THE THORN PROPERTY

(Trapper Lake, B. C.)

(10K-10W)

Atlin Mining Division

by

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TABLE OF CONTENTS

	Page No.
INTRODUCTION	1
LOCATION AND ACCESS	1
CLAIMS AND OWNERSHIP	2
HISTORY OF EXPLORATION	2
REGIONAL GEOLOGY	3
LOCAL GEOLOGY	
Petrography	4
Mineralization	7
GEOCHEMISTRY	8
CONCLUSIONS	9
RECOMMENDATIONS	10

APPENDIXES

Appendix I -- Geochemical Techniques

Appendix II -- Costs

FIGURES

1.	Location Map	1a
2.	Claim Map	1b
3.	Sample Numbers	11a
4.	Rocks and Alteration	11b
5.	Cu Geochemistry	11c
6.	Pb Geochemistry	11d
7.	Zn Geochemistry	11e
8.	Ag, Au Geochemistry	11f
9.	Mn Geochemistry	11g
10.	Mo Geochemistry	11h
11.	F Geochemistry	11i
12.	As, Sb Geochemistry	11j

THE THORN PROPERTY (Trapper Lake, B. C.)

INTRODUCTION

The Thorn Property, a large jarositic alteration zone on a branch of the Sùtlakine River, has been the object of intermittent exploration work since 1959. The most significant work was done by Julian Mining Company Ltd. between 1963 and 1965. This included considerable prospecting and some diamond drilling, resulting in the discovery of silver-gold prospects on the Thorn property and copper mineralization on the Kay claims (Cirque Zone), a few miles further north. Most of the exploration drilling was done on the Cirque Zone.

J. R. Woodcock became intrigued with the property in 1959 and, in 1982, had the opportunity to acquire the property. Perusal of the data filed for assessment work and of other reports and a quick trip to the property in 1974 led to the conclusion that some of the rock mapped as a porphyry stock might be rhyolitic or acidic volcanics. Moreover, the source of some of the reported mineralized float is still unknown and some of the copper anoamlies noted in the assessment work files are not explained.

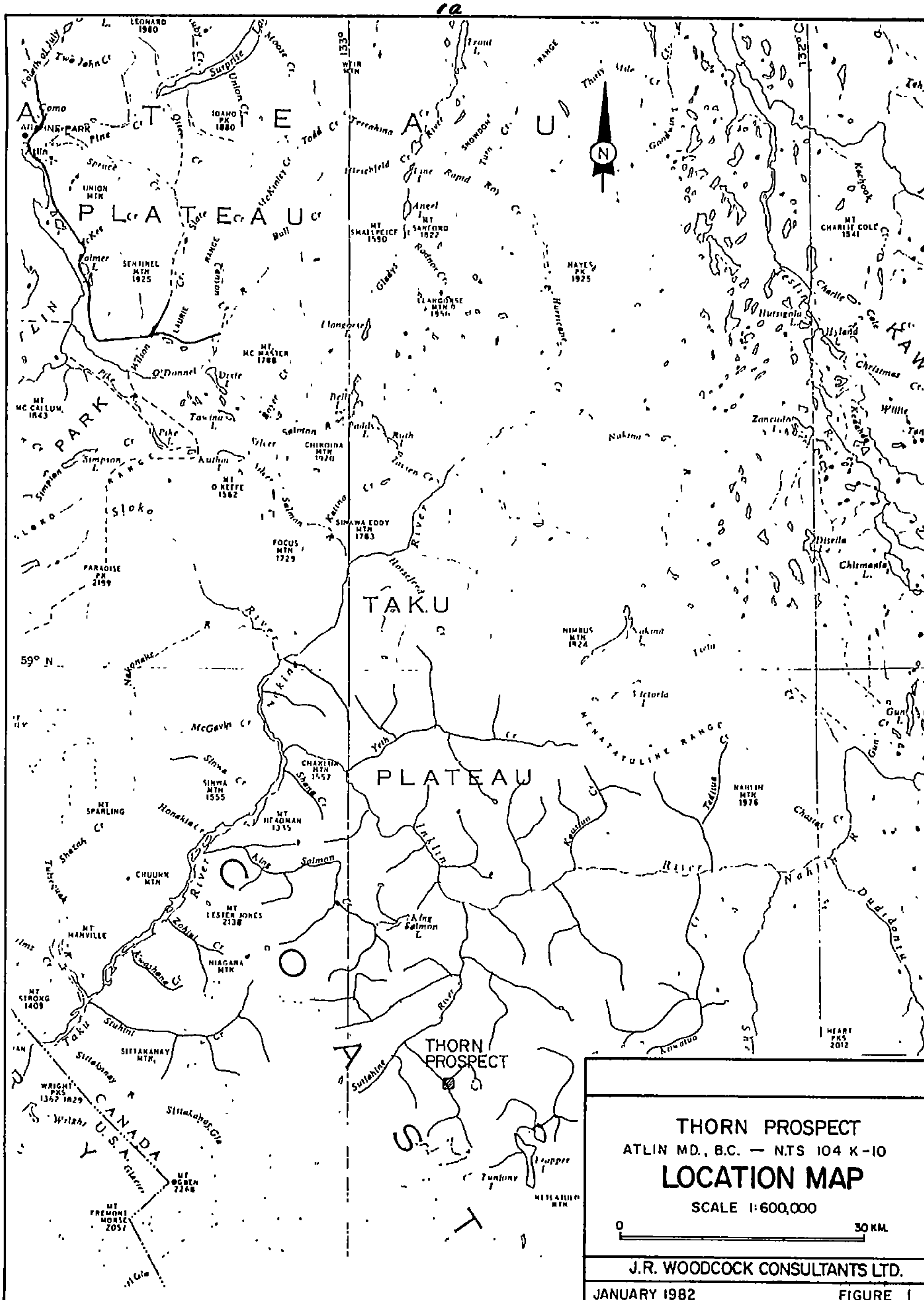
In 1981, Woodcock and two geologists spent one day collecting specimens and rock chip samples. The specimens have been examined with a petrographic microscope for alteration and rock types. Thirty-one rock samples were analyzed by Vangeochem Laboratories Ltd. for Cu, Pb, Zn, Ag, Mo, F, As. In addition, 11 silt samples from side streams were also analyzed.

Unfortunately, the nearest helicopter was in Atlin and the pilot could not stay around to move the mapping crews along the canyon. Therefore, the number of samples and specimens collected was somewhat limited; however, it did give enough information to show that additional mapping is warranted.

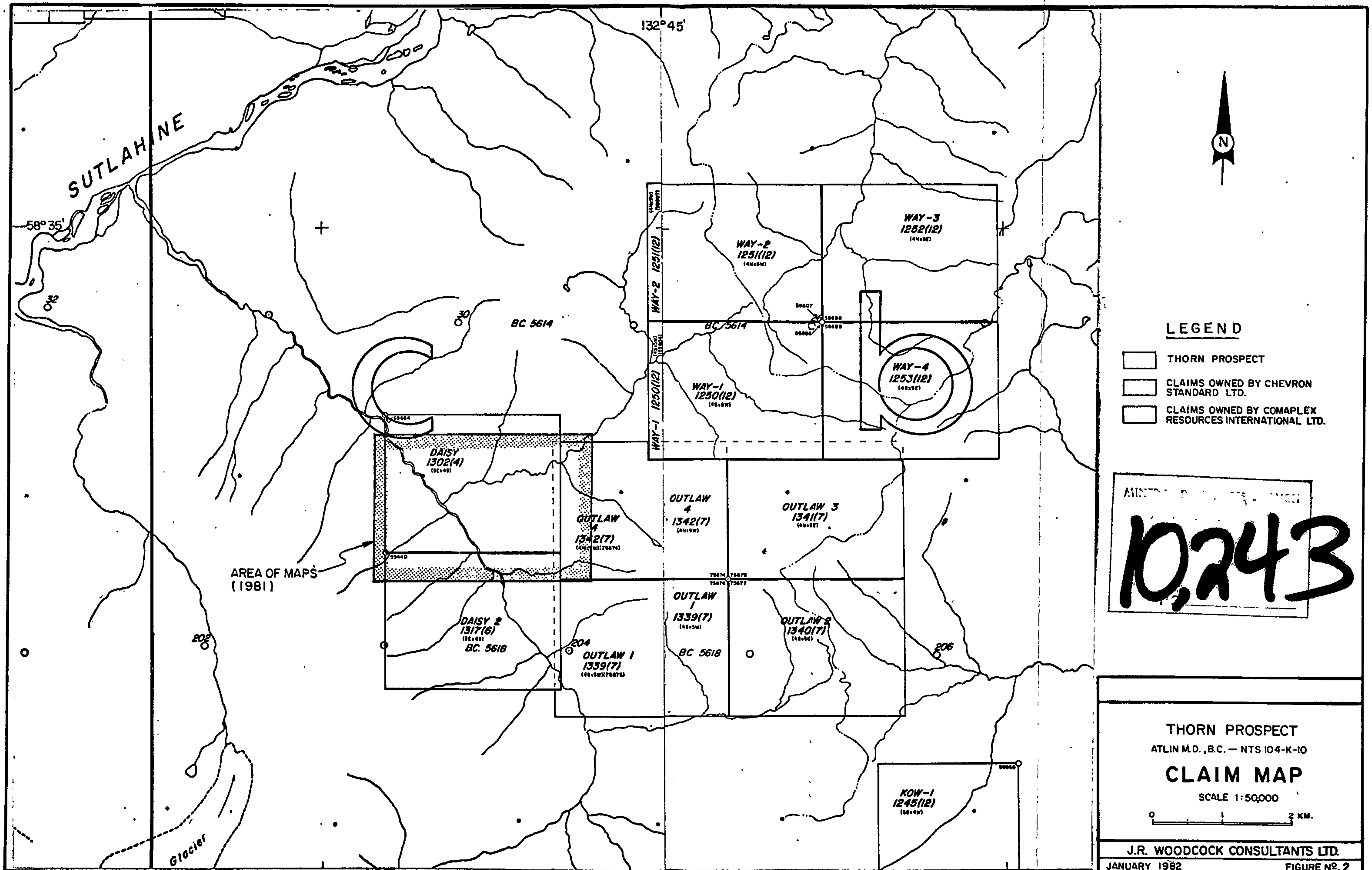
LOCATION AND ACCESS

The Thorn property lies on Lajaune Creek which flows northwest into the Sutlahine River. The Sutlahine River is a large tributary of the Taku River which drains into the Pacific Ocean through the Alaska Panhandle. An area of acidic igneous rocks, mapped as a porphyry stock, is the locus of the numerous showings of precious metal mineralization. The center of this acid igneous area is at the junction of a northerly branch and a southeasterly branch of Lajaune Creek at latitude 58° 11.1' N, longitude 132° 48.3' W on map sheet 104K-10 W.

