85-251-13650

GEOLOGY AND GEOCHEMISTRY

SAULT CLAIMS

KITSAULT PROJECT

SKEENA M.D.   NTS 103P-14

by

J. R. Woodcock

April 1985

Province of British Columbia

Ministry of Energy, Mines and Petroleum Resources

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ASSESSMENT REPORT
TITLE PAGE AND SUMMARY

TYPE OF REPORT/SURVEY(S): Geology, geochemistry

TOTAL COST: 8070-94

AUTHOR(S): John R. Woodcock

SIGNATURE(S): J R Woodcock

DATE STATEMENT OF EXPLORATION AND DEVELOPMENT FILED: Apr 12, 1985

YEAR OF WORK: 1984-85

PROPERTY NAME(S): KITSAULT

COMMODITIES PRESENT: Zn Pb

B.C. MINERAL INVENTORY NUMBER(S), IF KNOWN:

MINING DIVISION: Skeena

NTS: 103P-14

LATITUDE: 55° 46' N

LONGITUDE: 129° 29' W

NAMES and NUMBERS of all mineral tenures in good standing (when work was done) that form the property (Examples: TAX 1-4, FIRE 2 (12 units); PHOENIX (Lot 1706); Mineral Lease M 123; Mining or Certified Mining Lease ML 12 (claims involved)):

SAULT 1 (20 units)
SAULT 3 (6 units)

OWNER(S)

(1) COMINCO LTD

(2)

MAILING ADDRESS

700-409 GRANVILLE ST
VANCOUVER BC V6C 1T2

OPERATOR(S) (that is, Company paying for the work)

(1) J.R. Woodcock

(2)

MAILING ADDRESS

806-602 W Hastings St
Vancouver BC V6C 1P2

SUMMARY GEOLOGY (lithology, age, structure, alteration, mineralization, size, and attitude):

Volcanic rocks of the Jurassic Hazelton Group have a band composed of tuffs and exhalative minerals such as chert, jasper, pyrite and sulfates (probably barite).
This horizon is anomalous in places in Zn, As, Mo,
No precious metals found to date

REFERENCES TO PREVIOUS WORK

(over)

TYPE OF WORK IN THIS REPORT	EXTENT OF WORK (IN METRIC UNITS)	ON WHICH CLAIMS	COST APPORTIONED
GEOLOGICAL (scale, area)			
Ground	800m x 2500m preliminary study	SAULT 1, SAULT 3	
Photo			
GEOPHYSICAL (line-kilometres)			
Ground			
Magnetic			
Electromagnetic			
Induced Polarization			
Radiometric			
Seismic			
Other			
Airborne			
GEOCHEMICAL (number of samples analysed for ....)			
Soil	4 Mo. Cu. Pb. Zn. Ag. As	SAULT 1, SAULT 3	
Silt	37 Mo. Cu. Pb. Zn. Ag. As		
Rock	14 Mo. Cu. Pb. Zn. Ag. Hg. Co.		
Other	Mn. Cd. Bi. As, Hg		
DRILLING (total metres; number of holes, size)			
Core			
Non-core			
RELATED TECHNICAL			
Sampling/assaying			
Petrographic			
Mineralogic			
Metallurgic			
PROSPECTING (scale, area)			
PREPARATORY/PHYSICAL			
Legal surveys (scale, area)			
Topographic (scale, area)			
Photogrammetric (scale, area)			
Line/grid (kilometres)			
Road, local access (kilometres)			
Trench (metres)			
Underground (metres)			
		TOTAL COST	

FOR MINISTRY USE ONLY	NAME OF PAC ACCOUNT	DEBIT	CREDIT	REMARKS:
Value work done (from report)				
Value of work approved				
Value claimed (from statement)				
Value credited to PAC account				
Value debited to PAC account				
Accepted .... Date	Rept. No.			Information Class

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KITSAULT PROPERTY

1. INTRODUCTION

In 1966 J. R. Woodcock, geologist, and Nick Wychopen, prospector, in a search for molybdenum deposits, discovered a small molybdenum-zinc anomaly in an area of shallow overburden with limited exposures. Prospecting revealed an outcrop carrying barite, realgar, and pyrite in addition to outcrops composed of grey jasper . Assays for precious metals were discouraging.

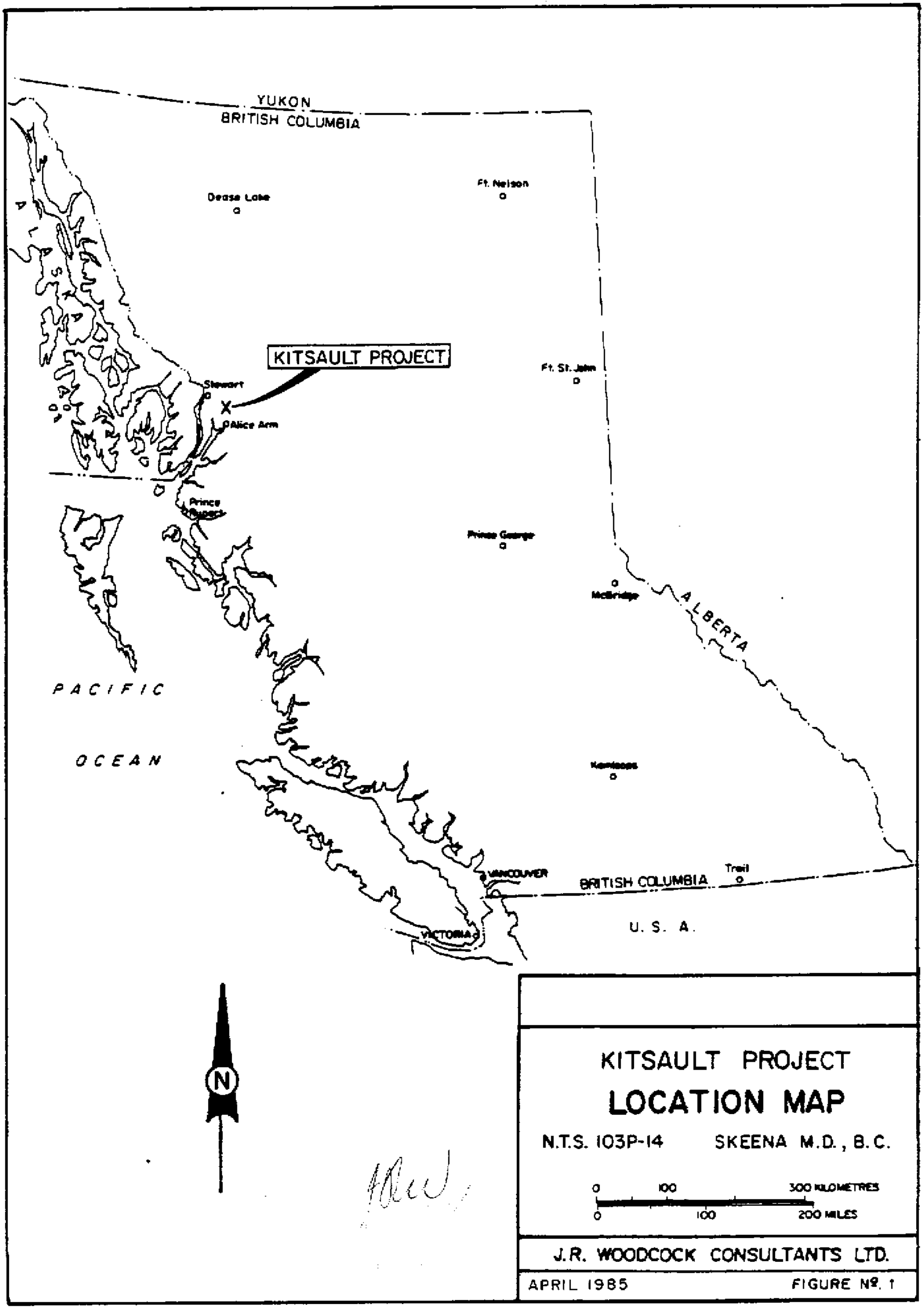
The claims staked in 1966 subsequently lapsed. Also later claims staked by other organizations lapsed. In 1983 the silt samples were analyzed for arsenic and gold and this revealed a fairly extensive area of somewhat anomalous values.

In 1984 J. R. Woodcock staked new claims and started a program of geological mapping and geochemical sampling.

2. LOCATION AND ACCESS

The property lies along the southeast side of Kitsault Lake at an elevation of 2800 feet (850 meters). It is on map 103P-14 at latitude 55° 46' N, longitude 129° 29' W.

Kitsault Lake at one time provided the hydro power for the old Torbrit silver mine. It drains southward down Kitsault River to the seaport of Alice Arm, a distance of 20 miles (32 km). Access at present


YUKON
BRITISH COLUMBIA
Dease Lake
Ft. Nelson
ALASKA
KITSAULT PROJECT
Ft. St. John
Stewart
Alice Arm
Prince Rupert
Prince George
McBride
ALBERTA
PACIFIC
OCEAN
Kamloops
VANCOUVER
BRITISH COLUMBIA
Trail
U. S. A.
VICTORIA
N
KITSAULT PROJECT
LOCATION MAP
N.T.S. 103P-14
SKEENA M.D., B.C.
0 100 300 KILOMETRES
0 100 200 MILES
J.R. WOODCOCK CONSULTANTS LTD.
APRIL 1985
FIGURE Nº. 1

would have to be by float plane to Kitsault Lake from Terrace, Prince Rupert, or Smithers, 120 to 150 miles (200 to 250 km) distant. Helicopters are based at Stewart, 25 miles (40 km) to the northwest.

