COMPILATION REPORT

ON

GEOPHYSICAL AND GEOCHEMICAL SURVEYS

OVER A PORTION OF THE

SAB CLAIMS

STOVE CREEK, KETTLE RIVER VALLEY

VERNON M.D.

BRITISH COLUMBIA

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WRITTEN FOR

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DATED

- : Along Kettle River at Stove Creek, and 16 km southwest of F.C.'s Highway #6 along forestry access roads
- : 49° 55' North Latitude 118° 42' West Longitude
- : N.T.S. 82E/15
- : Y-H Technical Services Ltd. Box 298 Vernon, B.C., VIT 6M2
- : Patrick Cruickshank, Geo David G. Mack, Geophysid GEOFRONICS SURVEYS 1470. 530 - 800 West Pender St Vancouver, B.C., V6C 2V6
- : February 28, 1989



GEOTRONICS SURVEYS LTD. Engineering & Mining Geophysicists

VANCOUVER, CANADA

ARIS SUMMARY SHEET

District Geo	ologist, Kamloops		Off Confider	ntial: 89.12.02
ASSESSMENT 1	REPORT 18533	MINING DIVISION:	Vernon	
PROPERTY:	Sab			
LOCATION:	LAT 49 55 00	LONG 118 42 0	0	
節果	UTM 11 5530531	377954		
	NTS 082E15E			
CLAIM(S):	Sab 3-5			
OPERATOR(S)	: Y-H Technical Ser	vices		
AUTHOR(S):	Mark, D.G.;Cruick	shank, P.		
REPORT YEAR COMMODITIES	: 1989, 53 Pages			
SEARCHED FOI	R: Gold,Silver,Lead,	Zinc,Copper		
KEYWORDS:	Mesozoic, Proteroz	oic,Nelson Pluton	ic Rocks,Monash	nee Group
WORK	Paragneiss,Limest	cone,Porphyritic G	ranite,Diorite	
DONE: G	eophysical			
E	IGR 9.3 km;VLF			
I. I.	POL 18.3 km			
	Map(s) - 22; Scal	e(s) - 1:2500, 1:50	000	
M	AGG 7.2 km		· .	
RELATED				
REPORTS:	09576,10222,14100)		
MINFILE:	082ENE044			

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SUMMARY

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A) <u>General</u>

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This report discusses the results from several geophysical and geochemical surveys conducted by Mohawk Oil Co Ltd during the time the SAB property was under option to them (1980 to 1985); over a portion of the SAB claims located along the west side of the Kettle River and 16 km southwest of B.C.'s Highway #6 along The surveys herein compiled include doubleforestry roads. dipole and pole-dipole IP and resistivity surveys conducted during the autumn of 1984; a magnetometer survey conducted in 1982; VLF-EM surveys conducted during the period 1981 to 1982; and geochemical surveys conducted in 1981, 1982 and 1984, for gold and In addition data obtained from various surveys, includsilver. ing VLF-EM and soil geochemistry conducted by the prospectors during 1978 and 1979 have also been utilized. The purpose of this report is to compile the data from these various surveys to assist in locating zones of economically mineable gold mineralization.

The property is accessible by two-wheel drive vehicle along logging roads in the summer, but a four-wheel drive vehicle with chains is recommended in the winter. The terrain consists of gentle to steep slopes originally covered with lodgepole pine, fir, and balsam spruce. Most of the property has been logged during the past 20 years and is now covered by a second growth of the above species and extensive alder patches.

The general area is underlain by intrusives of the Greater Nelson Batholith, of Cretaceous age which also primarily underly the SAB property. Roof pendants of Permian Anarchist Group limestone and andesite occur sporadically in confined localities across the property. A main north-south fault system traverses the length of the property (Kettle River), as well as secondary northwest and east-west trending structural systems. The primary target on the property is structurally controlled epithermal quartz or quartz-calcite veins infilling the main fault and shear system, and/or northwest and/or northeast structures. At least one eastwest trending structure hosts lead-zinc-silver mineralization which appears to predate the epithermal events; however, this is not discussed in detail in this report.

The latest IP and resistivity surveys were carried out using both the double dipole and pole-dipole survey methods with 50-m stations read from one to eight levels. The survey lines were run east-west and separated by 120 metres. The magnetometer survey was carried out at both 30 and 15 metre stations over the same lines and in some cases, detailed infilling was carried out on interspaced lines. The VLF-EM surveys were carried out over the same station intervals as the magnetometer survey, using the Annapolis and Hawaii transmitting stations. The gold and silver geochemistry surveys were carried out over the same lines at 100-ft (30-m) station intervals. Fourteen lines were interpreted using all four methods . In addition, three resistivity survey lines located along the north-trending roads within the same area were interpreted, for a total of seventeen survey lines.

B) <u>History</u>

From R.W. Yorke-Hardy:

 (a) The data obtained during the tenure of Mohawk was interpreted as indicating a "porphyry" type deposit. The stockwork area was considered as the "breccia cap" associated with such a deposit. The clay zones were

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often considered to relate to fault structures vs. alteration. Intense alteration noted was interpreted into the above model.

- (b) In 1983 and 1984, independent consultant geologists recognized the alteration zones as being related to "epithermal" events and recommended Mohawk utilize this model for re-interpreting existing data and guiding future exploration efforts.
- (C) Work conducted in 1984 under the guidance of F. Marshall Smith, P.Eng., included relogging of drill holes and re-interpretation of IP/resistivity data and the re-surveying of extensive portions of the property to obtain greater depth penetration and detail. Α report prepared by Smith in late 1984 recommended a \$230,000 program of work which, if successful, would be followed by an extensive drill program to delineate and assess mineralized zones. The program conducted was successful in confirming the existence of three extensive zones of epithermal alteration -- each at least partially delineated by the IP/resistivity surveys and two of which were intersected by 1984 drilling.

Drill holes 84-1 2 both & intersect zones of epithermal-type alteration correlating with an intense "resistivity low" anomaly. Core contained pyrite mineralization with associated gold/silver values from anomalous to low levels over considerable width to grades approaching economic levels over narrow widths. Holes 4 & 5 also encountered intense alteration in a second "resistivity low" zone, although pyrite content

was low and gold/silver values reached only anomalous levels.

- (d) The 1984 drilling and IP/resistivity program was not fully assessed due to changing plans within Mohawk, which resulted in the termination of their option on the property upon failure to make a required option payment. The property was in limbo until 1988.
- (e) During the last quarter of 1988 and early 1989, extensive compilation of data was undertaken in order to better understand the property potential. Specific points follow:
 - i) The gold/silver ratio in the HG zone area and extending both north and south is higher than elsewhere on the property.
 - ii) Anomalous to economic grades of mineralization have been exposed on surface and in drill holes in the HG zone. Drilling along strike North and South is warranted.
 - iii) The gold/silver ratio in the "waterhole" zone (East Pb Zone) is the next highest level. Grades approach economic in drill core samples. Further drilling is required to assess this area.
 - iv) The Stockwork zone has potential for developing "smaller" zones of economic mineralization related to concentrated veining/quartz flooding and pyritization. The HG zone likely extends back (North) into the Stockwork zone. The K-8 trench and drill hole #80-3 encountered economic grades of gold/silver mineralization.
 - v) The Pb zone as drilled in 1983 was not disproven. The drilling was widespaced and oriented to optimize a perpendicular intersection rather than considering the complex problems of post-mineralization faulting and dyke infilling. Grades in

excess of 20 o.p.t. silver were located on surface in the K-1 trench in 1983. This zone warrants more work and could be readily explored by underground drifting utilizing the existing open-cut face as a partial head wall. Geophysical work along this east/west trending zone could assist in delineating drill targets.