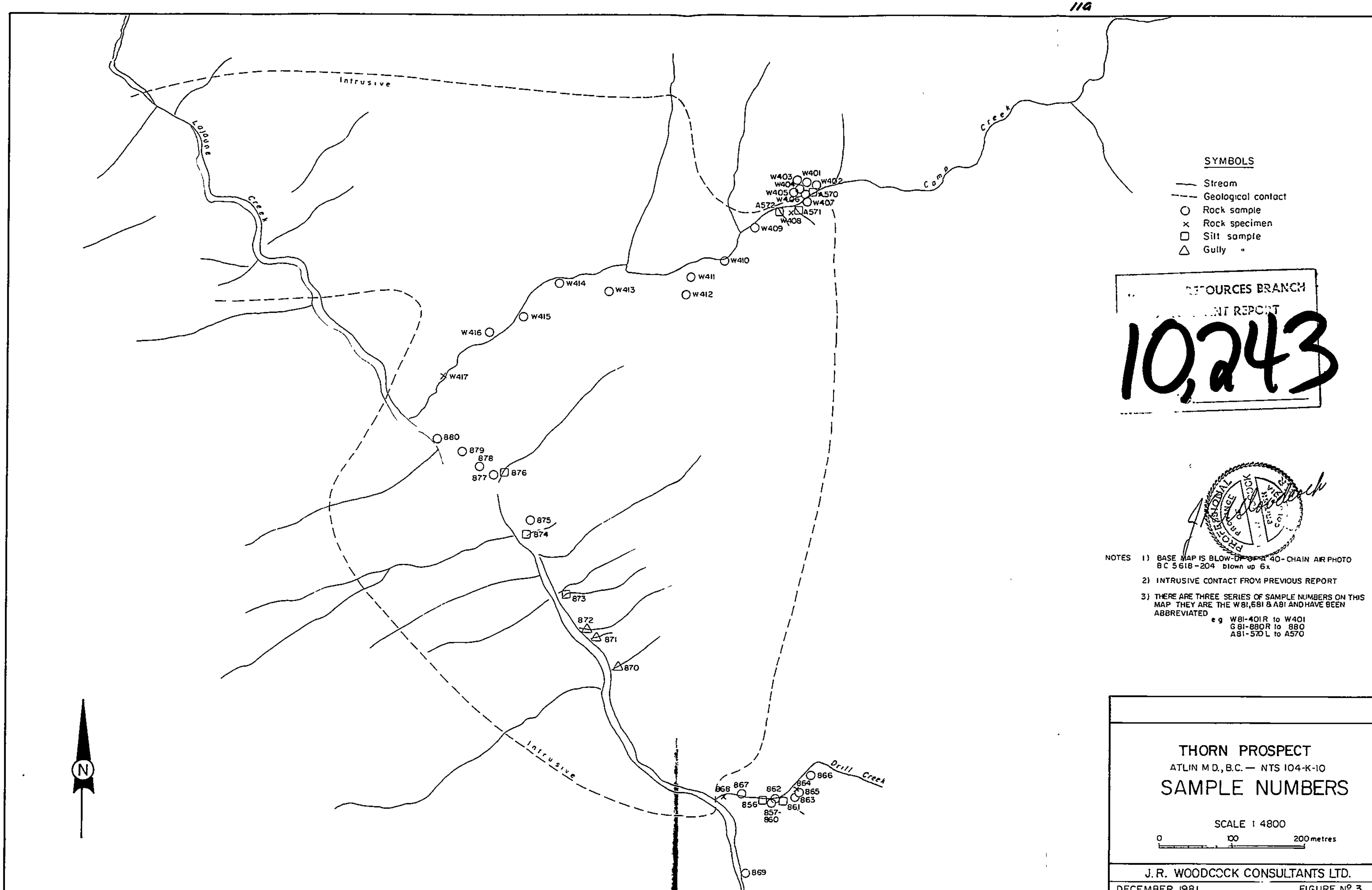
.../2

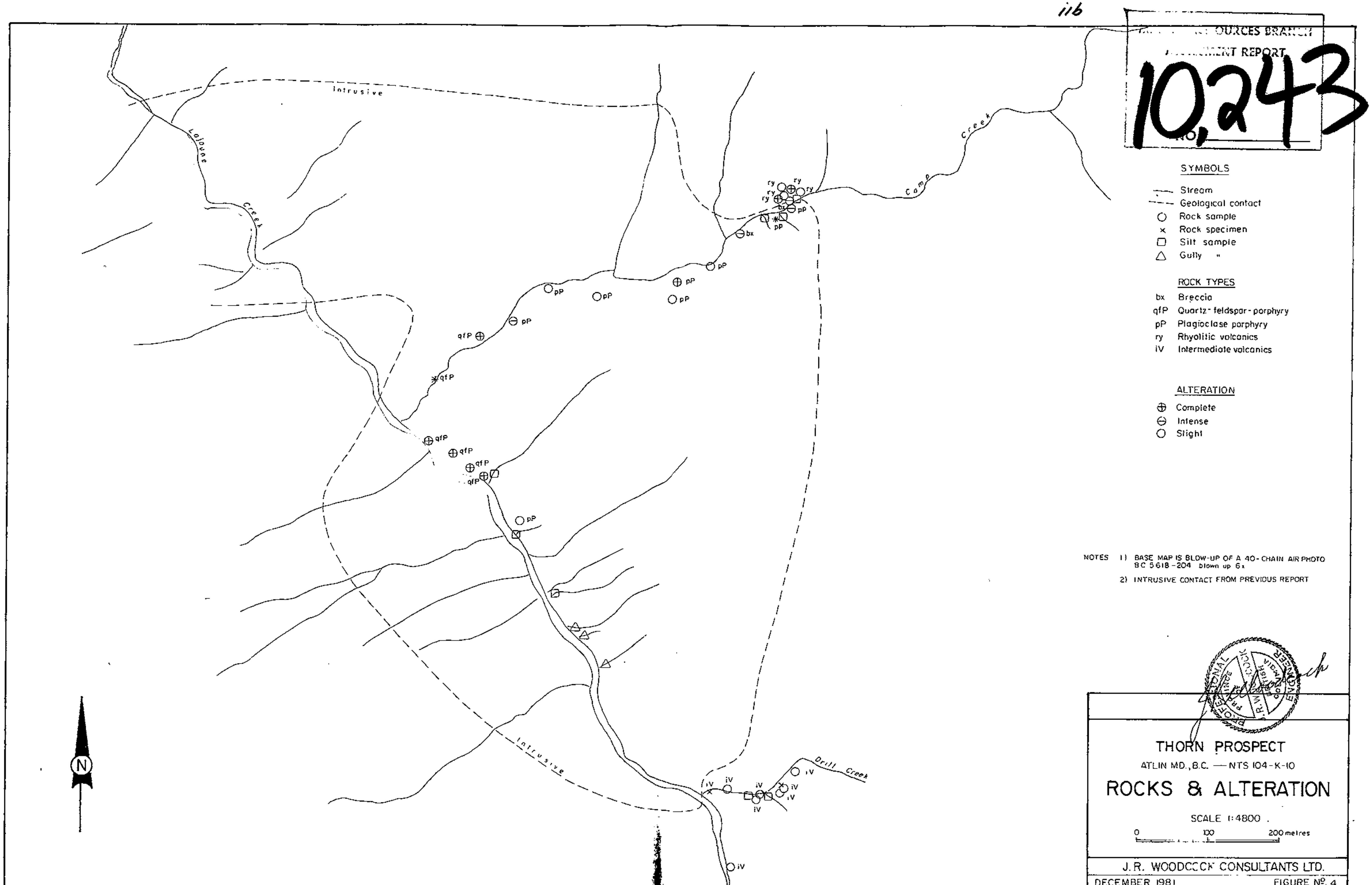

THORN PROSPECT
ATLIN M.D., B.C. — N.T.S 104 K-10
LOCATION MAP
SCALE 1:600,000
0
30 KM.
J.R. WOODCOCK CONSULTANTS LTD.
JANUARY 1982
FIGURE 1
THORN PROSPECT
N
133°
132°
59° N
TAKU
PLATEAU
P L A T E A U
CANADA
U.S.A.
LEONARD 1980
IDAHO PK 1880
UNION MTN
SENTINEL MTN 1925
MT MC MASTER 1788
MT MC CALLUM 1843
MT O'KEEFE 1562
PARADISE PK 2199
CHIKOIDA MTN 1920
SINWA EDDY MTN 1763
FOCUS MTN 1729
MT SMALLPEICE 1490
MT SANFORD 1822
LLANGORSE MTN 1956
HAYES PK 1925
MT CHARLIE COLE 1541
NIMBUS MTN 1924
NAHLIN MTN 1976
CHAKLUK MTN 1557
SINWA MTN 1555
MT HEADMAN 1315
MT SPARLING
CHUUNK MTN
MT LESTER JONES 2138
MT MANVILLE
NIAGARA MTN
MT STRONG 1409
SITTAKANAY MTN
WRIGHT PKS 1362 1829
MT OGDEN 2266
MT FREMONT MORSE 2051
HEART PKS 2012
Taku R.
Inklin R.
Nakina R.
Sloko
Teslin
Atlin
Como
Surprise L.
Pike R.
Simpson L.
Kuthai L.
Trapper L.
Tunjony L.
King Salmon L.
Nahlin R.
Dudidontu R.
Sittakanay R.
Wright Glacier
Stuhini Cr.
Sutlahine R.
Tedideh Cr.
Kowatua Cr.
Victoria L.
Dixie L.
Tatsamenie L.