Highway 37 lies along the Nass River 20 miles (32 km) to the northeast; the intervening area is one of relatively subdued and low topography. In addition the old road to the Kitsault mine did extend up the Kitsault Valley to within six miles (9.6 km) of the property.

Although the property is at a low elevation, it is in an area of heavy rainfall with abundant snow in the winter. The Cambria Icefield lies a short distance to the northwest.

3. HISTORY

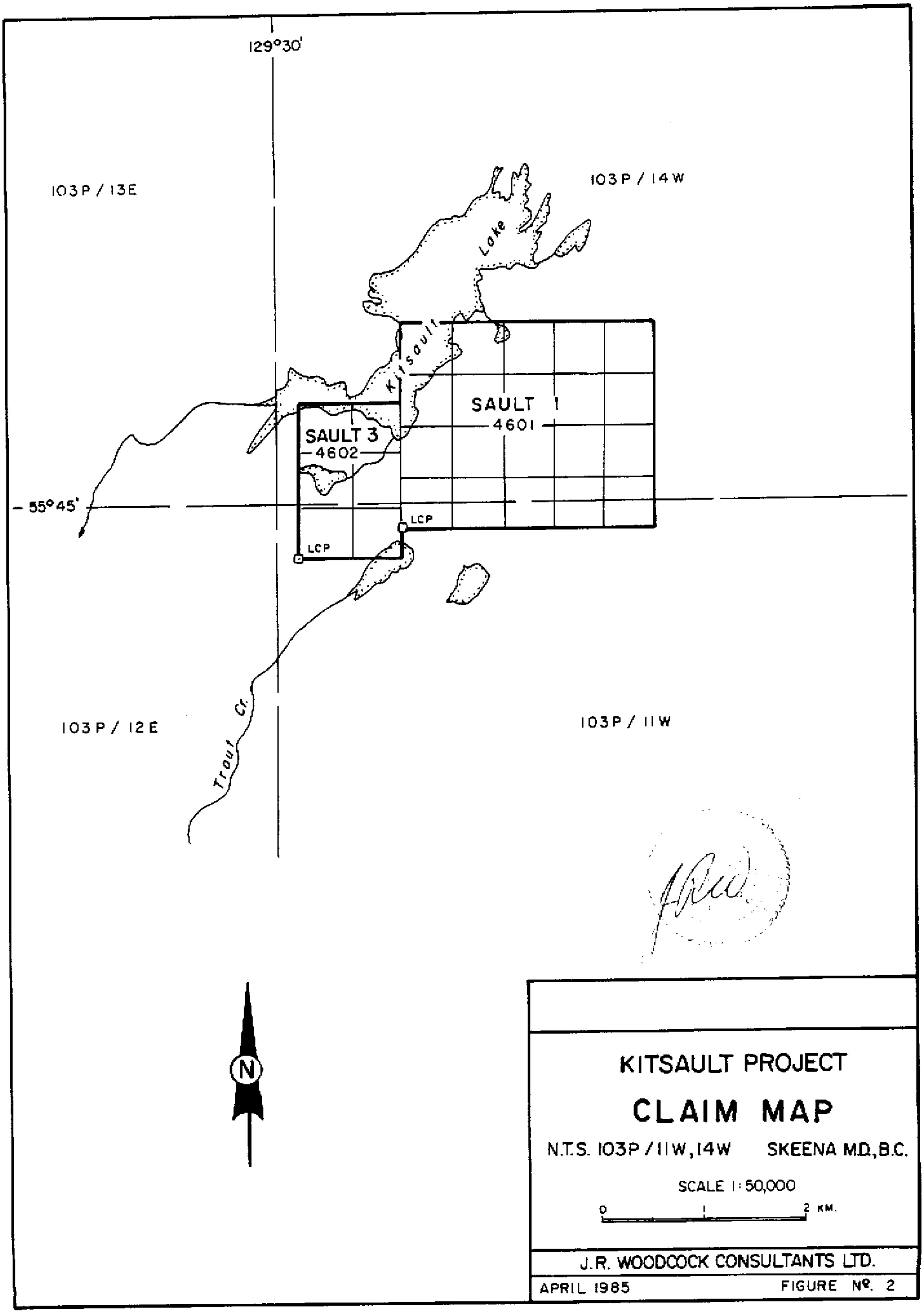
The Kitsault Valley has had a long history of mining for precious metals, most of it coming from the old Torbrit Silver Mine and the Dolly Varden Mine.

A brief period of production from the Dolly Varden Mine started in 1919. Production from the adjacent Toric property (Torbrit Silver Mines Ltd.) lasted from 1949 to 1959. At this time Torbrit Silver ranked third in silver production in Canada.

Between 1960 and 1980 exploration for and mining of molybdenum supplanted the silver mining activity of the district.

Realgar mineralization was noted by J. R. Woodcock and Nick Wychopen in 1966 in the search for molybdenum deposits. At this time some claims were staked and a small amount of prospecting done. In 1983 and 1984 Woodcock had new claims staked on the zone.

... 3


129°30'
103P / 13E
103P / 14W
Lake
Kitsault
SAULT 1
4601
SAULT 3
4602
55°45'
LCP
LCP
Trout Cr.
103P / 12E
103P / 11W
N
KITSAULT PROJECT
CLAIM MAP
N.T.S. 103P / 11W, 14W
SKEENA M.D., B.C.
SCALE 1:50,000
0
1
2 KM.
J.R. WOODCOCK CONSULTANTS LTD.
APRIL 1985
FIGURE Nº. 2

4. CLAIMS AND OWNERSHIP

On October 21, 1983 Mr. H. B. Reedy staked the Kit 1 (20 units) claim as agent for John R. Woodcock. Because of inclement weather and snow conditions, he could not complete some of the claim lines. In 1984, John R. Woodcock, under Section 17 of the Mineral Act, overstaked the Kit 1 claim with the Sault 1 claim and subsequently allowed the Kit 1 claim to lapse. In addition he also staked the Sault 3 claim (6 units).

The claim data is as follows:

Claim Name	Units	Record #	Completion Date	Record Date
Sault 1	20	4601	July 9/84	July 25/84
Sault 3	6	4602	July 10/84	July 25/84

The claims are in the Skeena Mining Division.

5. GENERAL GEOLOGY

The strata in this region consist of volcanic rocks and inter-bedded sedimentary rocks which have been assigned to the Hazelton Group of Lower Jurassic Age. The Hazelton strata are unconformably overlain by the Bowser Lake Group composed mainly of shales, siltstones, greywackes, and sandstones. The Bowser Lake Group fill a large basin lying to the north of the target and also extend westerly into the rugged Coast Plutonic Complex. Generally the contact is considered an erosional unconformity; however the edge of the basin just east of Stewart is the loci of a number of gently dipping thrust faults.

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The two Mesozoic formations have been intruded by plutons of the Coast Range Complex, mainly of Cretaceous age but also including some of Tertiary age. Some of the stocks dated at 52 MY have associated molybdenum mineralization.

Late volcanic rocks fill some of the valleys in the general vicinity. Some remnants of flows of late Tertiary age unconformably overlie the stocks at Alice Arm. Younger flows occur in places along the Nass River to the east.

Silver mineralization of the Dolly Varden and Torbrit silver deposits or mine is of a Kuroko type and occurs within the Hazelton volcanic rocks. In addition a number of silver-bearing veins occur along the Kitsault Valley and east of Alice Arm. Some gold-silver mineralization occurs in veins west of Kitsault Lake.

6. GEOLOGY OF THE PROPERTY

GENERAL

A perusal of the aerial photographs shows that the Bowser Lake Assemblage of Kitsault Lake is readily distinguished from the Hazelton rocks east of the lake by the structural fabric. The Hazelton Group rocks are highly broken, topography is of low relief and drainage is by small creeks. This broken topography is also reflected by the irregular outline of the eastern edge of Kitsault Lake and the numerous small lakes that occur to the east of it. Several strong structures within this zone trend northeasterly parallel to Kitsault Lake.

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The Bowser Lake Assemblage lying north and west of the lake contrast in that the strata are less broken. These strata can be differentiated by the regular bedding that shows on the aerial photographs.

The Hazelton Group of rocks along the Kitsault River, north of the Torbrit camp have been divided by Black (1951) into four units which occur as a synclinal structure in which both limbs dip westerly. At the base of the group is Formation A which is predominantly shale with some conglomerate beds. Above this is Formation B which is predominantly volcanic agglomerate and tuff. Formation C which lies above the agglomerate bed is predominantly shale but does contain beds of sandstone and greywacke tuff. The upper Formation D is predominantly volcanic agglomerate and tuff and contains some sedimentary beds with abundant fossils.