V

vi) Detailed resistivity surveying and geological mapping in the vicinity of the large epithermal altered zones will assist in orienting the structures which are considered most favourable for mineralization prior to drilling -- see F.M. Smith report for further conclusions and recommendations.

CONCLUSIONS

- 1. The gold and silver geochemistry survey results show that this property has very good potential to host economic mineralization since the mean background levels are very high relative to surveys in other areas and since a number of strong anomalies have been revealed throughout the survey area.
- 2. The results of correlating drill hole logs with the resistivity pseudosections has proven that the low resistivities point to zones of moderate to intense alteration, both propylitic and phyllic -- both types typical of an epithermal type of mineral deposit. Gold and silver mineralization have also been shown to occur within these areas of alteration.
- 3. On many of the lines, the coverage of the double-dipole survey is too little to facilitate a good interpretation.

Correlations between the IP/resistivity surveys and other surveys have assisted in extrapolating and interpolating some resistivity anomalies.

- 4. Strong resistivity anomalous lows often correlate with medium-strength IP highs, sugggesting that some sulphides occur with them. The resistivity anomalies are very wide and/or deep. suggesting that the causative sources are also wide and/or deep.
- 5. VLF-EM anomalies correlate very well with lineal resistivity lows, suggesting that the causative sources are geologic structure such as fracture and/or shear zones.
- 6. The magnetometer survey ghas generally litle variation across the limits of the survey, but in profile form it can be seen that areas of high magnetic field correlate with zones of higher resistivity. The causative sources are likely volcanics of the anarchist Group, in the form of "roof pendants".

RECOMMENDATIONS

1.

More IP and resistivity surveying, using the double-dipole array method, should be conducted to fill in areas of interest which were missing such data for this report. Particular attention should be paid to the area immediately north of line 0+00, and west of the baseline, south of line 7+20S. More IP and resistivity surveying, using the double-dipole array method, should be conducted to fill in areas of interest which were missing such data for this report. Particular atention should be paid to the area immediately north of line 0+00.

2.

3. Pending the results of the above surveys, more driling should be carried out, and to greater depths than the previous programmes. In addition, resistivity anomaly A should be explored by drilling.

REPORT

ON

GEOPHYSICAL AND GEOCHEMICAL SURVEYS

OVER A PORTION OF THE

SAB CLAIMS

KETTLE RIVER, VERNON AREA

VERNON M.D.

BRITISH COLUMBIA

INTRODUCTION AND GENERAL REMARKS

1

This report discusses the compiled results of induced polarization (IP), resistivity, magnetometer, VLF-EM and geochemistry surveys carried out over a portion of the SAB claims, located over the confluence of Stove Creek with Kettle River in the Vernon Mining Division of British Columbia.

The field work under discussion was completed in many stages between 1978 and the autumn of 1984 but was never properly compiled and interpreted. This report was written under the general direction of David G. Mark, geophysicist, with consulting advice from Bob Yorke-Hardy, exploration technician, whose advanced knowledge of the property proved invaluable.

Within the current areas of interest on the property economical grades of gold and silver mineralization are known to occur along

"reidel" features and these in turn appear to relate to large epithermal alteration zones. Gold and silver values from anomalous levels to economic grades have also been encountered within these epithermally altered zones although these have not yet been the target of any concerted exploration effort.

2

To date most of the exploration methods used on the property were designed to locate large tonnage deposits related to "Stockwork/ Porphyry Type" fracture zones within the intrusives. The original purpose of the resistivity survey was to detect zones of disseminated mineralization associated with such deposits and map them as resistivity lows caused by fracturing and/or alteration. It later became apparent that resistivity lows were mapped which relate to epithermal alteration zones. The main purpose of the IP survey was to locate associated sulphide vein-fillings as chargeability highs. The purpose of the magnetometer survey, and a secondary purpose of the resistivity survey, was to map lithology and geologic structure, and that of the VLF-EM survey was to map geologic structure as EM conductors. The purpose of the soil geochemistry survey was to locate gold and/or silver mineralization.

This report was written to compile the results of several different geophysical and geochemical surveys together and produce a cohesive interpretation of the potential for gold/silver mineralization on the property as it might relate to the epithermal events now recognized as the "model" best suited to the property.

PROPERTY AND OWNERSHIP

The property consists of seven contiguous claims totalling 105 units as shown on Map 2 and as described below:

<u>Name of Claim</u>	<u>No of Units</u>	Record Number	Expiry Date
SAB 1	15	619	May 21, 1991
SAB 2	15	620	May 22, 1991
SAB 3	9	621	May 24, 1991
SAB 4	16	622	May 24, 1991
SAB 5	18	623	May 24, 1991
SAB 8	12	1008	March 6, 1991
SAB 9	20	1916	Dec. 5, 1989

Title on all claims is held by R.W. Yorke-Hardy (registered record holder).

The expiry dates above take into account this report being accepted for assessment credits.

LOCATION AND ACCESS

The SAB claims are located in the Kettle River valley, some 54.5 kilometers at a bearing of 130° southwest of the City of Vernon, B.C. It occurs largely on the west side of the Kettle River at its confluence with Stove Creek.

The geographical coordinates for the center of the property are 49° 55' north latitude and 118° 42' west longitude.

Access is readily gained from the town of Vernon by travelling 99 km east along Highway #6, to the gravel forestry road at the Spruce Grove cafe near the Monashee Pass summit. The property is located 16 km southwest along this road, at Stove Creek. Access is easily gained by two-wheel drive in the summer months, but a four-wheel drive with chains is recommended for the winter months. Winter access may be subject to closure unless logging activities continue in the area or the road is otherwise kept open.

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PHYSIOGRAPHY AND VEGETATION (from Smith [1984])

"The property is located in the eastern boundary of the Okanagan Highland, a division of the Interior Plateau System immediately west of the Monashee Mountains. Relief is moderate, rising from an elevation of 1,050 m at the Kettle River, which intersects the property, to 1,650 m in the northwestern part of the property. The primary exploration targets are at about 1,200 m elevation.

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"Several creeks, including Stove, Bruer, Haggart and Winnifred flow through the property into the Kettle River. Outcrop in the creek valleys is abundant but overall rock exposure is less than 25%. The remainder of the property is covered by glacial till.

"The vegetation on the property originally consisted of lodgepole pine, fir, balsam spruce and, locally, alder. Approximately 50% of the property has been logged during the past 10 - 12 years. Secondary stands of pine and fir are established in some of the older logged areas."

HISTORY OF PREVIOUS WORK

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From Robert W. Yorke-Hardy:

The SAB property is located approximately 13 km northwest of the Lightning Peak Camp, which produced high grade silver ore until the mid 1930's; and approximately 24 km southwest of the Monashee Camp, which produced lode gold and silver ores as well as placer gold, from the mid-nineteenth century until early in the twentieth century. Many of these old properties are again being explored for precious metals. Other "new prospects" have received considerable attention in the Monashee Pass-Keefer Lake and Lightning Peak areas. The SAB property was first staked in 1972 by R.W. Yorke-Hardy and S.E. Arnold to cover sulphide-bearing quartz veins and altered zones exposed during logging road construction along the west side of the Kettle River south of Stove Creek. These veins carried pyrite, galena and sphalerite with associated gold and silver values. Between 1973 and 1977 the claims were prospected and numerous trenches and test pits were dug. Five additional veins and a large stockwork area were discovered all of which yielded gold and/or silver values from anomalous levels to assays of 0.317 o.p.t. gold, 4.58 o.p.t. silver across four feet of quartz vein (south vein area). A two-element (lead, silver) soil geochem survey and single frequency VLF-EM survey (Seattle station - 18.7 KHz) were conducted in the fall of 1977 (see Geotronics report dated February 20, 1978 for details) which indicated several anomalies correlating with an inferred extension of the zones of known interest.

