TOUCHÉ 1-56 CLAIMS

GEOLOGY, GEOPHYSICS AND GEOCHEMISTRY, 1982

DAWSON MINING DISTRICT

NTS : 106L and 116I
LATITUDE : $66^{o}51'N$
LONGITUDE : $136^{o}02'W$

AUTHOR : BRUCE JAGO, M.Sc.

OWNER : MATTAGAMI LAKE EXPLORATION LTD.

DATE : DECEMBER, 1982

This report has been examined by the Geological Evaluation Unit under Section 53 (4) Yukon Quartz Mining Act and is allowed as representation work in the amount of $ 22,400 —

P. Watson

for Regional Manager, Exploration and Geological Services for Commissioner of Yukon Territory.

Government of Canada | Gouvernement du Canada

MEMORANDUM | **NOTE DE SERVICE**

TO / À: Bonnie Proudfoot
Dawson Mining Recorder

FROM / DE: Pat Watson
Geology

SECURITY - CLASSIFICATION - DE SÉCURITÉ	
OUR FILE/NOTRE RÉFÉRENCE	
YOUR FILE/VOTRE RÉFÉRENCE	
DATE	January 26, 1983

SUBJECT / OBJET: Assessment report on Touche claims, 106 L 13, By Noranda

Noranda has requested $22,400 assessment on this property, However, only part of the work described was carried out during the 1982 claim year.

The claims were staked July 1, 1980 and recorded July 8, 1980. The work desctibed in this report was conducted on June 12 to 20, 1982 and on August 23 to 27, 1982. The first of these periods is within last year's claim year.

Are they filing for this year's claim year only? If so, please inform them of the above problem and request a statement of costs which divides the expenses by date (enclosed is a copy of the present, inadequate statement). Otherwise, this report cannot be evaluated.

Thanks.

Pat

INDIAN and
NORTHERN AFFAIRS

TRANSMITTAL FORM

M.R. File No.
R.M.M.R. No

Date Fwd 3 March 83

FROM: Mining Recorder at DAWSON

TO: Regional Manager Mineral Rights at Whitehorse. Y.T.

Office of the Regional Manager
MAR 17 1983
Yukon Terr.

FOR ACTION ARE:

- [ ] NEW APPL'N for PLACER LEASE to PROSPECT: Name:
- [ ] RENEWAL APPL'N PLACER LEASE to PROSPECT: Name: Lease No.
- [ ] AFFIDAVIT of EXPENDITURE on PLACER LEASE. Name. Lease No.
- [ ] ASSIGNMENT of PLACER LEASE No. .... From: To:
- [ ] PROSPECT LEASE POWER OF ATTORNEY NO. .... FROM............. TO..............
- [ ] GROUPING APPL'N UNDER SEC. 52(2) PLACER MINING ACT. Owner:
- [ ] DIAMOND DRILL LOGS: Claims: Claim sheet no:
- [ ] QUARTZ ASSESSMENT REPORT:

Claims: Touché 1-56 Claim sheet no. 106 L-13

Type of report: Geology, Geophysics and Geochemistry Submitted by: Noranda

Cls. work performed on: Touche 1-56. $ Req. for ren. application 22400

REMARKS/NOTES
This is the breakdown of statement of costs

Signature B.J. PROUDFOOT

REPLY ACTION. Date Ret.:

Pat Watson
Geology Section

2ND COPY

Signature

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CHAPTER ONE : INTRODUCTION

Location and Access :

The TOUCHÉ 1-56 claims are located in the northern Richardson Mountains at 136°02'W, 66°51'N (Figure 1). They straddle Cornwall Creek, a tributary of the Rock River, approximately 12 km east of the Dempster Highway (Figure 2). The town of Inuvik is approximately 300 km by road to the north, and Dawson 500 km to the south (Biczok, 1981).

Access was by helicopter from a gravel pit beside the Dempster Highway. If future developments warrant it, a road could easily be constructed to the property along the Rock River and Cornwall Creek river valleys. The potential routes traverse an area of rolling hills with gentle slopes (Biczok, 1981).

History of the Claims :

The TOUCHÉ 1-56 claims were staked by J. Biczok and his crew on July 1, 1980, and recorded on July 8, 1980. Grant numbers assigned to the claims are YA52693 to YA52748 inclusive. Upon filing of the 1981 report, the claims were in good standing until July 8, 1985.

The TOUCHÉ area was first investigated by the company during a 1979 regional stream sampling program. Ground follow-up of Cu-Ba geochemical anomalies led to the discovery of outcrops of spectacular crystalline barite and fault related Pb-Zn-Ag mineralization. The TOUCHÉ claims were immediately staked to cover this mineralization. A minor stream sampling and prospecting program was subsequently carried out by company personnel in the summer of 1980.

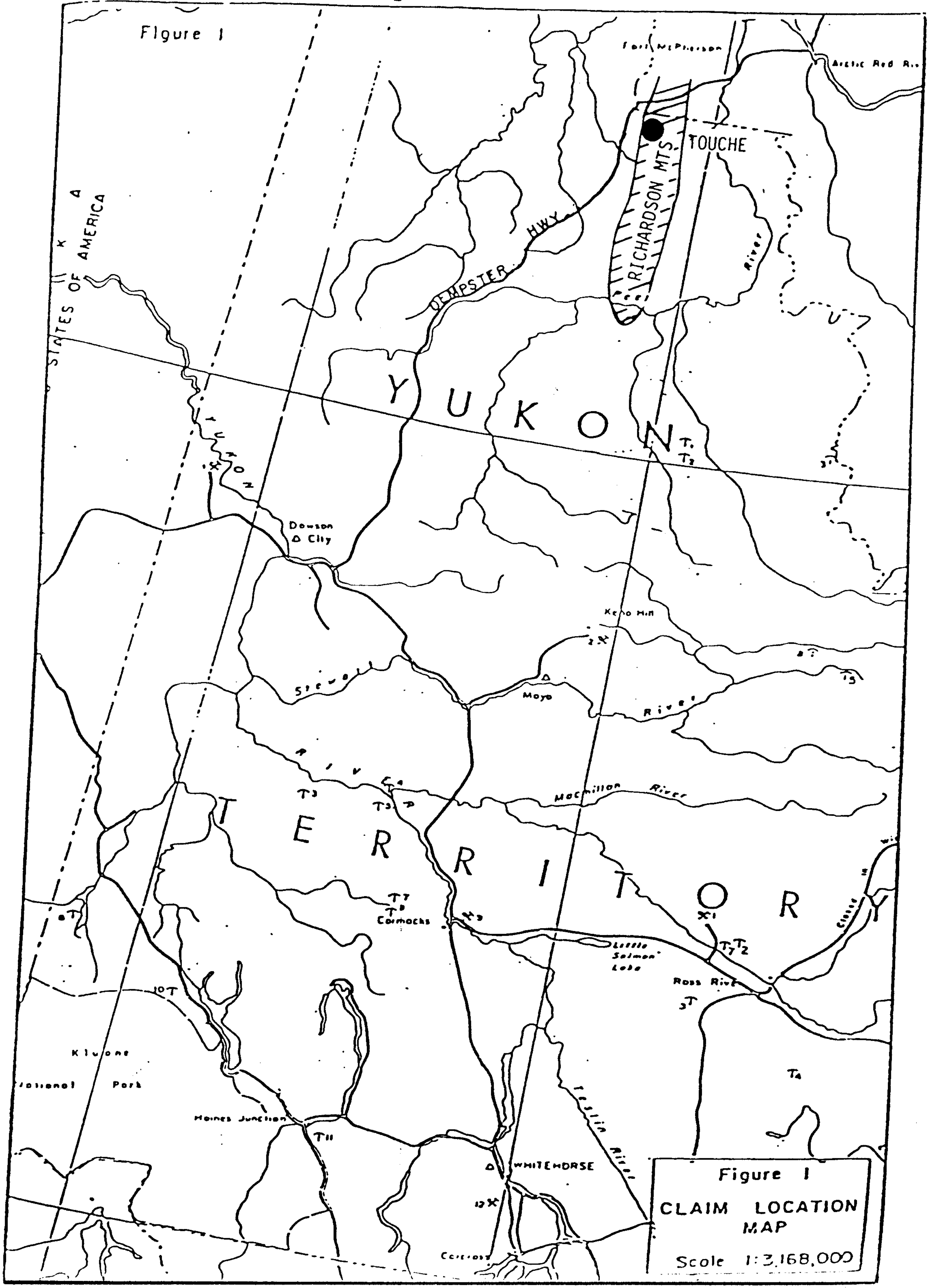
Figure 1
Fort McPherson
Arctic Red R.
TOUCHE
RICHARDSON MTS.
DEMPSTER HWY.
Peel River
STATES OF AMERICA
YUKON
Dawson City
Keno Hill
Stewart
Mayo
River
Macmillan River
TERRITORY
Carmacks
Little Salmon Lake
Ross River
Kluane National Park
Haines Junction
WHITEHORSE
Teslin River
Carcross
Figure 1
CLAIM LOCATION MAP
Scale 1:3,168,000