The strata along much of the Kitsault River strike north northwesterly parallel to the river. However towards the north they swing northeasterly along the southeast side of Kitsault Lake.

Mapping in 1984 was a preliminary pass to gain enough data to plan a more detailed mapping program and to aid in appraisal of geochemical results. Rock specimens were collected along traverses for subsequent petrography and classification. These results are given on the "Rock Type" map (Figure 4). *

Mapping on the property has been mainly in a narrow zone of exhalative and tuffaceous rocks that strikes northeasterly and is bounded on the northwest and the southeast by andesitic volcanic rocks, much of which is pyroclastic. These strata are part of Black's Formation B.

The black slate and the conglomerate noted along the west shore of the lake at the southwest corner of Sault 3 claim is presumably part of Black's Formation A. The argillites and black slates mapped along the north side of the Sault 1 claim are part of the Bowser Lake Assemblage.

... 6

The zone of economic interest with anomalous geology and geochemistry occurs near the southeast side of Kitsault Lake. Outcrops are scarce in this area and occur only on parts of the little brush-covered knolls. These knolls are separated by a fairly extensive swamp. As a consequence the geological map consists of a number of separated sample and specimen sites on exposures found along the creeks and along a few traverses.

ROCK UNITS

The Exhalative-Tuff Zone

The rock units within the exhalative-tuff zone will be separately described and example sites specified. Most of the rock types within this zone have been examined under thin sections and these descriptions appear in the Appendix. The strata dip about 25° northwest; their base lies southwest of the narrow mapped area. The various rock units will be described starting at the southeast exposures. However the exact sequence is unknown; with such shallow dips, small vertical displacements can drastically alter the outcrop location of any specific bed.

One of the most unusual rock types is a very porous black tuffaceous clastic which crops out along a creek (Specimens 180, 181). This generally has abundant pyrite. Similar rock occurs 600 meters to the southwest (Specimen 203) where it appears to be in fault contact on the north with greyish volcanic. Similar rock underlies some bedded barite 1300 meters to the southwest (Specimen 162).

Black limestone cut by white calcite veinlets presumably overlies the black tuff. It is found in an extensive exposure along the creek bed (Specimen 177).

... 7

The next highest exposure, but separated by considerable unexposed section, is a grey limestone which is cut by some veinlets of very fine-grained pyrite. It has some barite* and some fractures are coated with realgar (Specimen 123). A similar exposure occurs 150 meters (Specimen 131) to the southwest and another exposure of similar rock occurs 150 meters to the northwest (Specimen 191). The relationship between these three exposures is unknown.

Overlying the barite-limestone is some white to grey jasperoid that has abundant disseminated fine-grained pyrite (Specimens 124, 125).

An unusual bed of conglomerate forms a ridge along the northwest edge of a small pond (Specimens 129, 130). This appears to overlie the barite-limestone of sites 131 and 132. The matrix of this conglomerate includes a number of clastic rock types but is mainly clasts of very fine-grained limestone. It has a variety of large boulders. Noticeable are grey jasperoid and reddish jasperoid in the boulders up to 25 cm long. The lateral extent of this bed is unknown as there is a lack of exposure along strike to the northeast and southwest.

A thinly banded rock consisting of several different rock types is exposed in a creek bed and in other places (Specimen 133, 134, 193). This includes a carbonate-rich shale that has layers of fine-grained pyrite; bedded barite mixed with some limestone layers or some red jasperoid layers. Further to the west some thinly-bedded barite-carbonate-pyrite (Specimen 161) overlies the black tuff. The correlation of this bedded barite-rich bed is uncertain.

Associated with this unusual sequence of rocks are some porphyritic andesites that are altered to carbonate and sericite. Some specimens which have been logged as this type of rock include 128, 176, 198, 204 and 163.

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* Identified only by high specific gravity, moderately high relief, low birefringence.

The Bounding Andesitic Volcanics

A variety of andesitic volcanic rocks overlie and underlie the exhalative-tuff zone. These have been divided into grey volcanics, green andesites, purple-green pyroclastics, and miscellaneous andesitic volcanics. The mapping done thus far indicates that, in places, faulting may separate the volcanic rocks from the exhalative rocks. Further mapping will be required to determine the exact relationship.

The Argillaceous Rocks

About two kilometers south of Kitsault Lake, in the vicinity of the southwest corner of the Sault 3 claim, is a sharp deep basin filled with a lake. The west shore of this lake contains considerable float of black slate and also some outcrops of a conglomerate. These are part of the Hazelton Group and presumably part of Black's "Formation A".

The Bowser Lake Formation

Along the north side of the Sault 1 claim are scattered exposures of slates and argillites which are part of the Bowser Lake Formation. This formation unconformably overlies the formations of the Hazelton Group.

... 9

Soils: B horizon, shallow rusty brown
Silt: active channel
Rocks: grab

7. GEOCHEMISTRY

PROCEDURES

In a number of places rock samples have been taken from the small exposures of mineralized or altered rock and analyzed for a variety of elements. Also silts have been collected from many of the streams encountered during the traverses and these have also been analyzed for a variety of elements.

Analytical work was done by Vangeochem Lab Ltd. Gold analyses are by fire assay plus atomic absorption (FA + AA); arsenic and mercury are by specific techniques; the remainder are by aqua regia digestion plus atomic absorption. Techniques are included in Appendix II.

Figure 3 gives the sites for all specimens, rock samples, and silt samples according to sample number. Figure 5 gives the results for lead, zinc and Figure 6 gives the results for molybdenum-arsenic. In addition, mercury and manganese in the rock samples are given on Figure 7. Results for gold in silt (analytical report 84-99-029) and for copper and silver (report 84-99-018) are included in the appendix. These three metals did not show any significant variation. The silver, bismuth, cobalt, and copper did not show any significant variation in rock; the values are included in the appendix (report 84-99-030).

SILT AND SOIL SAMPLES

In the silt sampling, many of the streams taken were very small and draining somewhat swampy areas and therefore the silt did contain considerable organic material. Only in the larger streams has there been

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vigorous sorting and formation of good silts. Therefore some of the anomalous values are due to absorption and concentration by the organic material.

In interpreting the results of the silt sampling, the formations have been divided into the Bowser Lake Assemblage, the Exhalative-Tuff Zone, and the Hazelton Volcanics. In general the molybdenum values are quite high, with generally higher values within the Hazelton Volcanics than in the Bowser Lake sediments. The results from the Exhalative-Tuff Zone are variable but contain the highest values obtained (up to 33 ppm). Background values for arsenic are quite high for some of the silts draining Hazelton Volcanics and are very high for most of the silts that drain the Exhalative-Tuff Zone (up to 150 ppm). Two samples of soil (126 and 127) returned values respectively of 1100 ppm and 150 ppm arsenic. These soil samples were taken on an outcrop of barite-jasper.

Except for two soil samples (196 and 197) taken on an exposure of barite-pyrite, lead results are very even with no significant anomalous values. Copper and silver, also obtained by AA, and gold, obtained by FA plus AA, show no significant variations.

Zinc is also somewhat erratic in its results. Most of the silt samples from the Exhalative-Tuff Zone are anomalous (generally > 300 ppm). The values obtained over Hazelton rocks are quite uniform (100 to 200 ppm) whereas those obtained over Bowser Lake rocks are quite erratic with values ranging from 83 to 1160 ppm. Some high values may be due to concentration in the organic material as the highest value was obtained in a very small drainage on a swampy area. A few soil samples taken on mineralized rock (126, 127, 196, and 197) are generally quite anomalous in zinc.

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ROCK SAMPLES

The rock samples were mainly from the Exhalative-Tuff Zone including the mineralized tuffs, the barite-rich rocks, and some of the altered volcanics. The results do show anomalous arsenic, zinc, cadmium, mercury, and some lead. Again the molybdenum values are very high and correspond to other anomalous metal values.

8. CONCLUSIONS

1. The mapping done thus far is limited and merely designed to sort out the rock types and determine if more extensive mapping is warranted.

2. The zone of exhalative rocks and mineralized tuffs is anomalous, both geologically and geochemically. It appears to lie within Black's Formation B (Black, 1951).

3. The main area of anomalous geology and geochemistry is bounded by the andesitic volcanics on the northwest; it also abuts against some andesitic volcanics along strike to the southwest. However its extension to the south and to the east is unknown.

4. Analytical work thus far has not detected significant precious metals.

J. R. Woodcock, P. Eng.

APPENDIX I

Appendix I

PETROGRAPHY

W84-181

Hand Specimen

The specimen is a grey lightweight pyroclastic which appears to be barely lithified. It crumbles readily, especially when wet. Fragments in it are up to one centimeter long and generally the larger fragments are white.

The specimen has a very porous surface; however the porosity decreases inward. This could be due to leaching of carbonate.

Thin Section

Examination shows a variety of fragments including clastic fragments, mineral fragments and rock fragments. Comments on some of these fragments are as follows:

(a) A fragment of andesitic volcanic has plagioclase phenocrysts of a variety of sizes and a matrix composed of fine-grained plagioclase. Carbonate alteration occurs in the matrix and in the phenocrysts.

(b) Some fragments are completely altered to a mosaic of carbonate.