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In 1978 a private company, Snowflake Mining Ltd. (of which R.W. Yorke-Hardy is a 25% owner), acquired an option to earn up to a 50% interest in the property. A program of trenching and stripping was conducted in early 1978 as was a test program of overburden sample drilling. This was followed by percussion drilling in the Stockwork zone (1,082 feet in 5 holes). In the late fall of 1978 a bulk sampling program was undertaken in the H.G. zone. During this program a 24.2 ton sample was mined from the H.G. zone and was shipped to the Selmon Resources mill in Slocan City for metallurgical testing. The average grade of the shipment was 0.11 o.p.t. gold and 4.2 o.p.t. silver. Concentrates obtained from the mill test were sold to the Cominco smelter in Trail in late 1979.

In early 1979 Snowflake commissioned a consultant's report; (see Kerr report dated June 19, 1979) recommendations from which led to the establishment of a cut-line grid over which a frequency effect IP/Resistivity survey was conducted. This survey indicated several high chargeability "targets" as well as numerous extensive resistivity "lows". At the end of 1979 Snowflake decided not to continue its option. Total expenditures by Snowflake on the property had reached \$50,000.00 which, under the agreement, allowed them to earn a 20% working interest therein. The original prospectors each retained a 40% working interest.

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In May 1980, Mohawk Oil Company Ltd. optioned the property and completed a program of trenching and diamond drilling plus some follow-up frequency effect IP/Resistivity surveying. A total of 10,218 feet of NQ diamond drilling was completed which targeted the H.G.zone, the Stockwork zone, IP (chargeability) anomalies, the South End quartz veins and the newly discovered Pb zone. Extensive areas of quartz/sericite alteration with associated pyrite mineralization related to the H.G. zone quartz vein and the Stockwork zone in addition to several extensive areas of clay alteration with associated pyrite mineralization were encountered in the drilling. Locally severe core losses were sustained. The best assay results are listed below:

1980 Drilling

80-#1	_ ^	H.G. zone - 1.5 feet of 0.32 o.p.t. gold, 7.50 o.p.t., 0.88% copper; Also, 2.6 feet of 0.206 o.p.t. gold, Tr. silver
80-#2		IP target - 2.5 feet of 0.119 o.p.t. gold, 0.07 o.p.t. silver.
80-#3		Stockwork zone - 2.2 feet of 0.112 o.p.t. gold, 1.37 o.p.t. silver; Plus, numerous zones of >0.10 and up to 2.87 o.p.t. silver.
80-#13	-	H.G. zone - 0.5 feet of 0.23 o.p.t. gold, 6.65 o.p.t. silver, 0.07% copper.

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80-#21 to #23 -

23 - Stockwork zone Numerous intersections of >.10 and up to 1.00 o.p.t. silver.

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The various altered zone intersected, although often well mineralized with disseminated and/or blebs of iron pyrite, in general returned only low (but frequently anomalous) grades of gold and silver. These zones were at that time interpreted to relate to a hydrothermal event with the possibility of developing into a large "Porphyry Type" deposit. The newly discovered Pb zone lead-zinc-silver mineralization, encountered in the 1979-80 trenching program, suggested a causatve source of the largest of the 1978 lead geochem anomalies. This zone was interpreted to be a peripheral part of the large scale porphyry model.

During 1981, an additional cut-line and flagged line grid was established to cover extensive portions of the property. A soil and silt geochemistry survey and a time domain IP/resistivity survey were conducted. Survey controls for the property were established by McElhanney Surveys Ltd.; including a legal survey of the claim ICP's locations. Topographic base maps from available airphotos were also acquired from McElhanney Surveys Ltd. Extensive cat trenching and geological mapping was conducted. As a result of the 1981 program numerous extensive multi-element soil anomalies were discovered, as were several IP "chargeability" anomalies. Chargeability highs encountered in previous surveys were again detected; as were the extensive resistivity "Lows". Optimum targets were interpreted to be those showing medium to high chargeability (i.e. "porphyry type" targets). Samples from the new soil geochemistry survey were run for multiple elements including gold, silver, lead, zinc, copper and molybdenum. The area of the 1978 soil geochemistry survey was not re-sampled as part of this survey resulting in incomplete soil survey data (i.e. no gold, copper, zinc or molybdenum values) in the old grid area.

test the near surface portion of the Pb zone and south vein areas. Drill holes in the Pb zone area encountered high grade silver-lead-zinc mineralization. The best results are listed below:

1981 Drilling

- 81-#13 Pb Zone Average grade across 3.47 feet
 9.63 o.p.t. silver, 5.196% lead, 3.35% zinc;
 also, 0.5 feet grading
 40.50 o.p.t. silver, 0.96% lead, 15.40% zinc.
- 81-#17 Pb Zone Average grade across 1.32 feet
 14.73 o.p.t. silver, 5.536% lead, 9.259% zinc;
 also, average grade across 3.74 feet
 6.147 o.p.t. silver, 0.32% lead, 8.007% zinc.
- 81-#19 Pb Zone Average grade across 1.52 feet 8.489 o.p.t. silver, 1.54% lead, 9.87% zinc.

Some trenching was conducted in the vicinity of the south veins during early 1982. Later in 1982 follow-up soil geochemistry in the "1981 anomalous" areas was conducted as were extensive magnetometer and VLF-EM surveys. Follow-up soil sampling in many cases did not support earlier results. No reason for these lower results was determined; however, the 1981 soil survey data has been determined to be the most consistent over a longer term and for a greater number of samples; the 1981 data is therefore considered to be the most valid data. The VLF-EM and magnetometer survey coverage was extended across the old grid area. With the exception of two drill holes located near the eastern limit of the Pb zone, diamond drilling during 1981 was limited to testing the near surface potential of the South veins and the H.G. zone. The better 1982 drill results are listed below:

1982 Drilling

82-#6		H.G. Zone 0.5 feet 0.228 o.p.t. gold, 4.40 o.p.t. silver;
82-#7		H.G. Zone 0.33 feet 0.101 o.p.t. gold, 1.80 o.p.t. silver;
82-#8		H.G. Zone 0.66 feet 0.186 o.p.t. gold, 4.63 o.p.t. silver;
82-#13	-	H.G. Zone, 2.33 feet 0.52 o.p.t. gold, 8.2 o.p.t. silver, 1.34% lead, and 0.12% zinc, 0.10% copper.

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Drill holes 82-#1 and #2 located east of the Pb zone encountered zones of intense alteration (including clay zones) similar to those encountered in the 1980 drilling program.

Also during 1982, a small test mill was constructed on the property. So as not to misrepresent the reasoning behind this mill construction the following explanation is considered necessary. This "mill construction project" was initiated to utilize existing Mohawk assets (previously acquired assortment of milling equipment) in order to establish a portable mill which would:

- 1. Serve as a bargaining tool in pursuing other options in a variety of locations in B.C. and Alaska;
- 2. Attract "custom milling" jobs from other nearby properties actively test mining;
- 3. To provide a functional portable mill for use on this or any other exploration site as required, and at the same time to;
- 4. Assist in assessing the potential of the various mineralized zones exposed on the property by providing mining and metallurgical data at the same time as serving to de-bug and tune-up the portable mill.

As of the end of the 1982 season the main thrust of the exploration project continued to be the search for the "porphyry-type" deposit; although the potential for small tonnage high grade vein type deposits were considered feasible.