During 1981, camp was established on the property from July 14th to July 27th. The work program consisted of grid layout, soil sampling, a Radem survey, detailed geological mapping and prospecting.

Physiography and Vegetation :

In the Rock River area, the Richardson Mountains form a north-south trending belt, roughly 20 km wide, separating the Porcupine Plain on the west from the Peel Plateau to the east. Since the range consists almost entirely of relatively shallow dipping sedimentary strata which have not been glaciated, it is topographically expressed as a series of low rolling hills, often with moderate slopes. Water erosion has produced numerous V-shaped valleys and canyons but these are generally of little consequence to the region's accessibility. The maximum local elevation seldom exceeds 1,100 meters (Biczok, 1981).

Trees and shrubs of a significant height are quite rare in the Richardson Mountains. They are generally found in sheltered valley bottoms. Most slopes are covered with grass, lichen and moss. On the TOUCHÉ property, shrubs and trees are found on the steep eastern bank of Cornwall Creek, extending uphill to the western edge of the grid. The rest of the property is largely bare of trees or shrubs (Biczok, 1981).

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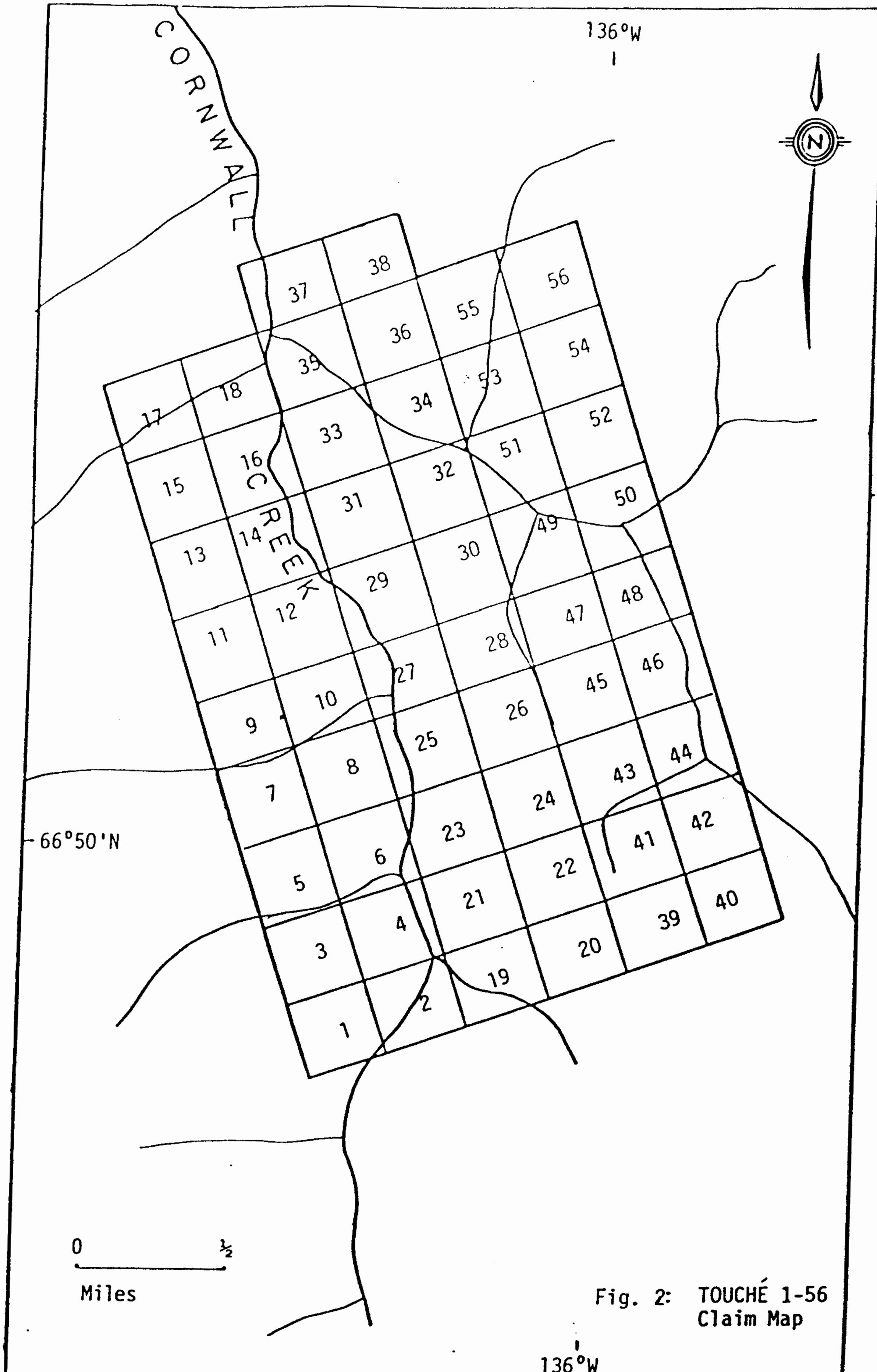

Fig. 2: TOUCHÉ 1-56 Claim Map

1982 Work Program :

The 1982 work program was divided into two stages. During the initial stage (June 12 to June 20, 5 man crew), detailed mapping was conducted on a 1:16,000 airphoto (A22420-1372) enlargement and the existing soil grid was expanded and sampled as recommended by Biczok,(1981). In addition, the EM16 and EM16R geophysical methods were evaluated to assess their usefulness in exploring for fault related mineralization. Trenching of the most northerly geochemical anomaly was initiated to locate the source of strong, fault related soil geochemical anomalies.