1b

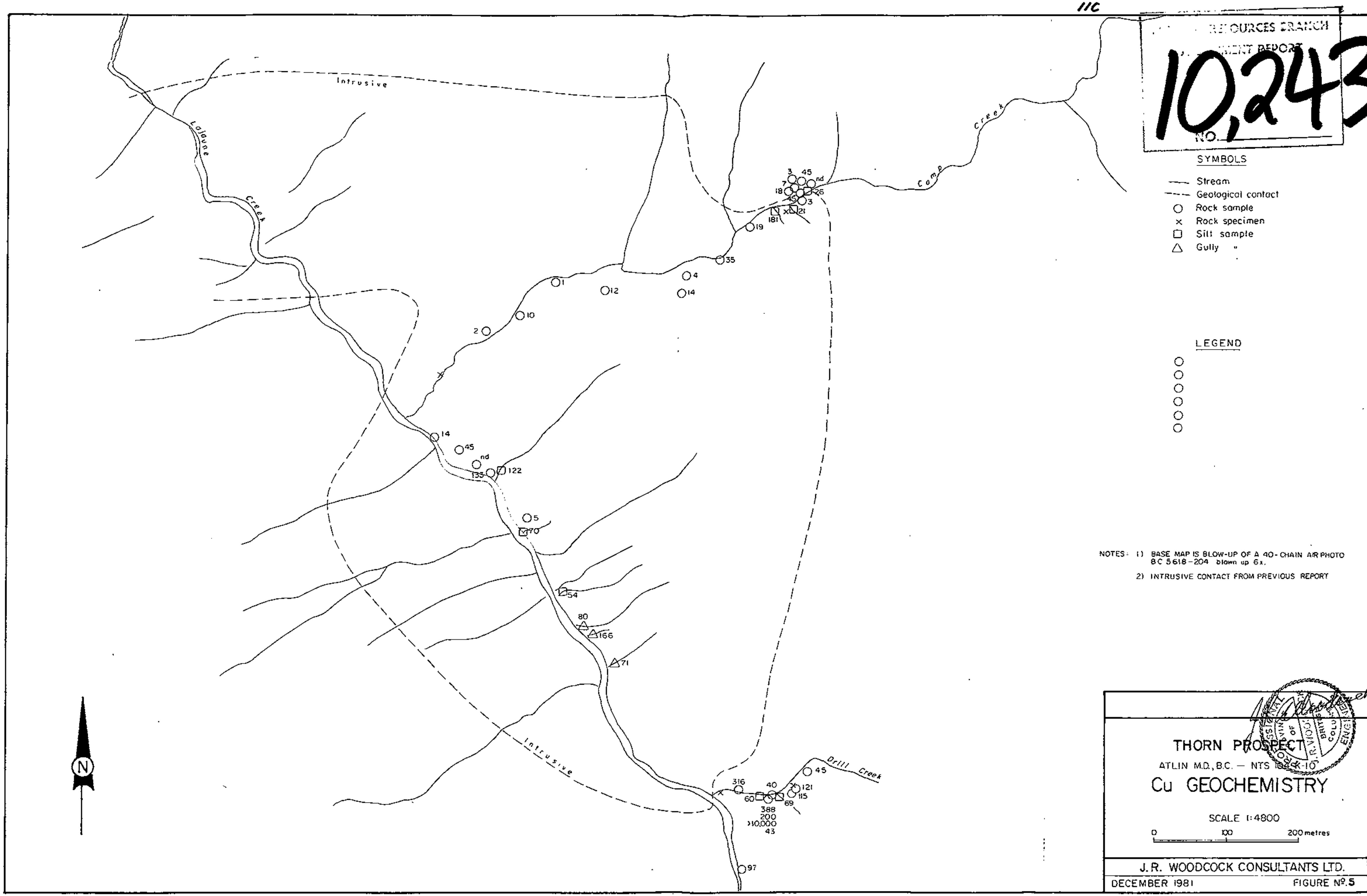


SUTLAHINE
132°45'
58°35'
BC 5614
AREA OF MAPS (1981)
DAISY 1302(4)
DAISY 2 1317(6)
BC 5618
OUTLAW 4 1342(7)
OUTLAW 3 1341(7)
OUTLAW 1 1339(7)
OUTLAW 2 1340(7)
WAY-1 1250(12)
WAY-2 1251(12)
WAY-3 1252(12)
WAY-4 1253(12)
KOW-1 1245(12)
Glacier
LEGEND
THORN PROSPECT
CLAIMS OWNED BY CHEVRON STANDARD LTD.
CLAIMS OWNED BY COMAPLEX RESOURCES INTERNATIONAL LTD.
10,243
THORN PROSPECT
ATLIN M.D., B.C. — NTS 104-K-10
CLAIM MAP
SCALE 1:50,000
0 1 2 KM.
J.R. WOODCOCK CONSULTANTS LTD.
JANUARY 1982
FIGURE Nº. 2


Intrusive
Lojoune Creek
Camp Creek
Drill Creek
Intrusive
W401
W402
W403
W404
W405
W406
W407
W408
W409
W410
W411
W412
W413
W414
W415
W416
W417
A570
A571
A572
880
879
878
877
876
875
874
873
872
871
870
869
868
867
866
865
864
863
862
861
856
857-860
N
SYMBOLS
Stream
Geological contact
Rock sample
Rock specimen
Silt sample
Gully "
RESOURCES BRANCH
ASSESSMENT REPORT
10,243
NOTES 1) BASE MAP IS BLOW-UP OF A 40-CHAIN AIR PHOTO BC 5618-204 blown up 6x
2) INTRUSIVE CONTACT FROM PREVIOUS REPORT
3) THERE ARE THREE SERIES OF SAMPLE NUMBERS ON THIS MAP THEY ARE THE W81, G81 & A81 AND HAVE BEEN ABBREVIATED
e.g. W81-401R to W401
G81-880R to 880
A81-570L to A570
THORN PROSPECT
ATLIN M.D., B.C. — NTS 104-K-10
SAMPLE NUMBERS
SCALE 1:4800
0
100
200 metres
J.R. WOODCOCK CONSULTANTS LTD.
DECEMBER 1981
FIGURE Nº 3

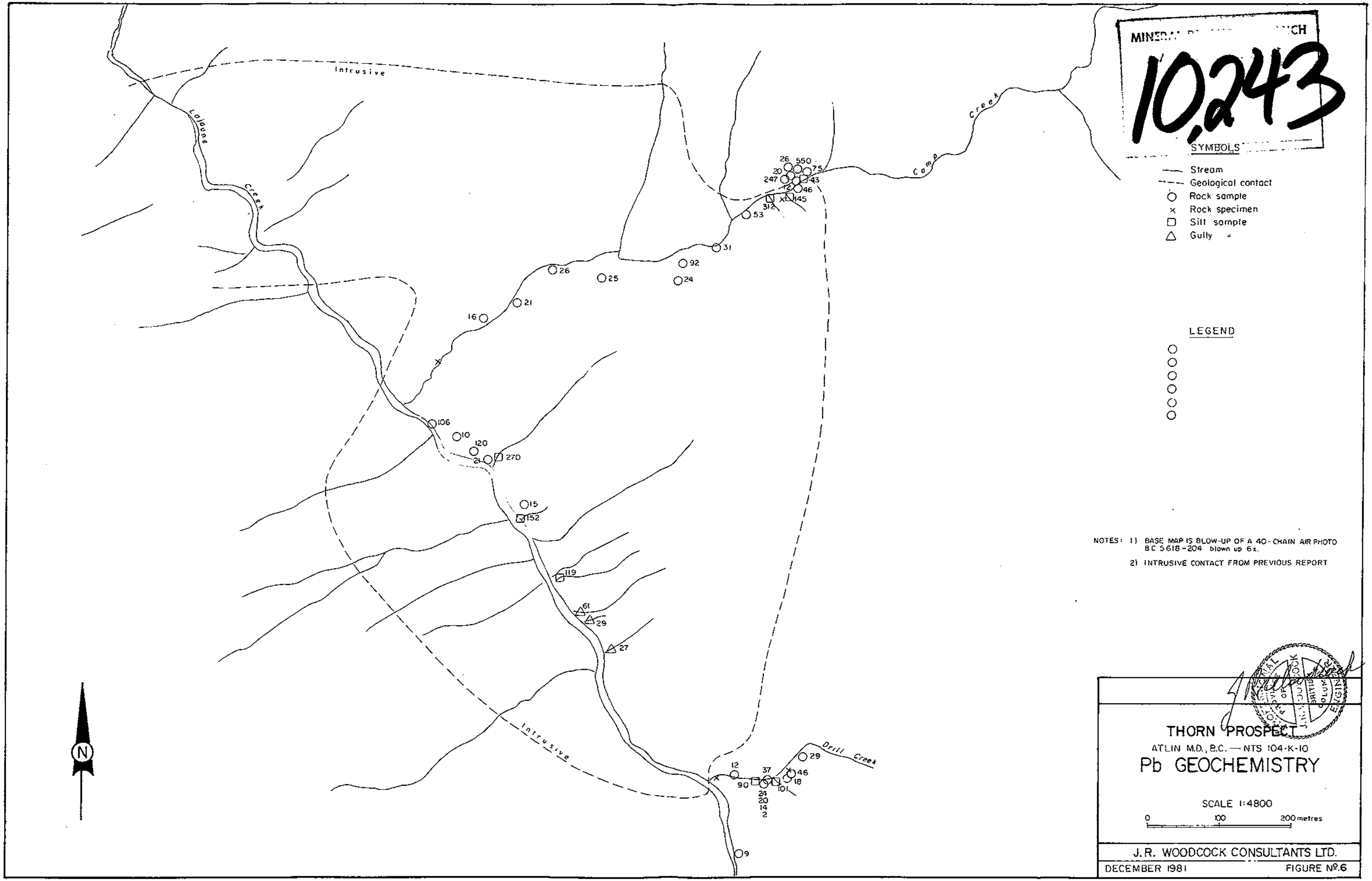


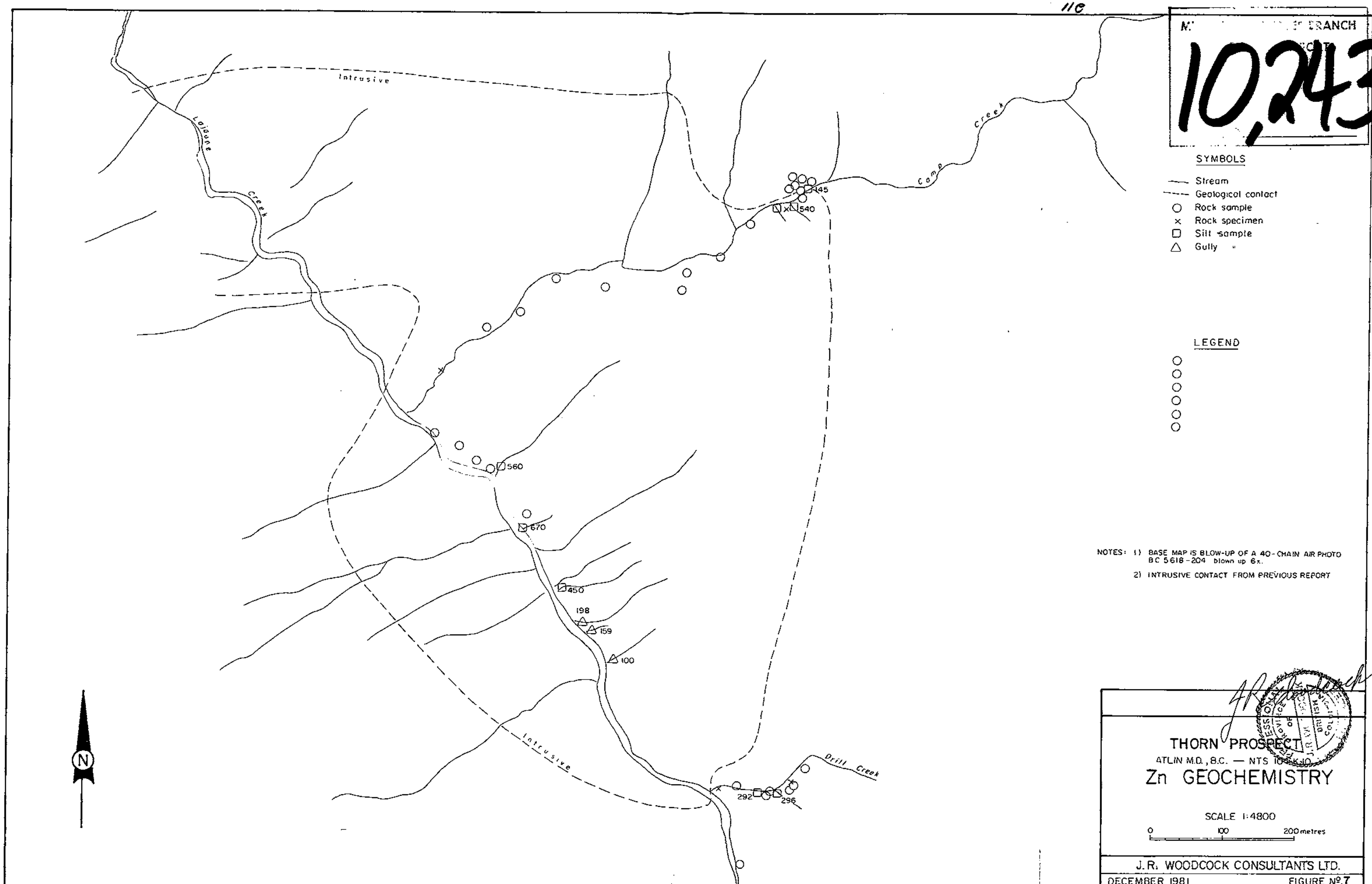
116
OURCES BRANCH
REPORT
10,243
NO.
Intrusive
Lajoune Creek
Camp Creek
Drill Creek
SYMBOLS
Stream
Geological contact
Rock sample
Rock specimen
Silt sample
Gully "
ROCK TYPES
bx Breccia
qfP Quartz-feldspar-porphyry
pP Plagioclase porphyry
ry Rhyolitic volcanics
iV Intermediate volcanics
ALTERATION
Complete
Intense
Slight
NOTES 1) BASE MAP IS BLOW-UP OF A 40-CHAIN AIR PHOTO BC 5618-204 blown up 6x
2) INTRUSIVE CONTACT FROM PREVIOUS REPORT
THORN PROSPECT
ATLIN MD., B.C. — NTS 104-K-10
ROCKS & ALTERATION
SCALE 1:4800
0 100 200 metres
J.R. WOODCOCK CONSULTANTS LTD.
DECEMBER 1981
FIGURE Nº 4