In 1983 Alex Burton, P.Eng, was brought onto the property by R.W. Yorke-Hardy to give an alternate opinion. Burton immediately recognized several occurrences of "Epithermal alteration" which had not been interpreted as such by Mohawk personnel. Burton recommended follow-up work in these altered areas plus This work was not undercheck logging of previous drill core. taken as no general exploration program was conducted during the Mohawk's main goal had turned to seeking immediate year. test mining/milling program possibilities. The production comenced in 1982 continued throughout 1983 with the main source of mill feed being the Pb zone open-cut. Small volumes of ore were mined and treated from the south veins and one truck load was gathered from the H.G. zone. Concentrates were sold to the A program of diamond Cominco smelter in Trail in late 1983. drilling along the strike of the Pb zone was conducted during the late summer to early winter of 1983. This program was not successful (at least in part due to the numerous dykes and faults encountered in the drilling) in its objective of blocking out mineable ore reserves sufficient to warrant underground bulk sampling and exploration of the Pb zone system and mill capacity expansion to an economic production level. However, sampling of surface trenches crossing this system indicate that the potential Surface samples still exists to develop ore in this zone. returned grades from 22.10 o.p.t. silver across 4 feet to 56.7 o.p.t. silver across 5.5 feet from the K-1 trench located 130 feet west of the headwall of the Pb zone open cut.

1983 Drilling

83-#6	-	Pb zone - 1.0 foot		
		0.016 o.p.t. gold, 6.00 o.p.t. s	silver	and
		4.24% lead, 7.91% zinc.		

83-#11 - Pb zone (located near the baseline) (western extension of the Pb zone) -2.0 feet

> 0.18 o.p.t. gold, 0.08 o.p.t. silver. <u>Note:</u> This drill hole happens also to be near one of the apparent "Epithermal" alteration zones.

Recognizing no immediate obvious mineable ore grade reserves, major efforts were switched to locating alternate financing for the exploration program although the 1984 season saw an initial effort conducted towards testing the "Epithermal" model. Five drill holes were drilled into apparent "Low Resistivity" anomalies detected earlier to determine whether they represented epithermal alteration zones. Three of these diamond drill holes were collared near the eastern end of the Pb zone structure; near the intersection with a major north-south fault zone. Previous trenching in this area had encountered extensive clay alteration which was in 1984 interpreted by F. Marshall Smith, P. Eng. to be "Low pH" alteration associated with "Epithermal Type Deposits". Two of 1984 these drill holes encountered significant "Epithermal" alteration zones and each intersected anomalous to economic gold-silver mineralization. grades of The best individual intersection was:

1984 Drilling

84-#1 - East end Pb zone - one foot of 0.096 o.p.t. gold, 14.80 o.p.t. silver which forms part of an overall 10.41 feet of 0.0183 o.p.t. gold, 2.974 o.p.t. silver.

84-#2 - East end Pb zone - 1.5 feet of 0.019 o.p.t. gold, 2.25 o.p.t. silver.

Several other intersections in both holes 84-#1 and 84-#2 encountered values as high as 0.019 o.p.t. gold, 2.34 o.p.t. The third hole in this area, Hole 84-#3, was drilled to silver. test the intersection of the E/W striking Pb zone structure and the main N/W fault structure. This hole was drilled to the west (270°) at -60° and was interpreted as having followed the E/W shear zone. No samples were taken although the drill log indicates pervasive propylitic alteration with locally intensely altered and "Low pH" zones, calcification and silicification. Drill holes 84-#4 & #5 were drilled to intersect large resistivity low targets located west of the baseline in the area between lines 6+00S and 9+00S (collar location surveys and/or precise plot for all 1984 drilling have not been found). Both holes encountered zones of intense alteration with some zones being "Low pH" (Epithermal alteration) zones and logged as possibly narrow epithermal veins (eg. grey-sooty black quartz rich layer at 542'1" in 84-#4) before coring into the unaltered footwall (apparent) material. Limited sampling was conducted with only low values in gold and silver reported. The 1984 project included re-logging of many of the previous drill holes, with particular attention being paid to the 1980 drilling in which numerous zones of intense alteration had been encountered. Many of these alteration zones were re-classified as Intense Propylitic and/or "Low pH" alteration commonly associated with Epithermal Deposits. Extensive time domain IP/Resistivity surveying was conducted by Mohawk during 1984, commencing first with pole-dipole arrays and later switching to dipole-dipole arrays upon noting significant anomaly displacements depending upon the location of the current electrodes (ie. current east vs zones of low resistivity were broadly west). Numerous delineated; and these, where exposed to date, relate to epithermal alteration zones. Correlation between altered zones in

1980 drill holes and "low resistivity" anomalies indicate the low resistivity zones represent "alteration" (Note: The data obtained during this survey is the focus of the compilation and interpretations made later in this report). During mid 1984 Mohawk commissioned a report by F. Marshall Smith, P. Eng., which was completed in late October of that year. The results of the 1984 field program did not form part of the Smith report as the work was still in progress. Under Smith's direction field interpretation of the IP/Resistivity data was used to assist in drillhole As drill results indicate, there was a fair amount of locations. success with this approach. The report as submitted to Mohawk \$230,000 exploration and development program recommended a targeted at exploring for and testing the epithermal veins adjacent to and/or within the extensive alteration zones.

In 1985 the Mohawk option on the property was technically terminated as a result of a missed option payment and their renegotiate inability to а satisfactory deal with the prospectors. Mohawk refused to return the property to the prospectors based on their interpretation of the original option agreement. No work was conducted between the fall of 1985, at which time Mohawk did minor assessment work to maintain the SAB #9 mineral claim; and the summer of 1987 at which time all interest in the property was returned to the prospectors. In excess of \$1 million dollars of exploration and development expense was incurred by Mohawk during the period 1980 to 1984.

No further work was conducted until the fall of 1988 at which time assessment was again due on the SAB #9 mineral claim. The field program conducted and the compilation of data forms the basis of this report.

<u>REGIONAL GEOLOGY</u> (from Smith [1984])

"The SAB property is in an area of the Interior Plateau of British Columbia that is dominated by granitic rocks. The rocks in this area are mapped as the Cretaceous (?) Nelson or Valhalla Intrusions and tentatively grouped together into the Greater Nelson Batholith. The Batholith is composed of granite, porphyritic granite, granodiorite, diorite, monzonite and quartz monzonite.

"Roof pendants of Anarchist Group volcanic and sedimentary rocks exist in the area. Little (1957) shows small areas tentatively identified as Monashee (?) Group rocks. Recent work on and near the property indicates that these areas should be mapped as Anarchist Group rocks.

"Tertiary basalts of the Kamloops Group occur in the region south and west of the property.

"Late stage basalt and lamprophyre dykes intrude the older volcanic sedimentary and granitic rocks. These dykes are possibly Tertiary in age and related to the Kamloops Group Tertiary basalts.

"Mineralization in the region is hosted by the intrusives and the volcanic and sedimentary rocks. The recent basaltic rocks generally post-date the economic base and precious metal mineralization."

PROPERTY GEOLOGY (from Smith [1984])

"The SAB property is underlain primarily by granitic rocks of the Greater Nelson Batholith. Within the property there are

variations in the composition and texture of these rocks. The dominant rock type is a coarse grained, porphyritic granite or granodiorite with large (2.5 cm) phenocrysts of potassic feldspar. North of the camp monzonite outcrops.

"Roof pendants of Permian (?) Anarchist Group limestone and andesite occur sporadically in confined localities on the property. A large outcrop of metamorphosed limestone occurs south of the camp. In the northern part of the property andesite flows and tuffs occur. A small occurrence of 'granite gneiss' is located in the central portion of the claim. It is of uncertain origin and association.