During the second exploration stage (August 23 to August 27, two man crew), sixteen soil pits were excavated on significant soil anomalies, and detailed soil sampling of a single very high Zn and Pb-in-soil anomaly was completed.

The crew consisted of the following personnel :

J. Biczok	Project Geologist
B. Jago	Party Chief
L. Walton	Senior Assistant
P. Duguette	Junior Assistant
Y. Tainaka	Junior Assistant
T. Hensch	Junior Assistant
M. Watson	Junior Assistant
P. Kindle	Hiller 12E Pilot

All of these personnel did not work on this project for the duration of the work program. In total, 53 mandays were expended on the property and are divided as follows :

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Geological Mapping	13 mandays
Prospecting	5 mandays
Soil Sampling	9 mandays
Geophysical Survey	1 manday
Trenching	5 mandays
Grid Layout	6 mandays
Office Duties	3 mandays
General	11 mandays
Total	53 mandays

General activities include supply purchase days, days lost to inclement weather, and days spent in camp cooking by junior personnel.

CHAPTER TWO : GEOLOGY

General Geology :

The geology of the Richardson Mountains has been described in company reports by Biczok (1979) and Metcalfe (1980) and by D.K. Norris (1979), and M. Cecile et al (1982) of the Geological Survey of Canada. Briefly, the mountain range consists of a breached north-south trending anticlinorium cored by a sequence of Cambrian limestones and siltstones. These are flanked on the east and west by the Ordovician-Silurian Road River Formation and by a Middle to Upper Devonian clastic sequence consisting of black graptolite shale, sandstone and conglomerate (Biczok, 1981).

Geology of the TOUCHÉ Claims

Introduction :

The results of the 1982 detailed mapping program are presented on Map 1. This map was traced from a 1:16,000 scale enlargement of airphoto #22420-137. Previous mapping programs used a 1:10,000 scale claim map, which proved to be too inaccurate for detailed mapping. It is recommended that the new basemap be used for all future work.

Geology of the Claims :

The TOUCHE claims (Map 1) straddle a major fault zone striking approximately 160^{o} and extending 27 km to the southeast and at least 20 km to the northwest. This fault is actually a composite of several major and minor intersecting faults, locally called the Main Break, the North Break and the Carbonate Break.

TABLE 1

TABLE OF FORMATIONS

PERIOD	FORMATION	DESCRIPTION
Ordovician-Silurian	Road River Formation (3)	a - thin bedded, grey weathering dark limestone with scarce, thin grey shale partings
		b - laminated to thin bedded, grey gritty, turbiditic siltstone with scarce, grey, shale partings
		c - black, organic-rich, laminated, graptolitic shale with interbedded, laminated to thinly bedded, black, pyritiferous chert grading up-section into black, fetid limestone
	Unnamed Clastic F^m (2)	a - grey weathering, foliated, fine-grained shale with sandy sections throughout
		b - black, laminated, organic-rich shale with minor disseminated pyrite
Cambrian	Unnamed Clastic F^m (1)	a - thin bedded, clean to pyritiferous orthoquartzite locally cherty
		b - chert pebble conglomerate as a locally developed intraformation chert breccia-fragments to 8 cm

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PERIOD	FORMATION	DESCRIPTION
		c - interbedded, dirty, pyritiferous, thin bedded quartzite, thin bedded grey sandy shale grading southward into shales
		d - thin bedded, grey limestone with thin, calcareous, mudstone interbeds forming rounded boudins; limestone is locally pelletal
		e - red weathering lithic-pebble conglomerate containing round pebbles of limestone, chert and shale-hematite alteration is secondary
		f - rusty weathering, thin bedded sandstone grading upsection into sandy siltstone and siltstone

The central fault zone, the Main Break, is occupied by a zone of intensely altered and foliated rocks up to 50 m in width. This fault is a major stratigraphic break separating Ordovician to Silurian clastic and chemical sedimentary rocks exposed to the east, from Middle Cambrian clastic rocks exposed to the west. The Main Break appears to correspond to the major stratigraphic break mapped by Cecile et al 1982.

The Carbonate Break is located approximately 250 m east of the Main Break and intersects the same approximately one km north of the claims. This fault zone is occupied in part by a sparsely mineralized quartz-carbonate vein.

The North Break appears to be a splay fault of the Main Break. It also acts as a major stratigraphic break.

Description of Units :

The Table of Formations is given in Table 1. Previous mapping efforts and descriptions of units has been summarized by Biczok (1981).

A Middle Cambrian "Unnamed Clastic" unit contains the oldest sediments exposed on the TOUCHÉ claims. The base of this formation consists of clean, white, pyritiferous orthoquartzite (1a) which is locally cherty and interbedded with pyritiferous chert. The latter sediment is locally brecciated and forms a cherty, pyritiferous sharpstone conglomerate (1b). Constituent fragments are angular and up to 8 cm across. These relatively clean sediments are overlain by thin bedded, rusty, dirty quartzites interbedded with thin beds of grey to rusty shale (1c). The unit becomes progressively shalier to the south suggesting that the sediment source lies to the north. To the north, this unit is in fault contact with interbedded limestone and calcareous mudstone (1d). The thinly interbedded mudstones commonly form a chocolate-patte/boudinage structure between the enclosing limestone beds. This structural disruption occurs due to the ductility contrast between the limestone and mudstone and is related to the principal stress orientations during regional folding. Previously this structure was interpreted as a conglomerate unit. Mudstone interbeds become thicker from north to south. A single occurrence of a red weathering, lithic conglomerate (1e) occurs within unit (1d) above. This coarse clastic sediment consists of small (maximum 1 cm diameter) rounded pebbles of limestone and sub-angular fragments of chert in a red sandy matrix. The red colouration is secondary, presumably introduced into this formation during alteration along the Main Break, located 50 to 100 m to the east. The uppermost clastic unit (1f) in this formation consists largely of fine grained sediments which graded between three endmembers; shale, siltstone and sandstone. Separation of these three rock types is not practical in the field. The resultant rocks are largely laminated to thinly bedded fine grained, brown weathering sandy to silty shale.

The Middle Cambrian formation is overlain by an Ordovician-Silurian "Unnamed Clastic" formation which largely consists of grey laminated shale (2a). Detailed mapping has delineated a black, organic-rich shale member (2b) within the former unit which appears to have formed within a shallow, topographic depression.