/ 2

(c) Some fragments are zoned and were probably originally a plagioclase. Some of the zones are completely altered to carbonate whereas others are fine-grained clay or kaolinite (?) plus fine-grained carbonate.

(d) Some fragments are completely composed of very fine-grained carbonate which has a brown opaque dusting. In some of the brown patches differences in colour and density indicate former clasts within the large fragment.

(e) Some of the fragments have minor sericite in addition to the large areas of carbonate replacement.

(f) Some fragments are largely fine-grained kaolinite (?) with small clasts of quartz and patches of carbonate. This might be altered shale.

(g) Only a few quartz grains are present.

(h) Some large patches of mineral have white birefringence but no twinning and no good cleavage. This could be barite. It is associated with relatively coarse-grained carbonate.

The matrix, which appears to be clastic, contains much carbonate. Abundant fine-grained pyrite occurs in many of the fragments. Some of the small concentrations of pyrite could be clasts. The opaque material running through this rock, including that in the fine-grained clastic material and that that occurs within the matrix, is either pyrite or limonite.

/ 3

W84-177

Hand Specimen

This is the black limestone that is cut by white calcite veinlets. It effervesces very vigorously.

Thin Section

Examination shows that, although the grain size is very fine-grained, it varies from that which cannot be discerned under the high power lens to that in which crystals are quite evident. The variation in grain size is very irregular with no evidence of structure. Within this matrix of relatively clear calcite are some irregular patches with a brownish tint that is somewhat opaque. These patches are extremely fine-grained carbonate. Some of the patches contain little fragments of the clear coarser-grained carbonate. This could indicate some contemporary fragmentation that occurred within the limestone bed.

Minute veinlets of clear calcite, generally parallel, cut across the section.

W84-209A

Hand Specimen

This is a grey limestone which underlies barite-rich rock. It is cut by very small veinlets of fine-grained pyrite and also some irregular white veinlets. Some late realgar coats a few fractures.

/ 4

The fresh rock effervesces vigorously with acid. However the weathered brownish surface effervesces only moderately.

Thin Section

Examination shows that the rock is mainly extremely fine-grained carbonate which contains relatively unaltered crystal fragments of mineral with grey birefringence. Some of these fragments are definitely plagioclase. Some of the larger discrete grains or patches within this fine-grained carbonate are probably barite. Grains of pyrite are scattered throughout the rock.

One layer has relatively coarse-grained barite mixed with patches of the fine-grained carbonate. Abundant pyrite is associated with this band, especially at the contacts. In other places, patches of coarse-grained barite occur adjacent to a vague band of carbonate-barite-pyrite.

Some very irregular and discontinuous veinlets of barite also crosscut the bands. In a few places some of the carbonate has been recrystallized along microscopic shear zones.

W84-209C

Hand Specimen

This is the pyritic breccia that occurs with the barite-rich limestone. In places it contains abundant pyrite. The hand specimen shows a number of dark grey fragments floating in a matrix of light grey material.

/ 5

Thin Section

Examination shows that most of the fragments are composed of the fine-grained carbonate described for thin section 209A. The material between these limestone fragments is a mixture of fine-grained carbonate, barite, and fine-grained pyrite in varying proportions. In a few places the barite occurs alone in clear relatively coarse crystals. In places recrystallized calcite in comb crystals forms a fringe between limestone fragments and the carbonate-rich matrix. Fine-grained pyrite is concentrated into networks which occur as a discontinuous zone through part of the section.

W84-134

Hand Specimen

This is a finely-banded grey rock which underlies the barite-jasper in the creek bed. Very thin layers of pyrite occur in some of the layers and in places these form a network within a band. In a few places some short cross-cutting bands of pyrite occur.

Thin Section

Examination shows two main types of rock. One is an extremely fine-grained carbonate, similar to the limestone. The other is a very fine-grained mineral with grey birefringence and somewhat granular in appearance. This resembles kaolinite; however it is too fine-grained to identify and may be mixed with some extremely fine-grained quartz.

/ 6

In a few bands some very fine-grained sericite is mixed with the carbonate. Also along a prominent pyrite band, flakes of coarse sericite or muscovite extend between the pyrite crystals and are oriented at right angles to the pyrite boundaries.

The rock is tentatively called a limy shale.

W84-162

Hand Specimen

This is the dark grey tuff which contains anomalous zinc and underlies the bedded barite. The almost black aphanitic matrix contains numerous small light grey crystal fragments in addition to a number of light grey lithic fragments. Abundant pyrite is conspicuous on the surface.

Thin Section

Examination shows that this is almost completely clastic rock with a great range in size of clasts. Even the fine-grained black-looking rock of the hand specimen consists largely of clasts in a fine-grained material which, in places, is almost opaque. This could be due to the inclusion of some extremely fine-grained pyrite.

Some of the larger clasts are completely altered to sericite with abundant kaolinite (?) and patches of carbonate. Varying grain sizes, especially in the carbonate patches, probably indicate former crystals.

Some fragments composed largely of very fine-grained carbonate resemble the limestone of section 209A.

/ 7

A few crystal fragments of quartz are present.

Quartz and muscovite intermixed in comb-like crystals occur in the strain shadows of large euhedral pyrite crystals.

W84-176

Hand Specimen

In the field this was mapped as an altered volcanic rock, probably an andesite or tuff. The rock could be a porphyritic volcanic with at least two generations of phenocrysts including a large feldspar phenocryst plus a variety of sizes of smaller phenocrysts. It also appears to contain a fragment.

Thin Section

Examination shows that the rock is about 60% phenocrysts, most of which are plagioclase. Some of the plagioclase crystals display good zoning with alteration concentrating along discrete zones.

Alteration is mainly carbonate which, in places, has completely replaced the former phenocrysts and created a carbonate crystal. Some sericite alteration also occurs in the larger plagioclase phenocrysts.

The matrix is extremely fine-grained and has a grey birefringence.

The abundance of phenocrysts of andesine plagioclase, the absence of any quartz phenocrysts and the extreme fine-grained nature of the matrix indicate a porphyritic andesite lava.

APPENDIX II

VANGEOCHEM LAB LIMITED

1521 Pemberton Ave.
North Vancouver B.C. V7P 2S3
(604)986-5211 Telex: 04-352578

GEOCHEMICAL ANALYTICAL REPORT

CLIENT: J.R. WOODCOCK CONSULTANTS
ADDRESS: 806-602 West Hastings Street
: Vancouver B.C.
: V6B 1P2

DATE: July 20 1984
REPORT#: 84-99-018

PROJECT#: KIT
COPY SENT TO: J.R. WOODCOCK CONSULTANTS
SAMPLES ARRIVED: July 17 1984
REPORT COMPLETED: July 20 1984
ANALYSED FOR: Mo Cu Pb Zn Ag As

JOB#: 84262
INVOICE#: 8030
TOTAL SAMPLES: 41
SAMPLE TYPE: 41 soil & silt
REJECTS: DISCARDED

PREPARED FOR: J.R. WOODCOCK CONSULTANTS

ANALYSED BY: VGC Staff

SIGNED: ______________________

GENERAL REMARK: None

VANGEOCHEM LAB LIMITED
1521 Pemberton Avenue
North Vancouver B.C. V7P 2S3
(604) 986-5211 Telex: 04-352578

PREPARED FOR: J.R. WOODCOCK CONSULTANTS
NOTES: nd = none detected
: -- = not analysed
: is = insufficient sample

REPORT NUMBER: 84-99-010 JOB NUMBER: 84262

SAMPLE #	Mo ppm	Cu ppm	Pb ppm	Zn ppm	Ag ppm	As ppm
W84 - 101L	9	31	24	150	.1	15
W84 - 102L	9	21	29	151	.4	15
W84 - 103L	6	23	22	102	.2	4
W84 - 106L	5	24	20	115	.2	20
W84 - 109L	14	16	22	168	.4	40
W84 - 110L	9	18	23	220	.3	20
W84 - 113L	11	19	28	375	.1	60
W84 - 114L	33	15	28	358	.3	50
W84 - 118L	9	10	23	297	.1	60
W84 - 119L	7	14	27	580	.4	50
W84 - 120L	7	25	22	259	.1	60
W84 - 121L	11	20	27	358	.2	80
W84 - 122L	11	21	30	370	.6	80
W84 - 126S	50	23	40	7600	.4	1000
W84 - 127S	13	12	34	295	.2	150
W84 - 136L	8	20	24	160	.4	20
W84 - 137L	3	25	24	109	.2	4
W84 - 138L	4	28	23	225	.3	40
W84 - 139L	3	23	19	128	.2	4
W84 - 140L	9	24	21	100	.2	50
W84 - 141L	3	12	17	83	.2	10
W84 - 142L	2	16	23	146	.2	4
W84 - 143A	3	11	71	87	.1	30
W84 - 143B	2	13	21	89	.4	4
W84 - 145	4	22	23	138	nd	80
W84 - 148L	5	28	24	185	.4	30
W84 - 150	13	25	27	1160	.6	15
W84 - 152	10	27	21	225	.4	4
W84 - 153	3	18	19	140	.1	40
W84 - 155	3	23	20	103	.1	10
W84 - 157	5	30	20	174	.2	40
W84 - 159	3	28	22	153	.1	40
W84 - 178	11	21	24	285	.2	80
W84 - 179	13	15	20	250	.1	80
W84 - 187	6	28	30	290	.2	25
W84 - 190	14	20	21	115	.2	80
W84 - 195L S	10	26	102	1540	.3	80
W84 - 197S	12	23	105	260	.3	80
W84 - 200 L	10	8	21	433	.3	100
DETECTION LIMIT	1	1	2	1	0.1	2