"The valley of the Kettle River (which runs through the property) is believed to be structurally controlled, part of a major north to northeast striking fault system. There is evidence, in outcrop and geophysical survey interpretation, that this system of parallel faults and shears is manifest in several areas across the property, extending along its full length. The main fault system is cut at high angle by lesser E-W structural system.

"The structures and mineralization first exposed (South Vein, Lead Zone and Stockwork) were originally interpreted to indicate a gold-copper porphyry deposit and/or a silver-lead fissure vein deposit. This interpretation focused the concentration of exploration away from the north trending fault system.

"The mineralization on the property is now recognized to be a structurally controlled epithermal system of quartz, or quartzcalcite veins and veinlets infilling the main fault and shear system and sometimes the cross-cutting EW structures. The main faults exposed on the property strike north to northeast and dip steeply (70°) east. Further west, on the property, veins have more shallow dips $(15^{\circ}-40^{\circ})$ but strike north to northeast. In 1983, a large zone of intense, low pH, alteration was found around the main apparent dip slip main fault. This zone can be traced out almost 300m N-S. It varies from 35m to 200m wide but is in general and on average 50m wide. Since that time several other zones of epithermal alteration have been recognized.

"This main vein is unusual in that it is not characterized by bull (white) quartz and weathers recessively. It is very fine grained with a high calcite and iron-silicate (?) content with a pale green colour when fine grained.

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"There are tear-faults (reidels) in the footwall of the north trending faults. The reidel High Grade Zone was in-filled by a single event. There is no evidence of boiling as the alteration of footwall and hanging wall are equal. The edges of the infill are fine grained quartz surrounding a core of coarse druzy quartz and sulfides.

"In addition to the vein following the main north striking faults system and reidels and those infilling cross cutting E-W shears, there is mapped on the property an area called a stockwork zone. In this zone the veins and veinlets exposed do not follow a clear-cut alignment and the main NE trending fault appears to splay.

"Detail IP-resistivity and diamond drilling during the 1984 season determined that, at least in part, the mineralization of interest is related to cross fractures between the north-south faults. The precise controls of potential ore zones (strike slip or dip slip) including the rake and relation to the predominant north-south faults have to be determined."

MINERALIZATION (from Smith [1984])

"There are four zones of mineralization exposed on the SAB property, west of the Kettle River. There are also surface indications of further, as yet unexplored, zones east of the river.

"The four zones west of the river that have been investigated are called the South Zone, Lead Zone, High Grade Zone and Stockwork Zone (see figure 4). Extensive catwork has opened large areas of veining within these areas in trenches and road cuts.

"There is evidence that the mineralization exposed on the property is related to an epithermal event. The alteration halo, recently exposed in the two central zones, is extensive and intense low pH style, with kaolinite to sericite facies, with surface exposures composed of soft clays, hematite, siderite and sericite.

"In general it appears that the veining follows the fault zone trend northeast also infilling tear faults in the footwall and possibly infilling cross-cutting E-W structures. The mineralization in the exposed zones varies and is described separately. The precise geometry controlling the mineralization has to be determined.

South Zone

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"In the most southerly of the four zones a vein, or a series of subparallel veins, is discontinuously exposed over a 185m strike length, in road cuts and trenches, each up to 35m long. The vein averages 1.5m wide but ranges from about 0.5 to 4.1m in width. In general it strikes slightly west of north and dips moderately west. Minor fault offsets are exposed in the trenches. "In this zone is the "Lead Vein", the first mineralization found on the property. Mineralization in this zone is galena, pyrite and sphalerite. These minerals occur on fine-grained white quartz as blebs and in veinlets and also as massive to semimassive sulfide, usually well crystallized. Assay values vary within the zone, but tend to range between 6-10% lead, 0.5-6% zinc, .002-0.28 oz/ton gold and 1.5-4.5 oz/ton silver, all from 2' to 4' chip sample or bulk samples. The gold is in the pyrite. The silver occurs in the galena, in the pyrite and as very fine grained argentite.

Lead Zone

"The massive sulfide veins of the lead zone have been exposed, by trenching and the mining of bulk samples, over a continuous length of 170m and discontinuously trenched over a further 200m. The zone strikes west (260° to 280°) and dips steeply (70°) south, in filling a vertical tear fault or cross-cutting structure in the footwall of the main north trending fault system. The lack of gold mineralization indicates that the filling predated the epithermal event. Masses of fine grained and coarse well crystallized galena and sphalerite as well as blebs of fine grained pyrite and minor chalcopyrite from veins with only minor quartz.

"The silver occurrence is as ruby silver and native silver. The ruby silver is intimately associated with the sphalerite. The native silver occurs in the calcite (re-worked, or a later stage). In the zone silver is not in pyrite (as it is in the south zone), however, it may be contained in small amounts in the galena. There is evidence in outcrop and in thin ssection of post infill shearing.

<u>High Grade Zone</u>

"The veins in this zone infill tear faults in the footwall of the main structure (previous section, the report). The full width of the zone has not been exposed. The greatest exposed width is 3.1m.

"The mineralization of the quartz vein in this zone is primarily pyrite as cubes, fine-grained blebs, discontinuous veinlets and semi-massive to massive sections. Accessory chalcopyrite occurs with the pyrite. Fine grained argentite and accessory scheelite are reported to occur in these veins (Kerr, 1979). A 24.2 ton bulk sample graded 0.11 oz/ton gold and 4.2 oz/ton silver. Chip samples over 0.75m averaged 0.24 oz/ton gold and 2.36 oz/ton silver. These grades from the single event filling imply the strong possibility of higher grades in the main system if, as is usual, the process was multiphased."

Stockwork Zone

"This zone is discontinuously exposed over an area of approximately 300m by 450m. Within this area several veins are exposed within a stockwork of randomly oriented veinlets. Veins and veinlets are composed of quartz and host pyrite as blebs and veinlets. Accessory scheelite and zircon are also reported (Kerr, 1979). Gold and silver values in areas drilled and sampled are low but definitely anomalous (0.02-0.005 oz/ton gold and 0.5-0.1 oz.ton silver).

"There is no clay or sericite alteration in the area of these veins and all quartz is "bull" type rather than the green amorphous or clear druzy quartz of the epithermal style to the south. These zones may represent low grade versions of the porphyrite style. "The northern portion of the property has no outcropping mineralization. However, an extensive multi-element soil geochemical anomaly (silver, lead, zinc and copper) is located coincident with geophysical (magnetic and EM anomalies."

MAGNETOMETER SURVEY

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A) <u>Instrumentation and Theory</u>

The magnetic survey was carried out with a Scintrex MP-2 proton precession magnetometer. This instrument reads directly in gammas the Earth's total magnetic field to an accuracy of ± 1 gamma, over a range of 20,000 - 100,000 gammas. Operating temperature range is -35° to +50° C, and gradient tolerance is up to 5,000 gammas per meter.

Only two commonly occurring minerals are strongly magnetic, magnetite and pyrrhotite; magnetic surveys are therefore used to detect the presence of these minerals in varying concentrations.

Magnetics is also useful as a reconnaissance tool for mapping geologic lithology and structure since different rock types have different background amounts of magnetite and/or pyrrhotite.

B) Field Procedure

The magnetic survey was carried out reading the instrument every 30 and 15 metres on 120-metre separated, east-west lines with 50metre separated detail lines completed in some areas.

The diurnal variation was monitored in the field by the closed loop method to enable the variation to be removed from the raw data prior to plotting.