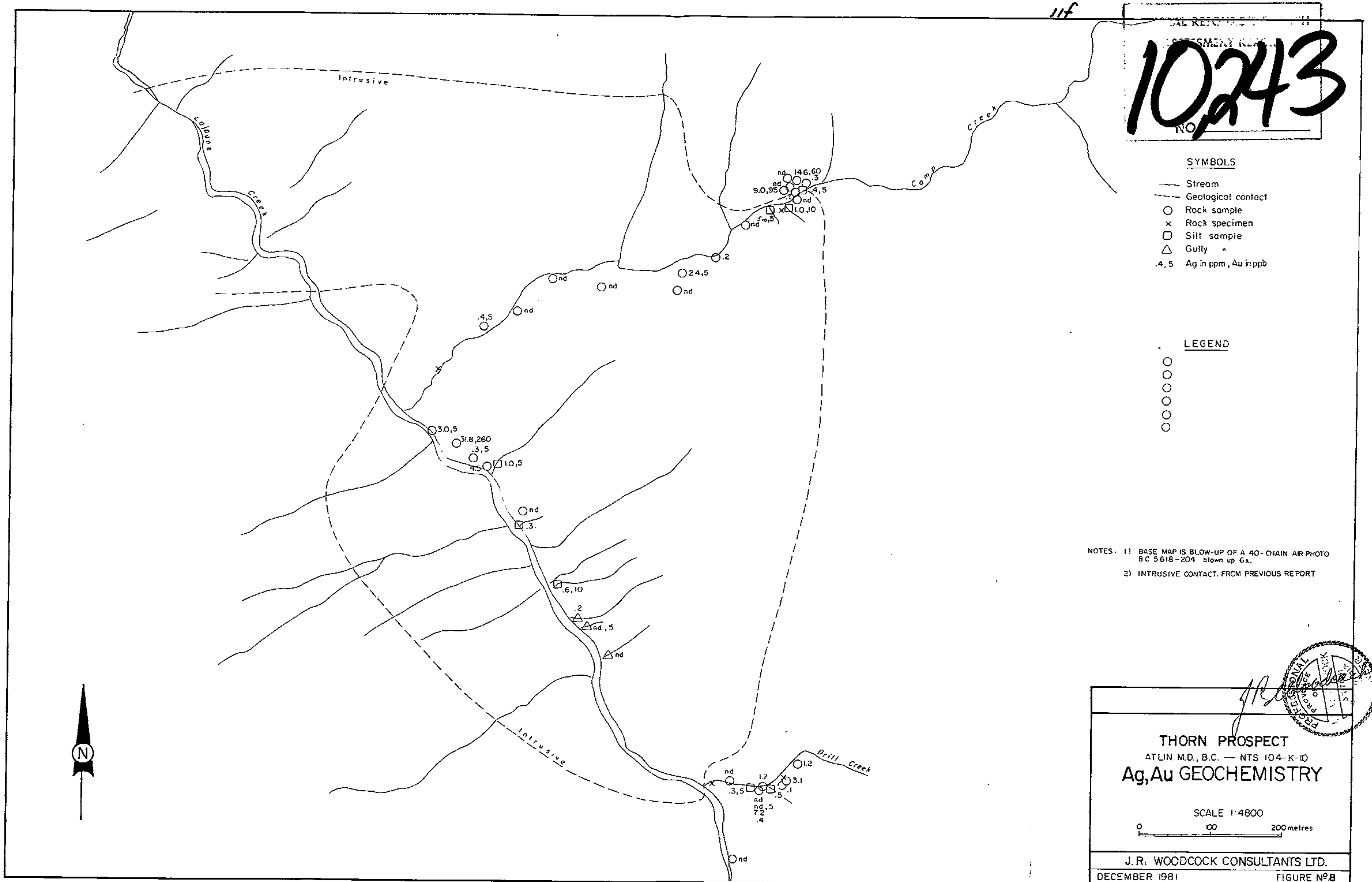
11C
RESOURCES BRANCH
REPORT
10,243
NO.
SYMBOLS
Stream
Geological contact
Rock sample
Rock specimen
Silt sample
Gully "
LEGEND
NOTES: 1) BASE MAP IS BLOW-UP OF A 40-CHAIN AIR PHOTO BC 5618-204 blown up 6x.
2) INTRUSIVE CONTACT FROM PREVIOUS REPORT
Intrusive
Lajaune Creek
Camp Creek
Drill Creek
Intrusive
THORN PROSPECT
ATLIN M.D., B.C. — NTS 104K-10
Cu GEOCHEMISTRY
SCALE 1:4800
0 100 200 metres
J.R. WOODCOCK CONSULTANTS LTD.
DECEMBER 1981
FIGURE Nº 5

11d


MINERAL ... BRANCH
10,243
Intrusive
Lajaune Creek
Camp Creek
Drill Creek
SYMBOLS
Stream
Geological contact
Rock sample
Rock specimen
Silt sample
Gully "
LEGEND
NOTES: 1) BASE MAP IS BLOW-UP OF A 40-CHAIN AIR PHOTO BC 5618-204 blown up 6x.
2) INTRUSIVE CONTACT FROM PREVIOUS REPORT
N
THORN PROSPECT
ATLIN M.D., B.C. — NTS 104-K-10
Pb GEOCHEMISTRY
SCALE 1:4800
0 100 200 metres
J.R. WOODCOCK CONSULTANTS LTD.
DECEMBER 1981
FIGURE Nº 6



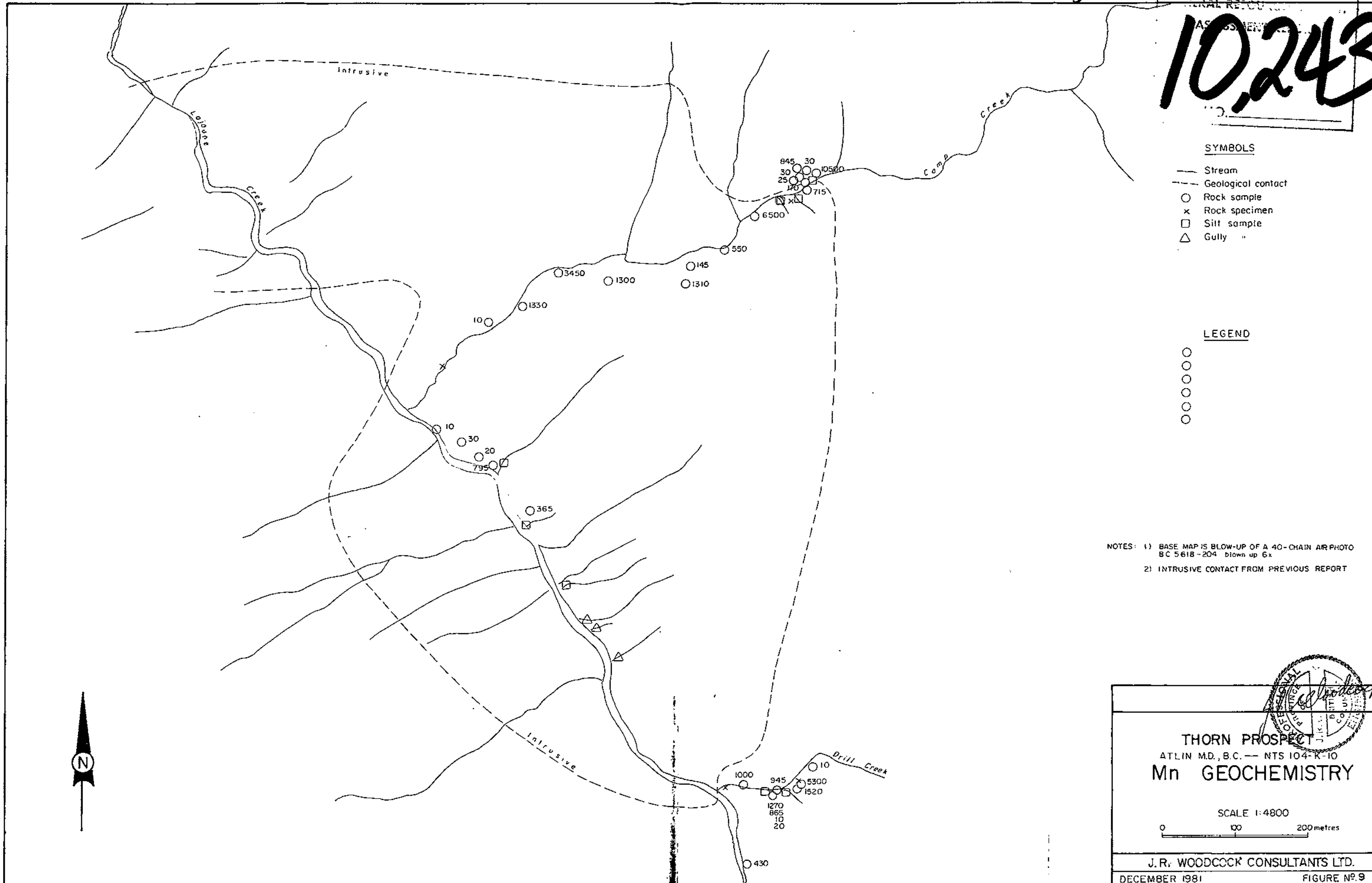
10,243
BRANCH
SYMBOLS
Stream
Geological contact
Rock sample
Rock specimen
Silt sample
Gully "
LEGEND
Intrusive
Lajoue Creek
Camp Creek
Drill Creek
145
540
560
670
450
198
159
100
292
296
NOTES: 1) BASE MAP IS BLOW-UP OF A 40-CHAIN AIR PHOTO BC 5618-204 blown up 6x.
2) INTRUSIVE CONTACT FROM PREVIOUS REPORT
THORN PROSPECT
ATLIN M.D., B.C. — NTS 104-K-10
Zn GEOCHEMISTRY
SCALE 1:4800
0 100 200 metres
J.R. WOODCOCK CONSULTANTS LTD.
DECEMBER 1981
FIGURE Nº.7



