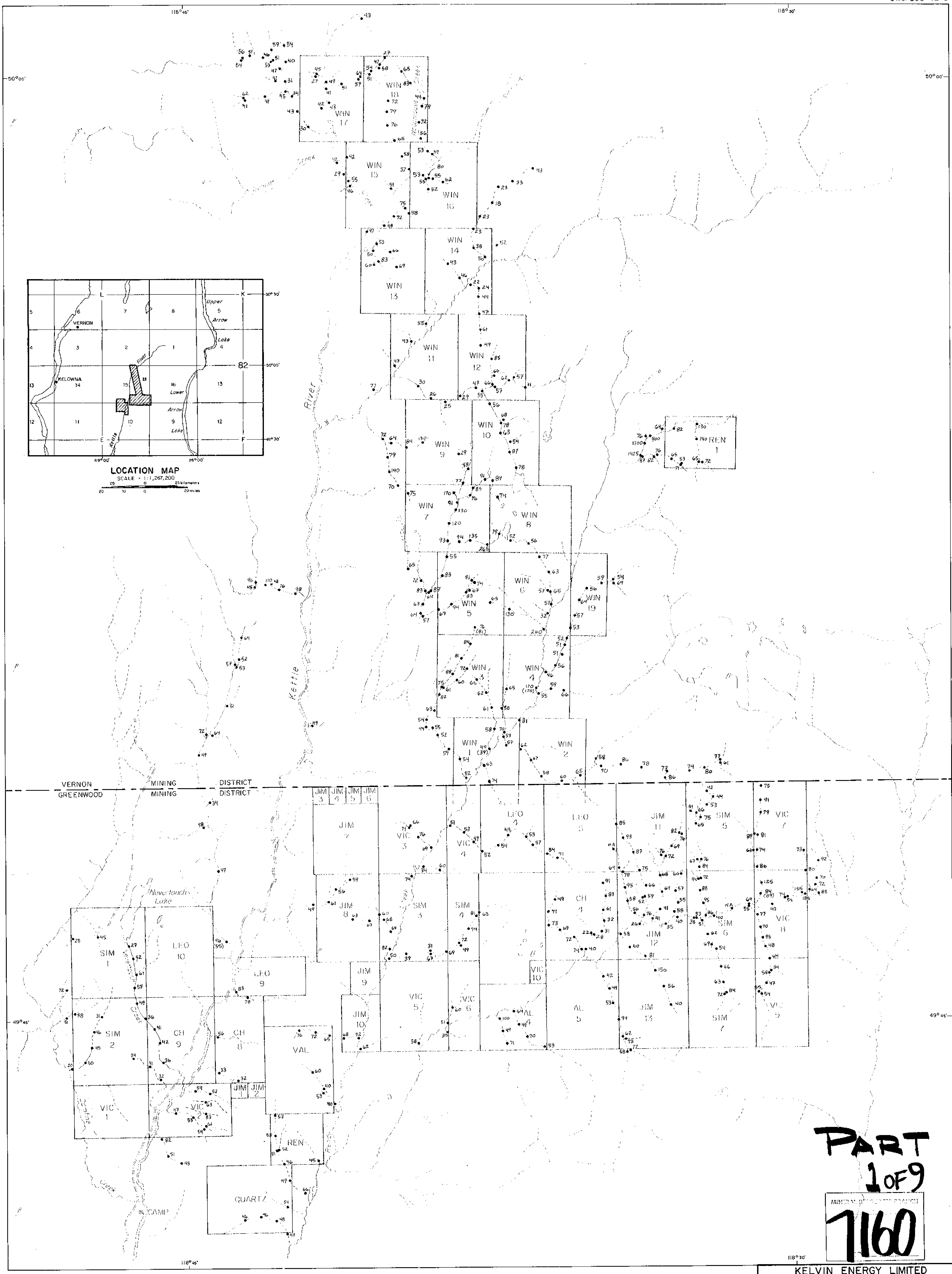
DRAINAGE GEOCHEMICAL SURVEY

LEAD IN STREAM SEDIMENTS

JUNE-JULY 1978 | N.T.S. 82E/9,10,15 82L/2 | DWG. 208-42-4

PART 1 OF 9

MR # 7160



N
A

LEGEND

- • 75 Sample location and value in p.p.m.
- JIM 6 Claim boundary and name
- × 74 Rock chip and value in p.p.m.