VANGEOCHEM LAB LIMITED
1521 Pemberton Avenue
North Vancouver B.C. V7P 2S3
(604) 986-5211 Telex: 04-352578

PREPARED FOR: J.R. WOODCOCK CONSULTANTS
NOTES: nd = none detected
: -- = not analysed
: is = insufficient sample

REPORT NUMBER: 84-39-018 JOB NUMBER: 84262

SAMPLE #	Mo ppm	Cu ppm	Pb ppm	Zn ppm	Ag ppm	As ppm
W84 - 202	15	15	25	550	.2	150
W84 - 206	9	21	26	320	.1	60
DETECTION LIMIT	1	1	2	1	0.1	2

VANGEOCHEM LAB LIMITED

MAIN OFFICE
1521 Pemberton Ave.
North Vancouver B.C. V7P 2S3
(604)986-5211 Telex: 04-352578

BRANCH OFFICE
1630 Pandora St.
Vancouver B.C. V5L 1L6
(604)251-5656

GEOCHEMICAL ANALYTICAL REPORT

CLIENT: J.R. WOODCOCK CONSULTANTS
ADDRESS: 806-602 West Hastings Street
: Vancouver B.C.
: V6B 1P2

DATE: Sept 14 1984
REPORT#: 84-99-030(A)
JOB#: 84324(A)

PROJECT#: KIT
SAMPLES ARRIVED: Sept 10 1984
REPORT COMPLETED: Sept 14 1984
ANALYSED FOR: Co Mn Cd Bi As
SAMPLES FROM: J.R. WOODCOCK CONSULTANTS
COPY SENT TO: J.R. WOODCOCK CONSULTANTS

INVOICE#: 8278
TOTAL SAMPLES: 14
SAMPLE TYPE: 14 pulps
REJECTS: DISCARDED

PREPARED FOR: J.R. WOODCOCK CONSULTANTS

ANALYSED BY: VGC Staff

SIGNED: ____________________

GENERAL REMARK: RE: job #84-324

VANGEOCHEM LAB LIMITED
1521 Pemberton Avenue
North Vancouver B.C. V7P 2S3
(604) 986-5211 Telex: 04-352578

PREPARED FOR: J.R. WOODCOCK CONSULTANTS
NOTES: nd = none detected
: -- = not analysed
: is = insufficient sample

REPORT NUMBER: 84-99-030 JOB NUMBER: 84324(A)

SAMPLE #	Mo ppm	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Hg ppb
W84-104R	2	39	15	18	.2	2600
W84-115R	1	11	13	55	.2	50
W84-123R	20	5	51	1840	.3	240
W84-124R	8	12	29	165	.7	145
W84-125R	1	26	15	44	.2	35
W84-131R	7	5	35	490	nd	75
W84-132R	19	5	93	1810	nd	300
W84-133R	1	2	10	55	nd	30
W83-133R	3	8	21	295	.2	140
W84-158R	2	37	17	94	.1	15
W84-161R	16	4	320	7000	nd	1150
W84-162R	17	24	1160	17500	.4	4700
W84-191R	10	7	36	490	nd	310
W84-193R	2	19	22	225	.4	100
DETECTION LIMIT	1	1	2	1	0.1	

VANGEOCHEM LAB LIMITED
1521 Pemberton Avenue
North Vancouver B.C. V7P 2S3
(604) 986-5211 Telex: 04-352578

PREPARED FOR: J.R. WOODCOCK CONSULTANTS

NOTES: nd = none detected
: — = not analysed
: is = insufficient sample

REPORT NUMBER: 84-99-030(A) JOB NUMBER: 84324(A)

SAMPLE #	Co ppm	Mn ppm	Cd ppm	Bi ppm	As ppm
W84-104R	35	10	nd	2	60
W84-115R	10	215	.2	nd	15
W84-123R	30	4050	5.4	nd	200
W84-124R	25	1440	1.3	nd	200
W84-125R	20	135	.2	nd	700
W84-131R	20	3100	3.9	nd	150
W84-132R	35	5850	7.8	2	600
W84-133R	5	610	1.5	nd	15
W83-133R	25	960	1.5	2	35
W84-150R	45	385	.1	nd	15
W84-161R	30	1070	20.2	nd	40
W84-162R	40	850	56.2	1	1200
W84-191R	30	900	.9	nd	80
W84-193R	25	1345	.3	nd	35
DETECTION LIMIT	1	1	0.1	1	2

APPENDIX III

VANGEOCHEM LAB LTD.
1521 Pemberton Ave.
North Vancouver. B.C.
V7P 2S3

To: J.R. WOODCOCK CONSULTANTS
806 602 West Hastings Street
Vancouver B.C. V6B 1P2

FROM: Vangoechem Lab Ltd.
1521 Pemberton Ave.
North Vancouver, B.C. V7P 2S3

SUBJECT: Analytical procedure used to determine Aqua Regia soluble gold in geochemical samples

1. Method_of_Sample_Preparation

(a) Geochemical soil, silt or rock samples were received in the laboratory in wet-strength 4" x 6" Kraft paper bags or rock samples sometimes in 8" x 12" plastic bags.

(b) The dried soil and silt samples were sifted by hand using a 8" diameter 80-mesh stainless steel sieve. The plus 80-mesh fraction was rejected and the minus 80-mesh fraction was transferred into a new bag for analysis later.

(c) The dried rock samples were crushed by using a jaw crusher and pulverized to 100-mesh or finer by using a disc mill. The pulverized samples were then put in a new bag for later analysis.

2. Method_of_Digestion

(a) 5.00 - 10.00 grams of the minus 80-mesh samples were used. Samples were weighed out by using an electronic micro-balance into beakers.

(b) 20 ml of Aqua Regia (3:1 HCl : HNO3) were used to digest the samples over a hot plate vigorously.

(c) The digested samples were filtered and the washed pulps were discarded and the filtrate was reduced to about 5 ml.

(d) The Au complex ions were extracted into diisobutyl ketone and thiourea medium. (Anion exchange liquids "Aliquot 336").

(e) Separate Funnels were used to separate the organic layer.

3. Method_of_Detection

The gold analyses were detected by using a Techtron model AA5 Atomic Absorption Spectrophotometer with a gold hollow cathode lamp. The results were read out on a strip chart recorder. A hydrogen lamp was used to correct any background interferences. The gold values in parts per billion were calculated by comparing them with a set of gold standards.

4. The analyses were supervised or determined by Mr. Conway Chun or Mr. Eddie Tang and his laboratory staff.

Eddie Tang
VANGEOCHEM LAB LTD.

VANGEOCHEM LAB LTD.
1521 Pemberton Ave.,
North Vancouver. B.C.
V7P 2S3

TO: J.R. WOODCOCK CONSULTANTS
806 - 602 West Hastings Street
Vancouver B.C. V6B 1P2

FROM: Vangeochem Lab Ltd.
1521 Pemberton Ave.
North Vancouver. B.C. V7P 2S3

SUBJECT: Analytical procedure used to determine Aqua Regia soluble Hg vapour in geochemical samples.

1. Method of Sample Preparations

(a) Geochemical soil, silt or rock samples were received in the laboratory in wet-strength 4x6 Kraft paper bags or rock samples sometimes in 8"x12" plastic bags.

(b) The dried soil and silt samples were sifted by hand using a 8" diameter 80-mesh stainless steel sieve. The plus 80-mesh fraction was rejected and the minus 80-mesh fraction was transferred into a new coin envelope for analysis later.

(c) The dried rock samples were crushed by using a jaw crusher and pulverized to 100-mesh or finer by using a disc mill. The pulverized samples were then put in a new bag for later analysis.

2. Method of Digestion

(a) 0.50 gram samples of the minus 80-mesh fraction were weighed out by using an electronic micro-balance into the test tubes.

(b) The samples were digested with aqua-regia in a hot water bath for an hour.

(c) The samples were shaken and diluted with demineralized water to a fixed volume settled.

3. Method of Analysis

(a) An aliquot of the digested samples were mixed with H2SO4 acid, NaCl, & hydroxylamine sulphate-stannous sulfate as the reductant.

(b) The vapour of the mixture was then drawn into the absorption cell and the Hg vapour was detected by the Techtron model AA-5 atomic absorption spectrophotometer.

(c) The results were recorded on a strip chart recorder. The concentration were calculated in parts per billion by comparing with a set of Hg vapour standards.

4. The analyses were supervised or determined by Mr. Eddie Tang or Mr. Conway Chun and their laboratory staff.

Eddie Tang
Vangeochem Lab Ltd.