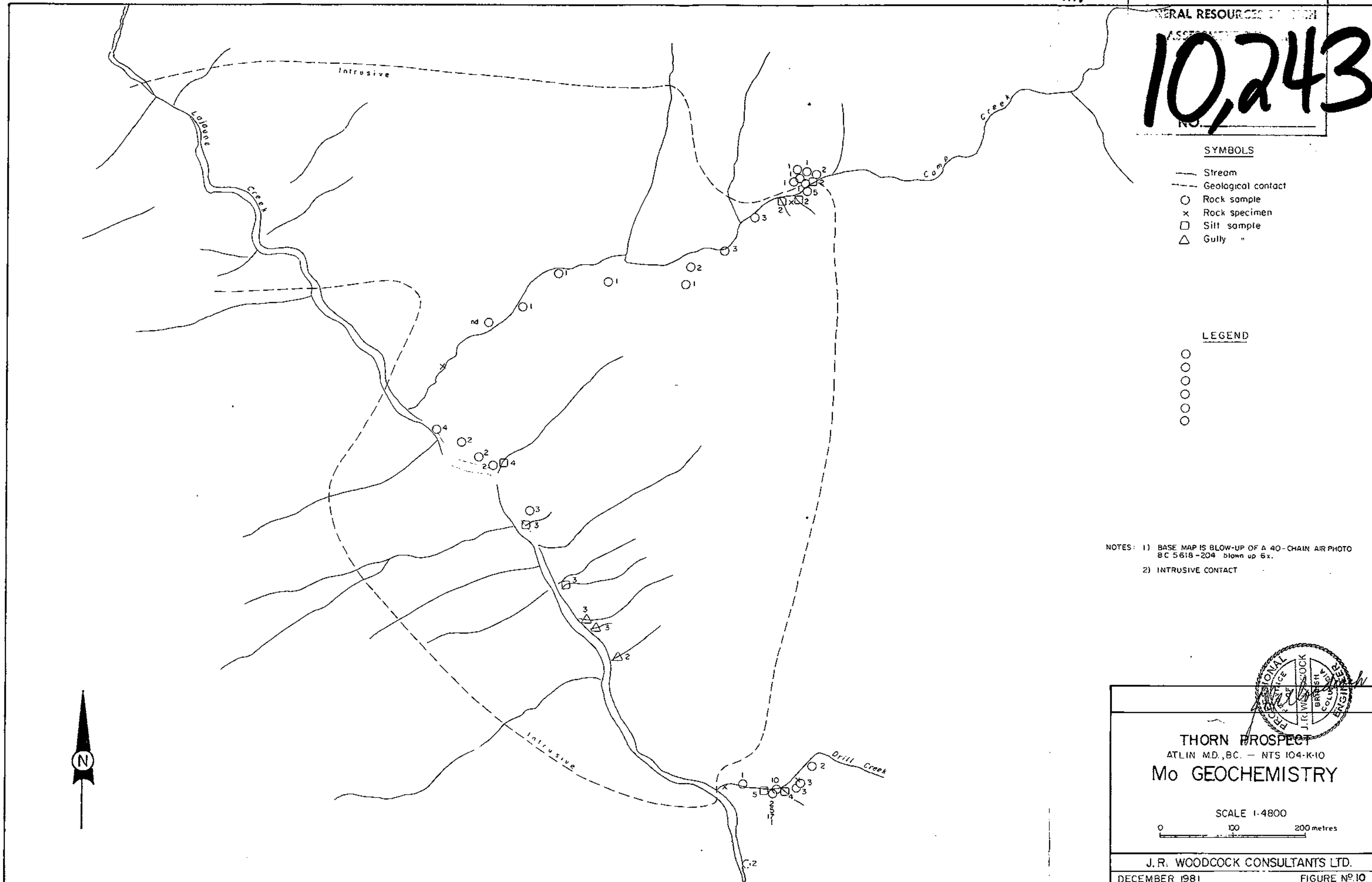
11f
10,243
SYMBOLS
Stream
Geological contact
Rock sample
Rock specimen
Silt sample
Gully "
.4, 5 Ag in ppm, Au in ppb
LEGEND
NOTES. 1) BASE MAP IS BLOW-UP OF A 40-CHAIN AIR PHOTO BC 5618-204 blown up 6x.
2) INTRUSIVE CONTACT FROM PREVIOUS REPORT
Intrusive
Lajune Creek
Camp Creek
Drill Creek
N
THORN PROSPECT
ATLIN M.D., B.C. — NTS 104-K-10
Ag, Au GEOCHEMISTRY
SCALE 1:4800
0 100 200 metres
J.R. WOODCOCK CONSULTANTS LTD.
DECEMBER 1981
FIGURE Nº 8

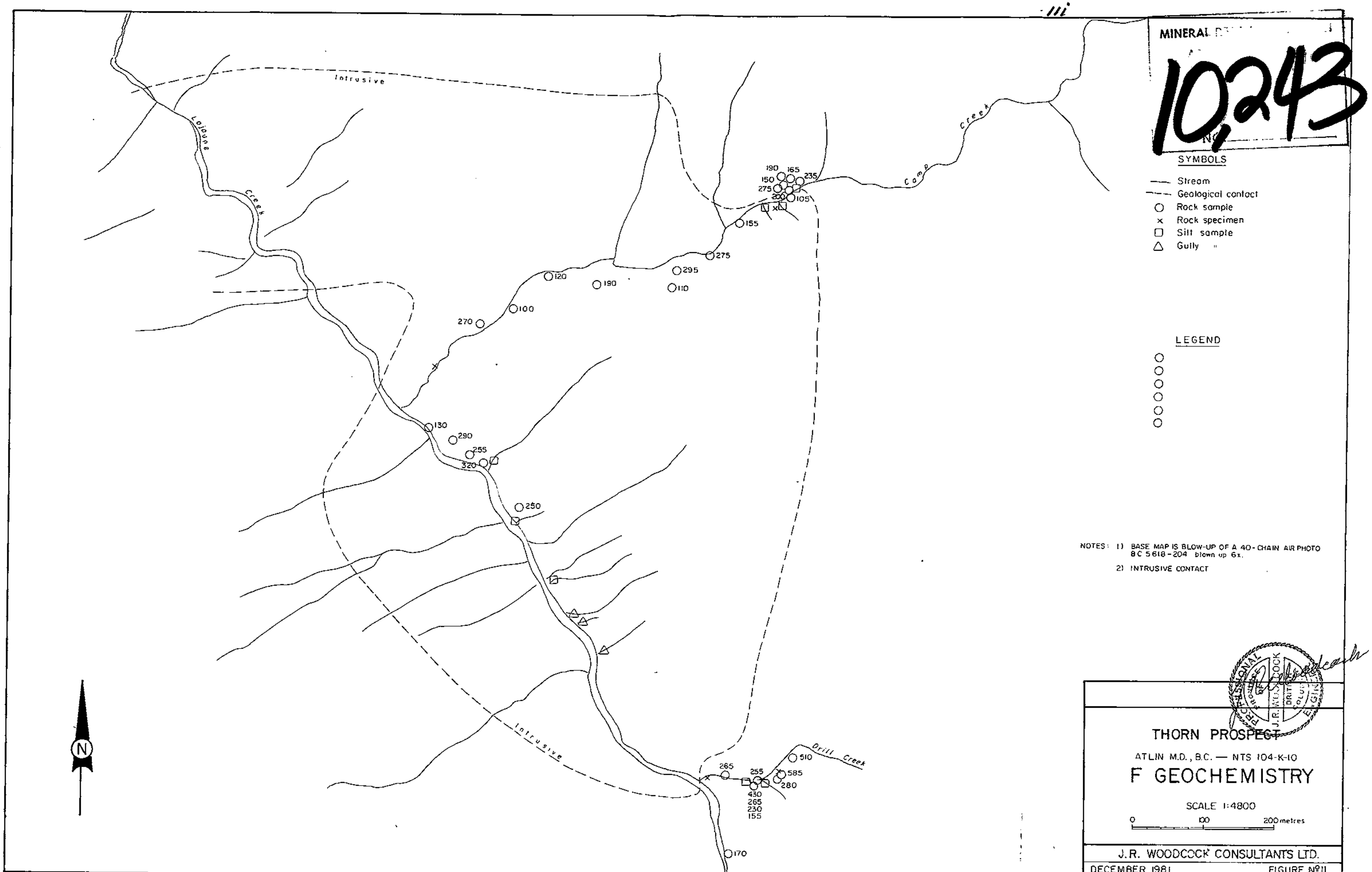
119

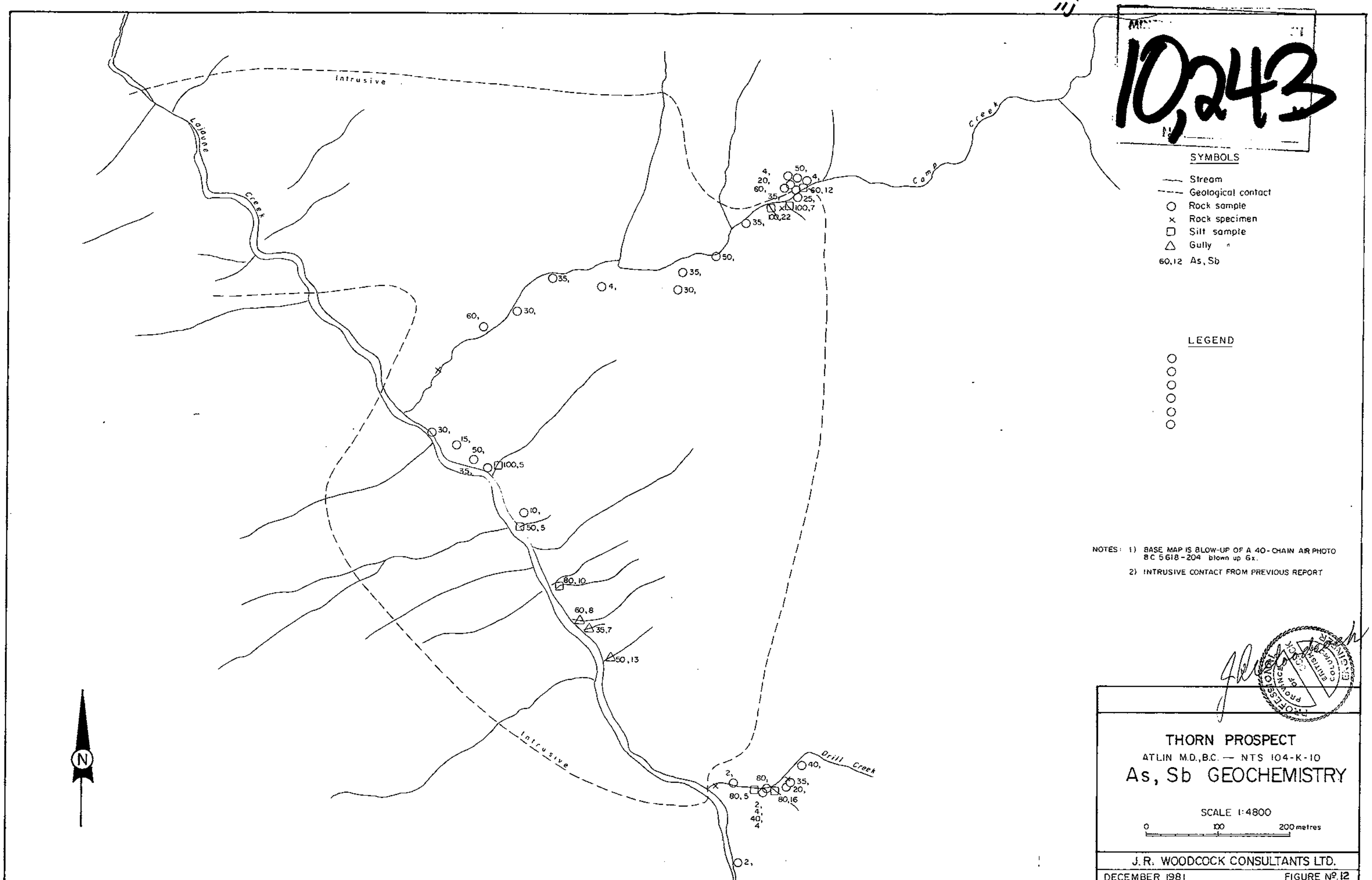
10,243



Intrusive
Lojoune Creek
Camp Creek
Drill Creek
845 30 30 25 10500 170 715 6500 550 145 1310 1300 3450 1330 10 10 30 20 795 365 1000 945 5300 1520 10 1270 865 10 20 430
SYMBOLS
Stream
Geological contact
Rock sample
Rock specimen
Silt sample
Gully "
LEGEND
NOTES: 1) BASE MAP IS BLOW-UP OF A 40-CHAIN AIR PHOTO BC 5618-204 blown up 6x
2) INTRUSIVE CONTACT FROM PREVIOUS REPORT
N
THORN PROSPECT
ATLIN M.D., B.C. — NTS 104-K-10
Mn GEOCHEMISTRY
SCALE 1:4800
0 100 200 metres
J.R. WOODCOCK CONSULTANTS LTD.
DECEMBER 1981
FIGURE Nº 9