The Ordovician-Silurian "Road River" formation flanks the TOUCHÉ claims on the east and west. This formation consists of three distinct members. The lowermost unit consists of thin bedded (15-20 cm), grey weathering, dark limestone (3a) with thin (1-2 cm), dark grey, shale partings. This chemical sediment is conformably overlain by a laminated to thin bedded (5-10 cm) grey, gritty, turbiditic siltstone (3b), which demonstrates graded bedding and scarce rip-up clasts. The uppermost laminated siltstones grade upsection and laterally (?) into a black clastic

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unit. This member (3c) passes from interbedded black, organic-rich pyritiferous shale and cherts at its base, upsection into dark thin bedded (15-20 cm) fetid limestones. These are interbedded with thin shale partings which disappear upsection as the limestones become lighter in colour and thicker bedded.

Structure :

The structure of the strata underlying the TOUCHÉ claims is complex and is largely controlled by movement along the numerous major and minor faults which transect the property. Briefly, all strata dip to the west away from a major regional anticline (Cecile et al, 1982) located 5 km to the east. Dip reversals and small folding are common adjacent to and between fault zones, where complex alteration/mineralization assemblages (Main Break) and veins (Carbonate Break) may be developed.

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CHAPTER THREE : GEOCHEMISTRY

Stream Geochemistry :

Stream silt and water samples were collected in an attempt to locate potentially mineralized strata on the TOUCHÉ claims and to locate the source of chalcopyrite boulders found in Cornwall Creek during 1981 and 1982. The results of the stream sampling program are given in Appendix A; sample locations are plotted om Map 2.

A review of Appendix A shows that only two silt/water samples (S/W 1010,1012) returned anomalous concentrations of basemetals and silver. These samples were recovered in creeks (normal pH) located approximately one km north of the TOUCHÉ claims. Basemetal mineralization was found upstream from these locations and consisted of malachite and azurite stained shale chips and tiny fragments of chalcopyrite which were derived from a fault zone.

The zinc-enriched nature of several samples is not unusual as these samples were recovered in streams draining black shales. Exploration by Mattagami elsewhere in the Yukon has shown that these levels are normal for streams draining such strata.

Soil Geochemistry :

During 1982, soil samples were recovered from the Main Break, Main Break extension and Carbonate Break soil grids. In addition, 17 soil pits were excavated on significant soil anomalies along the Main Break and six soil samples were recovered from the south bank of **Barite Creek** in a soil alteration zone. All soil location sites are presented on Maps 2 and 3. Appendix B and Map 4 present the results of this study.

Discussion :

Examination of Map 4 shows that the Main Break is lead/zinc anomalous along its entire length, but copper and silver enrichments are confined to the northern end. Seven anomalous areas have been delineated (A to G) on the basis of copper (G 50 ppm Cu), lead (G 100 ppm Pb), zinc (G 200 ppm Zn) and silver (2.0 ppm Ag). The barium results are not shown due to its widespread occurrence in very small veins.

Anomaly A (L9,000N, 11,100E)

Anomaly A is a lead (G 1000 ppm Pb)/zinc (G 200 ppm Zn) anomaly centred underlain by highly brecciated and altered quartzite fault gouge. Two rock samples (R561, 562) and a single soil sample (P39736) were recovered from a soil pit at this site. These samples were not anomalous in either basemetals or silver returning only 280 ppm zinc and 6300 ppm barium-in-soils. The latter suggests that only minor barite is present in this area.

Anomaly B (L9,400N to 9,800N, 10,850E to 11,200E)

This anomaly is characterized by numerous,isolated lead/zinc concentrations in soil within a weakly anomalous zinc background. Two soil pits were excavated to test this anomaly (L9,600N, 11,050E/9,800N, 10,900E). Soil and rock samples P39737 and 39738 and 39739 and R565 to R568 and R569 and R570 were recovered from these two pits respectively. Samples from the first pit were only weakly anomalous in zinc (200 ppm Zn-in-soil, 450 ppm Zn-in-rock) and lead (86 ppm Pb-in-soil). Samples from the second pit were less encouraging returning a maximum of 240 ppm zinc-in-soil. No mineralized float was found at this location. Epidote is widespread in the upper soil horizon around the second pit.

Anomaly C (10,100N to 10,400N/10,900E to 11,000E)

Anomaly C is a linear anomaly similar in character to Anomaly B. Three soil pits were excavated in brown and green (epidote) soils to test this anomaly. Rock samples collected from the pit are highly altered and brecciated.

Rock and soil samples from the southernmost soil pit (R572, 573 and P39742) returned a maximum of 840 ppm zinc-in-rock and 240 ppm zinc-in-soil. No sulphide mineralization was found at this site.

Soil samples (P39743 and 39744) excavated from a second pit 100 m north of the first returned only 280 ppm zinc. Rock samples (R574,575 and 576) returned a maximum of 270 ppm zinc and 24 ppm lead.

Rock (R580) and soil (P39748) samples from the most northerly pit (L10,400N) excavated on this zone returned only low zinc values (maximum 470 ppm zinc-in-rock and 110 ppm zinc-in-soil).

Lead and zinc mineralization was located in brown soils on L10,300N, 11,000E. A single rock sample (R578) was zinc-rich (19.00% Zn) and lead-rich (1.94% Pb). A second rock sample (R579) from the same location was only weakly anomalous (2640 ppm Zn, 284 ppm Pb). Two soil samples collected upslope from this site were weakly zinc anomalous (maximum 3-0 ppm Zn) suggesting that the mineralization is isolated and of little consequence.

Anomaly D (10,800N, 11,000E)

Anomaly D covers two isolated lead/zinc-in-soil anomalies. Prospecting in the vicinity of these anomalies failed to locate any mineralization. No soil pits were excavated here.

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Anomaly E (11,400N to 11,700N/10,950E to 11,200E)

This broad linear anomaly occurs on the flank and hillside beside the Main Break whose side slope follows line 10,975E. This zone is weakly enriched in zinc and copper (100-200 ppm Zn, 50-100 ppm Cu) and highly enriched in silver (3.0 to 4.0 ppm Ag). All lead values are low (less than 25 ppm Pb).

Soil and rock samples (P1106 to P1112 and R1121 to 1125) obtained from a soil pit at L11,200, 10,950E were only weakly zinc (maximum 170 ppm zinc-in-soil and 535 ppm zinc-in-rock) and lead (maximum 170 ppm Pb-in-rock) anomalous. Several soil horizons were sampled in this pit however no metal-rich horizons or mineralization were encountered.