SCALE - 1:50,000

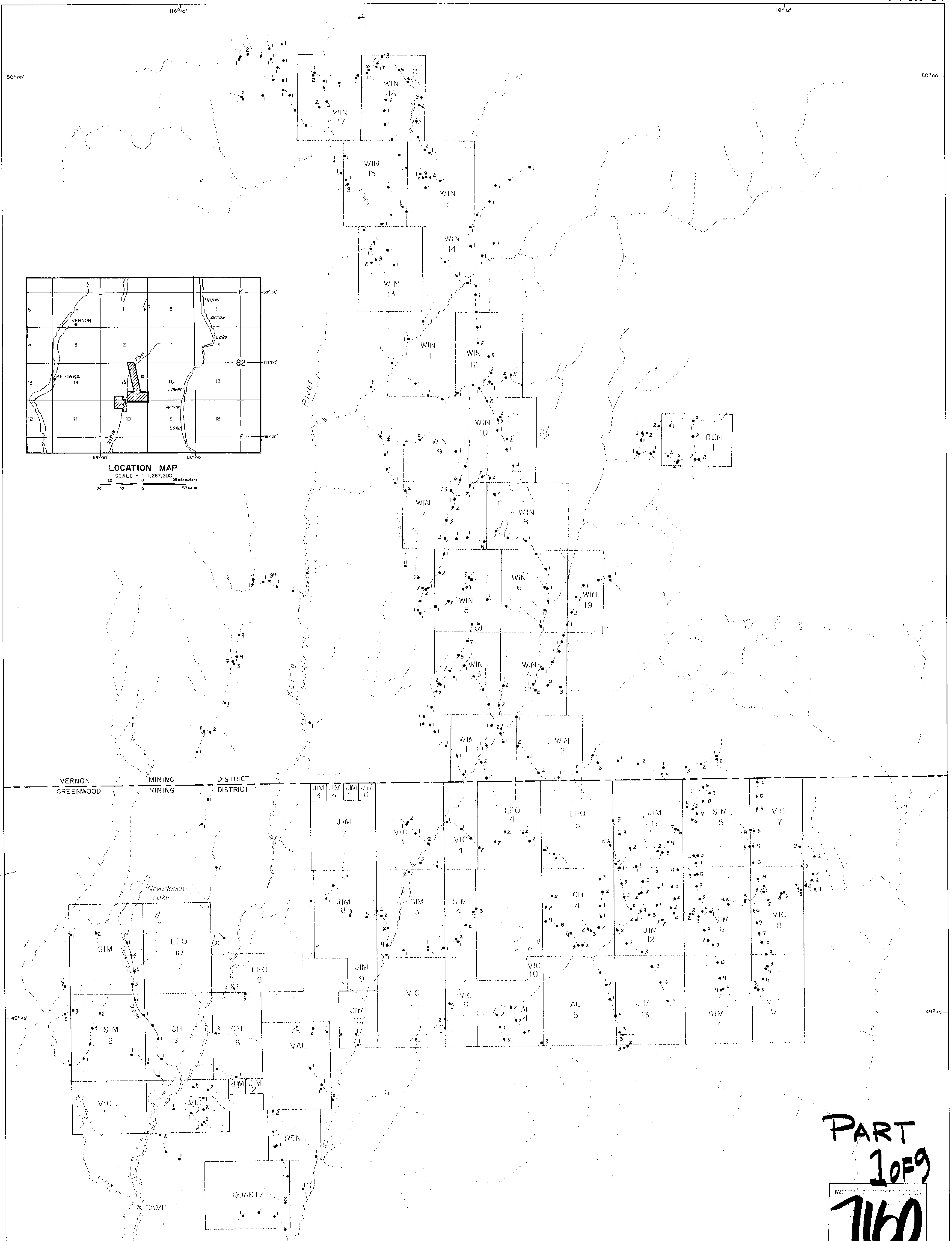
1 0 1 2 MILES

1000 0 1000 2000 3000 METRES

Work performed by
BARRINGER MAGENTA LTD, Toronto, Canada.

KELVIN ENERGY LIMITED KETTLE RIVER AREA, B.C.		
DRAINAGE GEOCHEMICAL SURVEY		
ZINC IN STREAM SEDIMENTS		
JUNE-JULY 1978	N.T.S. 82E/9,10,15 82L/2	DWG. 208-42-5

DWG. 208-42-6



N

A

LEGEND

• 15 Sample location and value in p.p.m.

JIM 6 Claim boundary and name

x 14 Rock chip and value in p.p.m.

SCALE - 1:50,000

1000 0 1000 2000 3000 METRES

0 1 2 MILES

Work performed by
BARRINGER MAGENTA LTD, Toronto, Canada.