10,243
Intrusive
Lajeune Creek
Camp Creek
Drill Creek
SYMBOLS
Stream
Geological contact
Rock sample
Rock specimen
Silt sample
Gully "
LEGEND
NOTES: 1) BASE MAP IS BLOW-UP OF A 40-CHAIN AIR PHOTO BC 5618-204 blown up 6x.
2) INTRUSIVE CONTACT
THORN PROSPECT
ATLIN M.D., B.C. — NTS 104-K-10
Mo GEOCHEMISTRY
SCALE 1:4800
0 100 200 metres
J.R. WOODCOCK CONSULTANTS LTD.
DECEMBER 1981
FIGURE No. 10


MINERAL
10,243
SYMBOLS
Stream
Geological contact
Rock sample
Rock specimen
Silt sample
Gully "
LEGEND
Intrusive
Lojoune Creek
Camp Creek
Drill Creek
Intrusive
190
165
150
235
275
200
105
155
275
295
120
190
110
100
270
130
290
255
320
250
265
255
510
585
280
430
265
230
155
170
N
NOTES: 1) BASE MAP IS BLOW-UP OF A 40-CHAIN AIR PHOTO BC 5618-204 blown up 6x.
2) INTRUSIVE CONTACT
THORN PROSPECT
ATLIN M.D., B.C. — NTS 104-K-10
F GEOCHEMISTRY
SCALE 1:4800
0
100
200 metres
J.R. WOODCOCK CONSULTANTS LTD.
DECEMBER 1981
FIGURE Nº 11


10,243
Intrusive
Lajoune Creek
Camp Creek
Drill Creek
SYMBOLS
Stream
Geological contact
Rock sample
Rock specimen
Silt sample
Gully "
60,12 As, Sb
LEGEND
NOTES: 1) BASE MAP IS BLOW-UP OF A 40-CHAIN AIR PHOTO BC 5618-204 blown up 6x.
2) INTRUSIVE CONTACT FROM PREVIOUS REPORT
N
THORN PROSPECT
ATLIN M.D., B.C. — NTS 104-K-10
As, Sb GEOCHEMISTRY
SCALE 1:4800
0 100 200 metres
J.R. WOODCOCK CONSULTANTS LTD.
DECEMBER 1981
FIGURE Nº 12

Elevation at the junction is approximately 2350 feet and the creeks have cut deeply into the highly pyritized and altered rock, forming a very rugged canyon. The steep slopes above the canyon and parts of the bed of Lajaune Creek are covered with large trees and considerable underbrush including Devils Club.

Trapper Lake lies about 3 kilometers to the southwest and this lake is large enough for float planes. However, transportation to the property must be by helicopter. The nearest settlements are Telegraph Creek, 115 kilometers to the southeast, and Atlin, 130 kilometers to the northwest. Juneau, Alaska is 95 kilometers to the west.

CLAIMS AND OWNERSHIP

The Daisy 1 and Daisy 2 mineral claims were staked by Phil Timpany as agent for John Richard Woodcock. The data on the claims is as follows:

Claim Name	Record No.	Record Date
Daisy 1	1302	April 24, 1981
Daisy 2	1317	June 15, 1981

The relative position of these claims with respect to Lajaune Creek are shown on Figure 2.

HISTORY OF EXPLORATION

1. In 1959, D. Barr and J. R. Woodcock, working for Kennco Exploration Western Ltd., discovered a large, highly anomalous, and highly jarositic alteration zone along a branch of the Sutlakine River. Follow-up work of the geochemistry in 1959 and possibly in the subsequent seasons disclosed some tetrahedrite and other types of mineralization. Whether or not Kennco staked the property in the early 1960's, is not known; however, if so, the claims were allowed to lapse soon thereafter.

2. In 1963, prospectors working for Julian Mining Company Ltd. (subsidiary of Anaconda) discovered a number of mineralized zones in the drainage basin of Lajaune Creek and staked a block of claims called the Thorn group.

.../3

In 1964, additional prospecting was done on these claim groups, additional mineralization was found and the group was expanded to 132 claims. This 1964 work, in addition to the prospecting, was supplemented by soil sampling, some hand trenching and limited I.P. geophysical work. In addition to the precious metal mineralization found along Lajaune Creek, some chalcopyrite mineralization was found in volcanic rocks in the Cirque Zone further to the north. This zone was covered by the Kay claim group.

In 1965, additional work was done on these properties, largely on the Cirque Zone. This work included a detailed geological map, an I.P. survey and a magnetic survey. In August and September, 2760 feet of B X wire line drilling in six holes was completed. In addition to the drilling and mapping done on the Cirque Zone, some more work was done on the Thorn copper-gold-silver prospects. This included geological mapping, geochemical surveys, and 1003 feet of light diamond drilling on the various mineralized zones.

3. In 1968, 10 claims (INK 1 to 10) were staked to cover the Thorn showing and 8 claims (LIN 1 to 8) were staked to cover the Cirque copper prospect or old Kay claim group. These claims were staked by Barry Watson, who had originally done some of the prospecting for Julian. The claims were sold to Montana Mines Ltd. of Whitehorse and this company in turn optioned the claims to American Uranium Ltd.

   In June to August, 1969, crews of Cordilleran Engineering Ltd., under the direction of Mike Sanguinetti, did addtional prospecting, sampling, geochemistry and geophysics to determine if further work were warranted. The data is summarized in assessment work report 2512 for American Uranium Ltd.

4. In 1974, Barry Watson again staked the showings on Lajaune Creek, but the claims subsequently lapsed.

5. In more recent years Rose 1 and Rose 2 claims were staked (April, 1979) for Noranda. These claims lapsed in 1980 and 1981.

6. In 1982, Phil Timpany of Atlin staked the Daisy claims for John Richard Woodcock.

REGIONAL GEOLOGY

The Tulsequah area has been mapped by Dr. J. G. Souther (1971 G.S.C. Memoir 362). The eastern contact of the Coast Plutonic Complex

.../4

trends northwesterly diagionally across the central part of the map area. Within parts of this Coast Plutonic Complex and the adjacent Mesozoic strata immediately to the northeast of the Complex are a number of exposures of the Sloko volcanics - a group of acid to intermediate volcanic flows and pyroclastics of early Tertiary age. The band of Mesozoic volcanics, about 15 kilometers wide, lying adjacent to the batholith is also characterized by a number of stocks, sills and dykes of felsite, quartz-feldspar porphyry, and quartz monzonite, also of early Tertiary age.

Such a center occurs at Lajaune Creek and northeast of this drainage basin. The intrusive porphyries occur along the south and the southeast and east sides of an area of Sloko volcanics.

Many of these centers of porphyries and adjacent volcanics have pyrite mineralization. Such centers of mineralization have been the object of exploration of a number of small companies in 1980 and 1981 for precious metals.

LOCAL GEOLOGY

Petrography

The hand specimens collected with each rock chip sample have been examined and classified into four rock types including intermediate volcanics, rhyolite, plagioclase porphyry, quartz-feldspar porphyry and breccia. Many of the rocks in the vicinity of Camp Creek have been so highly bleached by hydrothermal alteration and subsequent supergene leaching that it is difficult to assign these rocks to an accurate category; however, some criteria have been found on the basis of thin section work to help in the classification.

Intermediate Volcanics

These volcanics are mainly tuffs with some porphyritic andesitic lavas. They occur in the area west of the porphyry. They have great variations in texture, colour and in shearing. No thin section examinations have been made to further classify these rocks.

Quartz Feldspar Porphyry

Although most of the porphyries collected have only sparse quartz phenocrysts, the quartz feldspar porphyry differs in that it has fairly abundant phenocrysts and can be distinguished in hand specimen by this single feature. Only highly altered and highly leached rocks have been found and so the unaltered appearance is not known. Samples that have been assigned to this class are all from near the junction of Camp and Lajaune Creeks.

.../5

Examination of the thin section for W416 shows that the rock is about 60% matrix and about 40% phenocrysts. Feldspar phenocrysts now completely altered to sericite, were probably largely plagioclase; however, this is not certain. These pseudomorphs of sericite form about 28% of the section. Rounded to quartz phenocrysts form 7% of the section and disseminated pyrite forms about 5% of the section. A large patch of epidote is probably alteration of previous phenocrysts. Whether these were plagioclase or mafic mineral is not known.

The matrix which forms 60% of the section consists of about 50-55% quartz, 40-45% sericite, and 2-3% pyrite, along with minor Ti-oxide.

Plagioclase Porphyry

This rock in its freshest form has a dark grey matrix and abundant phenocrysts. It also contains a few scattered round quartz phenocrysts.

Thin section studies of section G875 show that the rock has about 45% phenocrysts and the phenocrysts content of the rock is about 30% altered plagioclase, 8% quartz, and about 2% biotite replaced by muscovite. In addition there are calcite patches forming about 6% of the rock, these may be replaced mafic minerals or replaced plagioclase.

The matrix of the rock is composed of plagioclase (85 to 95%) with interstitial sericite (7 to 10%) and with scattered patches of accessory and mafic minerals (opaques, apatite, biotite, Ti-oxide, and calcite). The matrix has no quartz and no K-feldspar.

Rhyolites

A number of specimens collected on the northeast edge of the porphyry are rhyolites, probably flow rocks. In addition, a rhyolite specimen was collected about 300 meters down Lajaune Creek from the junction at Camp Creek and another similar specimen was collected more than a kilometer downstream.

In hand specimen these are dense white to slightly cream coloured rocks. The abundance of jarosite indicates that considerable pyrite has been present.

Thin section examination by John Payne has shown that this rock consists of plagioclase (60-65%), sericite (17-20%), quartz (15-17%) and minor limonite. The plagioclase has dusty alteration and commonly prismatic habit. The quartz is free of inclusions and is generally in sub-rounded to interstitial grains. Other similar specimens (W402) are similar rock but have scattered small quartz and plagioclase phenocrysts.