Two other soil pits were excavated upslope from the fault zone (L11,200N, 11,035E/L11,400N, 11,025E). Soil samples (P39526 and 39527 respectively) were enriched in zinc (240 and 1400 ppm zinc), copper (96 ppm and 210 ppm Cu) and silver (1.6 ppm and 3.8 ppm Ag). Samples of shale from these pits (R582, and R583A/B respectively) are weakly anomalous in zinc (300 ppm Zn, 510 and 780 ppm Zn), copper (24 ppm Cu, 78 and 82 ppm Cu) and silver (0.7 ppm Ag, 1.6 and 1.4 ppm Ag). These samples are essentially homogeneous black shales with no quartz or carbonate veins and are the likely source of the soil anomaly, rather than fault related mineralization. Other shale chips from this area (R584 and R585) are zinc and silver (240 ppm Zn, 1.2 ppm Ag) and copper, zinc and silver (108 ppm Cu, 215 ppm Zn and 1.6 ppm Ag) anomalous respectively.

Anomaly F (L11,650N to 11,800N/10,800E to 10,850E)

Anomaly F is an isolated lead/zinc (2900 ppm Pb, 7000 ppm Zn) anomaly that is not directly related to the Main Break but may occupy a narrow

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parallel fault zone. During follow-up detailed sampling (P39701 to 39731 and 39732 to 39734), lead/zinc mineralization (R551 to R554) was located on surface. Three soil pits were excavated at this site and samples P39732 to 39734 were recovered from the pit bottoms. Zinc and lead-in-soil concentrations reached maximum values of 9000 ppm and 300 ppm respectively, the latter substantially lower than the surface samples (2900 ppm Pb). No anomalous copper or silver values were returned, and only two rock samples from the surface and one pit sample contained appreciable mineralization. These returned a maximum of 44 ppm copper, 800 ppm lead, 5.10% zinc and 1.2 ppm silver. The isolated nature of the anomaly and the restricted distribution of mineralized rock samples should discourage any further work on this anomaly.

Anomaly G - Carbonate Break Soil Grid

This linear copper (94 ppm Cu), lead (2300 ppm Pb), zinc (8000 ppm Zn), silver (4.0 ppm Ag) and barium anomaly is directly associated with a quartz-carbonate-barite vein which occurs along a portion of the Carbonate Break. The high metal-in-soil values reflect the mineralized nature of this vein (rock samples R1103 to R1110 returned 20 ppm Cu, 2810 ppm Pb, 10,000 ppm Zn, 1.3 ppm Ag and 49% Ba). However, examination of the vein by the author and L. Walton shows that the mineralization is related to a central, narrow, pyritiferous shear zone, and related fractures within the vein, and is not of economic significance. No further work is warranted on this structure because of the sporadic and uneconomic nature of the mineralization.

Barite Creek Soil Samples :

Six soil samples (P2068 to 2073) were recovered from the southern stream of Barite Creek approximately 50 to 150 meters west of the Main Break. These samples were taken to assess the economic potential of a highly altered (epidote, hematite) soil horizon parallel to the Main Break and beside a small Pb-Zn-Ag occurrence (R1095). These soil samples were only weakly anomalous in zinc (maximum 430 ppm Zn). This zone is of no economic significance.

Main Break Extension :

Ten soil samples (P1015 to P1024) were recovered from a small grid located on a possible extension of the Main Break fault. Metal-in-soil values are generally low (maximum 180 ppm zinc, 140 ppm Pb and 1.4 ppm Ag) and do not define an anomalous zone. No further work is warranted in this area as it is unlikely that economic mineralization is present at depth.

Rock Geochemistry :

Approximately 100 rock samples were obtained during the 1982 field season and analyzed for base and precious metals. Most of these samples were obtained from the Main Break fault zone or Carbonate Break although all other rock strata are represented.

An examination of Appendix C shows that only low metal concentrations were obtained in most samples. A single sample (R578) returned 1.46% lead and 19.00% zinc. However, typical of all mineralization found to date on this property, the occurrence is isolated (1 sample). Similarly, those samples obtained from the Carbonate Break (R1103 to 1110) are not economically significant. A bulk sample from this vein returned 20 ppm Cu, 2810 ppm Pb, 8100 ppm Zn and 1.3 ppm silver. Elsewhere in the vein, samples returned up to 49% barium.

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One rock formation on the TOUCHÉ property returned weakly anomalous values in copper, zinc and silver. The Black Shale member of the Ordovician-Silurian Road River Formation contained up to 108 ppm Cu, 64 ppm Pb, 780 ppm Zn and 1.6 ppm silver. These low values are economically insignificant but typical of metal-in-shale values obtained by the company elsewhere in the Yukon.

CHAPTER FOUR : MINERALIZATION AND ALTERATION

A review of Map 2 shows that numerous occurrences of base and precious metal mineralization have been found on the claim block. These occurrences are invariably related to the major fault zones on the property and are intimately associated with quartz, quartz-carbonate or carbonate-barite veins. Within the major fault zones, the constituent rocks have been granulated, recrystallized and altered metasomatically by a variety of hydrothermal fluids which were probably syn-and-post tectonic. Epidote, hematite, carbonate and silica alteration products are the most common although only the latter two appear to have been associated with any metal enrichment. Epidote and hematite alteration are present only along the Main Break. These are manifested as greenish rock fragments or green coloured soil and as small nuggets of specular hematite, respectively. Carbonate and silica alteration are ubiquitous to all fault zones, present as veins or in metasomatized areas.

Quartz-Carbonate Veins :

Few quartz-carbonate veins are of any significance on the TOUCHÉ property. The Carbonate Break is occuppied by a three to four meter wide vein which is sparsely mineralized (see Rock Geochemistry) along its entire length; the best mineralization occurring where it outcrops in Barite Creek. Detailed mapping of the vein shows that the mineralization (galena-sphalerite-chalcopyrite) is related to a central pyritiferous shear zone and to related fractures distributed throughout the vein. Metal concentrations from selected grab samples and a bulk sample taken from the width of the vein are given in Appendix C (samples R1103 to R1110). Maximum values are 99 ppm copper, 2810 ppm lead, 10,000 ppm Zn, 1.3 ppm silver, 5 ppb gold and 21 ppm arsenic.

The vein changes upslope and along strike into barite and then further upslope progressively into a carbonate, quartz-carbonate and quartz vein. Only the lower portion of the vein in the creek valley contains significant mineralization.

Carbonate Veins :

Numerous unmineralized carbonate veins occur on the TOUCHÉ claims, although only two occurrences contain significant amounts of basemetals.

Samples R552 and R554 were recovered from a small soil pit located on L11,700N, 10,800E. These two samples contained between 5 and 20% honey sphalerite (up to 5.10% Zn) and minor galena (1%) in crystallized limestones. These samples were not abundant and soil geochemistry indicates that the associated anomaly is isolated.

Sample R578 is a regolith sample from L10,300N, 11,000E on the main soil grid. This single sample returned 1.46%b and 19.00% Zn.

Although this result is spectacular, no other minerlized float could be located and no soil anomaly was detected (sample 39746-47).

Carbonate metasomatism is also an agent of basemetal mineralization. Two rock samples (R547, R1127) obtained from fault gouge on Barite Creek in the vicinity of the exposed barite vein returned 6760 ppm Cu and 4.09 opt Ag and 5.50% Cu, 2.90% Pb, 8200 ppm zinc and 31.0 ppm Ag, respectively. These mineralized zones are very sporadic and of little lateral extent and are therefore not of any economic significance.