C) <u>Compilation of Data</u>

The total magnetic field values were plotted in profile form above the IP lines (at a scale of 1:2,500) at a profile scale of 1 cm = 200 gammas. The detail grid values were not plotted in profile form.

The magnetometer survey data was obtained from maps produced from the survey conducted in 1982. This data was not contoured on a plan map, but rather plotted in profile form above the pseudosections, with a vertical scale of 1 cm = 200 gammas. The base level was 58,000 gammas. Some data were missing due to survey parameters different from those of the IP/Resistivity and other surveys. The extent of the survey area covers only line 4+80S and southward.

IP/RESISTIVITY SURVEY

A) <u>Instrumentation</u>

The transmitter used for the induced polarization-resistivity survey is unknown.

The receiver used was a model IPR-8 manufactured by Scintrex. This is state-of-the-art equipment, with software-controlled functions, programmable through the front panel.

The IPR-8 system is capable of time domain, frequency domain, and complex resistivity measurements.

B) Theory

When a voltage is applied to the ground, electrical current plows, mainly in the electrolyte-filled capillaries within the rock. If the capillaries also contain certain mineral particles that transport current by electrons (most sulphides, some oxides and graphite), then the ionic charges build up at the particleelectrolyte interface, positive ones where the current enters the particle and negative ones where it leaves. This accumulation of charge creates a voltage that tends to oppose the current flow across the interface. When the current is switched off, the created voltage slowly decreases as the accumulated ions diffuse back into the electrolyte. This type of induced polarization phenomena is known as electrode polarization.

A similar effect occurs if clay particles are present in the conducting medium. Charged clay particles attract oppositelycharged ions from the surrounding electrolyte; when the current stops, the ions slowly diffuse back to their equilibrium state. This process is known as membrane polarization and gives rise to induced polarization effects even in the absence of metallic-type conductors.

Most IP surveys are carried out by taking measurements in the "time-domain" or the "frequency-domain".

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Time-domain measurements involve sampling the waveform at intervals after the current is switched off, to derive a dimensionless parameter, the chargeability, "M" which is a measure of the strength of the induced polarization effect. Measurements in the frequency-domain are based on the fact that the resistance produced at the electrolyte-charged particle interface decreases with increasing frequency. The difference between apparent resistivity readings at a high and low frequency is expressed as the percentage frequency effect, "PFE".

The quantity, apparent resistivity, , computed from electrical survey results is only the true earth resistivity in a homogeneous sub-surface. When vertical (and lateral) variations in electrical properties occur, as they always will in the real world, the apparent resistivity will be influenced by the various layers, depending on their depth relative to the electrode spacing. A single reading cannot therefore be attributed to a particular depth.

The ability of the ground to transmit electricity is, in the absence of metallic-type conductors, almost completely depending on the volume, nature and content of the pore space. Empirical relationships can be derived linking the formation resistivity to the pore water resistivity, as a function of porosity. Such a formula is Archie's Law, which states (assuming complete saturation) in clean formations:

$$\frac{Ro}{Rw} = 0^{-2}$$

Where: Ro is formation resistivity Rw is pore water resistivity 0 is porosity

C) <u>Survey Procedure</u>

The IP and resistivity measurements were taken in the time-domain mode using an 8-second square wave charge cycle (2-seconds positive charge, 2-seconds off, 2-seconds negative charge, 2-seconds off). The delay time used after the charge shuts off was 200 milliseconds and the integration time used was 1,500 milli-seconds divided into 10 windows.

The array chosen for one survey (lines 4+80S - 15+00S) was the dipole-dipole array shown as follows:

And the array chosen for another survey (lines 0+00 - 3+60S) was the pole-dipole array shown as follows:
The dipole length ('a') was chosen to be 50 m. It was read to a maximum of eight separations ('na') which was therefore 400 m which gives a theoretical depth penetration of 175 to 225 m.

The dipole-dipole array was chosen because of its symmetry resulting in a greater reliability in interpretation. Furthermore, narrow, vein-like targets which are known to occur within the property, can be missed by the pole-dipole array.

Stainless steel stakes were used for both current electrodes and potential electrodes.

The existing north-south baseline and east-west lines from the previous geophysical and geochemistry surveys were used. Readings were taken every 50 metres to the maximum level n=8.

In addition to the ten grid lines, three road lines were run across the grid lines, to test the responses to the east-west structures.

D) <u>Compilation of Data</u>

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The chargeability (IP) values are read directly from the instrument and no data processing is therefore required prior to plotting. The resistivity values are derived from current and voltage readings taken in the field. These values are combined with the geometrical factor appropriate for the dipole-dipole array to compute the apparent resistivities.

The results of the surveys are shown in pseudosection form for the 13 lines, on maps 9 to 27 at a scale of 1:2,500. Each value is plotted at a point formed from the intersection of a line drawn from the mid-point of each of the two dipoles (for doubledipole), or from the current pole and the voltage dipole midpoint. Lines 0+00 to 3+60S were compiled from data obtained in a 1984 pole-dipole survey which actually covered the whole grid, as far south as 15+00S. The pseudosections for lines 4+80S to 15+00S for this report were surveyed using the double-dipole array, and were run in 1984 after the pole-dipole survey was completed. Lines 6+00S and 8+40S were covered by the pole-dipole method, operating in both easterly and westerly directions. As can be seen in figures 24 to 27, the pole-dipole method is directionsensitive. These four pseudosections were compared with those of the double-dipole method, to obtain a form of standard interpretation and plotting method for the plan maps.

The pseudosections were plotted using the correct topographical sections along each line. The plot point for each value is positioned assuming a flat-earth model occurs between each (di)pole, such that this flat-earth model is dipping through each (di)pole. The initial topographic sections obtained from the original hand-plots produced by Mohawk Oil Co. Ltd. were later realized to be too inaccurate for plotting the true locations of the drill holes. Robert W. Yorke-Hardy plotted the IP lines on a 1:2,500 scale plan contour map of the property, from which the elevations and offsets (relative to the baseline) were obtained to produce true surface profiles of each line. These new profiles were then used to obtain the elevations and offsets for all stations across each line, which in turn were used to produce the IP/Resistivity pseudosections by computer. The resistivity was then contoured at a logarithmic interval of base 10 (i.e., a contour labelled "2.4" means $10^2.4 = 251.2$) ohm-metres. The chargeability was contoured using an interval of 0.5 milliseconds.

Two surveys lines, 6+00S and 8+40S, were run using the pole-dipole method in both westerly and easterly directions. The results are compared here with the results from the double-dipole survey carried out over the same lines. Considering first the

two pole-dipole surveys, it may be seen that the resistivity anomalies for the westerly-moving surveys are approximately onehalf station interval further west of the anomalies for the easterly-moving surveys. The corresponding anomalies for the double-dipole survey occur roughly coincident with the poledipole anomalies, at the shallow levels. Due to the plotting conventions used for this data, the double-dipole anomalies appear to occur almost one n-level below those of the pole-dipole anomalies. For these reasons, the plan contour map of each of the IP and resistivity could only be produced for n=1, if both pole-dipole and double-dipole were to be plotted. The resultant plots can be seen on maps 7 and 8. It must be noted that the data and contours for lines 0 through to 3+60S are those from the pole-dipole data, and the data and contours for all lines southward are from the double-dipole survey. Though there was some difference in the magnitude of the values between each survey, the contours still show trends.

VLF-EM SURVEY

A) Instrumentation and Theory

A VLF-EM receiver, Model 27, manufactured by Sabre Electronic Instruments Ltd. of Burnaby, B.C. was used for the VLF-EM survey. This instrument is designed to measure the electromagnetic component of the very low frequency field (VLF-EM), which for these surveys was transmitted at 21.4 KHz from Annapolis, Md, and 23.4 KHz from Lualuaiei, Oahu.