Other rhyolitic-looking rocks may actually be silicified acid

.../6

volcanics, possibly tuffs. Specimen 401 appears to be a highly altered rock in which most of the matrix and plagioclase phenocrysts have been altered to a mosaic of quartz crystals. The rock is silicified and the grain size in the quartz mosaics is highly variable with pockets and zones where the grain size is much coarser than the general size of the matrix. The quartz phenocrysts have also been partially resorbed and in places merge with the silicified matrix. Remnant plagioclase or other feldspar is completely altered to sericite. Pyrite crystals are scattered throughout with clusters in concentrations forming up to 30% of the rock in places.

Breccia

Two places with outcrops of breccia of unknown origin have been noted and these include specimens W406 and W409. At site W406, the breccia is in sharp contact with overlying, moderately dipping, pyritized rhyolites. One could interpret this as a fault contact underlain by a fault breccia. However, the highly altered fragments and matrix of this breccia appear to be somewhat variable in lithology. The alteration includes pyritization and hypogene sericitization plus subsequent supergene leaching and its attendant alteration.

On the east side of Camp Creek, there is another more extensive exposure of a breccia (W409) which contains sub-angular and rounded cobbles cemented by finer debris. This breccia lacks limonite and therefore was originally a low pyrite rock. Furthermore it does not have limonite cement in the breccia and therefore it is not merely debris cemented by recent limonite. It does, however, have considerable manganese stain.

Thin sections were made of one of the cobbles and the matrix. The matrix contains numerous angular crystal fragments, especially of quartz and it contains numerous angular lithic fragments, some of which are porphyritic lavas. Sericite and carbonate alteration are abundant throughout this material.

Thin section examination of one of the cobbles shows that it is a porphyry containing about 50% phenocrysts. The phenocrysts content of the rock is 34% plagioclase, 6% quartz, and 10% biotite. The biotite is almost completely altered to muscovite plus some opaques and some calcite. The plagioclase is highly altered to carbonate plus sericite and the quartz phenocrysts are partially resorbed.

The matrix consists of plagioclase (90-93%) with extremely fine-grained sericite (5%) which is partly an alteration of the plagioclase, scattered patches of accessory minerals (mainly apatite, some opaques, Ti-oxide, zircon) and a few patches of quartz-sericite (0.5%). The section contains no K-feldspar.

One can, from this description, conclude that this is an

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altered plagioclase porphyry and that this breccia, whether it be a slide breccia on the surface related to a volcanic pile or whether it be an intrusive breccia, is probably younger than the porphyries in the area.

Results of Petrographic Work

The thin section work and the hand specimen identification have divided the rock types into four major categories. When plotted, the specimens so identified occur in clusters or zones, thus confirming the hand specimen identification of even the altered rocks. These clusters include the indermediate volcanics to the south of the porphyry complex; the rhyolitic volcanics adjacent to the porphyries to the northeast along Camp Creek and probably continuing westward to the rhyolitic outcrops which occur in Lajaune Creek downstream from Camp Creek; the quartz feldspar porphyry which occurs at the junction of Camp Creek and Lejaune Creeks; and the plagioclase porphyry which seems to surround this smaller area of quartz feldspar porphyry.

The intensity of alteration is also shown on the map; it is divided into intensely altered and bleached, less altered but intensely sericitized, and relatively fresh (still altered in thin section examination). The results show that the quartz feldspar porphyry is also reflected by an area of complete alteration and that the other rocks along Camp Creek have variable alteration. Field observations indicate fault or structural control to the alteration in the plagioclase porphyry along Camp Creek.

Mineralization

Pyrite is widespread in the acidic Thorn Igneous Complex and also highly concentrated in shear zones. In addition to this widespread pyrite mineralization, about 15 occurrences of mineralized outcrop or mineralized float have been reported. In most cases this mineralization occurs with quartz; however, some float was reported as massive pyrite. Mineralization with these siliceous veins can include pyrite, tetrahedrite, galena, sphalerite, enargite, stibnite, and occasionally minor amounts of arsenopyrite. In some of these zones good values in gold and silver have been obtained and this seems to be coincident with the tetrahedrite.

In addition to the mineralized zones within the acid Thorn Complex, there are some zones in the adjacent volcanics. One zone to the southwest of the Complex occurs within brecciated rhyolites in a sequence of interbedded rhyolites and andesites. Mineralization in this area includes chalcopyrite, pyrite and quartz, with minor amounts of galena, barite, calcite and siderite. Three x-ray diamond drill holes were placed in this showing.

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GEOCHEMISTRY

At most of the sites where specimens were collected for the petrographic work, rock chip samples were taken to be analyzed for a number of elements including Pb, Zn, Cu, Ag, Mn, F, As and Sb. This included 27 rock samples. Small streams encountered during these traverses were also sampled and 11 gully and stream silts were collected.

The widespread precious metal veins or mineralized shear zones found within this porphyry area could be attributed to some sort of sub-volcanic mineralization of a precious metal type; however, one must also be aware of the abundant antimony-bearing veins that occur over some of the major porphyry copper deposits including the Berkley deposit in Montana and El Salvador in Chile. Generally with such porphyry-copper or molybdenite mineralization, a number of the elements will show good zoning. The molybdenum and copper and fluorine geochemical values should show good zoning. The manganese often gives a negative anomaly.

Results of the rock geochemistry shows that the molybdenum is background throughout with no variations or patterns. Fluorine is low and the limited sampling does not indicate any pattern; however, it is much too limited in extent to be certain of this conclusion. Manganese does show low values over the quartz feldspar porphyry and over some of the rhyolitic samples. Copper in rock is somewhat variable; however, most of the samples are low and no trend is established.

Elements which could be associated with volcanogenic or subvolcanic mineralization of precious metals includes Pb, Zn, Ag, and Au. The lead values in the rock are quite variable with only a few values over 100 ppm and with one value at 550 ppm. The silver values in rock do not consistently follow the lead values; however, most of the highest lead values do have corresponding high silver values. The highest silver value obtained (31.8 ppm) is not accompanied by corresponding high lead values. There is some indication that the more bleached rocks contain lower silver value than pyritic rocks from the same general area. However, whether this can be attributed to leaching of values or to differences in hypogene mineralization is not known. Arsenic values in rock are somewhat anomalous (up to 60 ppm); however, there is insufficient work to draw any conclusions.

The silt results are encouraging and values up to 312 ppm Pb, 5.6 ppm Ag, 1760 ppm Zn, and 100 ppm As have been obtained (sample A 572).

Gold analyses for some samples returned values up to 260 ppb. Generally the higher gold values follow the higher silver values.

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Tungsten analyses were obtained for all stream samples and for 12 rock samples. All values are < 2 ppm.

One can conclude from this limited amount of sampling:

a. No trends are apparent in the few results from the rock geochemistry to indicate porphyry, copper or molybdenum.
b. The silt sampling does give anomalies and could be a very useful tool.
c. There is probably considerable leaching of the more soluable metals (Cu, Zn, Ag) from these rocks. In places the abundant pyrite content is completely oxidized leaving jarosite.

CONCLUSIONS

1. The geological map by J.G. Souther, shows a regional zone of Tertiary stocks and sills trending in an northwesterly direction and including the Thorn Complex. In places, the Sloko volcanics are spacially associated with the Tertiary porphyry centers and there could be some genetic relationship. A number of these young intrusive and rhyolitic centers were the object of considerable exploration in 1980 and 1981 for precious metals.

2. The Thorn Complex is one of the more altered and pyritized of these acid Complexes and has a large number of associated precious metal showings. The precious metal values reported for some of the showings are very high. Exploration work on some showings in the past has indicated that they are fault controlled and that the mineralization is quite poddy.

3. Work done by previous geologists has indicated a triangular area of acid "porphyry" stock. The limited work done by J.R. Woodcock indicates that much of this is indeed porphyry. However, there are complications within this Complex. Parts of it appear to be rhyolites, possibly of extrusive origin and parts of it are breccia of unknown origin.

4. Lying to the east of this Complex and presumably overlying it is an area of sedimentary rocks. The implied contact is not exposed so whether it is conformable, unconformable, intrusive or faulted is not known. One does wonder whether this contact could be a control for some mineralization.

5. The geophysical work done by previous operators, included I.P. and magnetometer surveys of limited extent. No Em geophysics is reported.

   The geochemical soil and silt samples taken by previous operators were analyzed for copper only with a few lines of soil samples analyzed for copper, lead and zinc. No samples

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were analyzed for precious metals, arsenic, or antimony.

6. The area is one of very widespread deep overburden and dense vegetation of a coastal nature. In addition, the abundant pyrite in many of the zones has been completely oxidized and bleached and this has removed some of the metal values, including zinc and silver.

RECOMMENDATIONS

1. Additional mapping should be done, supported by petrography, to better define the geology within the porphyry-rhyolite complex. In conjunction with this mapping, the distribution of the pyrite-jarosite areas should be outlined and the shear and mineralized zones plotted. It is imperative that representative hand specimens be collected throughout this mapping and throughout the area for subsequent studies, including thin section work. In addition to the mapping within the complex, some attempt should be made to learn as much as possible about the relationship of the contacts of this complex, especially the contact in the sedimentary rocks to the east.

2. For the geological mapping, a scale of 1:1,000 is recommended. Possibly this could be a topographical map made from an aerial photograph prior to the field work, if a satisfactory aerial photograph exists. Another alternative would be to make a stadia traverse along the bottom of the canyons and creeks to establish control.

3. Silts from all drainages should be collected with samples spacing approximately 100 meters along the larger streams. These should be analyzed for Cu, Pb, Zn, Ag, Au, As, and Sb.

4. In conjunction with this geological mapping and silt sampling, some rock chip sampling might be done along the creek and canyon bottoms. If this is done, good representative hand specimens should be collected for every rock chip sample.

5. Some attempt should be made to get samples which will give information on the amount of supergene leaching of silver and copper.

6. Several areas of mineralized float discovered in the past have not been adequately explained and should be investigated. This could be done by a combination of geophysics (EM 16 or a more sophisticated EM unit) and soil or mull geochemistry. Any suitable targets, such as the eastern contact with the sedimentary strata, might also be investigated by a combination of such methods.

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7. Mull sampling is superior to soil sampling in many regions, especially if suitable climate and vegetation are present. If feasible, some orientation studies should be made to determine the effectiveness of mull prior to any extensive mull sampling programs for precious metals.

8. The topography in this area is steep and covered by thick vegetation in most places. Lajaune Creek itself cannot be crossed at any time of the season on foot and Camp Creek, the branch from the north, can only be crossed in places where logs lie across the creek. Such obstacles serve to dampen exploration enthusiasm and effectively defeat much of the hard work. Therefore, prior to doing any geotechnical work, trails shouls be cut along both sides of Lajaune Creek and some trees fallen across to provide foot bridges. Similar improvements might be made along the Cabin Creek; however, in this case, the rugged nature of the canyon precludes much improvement.

January 29, 1982

J. R. Woodcock

J. R. WOODCOCK

Appendix I

Geochemical Techniques

VGC

986-521

VANGEOCHEM LAB LTD. 1521 PEMBERTON AVE., NORTH VANCOUVER, B.C., CANADA 604-

V7P 2S3

November 20, 1981

TO: J.R. Woodcock Consultants
#806-602 W. Hastings St.
Vancouver, B.C. V6B 1P2

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

SUBJECT: Analytical procedure used to determine fluoride concentration in geochemical soil, silt, lake sediments and rock samples.