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Quartz Veins :

Two quartz veins (samples R529 and R538) of significant size were located on the property. Only sample (R538) was enriched in basemetals although this proved not to be of any economic significance (5960 ppm Cu, 35 ppb Au).

Barite/Carbonate Veins :

Numerous barite and barite/carbonate veins occur within the TOUCHÉ claims. The most significant and spectacular is located near the intersection of Barite and Cornwall Creeks (Biczok, 1981). No similar occurrences were found in 1982. The lateral extent of another barite vein associated with the mineralized quartz/carbonate vein on Barite Creek is unknown. The latter vein is three to four meters wide so presumably the associated baritiferous portion (found only in soil/rock talus slope) attains a similar width.

A similar occurrence of coarse, white crystalline barite was found in mixed shale/soil talus midway between the Carbonate and Main Break (L11,200N, 10,150E). This occurrence is characterized by blocks (30cm X 30cm) of pure barite with similar sized blocks of calcite occurring upslope.

All other barite occurrences on the property are quite small and are typically related to fault gouge along the Main Break. These veins or barite metasommatized zones are irregular and not laterally extensive.

CHAPTER FIVE : GEOPHYSICS

The author spent a single day surveying a portion of the Main Break with the EM16 and EM16R geophysical units. The former survey, contrary to the RADEM results obtained last year (Biczok, 1981), did not yield useful information. The receiving crystals carried in this unit are useful for strata for structures which strike to the east or west rather than north or south as is the case for the TOUCHÉ claims. The latter technique was ineffective due to permafrost conditions (L. Bradish, person. comm., 1982).

It is the authors opinion that potentially useful information may be gained from the EM16 survey if a transmitting station located to the south (Seattle, Washington) rather than to the southeast (Cutler, Maine) is chosen. The EM16R survey is of no use for exploration on the TOUCHÉ claims, because of year around permafrost conditions below 1.5 meters soil depth.

CHAPTER SIX : CONCLUSIONS AND RECOMMENDATIONS

A detailed mapping and soil/rock/stream sampling program was conducted on the TOUCHÉ 1-56 claims. Approximately 100 rock, 400 soil and 20 stream samples were recovered.

Detailed mapping defined a thick sequence of Cambrian to Silurian clastic and chemical sedimentary rocks. These sediments have been intensely altered and folded during regional tectonic events. Three principal fault zones were developed at this time. These fault zones acted as conduits for carbonate-silica-and barium-rich solutions. Minor amounts of base and precious metals accompanied this fluid influx. The resulting deposits are apparently small, and are uneconomic.

Soil and geochemical surveys defined several zones of metal-in-soil enrichment. A detailed follow-up of these anomalies did not reveal any economic mineralization, as most rock geochemical analyses returned sub-economic concentrations of metals. The silt sampling program found one additional mineral occurrence which was quite small and not of economic value.

The results of two geophysical surveys performed on the TOUCHE claims were inconclusive. The EM16R survey was discovered to be of no use due to deep permafrost conditions. The EM16 survey required a different transmitting crystal to be of use.

Because of the sporadic and low grade nature of mineralization on the TOUCHE claims and the seemingly low potential for finding economically significant quantities of base or precious metal mineralization, it is recommended that no additional work be conducted on these claims and that they be allowed to lapse.

If further work programs are conducted within the Richardson Mountains, they should continue to investigate the mineralization potential of the major fault zones and the possibility of encountering stratiform mineralization in the Ordovician to Silurian black clastic unit.

STATEMENT OF QUALIFICATIONS

I, John Biczok, of the City of Whitehorse, in the Yukon Territory, do hereby certify :

THAT I have been employed as a Geologist by Noranda Exploration Company, Limited (No Personal Liability) since October 1, 1982, and by Mattagami Lake Exploration Limited (No Personal Liability) (a Noranda subsidiary) for three years previous to that date;

THAT I am a graduate of Lakehead University in Thunder Bay, Ontario, with an Honours Bachelor of Science Degree in Geology;

THAT I am currently completing a Master of Science Degree in Geology with the University of Manitoba;

THAT I am a member of the Geological Association of Canada, and the Canadian Institute of Mining and Metallurgy;

THAT I supervised the work described in this report.

John L. Biczok
District Geologist
Noranda Exploration Co. Ltd. (N.P.L.)

STATEMENT OF COSTS

TOUCHE 1-56

revised see enclosed page

HELICOPTER CHARTER	$11,404.
WAGES	
GEOCHEMICAL=$1,914.	
GEOLOGICAL=$4,651	
TRENCHING =$811.	
REPORT WRITING=$1500	
DRAFTING=$900.	
GEOPHYSICS=$419	
TOTAL= $10,195	$10,195
CAMP COSTS	$ 950
ASSAYS	$ 2,917
TOTAL:	$25,466.

RECEIVED
MAR 2 1983
MINING RECORDER
DAWSON, Y.T.
I.A. & N.D.

STATEMENT OF COSTS

TOUCHE 1-56 CLAIMS

NORANDA EXPL. CO.L.T.D.

WORK DATES: June 12th -25th, 1982

Helicopter charter and fuel:		
Buffalo Airways Hiller 12E-		$9,604.
WAGES:		
Geochemical sampling	$1,914.	
Geological mapping	4,651.	
Trenching	811.	
Report writing	1,400.	
Drafting	900.	
Geophysics	419.	
TOTAL	:$9,095.	9,095
Assays:		
372 soil samples, 17 silt samples, 6 water samples.		2,917.
Camp costs:		950.
Vehicle rental:		
One 3-ton truck, one suburban, one van:		1,400.
Gas and tire repairs:		450.
Hotel accomodation:		
3 rooms x 2 nights x $55/night=		330.
		TOTAL : 24,746.

RECEIVED
MAR 2 1983
MINING RECORDER
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STATEMENT OF COSTS

TOUCHE 1-56 CLAIMS

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One 3-ton truck, one suburban, one van:		1,400.
Gas and tire repairs:		450.
Hotel accomodation:		
3 rooms x 2 nights x $55/night=		330.
		TOTAL : 24,746.