In all electromagnetic prospecting, a transmitter produces an alternating magnetic field (primary) by a strong alternating current usually through a coil of wire. If a conductive mass such as a sulphide body is within this magnetic field, a secondary alternating current is induced within it which in turn induces a

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secondary magnetic field that distorts the primary magnetic field. It is this distortion that the EM receiver measures. The VLF-EM uses a frequency range from 16 to 24 KHz, whereas most EM instruments use frequencies ranging from a few hundred to a few thousand Hz. Because of its relatively high frequency, the VLF-EM can pick up bodies of a much lower conductivity and therefore is more susceptible to clay beds, electrolyte-filling fault or shear zones and porous horizons, graphite, carbonaceous sediments, lithological contacts as well as sulphide bodies of too low a conductivity for other EM methods to pick up. Consequently the VLF-EM has additional uses in mapping structure and in picking up sulphide bodies of too low a conductivity for conventional EM methods and too small for induced polarization. (In places it can be used instead of I.P.). However, its susceptibility to lower conductive bodies results in a number of anomalies, many of them difficult to explain and, thus, VLF-EM preferably should not be interpreted without a good geological knowledge of the property and/or other geophysical and geochemical surveys.

B) <u>Field Procedure</u>

A north-south baseline exists through the center of the property. Cross lines running east-west at 120 m spacing with stations every 30 m from the original soil sampling, magnetic and VLF-EM surveys, were used.

VLF-EM readings were taken at each station facing towards each of the Annapolis and Hawaii transmitters.

C) <u>Compilation of Data</u>

The VLF-EM field results were reduced by applying the Fraser-filter and the filtered results subsequently plotted on vertical profiles above the resistivity pseudosections at a scale

of 1:2,500. The filtered data was plotted between actual reading stations. The original raw field results were not available to the writer.

The Fraser-filter is essentially a 4-point difference operator, which transforms zero crossings into peaks, and a low pass smoothing operator which induces the inherent high frequency noise in the data. Therefore, the noisy, non-contourable data are transformed into less noisy, contourable data. Another advantage of this filter is that a conductor that does not show up as a crossover on the unfiltered data quite often shows up on the filtered data.

The VLF-EM survey data were obtained from a survey conducted in 1982, using both the Annapolis and Hawaii transmitter stations. In both cases, the data were acquired from Fraser-filtered plan maps produced from these surveys. The grid used for these surveys was seen to disagree in several places with that of the IP/ Resistivity grid. The positions were measured from the plan maps, and assumed correct. The data were then plotted in profile form above the pseudosections with a vertical scale of 1 cm = 10°.

SOIL GEOCHEMISTRY

A) <u>Survey Procedure</u>

Samples were collected at 100-foot (30-m) intervals on the same eastwest lines as for the VLF-EM and magnetic surveys. The B horizon was sampled using a small D-handled shovel. Samples were placed in brown, wet-strength, paper bags with the sample number marked thereon.

B) <u>Testing Procedure</u>

The testing procedure is unknown to the writer, though the samples were analysed at the Kamloops Research and Assay Lab.

C) Treatment of Data and Compilation

The values in ppm silver and ppb gold have been plotted in profile form above the resistivity pseudosections.

The gold and silver geochemistry was acquired from two different surveys carried out in 1977, and later in 1981. The limits of the 1977 survey included only the eastern side of lines 0+00 to 14+40S, while the 1981 survey covered only those areas outside these limits. Due to the different date of the surveys, little control is assumed over the sample acquisition, through both sets of data were chemically assayed at the Kamloops Research and Assay Laboratory of Kamloops, B.C. The data were plotted in profile form above the pseudosections, using a different logarithmic vertical scale for each of the gold and silver surveys.

Because of the difference in sources from one set of data to the next, two different mean background levels for the soil geochemistry results may be seen. Also, for line 3+60S, there is no gold geochemistry data. The mean background level for gold for the 1977 survey is less than 10 ppb, with a sub-anomalous level of approximately 40 ppb. The mean background for the 1981 survey, however, is approximately 15 to 20 ppb, with a sub-anomalous level of approximately 45 ppb. The mean background for the silver geochemistry on the 1977 survey is approximately 0.75 ppm, while the mean background level for the 1981 survey was 0.65 Each of the gold and silver values have been plotted in ppm. profile form, however, at a logarithmic scale, which tends to minimize the difference in mean backgrounds somewhat, and

therefore the resulting anomalies correlate better from one survey to the next when plotted on the same chart.

DISCUSSION OF RESULTS

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A) <u>Gold/Silver Geochemistry</u>

The gold/silver values show much variation, but the overall levels tend to be higher across the northern parts of the surveys, in particular near the Stockwork zone and the H.G. zone. The mean background levels for both gold and silver are very high, indicating that this property has high potential for both gold and silver mineralization.

Within the area of the Stockwork and H.G. zones, the high values of gold (assaying values of 50 to 250 ppb) and silver (assaying values of 1.0 to 5.7 ppm) correlate well with the economic grades reported from within the drill holes in the same area (see maps 19 to 23). The most significant geochemistry values in this area occur on line 1+20S, and appear in two generally clear anomalous zones approximately within the Stockwork zone and immediately downslope. On this line, the drill hole results grade up to highs of 0.112 o.p.t. gold and 2.87 o.p.t. silver. On line 3+60S, however, the assay values of gold were all too low to measure, while the silver values were more moderate, reaching a high of only 2.1 ppm.

B) <u>Magnetometer</u>

The magnetic field shows little variation across the survey area, varying from a low of 57,320 gammas to a high of 58,830 gammas, both on line 12+00S. The magnetometer survey results show no clear correlation with either of the soil geochemistry results, but there is very good correlation between the minor magnetic highs and resistivity high zones. The zones of magnetic highs could reflect local occurrences of Anarchist Group volcanics, possibly as roof pendants.

C) VLF-EM

In general, the anomalous peaks from the survey using the Hawaii transmitter are shifted slightly east of those of the Annapolis transmitter survey. This is due to the trend of the causative sources, relative to the direction of each of the transmitters. Some anomalous peaks on the VLF-EM profiles can be traced in a north-northwest trend. The VLF-EM anomalies typically are not very strong, often reaching peaks of only 10°. These low-magnitude anomalies, however, are often enough to assist in the determination of causative sources.

One strong peak, labelled I, can be traced from line 6+00S to line 9+60S, and possibly as far south as 12+00S. This conductor strikes due southeast from near (6+00S, 3+75W), to near (8+40S, 1+50W), and then appears to strike due south to line 9+60S. It again appears on line 12+00S, at approximately 0+50E. It is possible that this conductor reflects a fracture or shear zone striking across the grid.

D) <u>IP/Resistivity</u>

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Resistivity high zones for the most part occupy the upper levels of the pseudosections, and most likely reflect roof pendants of the Anarchist Group volcanics. The results of the magnetometer survey correlate with these resistivity highs, and support this conclusion. The resistivity pseudosections for the double-dipole survey show extensive low areas, particularly at depth. On most sections, the resistivity lows have no apparent depth limit, but on those pseudosections which show these lows to have lineal or nearlineal characteristics, the anomalies tend to dip easterly. These extensive regions of lows could reflect pervasive zones of epithermal alteration. In some cases, near-lineal zones of resistivity lows extend into the zones of resistivity highs, and could reflect fracture zones with epithermal alteration. In almost every case, VLF-EM anomalies on the profiles correlate with these resistivity lows, further suggesting this possibility.