VANGEOCHEM LAB LTD.
1521 Pemberton Ave.
North Vancouver, B.C.
V7P 2S3

TO: J.R. WOODCOCK CONSULTANTS
806 - 602 West Hazstings Street
Vancouver B.C. V6B 1P2

FROM: Vangeochem Lab Ltd.
1521 Pemberton Ave.
North Vancouver, B.C. V7P 2S3

SUBJECT: Analytical procedure used to determine hot acid soluble for Mo,Cu,Pb,Zn,Ag,Sb & Mn in geochemical silt and soil samples.

1. Method of Sample Preparation

(a) Geochemical soil, silt or rock samples were received in the laboratory in wet-strength 4" x 6" Kraft paper bags or rock samples sometimes in 8" x 12" plastic bags.

(b) The dried soil and silt samples were sifted by hand using a 8" diameter 80-mesh stainless steel sieve. The plus 80-mesh fraction was rejected and the minus 80-mesh fraction was transferred into a new bag for analysis later.

(c) The dried rock samples were crushed by using a jaw crusher and pulverized to 100-mesh or finer by using a disc mill. The pulverized samples were then put in a new bag for later analysis.

2. Method of Digestion

(a) 0.50 gram of the minus 80-mesh samples was used. Samples were weighed out by using a electronic micro-balance.

(b) Samples were heated in a sand bath with nitric and perchloric acids (15% to 85% by volume of the concentrated acids respectively).

(c) Minimum of 5000 ppm of AlCO3 was added to each samples when Mo analysis is required, disgested samples were diluted with demineralized water to a fixed volume and shaken.

3. Method of Analysis

Mo, Cu, Pb, Zn, Ag, Sb & Mn analyses were determined by using a Techtron Atomic Absorption Spectrophotometer Model AA5 with their respective hollow cathode lamps. The digested samples were aspirated directly into an air and acetylene mixture flame. The results, in parts per million, were calculated by comparing a set of standards to calibrate the atomic absorption units.

4. Background Correction

A hydrogen continuum lamp is used to correct the Silver background interferences.

5. The analyses were supervised or determined by Mr. Conway Chun or Mr. Eddie Tang and the laboratory staff.

Eddie Tang
VANGEOCHEM LAB LTD.

VANGEOCHEM LAB LTD.
1521 Pemberton Ave.
North Vancouver, B.C.
V7P 2S3

TO: J.R. WOODCOCK CONSULTANTS
806 - 602 West Hastinos Street
Vancouver, B.C. V6B 1P2

FROM: Vangeochem Lab Ltd.
1521 Pemberton Ave.
North Vancouver, B.C. V7P 2S3

SUBJECT: Analvtical proceeure used to determine hot acid soluble arsenic in geochemical silt, soil, lake sediment and rock samoles.

1. Sample_Preparation

(a) Geochemical soil, silt, lake sediment or rock samoles were received in the laboratory in wet-strength 3 1/2 x 6 1/2 Kraft paper bags and rock samoles in 4" x 6" Kraft paper bags.

(b) The wet samoles were dried in a ventilated oven.

(c) The dried soil and silt samples were sifted by hands using a 8" diameter 80-mesh stainless steel sieve. The plus 80-mesh fraction was rejected and the minus 80-mesh fraction was transferred into a new bag for analysis later.

(d) The dried rock samoles were crushed by using a jaw crusher and pulverized to 100-mesh or finer by using a disc mill. The pulverized samoles were then put in a new bag for later analysis.

2. Method_of_Digestion

(a) 0.25 gram of the minus 80-mesh sample was used. Samoles were weighed out by using a eletronic micro-balance.

(b) Samples were heated in a sand bath with concentrated perchloric acid (70 – 72% $HClO_4$ by weight) at a medium heat for four hours.

(c) The digested samples were diluted with demineralized water.

3. Method of Analysis

(a) Potassium iodide and stannous chloride in HCl were added to the digested samples.

(b) Zinc metal was introduced and the arsenic in solution was passed off as arsene through a glass wool scrubber plug saturated with lead acetate and into a solution of silver diethyldithiocarbamate in chloroform with l-ephedrine, forming a red complex with the silver diethyldithiocarbamate.

(c) The concentration of the arsenic was determined colorimetrically by comparing the intensity of the color of the red complex with a set of known standards prepared in a similar fashion as the samples.

4. The analyses were supervised or determined by Mr. Eddie Tang or Mr. Conway Chun and their laboratory staff.

Eddie Tang
Vangeochem Lab Ltd.

APPENDIX IV

Appendix IV

STATEMENT OF COSTS

Disbursements

For Staking (25%) and Mapping (75%)

Central Mountain Air	$1,139.40		
Miscellaneous Field	1,590.35		
	2,729.75	(75%)	$2,047.31

For Technical Work

Geochemical Analyses and Thin Sections	$ 644.10	
Drafting	196.00	
Miscellaneous	266.03	1,106.13