APPENDICES

APPENDIX A

STREAM SAMPLING RESULTS

SAMPLE NUMBER	SILT *					WATER**						PAN
	Cu	Pb	Zn	Ag	Ba	Cu	Pb	Zn	F	Ph	K	
169-S/W												
502	56	24	120	0.6		***	--------	NO SAMPLE		-------------		
503	28	44	140	0.2		L10	L20	L10	20	7.5	140	
504	28	42	180	0.6		L10	L20	L10	20	7.5	140	
505	28	26	72	0.2			--------	NO SAMPLE	-	-------------		
1010	160	210	250	0.8		L10	L20	L10	20	7.6	120	
1011	18	24	100	0.2		L10	L20	L10	20	7.8	120	
1012	150	130	800	1.6		L10	L20	L10	30	7.5	150	
1013	64	20	130	0.2		L10	L20	L10	20	7.7	160	
1014	54	14	120	0.2		L10	L20	L10	40	8.0	320	
1015	22	32	110	0.2		L10	L20	L10	20	7.8	160	
1016	20	36	250	0.2		L10	L20	L10	10	7.8	150	
1017	26	24	160	0.2		L10	L20	L10	10	7.8	140	
1018	28	26	100	0.2		L10	L20	L10	10	7.9	170	
1020	28	8	56	0.2		L10	L20	L10	20	7.9	160	
1021	20	12	100	0.2		L10	L20	L10	20	7.8	170	
1022	32	6	60	0.2		L10	L20	L10	20	7.8	140	
1023	40	10	80	0.2		L10	L20	L10	20	7.9	140	
1024	34	6	66	0.2		L10	L20	L10	20	7.7	150	
1025	30	18	140	0.2		L10	L20	L10	10	7.8	170	
1026	24	12	100	0.2		L10	L20	L10	20	8.0	190	
1027	18	12	60	0.2		L10	L20	L10	20	8.0	190	

NOTES :
* silts in ppm
** waters in ppb
*** denotes less than

APPENDIX B

SOIL SAMPLE RESULTS

Sample Number (Location)	Soil								
	Cu	Pb	Zn	Ag	Ba	Mo	Hg		
500	66	42	800	2.0					
1015	38	18	160	0.4					
1016	28	140	160	0.4					
1017	46	2	110	0.4					
1018	14	2	180	0.2					
1019	48	20	160	1.4					
1020	28	4	82	0.2					
1021	18	2	88	0.2					
1022	42	2	84	0.2					
1023	20	2	80	0.2					
1024	34	20	96	0.6					
1025	52	22	200	1.0					
1026	26	1300	6000	1.8					
1027	12	250	900	0.6					
1028	32	16	30	0.6					
1029	94	24	600	2.8					
1030	24	12	130	1.2					
1031	54	16	88	1.4					
1032	72	490	2700	2.4					

Sample Number (Location)	Soil								
	Cu	Pb	Zn	Ag	Ba	Mo	Hg		
1033	78	350	2100	2.8					
1034	14	300	1400	0.8					
1035	82	430	2200	3.8					
1036	46	130	1500	1.4					
1037	88	200	3300	3.6					
1038	22	600	2300	1.6					
1039	18	150	900	0.6					
1040	48	62	1100	2.4					
1041	110	44	900	3.2					
1042	14	2	62	0.2					
1043	40	650	3500	2.6					
1044	22	18	500	0.4					
1045	16	16	110	0.4					
1046	12	36	140	0.4					
1047	16	24	110	0.4					
1048	14	10	90	0.2					
1049	18	40	200	0.4					
1050	18	26	160	0.4					
1051	82	2300	8000	4.4					

Sample Number (Location)	Soil								
	Cu	Pb	Zn	Ag	Ba	Mo	Hg		
1055	16	10	62	0.6					
1056	26	24	160	0.4					
1057	8	2	30	0.4					
1058	22	42	180	0.8					
1059	22	300	700	0.2					
1060	20	68	480	0.2					
1061	18	38	230	0.2					
1062	18	36	170	0.2					
1063	18	54	230	0.2					
1064	16	52	240	0.2					
1065	14	16	94	0.2					
1066	14	16	120	0.2					
1067	18	28	170	0.2					
1068	54	12	140	0.2					
1069	24	32	140	0.4					
1070	14	10	26	0.6					
1071	14	44	260	0.2					
1072	26	94	500	0.2					
1073	28	66	500	0.2					

Sample Number (Location)	Soil								
	Cu	Pb	Zn	Ag	Ba	Mo	Hg		
1074	10	14	100	0.2					
1075	18	20	360	0.4					
1076	24	40	1000	0.2					
1077	16	30	700	0.2					
1078	16	42	370	0.4					
1079	22	130	2000	0.4					
1080	12	10	160	0.2					
1081	14	6	110	0.4					
1082	18	100	250	0.4					
1083	70	92	390	0.6					
1084	20	72	290	0.4					
1085	24	40	250	0.4					
1086	24	8	120	0.6					
1087	16	34	180	0.4					
1088	24	28	260	0.6					
1089	20	14	78	0.2					
1090	14	12	80	0.2					
1091	14	6	50	0.2					
1092	14	6	74	0.2					

Sample Number (Location)	Soil Cu	Pb	Zn	Ag	Ba	As	Hg	Au	Sb
1093	18	8	82	0.2					
1094	18	38	170	0.4					
1095	16	56	200	0.4					
1096	14	74	340	0.2					
1097	12	110	370	0.2					
1098	14	34	190	0.2					
1099	12	160	20	0.2					
1100	16	24	110	0.4					
1101	18	16	130	0.4					
1102	18	28	270	0.4					
1103	16	20	140	0.2					
1104	40	22	170	0.2					
1105	14	24	130	0.4					
1106	52	20	160	1.2		<2	350	10	<1
1107	54	20	170	1.2		<2	NSS	10	2
1108	36	6	96	1.2		<2	200	10	<1
1109	28	12	86	0.6		<2	110	10	<1
1110	22	10	60	0.4		<2	170	10	<1
1111	52	14	130	1.2		<2	N.S.S.	10	<1

Sample Number (Location)	Soil Cu	Pb	Zn	Ag	Ba	As	Hg	Au	Sb
1112	24	10	140	0.4		<2	120	10	<1
1500	18	12	74	0.2					
1501	20	14	68	0.2					
1502	18	24	110	0.2					
1503	16	16	60	0.2					
1504	16	12	50	0.2					
1505	18	10	56	0.2					
1506	22	20	100	0.2					
1507	16	16	200	0.2					
1508	18	8	42	0.2					
1509	16	10	38	0.2					
1510	16	8	46	0.2					
1511	12	24	84	0.2					
1512	14	18	90	0.2					
1513	12	4	80	0.2					
1514	12	6	48	0.2					
1515	16	10	22	0.2					
1516	32	50	170	0.2					
1517	38	48	150	0.2					

Sample Number (Location)	Soil								
	Cu	Pb	Zn	Ag	Ba	Mo	Hg		
1518	22	26	76	0.2					
1519	18	16	54	0.2					
1520	16	14	50	0.2					
1521	24	16	60	0.2					
1522	14	14	48	0.2					
1523	14	20	74	0.2					
1524	14	20	200	0.2					
1525	12	20	280	0.2					
1526	20	12	52	0.2					
1527	24	20	120	0.2					
1528	14	10	140	0.2					
1529	22	12	74	0.2					
1530	24	110	840	0.2					
1531	24	120	1700	0.2					
1532	18	64	840	0.2					
1533	16	58	540	0.2					
1534	16	34	420	0.2					
1535	20	42	520	0.2					
1536	18	38	370	0.2					