<u>Resistivity anomaly A</u> strikes in a nearly north-south direction from line 0+00 to line 7+20S, for a minimum strike length of 720 metres. This anomaly dips eaterly on all sections, and can be seen on both pole-dipole and double-dipole sections. At lines 6+00S and 7+20S, it correlates directly with VLF-EM anomaly I. Using this correlation, VLF-EM anomaly I may be used to extrapolate resistivity anomaly A further down to line 9+60S, where it may occur at depth. Extrapolation was necessary due to the inadequate coverage of many of the lines. It may be necessary to run a new survey across many, if not all, of the lines to obtain a more complete data set and permit a more thorough interpretation of the mineral potential of this property.

Resistivity lows often correlate very well with the drill hole results returning (near) economic grades of mineralization associated with both phyllic and propylitic alteration. In drill holes 80-3, -4, -21 and -22 on line 1+20S, for example, moderate grades of gold and silver are seen to occur along local resistivity lows, though these lows are by no means the most definitive on this pseudosection. The IP response in this hame area on the pseudosection reaches a high of 14 milliseconds, an anomalous high for this survey which suggests the presence of minor sulphides.

The drill holes on line 3+60S show moderate to intense propylitic alteration to occur within areas of local resistivity lows. Drill hole 80-1 shows a gold value of .206 o.p.t. occurring within a zone of intense alteration, and at the edge of a definitive resistivity low/IP high zone. Drill hole 80-5 shows these zones to occur below the lower limit of the pseudosection, but the character of both the resistivity and chargeability pseudosections suggests that this zone also occurs within a zone of resistivity low/IP high.

The drill holes of line 9+60S show zones of alteration which correlate very well with zones of resistivity lows. Drill holes 1984-1 & 2 show mineralization occuring directly within the resistivity low zones. Drill holes 1982-1 & 2 were drilled from the north of this line and in a southerly trend, such that they have passed beneath the survey line. The approximate positions of intersection with this pseudosection have been plotted and show that intense propylitic alteration and a fault occur directly within a resistivity low zone. These results also agree with some minor IP highs of only up to 8 milliseconds.

Respectfully submitted, GEOTRONICS SURVEYS LTD.

M.A. Patrick Cruickshank, Geophysicist

February 28, 1989 49/G437

Dávið Mark. Geophysicist

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GEOPHYSICIST'S CERTIFICATE

I, M.A. PATRICK CRUICKSHANK, the City of Vancouver, in the Province of British Columbia, do hereby certify:

That I am a consulting geophysicist of Geotronics Surveys Ltd., with offices located at #530-800 West Pender Street, Vancouver, British Columbia.

I further certify:

- 1. I am a graduate of the University of British Columbia (1986) and hold a B.A.Sc. degree in Geophysics Engineering.
- 2. I have been practising my profession for over 1.5 years.
- 3. I am registered with the British Columbia Association of Professional Engineers as an Engineer-in-Training, in geophysics.
- 4. This report is compiled from data obtained from induced polarization and resistivity surveys, VLF-EM, magnetometer, and geochemistry surveys conducted by Mohawk Oil Co. Ltd., from 1977 to 1984.
- 5. I have no interest in Snowflake Mining Ltd. or Y-H Technical Services Ltd., nor in any property discussed in this report, nor will I be receiving any interest as a result of writing this report.

M.A. Patrick Cruickshank, Geophysicist

February 28, 1989 49/G437

GEOPHYSICIST'S CERTIFICATE

I, DAVID G. MARK, of the City of Vancouver, in the Province of British Columbia, do hereby certify:

That I am a Consulting Geophysicist of Geotronics Surveys Ltd., with offices located at #530-800 West Pender Street, Vancouver, British Columbia.

I further certify:

- I am a graduate of the University of British Columbia (1968) and hold a B.Sc. degree in Geophysics.
- I have been practising my profession for the past 20 years and have been active in the mining industry for the past 23 years.
- 3. I am an active member of the Society of Exploration Geophysicists and a member of the European Associationfor Exploration Geophysicists.
- 4. This report is compiled from data obtained from induced polarization and resistivity surveys, VLF-EM, magnetometer, and geochemistry surveys conducted by Mohawk Oil Co. Ltd., from 1977 to 1984.
- 5. I do not hold any interest in Snowflake Mining Ltd. or Y-H Technical Services Ltd., nor in any property discussed in this report, nor will I receive any interest as a result of writing this report.

David G/ Mark

David G. Mark Geophysicist

February 28, 1989 49/G437

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AFFIDAVIT OF EXPENSES

The compilation of data of all the exploration work until 1984 carried out over the SAB property located at the confluence of Stove Creek and Kettle River within the Vernon M.S., B.C. was done to the value of the following:

Senior geophysicist, 25 hours at \$45/hour	\$ 1,125
Junior geophysicist, 130 hours at \$35/hour	4,550
explorati9on technician, 264 hours at \$25/hour	6,600
Computer aided drating	4,475
Manual drafting	399
Printing	318
Word processing, compilation & photocopying	750
Grand Total	\$18,217

Approximately 20% of the above total was done up to and including December 5th, 1988, which is $\frac{53,643}{514,574}$. The remaining 80-% was done after December 5th, 1988, which is $\frac{514,574}{514,574}$.

Respectfully submitted, GEOTRONICS SURVEYS LTD.

Mark, Geophysicist David Manager

February 28, 1989 49/G437







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	GEOTRONICS SURVEYS LTD.
s	Y-H TECHNICAL SERVICES LTD.
	SAB CLAIMS
SCALE 1 : 2500 50 0 50 (metres) 100 150 200	Vernon Mining Division, B.C. APPARENT RESISTIVITY and CHARGEABILITY PSEUDOSECTIONS LINE 15+00S Drawn by: Job No. NTS Scale Date Map No. Geotronics 88-44 82E/15E 1:2500 Nov/88 9



SCALE 1 : 5000

Surveyed by MOHAWK OILS CO. LTD. 1984

Drawn by NTS Scale Date Map # GEOTRONICS 82E/15 1:5000 Nov/88 8

























LEGEND

Resistivity Contour Interval: Log Base 10 Ohm-metres Chargeability Contour Interval: .5 milliseconds INSTRUMENTATION

Receiver: Scintrex Model IPR-8 Transmitter/Generator: Phoenix MS2. 2.5 kWatt

SURVEY PARAMETERS

Survey Mode: Array: Dipole Length: Dipole separation: Delay Time: Integration Time: Charge Cycle:

Time Domain Pole-Dipole 165 feet(SD metres) n=1 to 4 200 milliseconds 1500 milliseconds 8 second square wave

PROFILE LEGEND

Gold scale: log base 10 ppb _____ Silver scale: log base 10 ppm _____ VLF-EN, Annapolis : 1cm = 10 deg. ______ VLF-EN, Hawaii : 1cm = 10 deg.

Magnetic profile scale:

1 cm = 200 gammas

NOTE: The base value for the magnetic profiles is 58,000 gammas

GEOLOGICAL BRANCH ASSESSMENT REPORT 8,533

Surveyed by MOHAWK OILS CO. LTD.

Compiled and interpreted by :

Y-H TECHNICAL SERVICES LTD. and GEOTRONICS SURVEYS LTD. 1988 - 1989

GEOTRONICS SURVEYS LTD. Y-H TECHNICAL SERVICES LTD. SAB CLAIMS

Vernon Mining Division, B.C. APPARENT RESISTIVITY and CHARGEABILITY PSEUDOSECTIONS LINE 2+40S

Brawn by: Job No. NTS Scale Date Map No. Geotronics 88-44 82E/15E 1:2500 Nov/88 20