1. Sample Prepartion

(a) Geochemical soil, silt, lake sediments or rock samples were received in the laboratory in wet-strength 3½ x 6½ Kraft paper bags and rock samples in 4" x 6" Kraft paper bags.

(b) The wet samples 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 sieves. 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 sampleq were crushed by using a jaw cursher and pulverized to 100-mesh for finer by using a disc mill. The pulverized samples were then put in a new bag for later analysis.

2. Method of Extraction

(a) 0.50 grams of the minus 80-mesh samples were used. The samples were weighted out into nickel crucibles by using a top-loading balance.

(b) 3.00 grams of sokium carbonate were weighed out into the nickel crucibles, using a top-loading balance, and thoroughly mixed with the samples.

(c) The samples were fused in muffle furnace at 900° C so that the sodium carbaonate was in the melted state for at least twenty minutes.

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2. Method of Extraction (continued) :

(d) The samples were cooled and leached overnight with distilled water.

(e) The samples were removed from the crucibles, by dissolving them on the hot plate, and added to 100 ml polyethylene beakers and the volume made up to 60 mls with distilled water.

(f) The samples were titrated using a pH meter with 2N sulphuric acid to a pH of 7.5 and the volume adjusted to 100 mls.

3. Method of Analysis

(a) The pH of the samples was re-adjusted to 7.5, using a pH meter, with 2N H_2SO_4.

(b) The concentration of fluoride in parts per million (ppm) was determined by using an Orion Specific Ion Electrode Meter, Model 407, with a fluoride electrode, which was calibrated with a set of standards prepared in a similar manner as for the samples.

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

Eddie Tang

VANGEOCHEM LAB LTD.

VGC

986-5211
VANGEOCHEM LAB LTD. 1521 PEMBERTON AVE., NORTH VANCOUVER, B.C., CANADA 604-
V7P 2S3

November 20, 1981

TO: J.R. Woodcock Consultants
#806-602 W. Hastings St.
Vancouver, B.C. V6B 1P2

FROM: Vangeochem Lab Limited
1521 Pemberton Avenue
North Vancouver, B.-C. V7P 2S3

SUBJECT: Analytical procedure used to determine tin in geochemical silt, soil and rock samples.

1. Sample Preparation

(a) Geochemical soil, silt or rock samples were received in the laboratory in wet-strength 3½ x 6½ Kraft paper bags and rock samples in 4" x 6" Kraft paper bags.

(b) The wet samples 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 sieves. 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 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 Extraction

(a) 0.25 gram of the minus 80-mesh samples was used. Samples were weighed out by using a top-loading balance.

(b) Samples were heated over a bunsen burner with 1 gram of ammonium iodide with constant cooling by water on the upper 2/3 of the test tube.

(C) 5 ml of 1N HCl were added when cooled.

Continued 2

(d) The solutions were then warmed on a hot water bath to dissolve the sublimate and let settled.

3. Method of Detection

(a) 1.0 ml of aliquots were transferred into other cleaned test tubes and mixed with 4 ml of buffers (NaOH; chloroacetic acid, ascorbic acid, pH 2.4).

(b) 0.1 ml of gallein reagents were added to the mixed solution and shook (gallein in ethyl alcohol).

(c) The concentration of the tin in parts per million were determined colorimetrically by comparing the intensity of the colour of the yellowish layer with a set of known tin standards prepared in a similar method as the samples.

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

Eddie Tang
VANGEOCHEM LAB LIMITED

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VANGEOCHEM LAB LTD. 1521 PEMBERTON AVE., NORTH VANCOUVER, B.C., CANADA 604-986-5211
V7P 2S3

November 20, 1981

TO: J.R. Woodcock Consultants
#806-602 W. Hastings St.
Vancouver, B.C. V6B 1P2

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

SUBJECT: Analytical procedure used to determine hot acid soluble arsenic in geochemical silt, soil, lake sediments and rock samples.

1. Sample Preparation

(a) Geochemical soil, silt, lake sediments or rock samples were received in the laboratory in wet-strength 3½ x 6½ Kraft paper bags and rock samples in 4" x 6" Kraft paper bags.

(b) The wet samples 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 sieves. The plus 80-mesh fraction was rejected and the minus 80-mesh fraction was transferred into a nwq bag for analysis later.

(d) 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) 0.25 gram of the minus 80-mesh sample was used. Samples were weighed out by using a top-loading 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.

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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 gassed off as arsene through a glass wool scrubber plug saturated with lead acetate and into a solution of silver diethyldithiocarbamate in chloroform with 1-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
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VANGEOCHEM LAB LTD. 1521 PEMBERTON AVE., NORTH VANCOUVER, B.C., CANADA 986-5211 604-XXXXXXX
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November 20, 1981

To: J.R. Woodcock Consultants
#806-602 W. Hastings St.
Vancouver, B.C. V6B 1P2

From: Vangeochem Lab Ltd.
1521 Pemberton Ave.
Nroth Vancouver, B.C. V7P 2S3

Subject: Analytical procedure used to determine trace tungsten in geochemical samples by fusion.

1. Sample Preparation

(a) Geochemical soil, silt and rock samples were received in the laboratory in high wet-strength 4" x 6" Kraft paper bags or rock samples in 8" x 10" plastic bags.

(b) The wet samples 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 sieves. 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 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 Dissolution by Fusion

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

(b) Two grams of flux ($NaCO_3$, KNO_3 and NaCl) were mixed with each sample and the samples were fused over a muffled furnace in high temperature.

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3. Method of Analysis

(a) The fused samples were then dissolved in demineralized water by heating in a hot water bath.

(b) A fixed volume was subsequently adjusted.

(c) An aliquot from each sample for tungsten analysis is developed in a strongly acid (HCl) solution of stannous chloride using a thiocyanate as the complexing agent.

(d) The tungsten-thiocyanate complex was extracted into 1/2 ml of a carbon tetrachloride and tri-n-butyl phosphate solvent mixture.

(e) The concentration of tungsten was calculated colorimetrically by comparing the intensity of its color organic layer with a set of known standards prepared in a similar fusion as the samples.

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

Eddie Tang
Vangeochem Lab Ltd.

ET:jl

986-5211
VANGEOCHEM LAB LTD. 1521 PEMBERTON AVE., NORTH VANCOUVER, B.C., CANADA 604-
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November 20, 1981

To: J.R. Woodcock Consultants
#806-602 W. Hastings St.
Vancouver, B.C. V6B 1P2

From: Vangeochem Lab Ltd.
1521 Pemberton Avunue
North Vancouver, B.C. V7P 2S3

Subject: Analytical procedure used to determine hot acid soluble Mo, Cu, Mn, & Sbin geochemical silt, soil and rock samples.

1. Sample Preparation

(a) Geochemical soil, silt or rock samples were received in the laboratory in wet-strength 3½ x 6½ Kraft paper bags and rock samples in 4" x 6" Kraft paper bags.

(b) The wet samples 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 sieves. 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 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. Methods of Digestion

(a) 0.50 gram of the minus 80-mesh samples was used. Samples were weighed out by using a top-loading 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) The digested samples were diluted with demineralized water to a fixed volume and shaken.

3. Method of Analysis

Mo, Cu, Mn & Sb analyses were determined by using a Techtron Atomic Absorption Spectrophotometer Model AA4 or Model AA5 with their respective hollow cathode lamps. The digested samples were aspirated directly into an air and acetylene flame, but Mo digestion were aspirated into an acetylene and nitrous flame. The results, in parts per million, were calculated by comparing a set of standards to calibrate the atomic absorption unit and displayed in a strip chart recorder.

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

Eddie Tang

VANGEOCHEM LAB LTD.

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V GEOCHEM LAB LTD. 1521 PEMBERTON AVE., NORTH VANCOUVER, B.C., CANADA 986-5211 604-XXXXXXX

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November 20, 1981

To: J.R. Woodcock Consultants
#806-602 W. Hastings St.
Vancouver, B.C. V6B 1P2

From: Vangeochem Lab Ltd.
1521 Pemberton Avenue
North Vancouver, B.C. V7P 2S3

Subject: Analytical procedure used to determine hot acid soluble Pb, Zn, Ag in geochemical silt, soil, and rock samples.

1. Sample Preparation

(a) Geochemical rock, silt, and soil samples were shipped to the lab by the above client. The rock samples were either stored in 8" x 13" plastic bags or in 4" x 9" cotton mailing bags. The silt and soil samples were stored in the wet-strength 3½" x 6½" Kraft paper bags.

(b) The wet samples were dried in a ventilated oven over-night.

(c) The dried soil or silt samples were sifted by hands, using a 8" diameter 80-mesh stainless steel sieve. The plus 80-mesh fraction materials were rejected and the minus 80-mesh fraction materials were transferred into coin envelopes for analyses later.

(d) The dried rock samples were crushed by a jaw crusher and pulverized by using a disc mill to minus 100-mesh. The pulverized samples were stored in the 4" x 6" paper bags for later analysis.

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2. Method of Digestion

(a) 0.50 gram of the minus 80-mesh samples was used. Samples were weighed out by using a top-loading 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) The digested samples were diluted with demineralized water to a fixed volume and shaken.

3. Method of Analysis

Pb, Zn Ag analyses were determined by using a Techtron Atomic Absorption Spectrophotometer Model AA4 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 camparing a set of standards to calibrate the atomic absorption units.

4. Back Ground Correction

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

5. Analysts

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

Eddie Tang

VANGEOCHEM LAB LTD.

ET:jl

APPENDIX II

TABULATED COSTS

Fire Mtn. (to November 20, 1981)

Disbursements:

	Aug. 2 to Sept. 2 1981	Sept. 20 to Nov. 20 1981
geochem, thin sections		2,228.86
drafting		25.20
maps, reproduction		268.09
food and accommodation	288.45	
helicopters	1,937.00	
truck rental, gas	571.74	
miscellaneous	291.67	
Totals	3,088.86	2,522.15

Total Disbursements $ 5,611.01

Fees:

J. R. Woodcock

Aug. 22	-	Aug. 30, 1981	7 3/4 days	
Aug. 31	-	Oct. 3, 1981	3/4 days	
Oct. 25	-	Nov. 21, 1981	5 days	
			13 1/2 days @ $440	$5,940.00

Dennis Gorc

Aug. 16	-	Aug. 29, 1981	7 days	
Aug. 30	-		1 day	
Sept. 13	-	Sept. 26, 1981	1 day	
Oct. 25	-	Nov. 7, 1981	2 3/4 days	
Nov. 8	-	Nov. 21, 1981	4 1/2 days	
			16 1/4 days @ $216	3,510.00

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Fees Cont'd.

Henry Awmack

Aug. 16 - Aug. 19, 1981 7 days
Aug. 30 - 1 day

8 days @ $120 $ 960.00

E. McCallum

Oct. 25 - Nov. 7, 1981 3 3/4 hrs.
Nov. 15 - Nov. 21, 1981 7 1/2 hrs.

11 1/4 hrs. @ $15 168.75

Total Fees	$10,578.75
Total Disbursements (Page i)	5,611.01
Total Fees & Disbursements	$16,189.76

Appendix II

Costs