PART 1 OF 9

7160

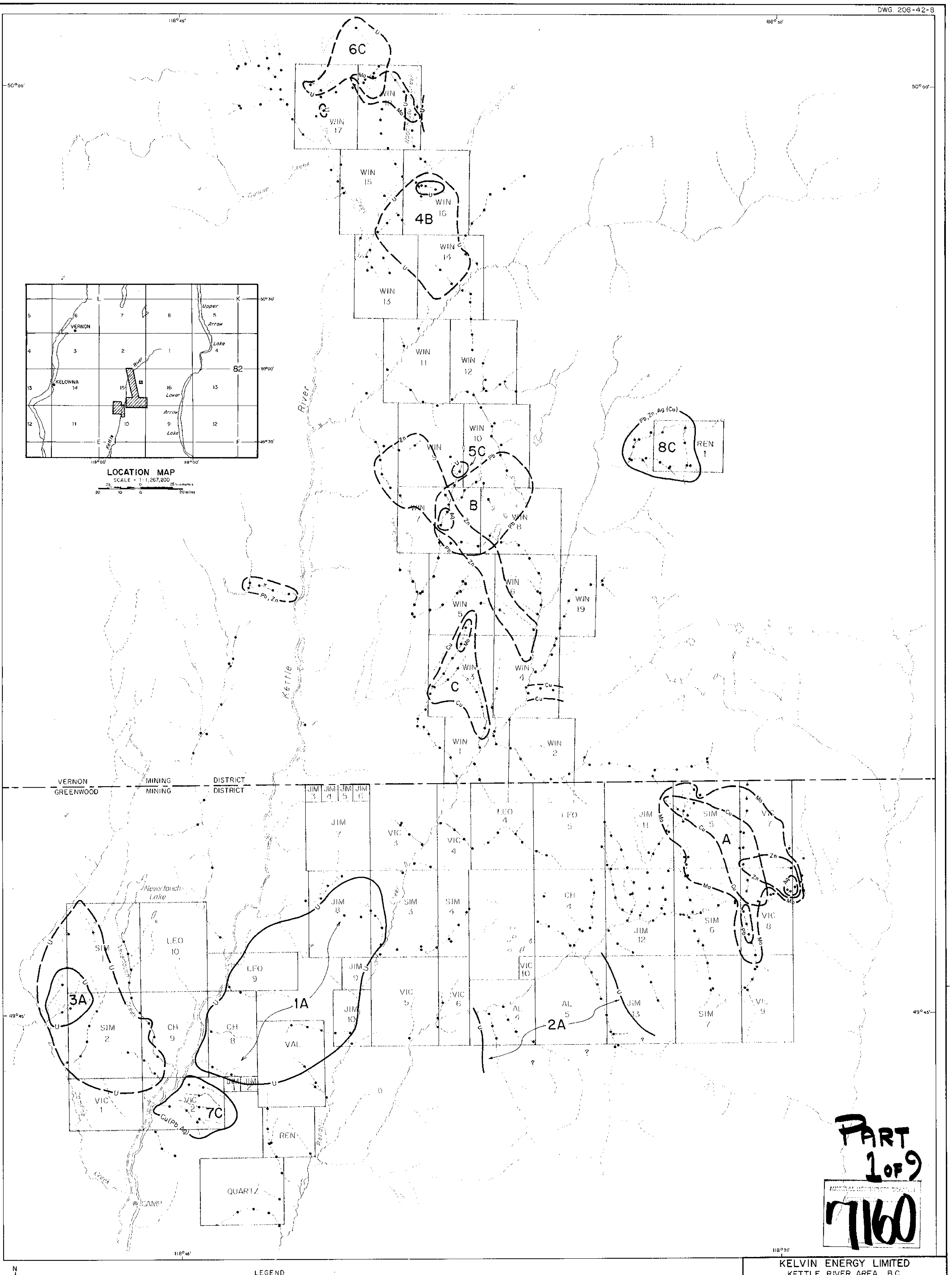
KELVIN ENERGY LIMITED
KETTLE RIVER AREA, B.C.

DRAINAGE GEOCHEMICAL SURVEY

MOLYBDENUM
IN
STREAM SEDIMENTS

JUNE-JULY 1978	N.T.S. 82E/9,10,15 82L/2	DWG. 208-42-6

DWG. 208-42-7
LOCATION MAP
SCALE - 1:1,267,200
VERNON MINING DISTRICT
GREENWOOD MINING DISTRICT
Kettle River
LEGEND
Sample location and value in p.p.m.
Claim boundary and name
Rock chip and value in p.p.m.
SCALE - 1:50,000
Work performed by
BARRINGER MAGENTA LTD, Toronto, Canada.
KELVIN ENERGY LIMITED
KETTLE RIVER AREA, B.C.
DRAINAGE GEOCHEMICAL SURVEY
SILVER
IN
STREAM SEDIMENTS
JUNE-JULY 1978
N.T.S. 82E/9,10,15 82L/2
DWG. 208-42-7
PART 1 OF 9
7160



LEGEND

- Strong anomaly
- Weaker and less well defined anomaly
- U(Ag) Major and (minor) components of anomaly
- 2A Ranking of anomaly
- • Sample location
- × Rock chip location

SCALE - 1: 50,000

Work performed by
BARRINGER MAGENTA LTD, Toronto, Canada.

KELVIN ENERGY LIMITED KETTLE RIVER AREA, B.C.		
DRAINAGE GEOCHEMICAL SURVEY		
INTERPRETATION		
JUNE-JULY 1978	N.T.S. 82E/9,10,15 82L/2	DWG. 208-42-8