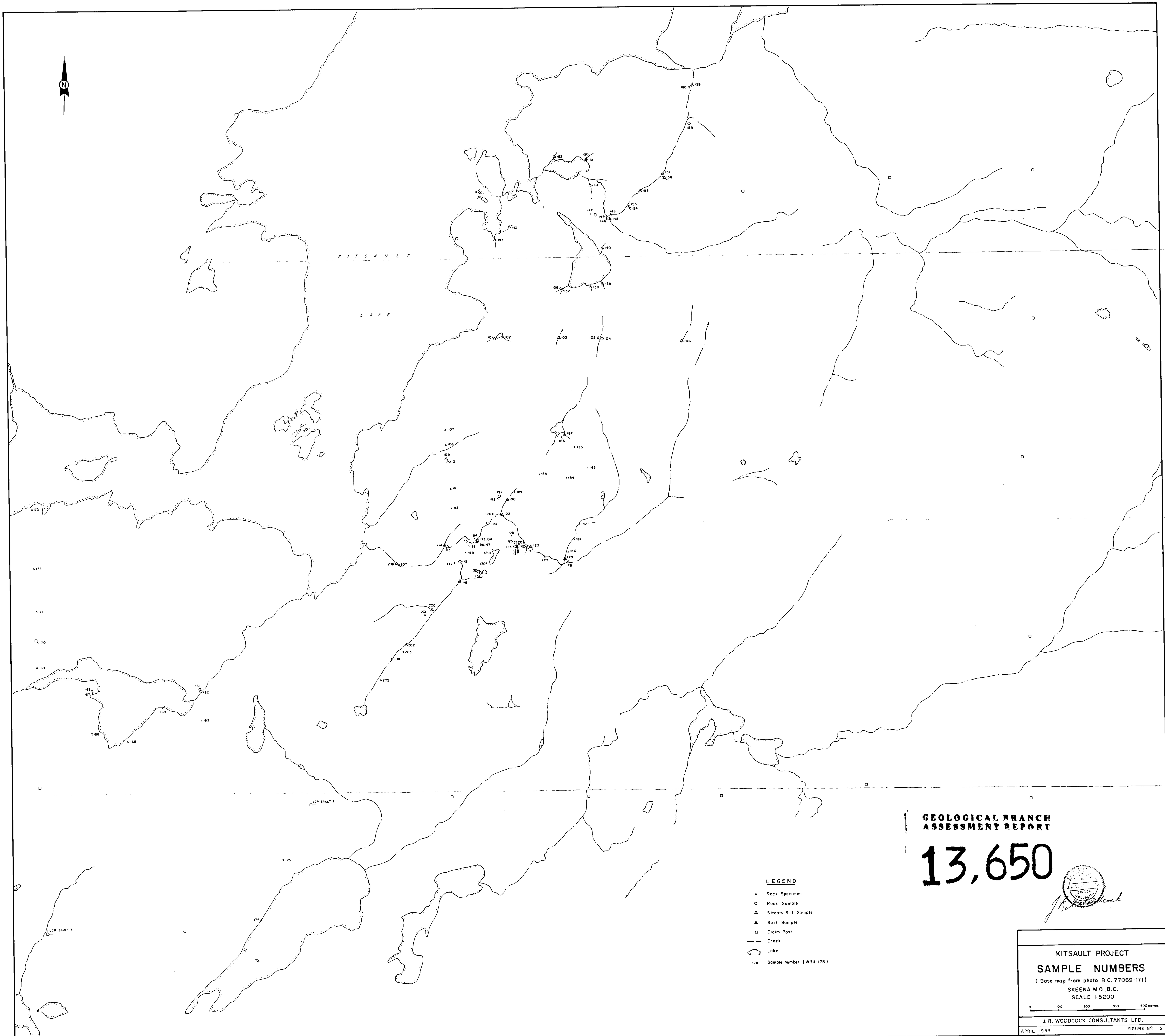
Fees

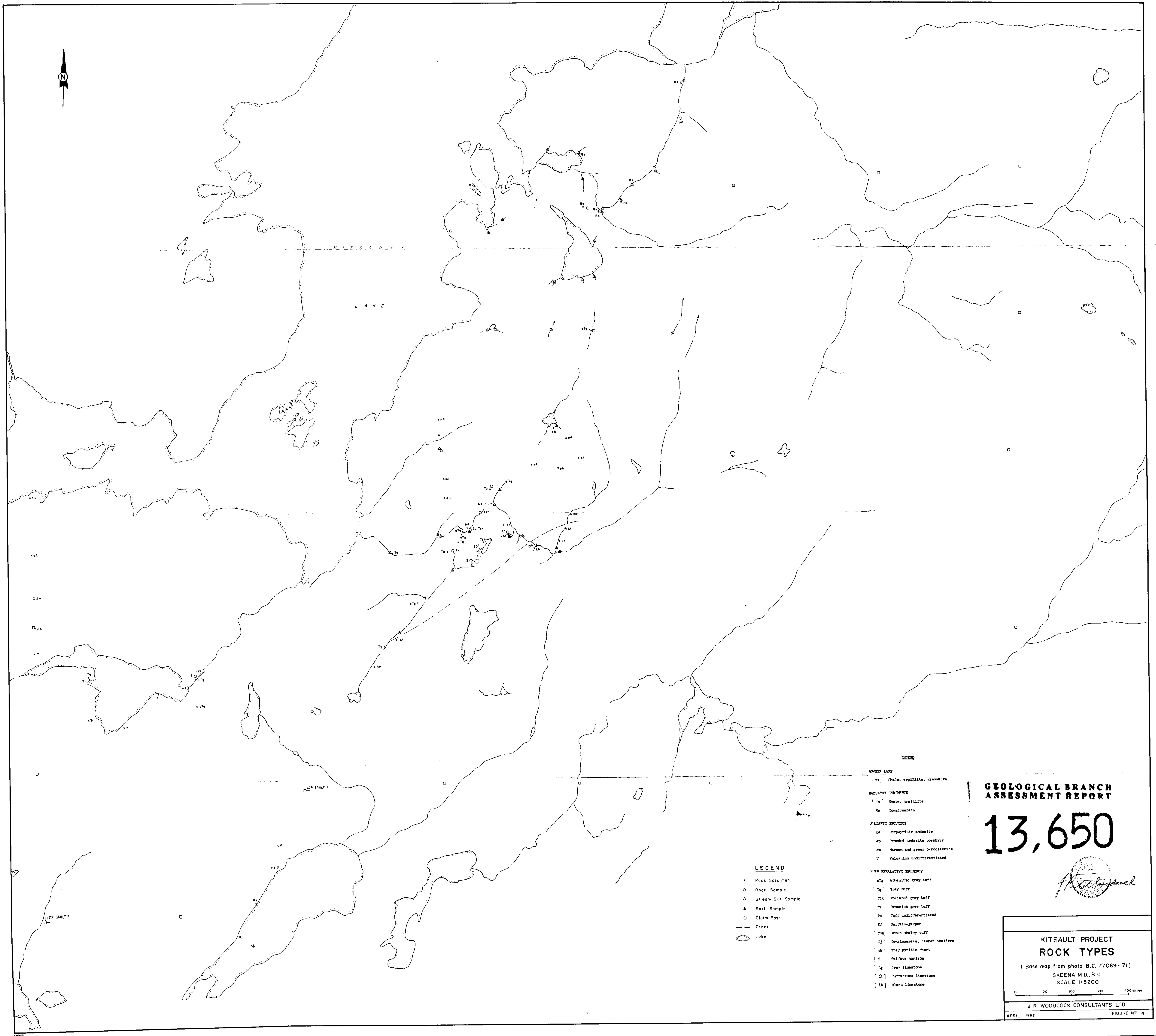
J. R. Woodcock

Field Mapping		
July 9, 10 (charge to Sault 1)	1 ½ days	
July 11, 12	2 "	
Petrography and Report		
July 13 - Oct. 13	4 "	
Oct. 14 - Nov. 27	3 "	
April 8-12	2 "	
	12 ½ days	
	@ $385	4,812.50

M. Brooks

Work on Report 7 hrs. @ $15	105.00
	$8,070.94


KITSAULT
LAKE
GEOLOGICAL BRANCH
ASSESSMENT REPORT
13,650
LEGEND
x Rock Specimen
O Rock Sample
Δ Stream Silt Sample
▲ Soil Sample
□ Claim Post
Creek
Lake
178 Sample number (W84-178)
KITSAULT PROJECT
SAMPLE NUMBERS
(Base map from photo B.C. 77069-171)
SKEENA M.D., B.C.
SCALE 1:5200
0 100 200 300 400 Metres
J. R. WOODCOCK CONSULTANTS LTD.
APRIL 1985
FIGURE Nº. 3



GEOLOGICAL BRANCH
ASSESSMENT REPORT

13,650

KITSAULT PROJECT

ROCK TYPES

(Base map from photo B.C. 77069-171)

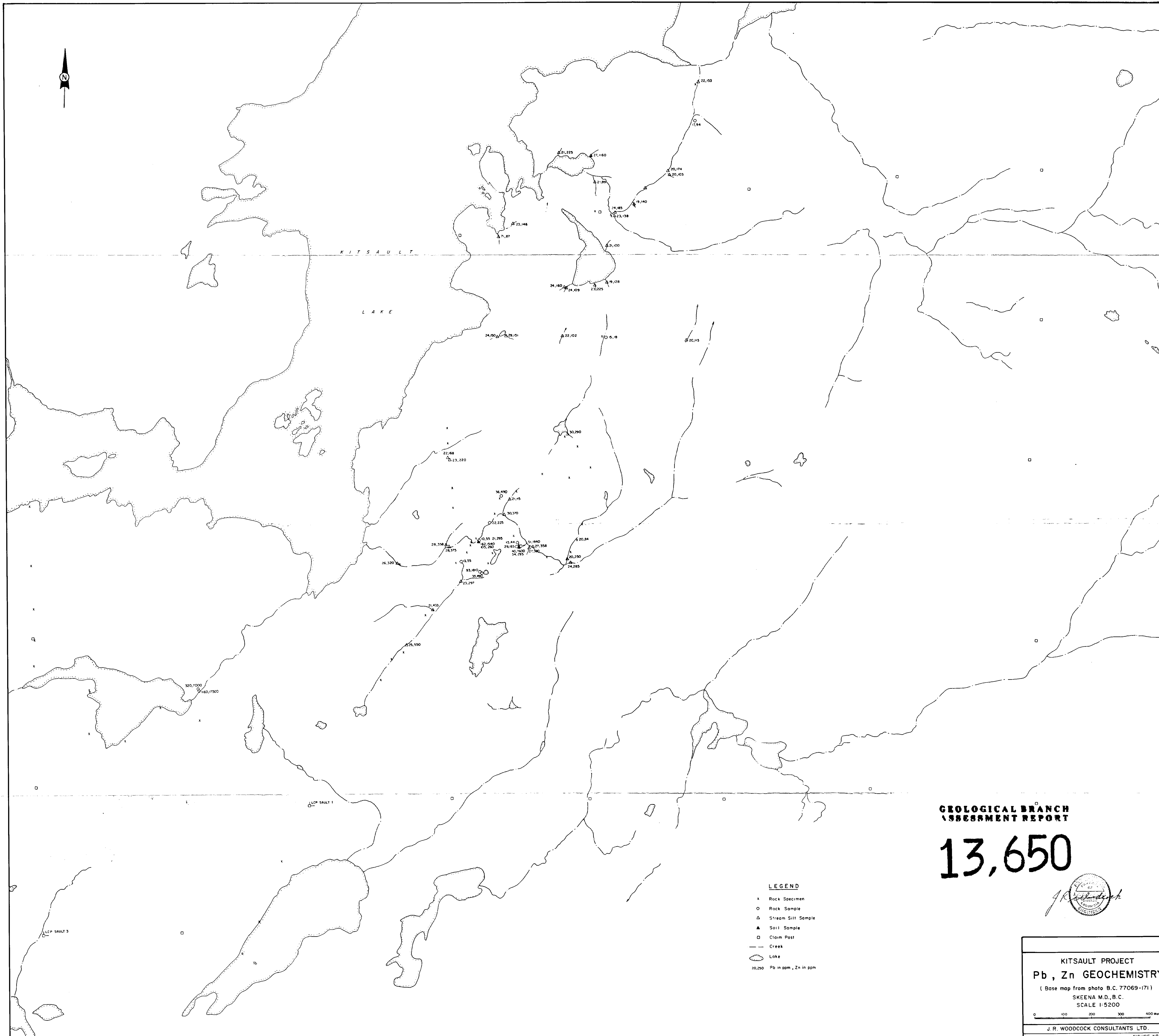
SKEENA M.D., B.C.

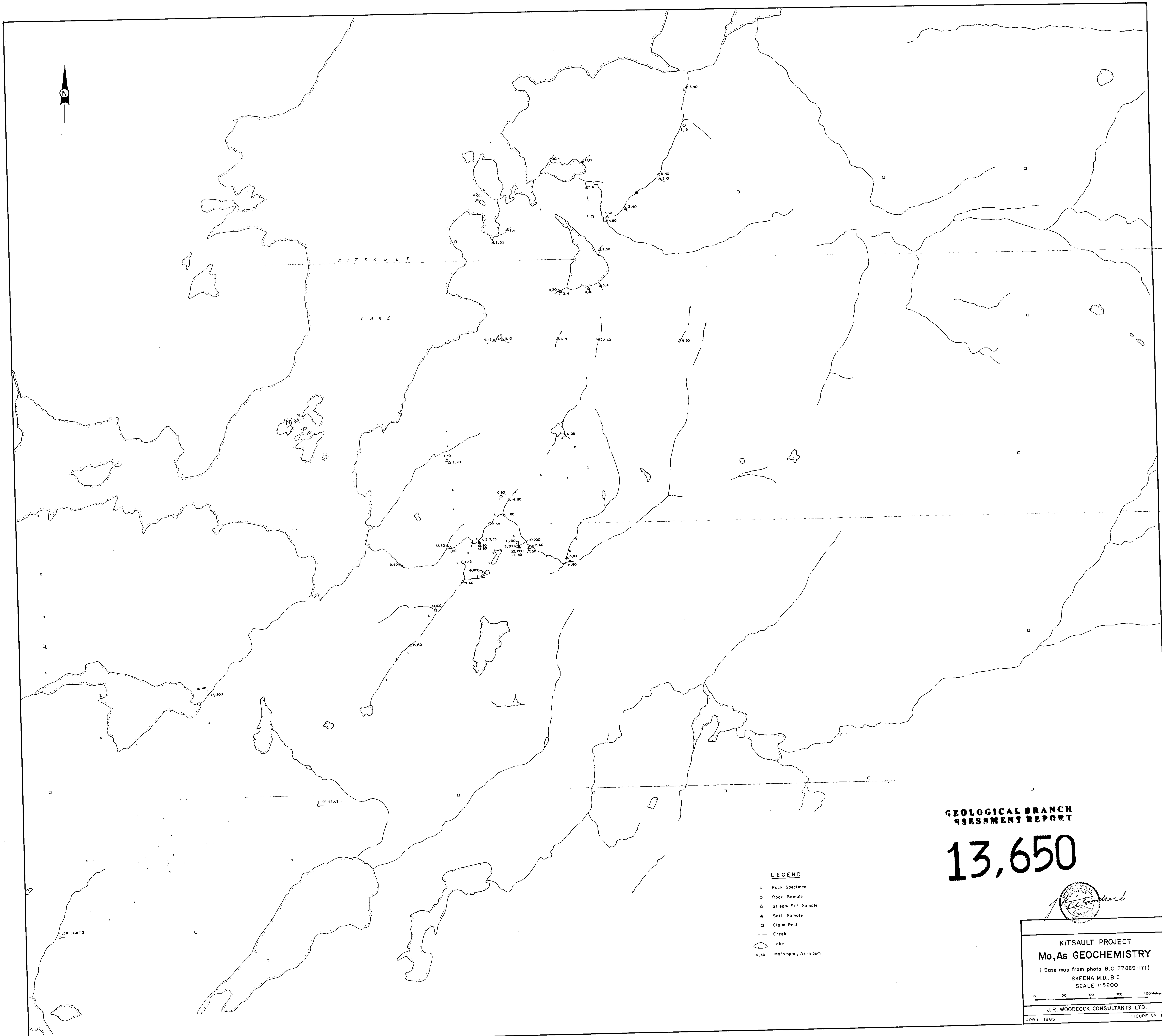
SCALE 1:5200

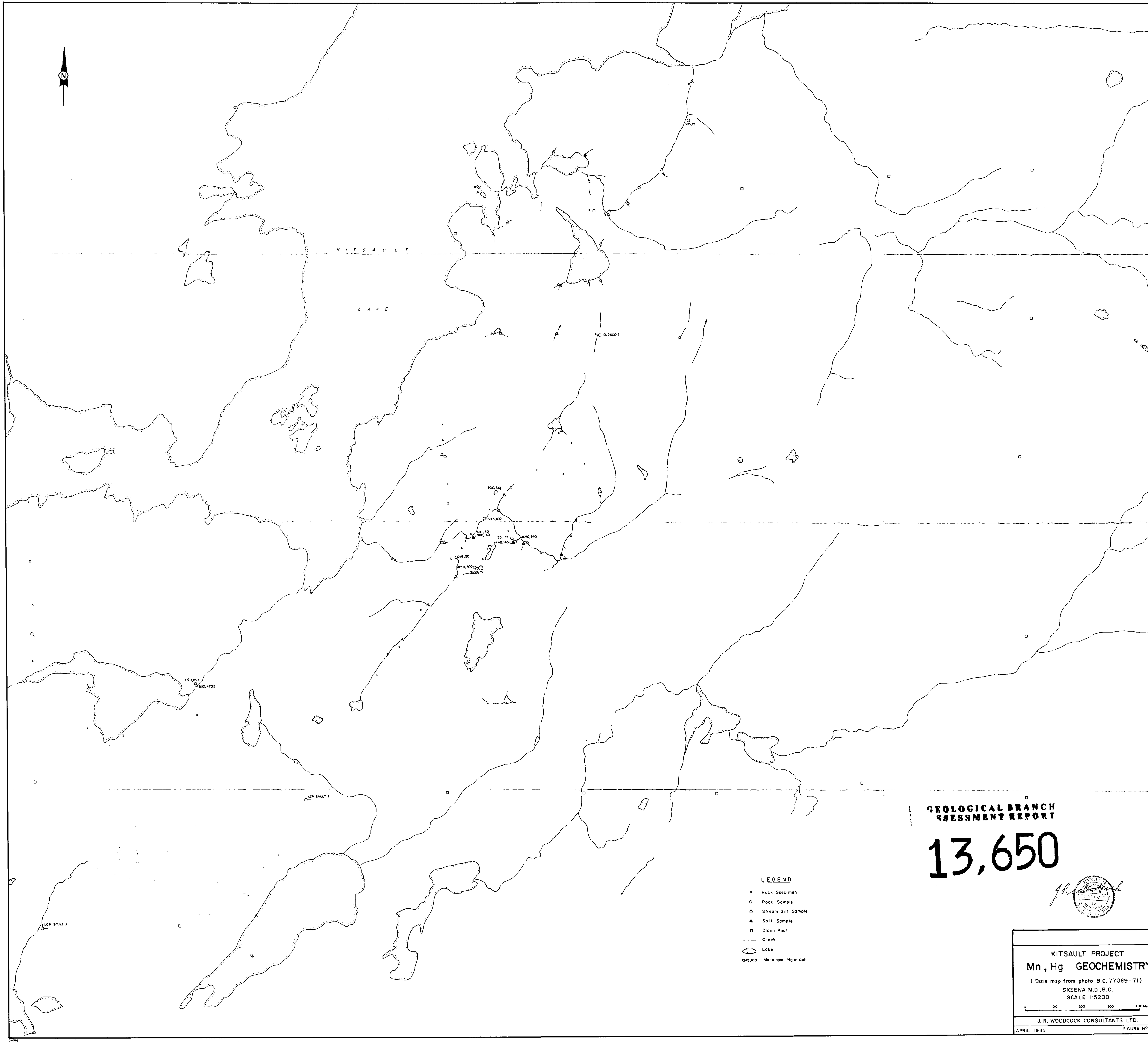
J. R. WOODCOCK CONSULTANTS LTD.

APRIL 1985

FIGURE Nº 4


N
KITSAULT
LAKE
LCP SAULT 1
LCP SAULT 3
GEOLOGICAL BRANCH
ASSESSMENT REPORT
13,650
LEGEND
x Rock Specimen
○ Rock Sample
△ Stream Silt Sample
▲ Soil Sample
□ Claim Post
Creek
Lake
20,250 Pb in ppm , Zn in ppm
KITSAULT PROJECT
Pb , Zn GEOCHEMISTRY
(Base map from photo B.C. 77069-171)
SKEENA M.D., B.C.
SCALE 1:5200
0 100 200 300 400 Metres
J. R. WOODCOCK CONSULTANTS LTD.
APRIL 1985
FIGURE Nº. 5


K I T S A U L T
L A K E
LCP SAULT 1
LCP SAULT 3
GEOLOGICAL BRANCH
SSESSMENT REPORT
13,650
LEGEND
Rock Specimen
Rock Sample
Stream Silt Sample
Soil Sample
Claim Post
Creek
Lake
14,40 Mo in ppm , As in ppm
KITSAULT PROJECT
Mo, As GEOCHEMISTRY
(Base map from photo B.C. 77069-171)
SKEENA M.D., B.C.
SCALE 1:5200
0 100 200 300 400 Metres
J. R. WOODCOCK CONSULTANTS LTD.
APRIL 1985
FIGURE Nº. 6


N
KITSAULT LAKE
385,15
10,2600 ?
900,310
1345,100
610,30
960,140
135,35
1440,145
4050,240
215,50
5850,300
3100,75
1070,150
890,4700
LCP SAULT 1
LCP SAULT 3
GEOLOGICAL BRANCH
ASSESSMENT REPORT
13,650
LEGEND
x Rock Specimen
Rock Sample
Stream Silt Sample
Soil Sample
Claim Post
Creek
Lake
1345,100 Mn in ppm, Hg in ppb
KITSAULT PROJECT
Mn, Hg GEOCHEMISTRY
(Base map from photo B.C. 77069-171)
SKEENA M.D., B.C.
SCALE 1:5200
0 100 200 300 400 Metres
J. R. WOODCOCK CONSULTANTS LTD.
APRIL 1985
FIGURE Nº 7