Sample Number (Location)	Soil								
	Cu	Pb	Zn	Ag	Ba	Mo	Hg		
1537	22	18	180	0.2					
1538	32	40	130	0.2					
1539	36	56	160	0.2					
1540	22	74	74	0.2					
1541	16	10	42	0.2					
1542	16	16	56	0.2					
1543	14	12	68	0.2					
1544	26	18	62	0.2					
1545	20	12	68	0.2					
1546	16	18	170	0.2					
1547	16	36	280	0.2					
1548	10	14	290	0.2					
1549	16	34	210	0.2					
1550	14	18	180	0.2					
1551	14	14	190	0.2					
1552	18	92	490	0.2					
1553	20	42	240	0.2					
1554	20	78	216	0.2					
1556	16	16	98	0.2					

Sample Number (Location)	Soil								
	Cu	Pb	Zn	Ag	Ba	Mo	Hg		
1556	14	10	42	0.2					
1557	16	10	80	0.2					
1558	12	10	44	0.2					
2000	18	16	24	0.4					
2001	22	20	28	0.4					
2002	16	24	26	0.4					
2003	18	6	22	0.4					
2004	22	22	72	0.4					
2005	22	16	48	0.4					
2006	26	16	56	0.4					
2007	18	12	40	0.2					
2008	20	14	44	0.6					
2009	16	14	42	0.4					
2010	68	70	200	0.8					
2011	40	36	180	0.6					
2012	32	52	160	0.4					
2013	22	52	440	0.2					
2014	18	60	280	0.4					
2015	14	56	200	0.2					

Sample Number (Location)	Soil								
	Cu	Pb	Zn	Ag	Ba	Mo	Hg		
2016	10	18	76	0.20					
[illegible]	14	12	80	0.20					
2018	14	12	82	0.20					
2019	14	12	92	0.2					
2020	14	12	190	0.2					
2021	22	20	200	0.6					
2022	16	12	86	0.2					
2023	20	22	180	0.2					
2024	18	4	80	0.2					
[illegible]	32	30	140	0.6					
2026	44	48	160	0.6					
[illegible]	38	40	140	0.4					
[illegible]	18	10	56	0.4					
[illegible]	16	4	48	0.4					
2030	14	6	18	0.2					
2031	12	2	17	0.2					
[illegible]	14	6	18	0.2					
2033	22	14	22	0.4					
[illegible]	56	26	21	0.2					

Sample Number (Location)	Soil Cu	Pb	Zn	Ag	Ba	Mo	Hg		
2035	14	2	22	0.2					
2036	14	4	18	0.2					
2037	10	6	24	0.4					
2038	10	4	28	0.2					
2039	10	6	36	0.4					
2040	14	10	48	0.2					
2041	10	8	42	0.2					
2042	20	24	130	0.2					
2043	14	12	86	0.2					
2044	16	22	170	0.2					
2045	16	34	230	0.2					
2046	18	20	200	0.2					
2047	16	24	190	0.2					
2048	12	10	120	0.2					
2049	12	8	78	0.2					
2050	14	18	100	0.2					
2051	14	24	140	0.2					
2052	20	26	250	0.2					
2053	12	20	100	0.2					
2054	20	32	180	0.2					
2055	24	92	470	0.2					
2056	14	44	170	0.2					
2057	30	42	150	0.2					
2058	8	8	28	0.2					
2059	8	6	30	0.2					
2060	8	4	34	0.2					
2061	6	4	24	0.2					
2062	8	4	34	0.2					
2063	16	2	30	0.2					
2064	14	4	26	0.2					
2065	14	8	30	0.2					
2066	28	22	80	0.2					
2067	20	20	100	0.2					
2068	24	12	96	0.2					
2069	16	46	210	0.2					
2070	20	48	220	0.2					
2071	26	66	430	0.8					
2072	26	62	290	0.2					

Sample Number (Location)	Soil								
	Cu	Pb	Zn	Ag	Ba	Mo	Hg		
7073	26	48	250	0.2					
7074	22	74	340	0.2					
7075	22	82	380	0.2					
7076	24	72	330	0.4					
7077	20	48	250	0.2					
7078	20	52	210	0.2					
7079	20	40	160	0.2					
7080	26	32	130	0.2					
7081	38	52	160	0.4					
7082	14	12	60	0.2					
7083	16	8	62	0.2					
7084	16	14	54	0.2					
7085	20	18	80	0.2					
7086	24	22	120	0.4					
7087	22	36	120	0.2					
7088	20	24	86	0.2					
7089	16	30	66	0.2					
7090	8	10	34	0.4					
7091	14	12	52	0.2					

Sample Number (Location)	Soil								
	Cu	Pb	Zn	Ag	Ba	Mo	Hg		
7092	14	12	52	0.2					
7093	28	32	136	0.2					
7094	46	40	160	0.2					
7095	16	16	46	0.2					
7096	20	10	26	0.2					
7097	16	18	38	0.4					
7098	20	4	32	0.6					
7099	16	4	56	0.2					
2100	16	8	54	0.2					
2101	20	6	100	0.2					
2102	38	48	160	0.6					
2103	32	38	160	0.4					
2104	38	38	140	0.2					
2105	14	10	56	0.2					
2106	20	10	60	0.2					
2107	20	14	64	0.2					
2108	32	24	120	0.4					
2109	24	16	80	0.4					
2110	22	20	80	0.2					

Sample Number (Location)	Soil								
	Cu	Pb	Zn	Ag	Ba	Mo	Hg		
2111	28	24	110	0.2					
2112	30	32	160	1.0					
2113	38	32	200	0.4					
2114	38	40	160	0.2					
2115	44	52	190	0.6					
2116	16	18	76	0.2					
2117	16	10	56	0.2					
2118	14	22	130	0.2					
2119	20	20	78	0.2					
2120	16	14	100	0.2					
2121	140	20	490	4.8					
2122	100	70	460	32					
2123	60	10	280	2.0					
2124	54	4	250	1.2					
2125	40	6	180	1.0					
2126	82	10	260	1.8					
2127	130	12	280	3.2					
2128	140	220	1600	3.2					
2129	160	56	800	6.4					

Sample Number (Location)	Soil								
	Cu	Pb	Zn	Ag	Ba	Mo	Hg		
2130	74	48	340	1.4					
2131	66	12	200	1.8					
2132	36	8	120	1.6					
2133	82	8	800	3.2					
2134	52	10	240	2.2					
2135	76	4	190	3.6					
2136	64	8	220	2.8					
2137	26	2900	7000	0.2					
2138	16	32	160	0.2					
2139	20	10	66	0.2					
2140	20	14	48	0.2					
2141	70	12	56	0.2					
2142	24	16	58	0.2					
2143	26	16	76	0.4					
2144	20	12	68	0.2					
2145	26	14	160	0.6					
2146	50	40	220	1.6					
2147	14	8	70	0.2					
2148	74	22	230	2.8					

Sample Number (Location)	Soil								
	Cu	Pb	Zn	Ag	Ba	Mo	Hg		
2149	88	18	290	2.0					
2150	28	22	160	0.2					
2151	22	18	130	0.2					
2152	22	20	140	0.2					
2153	36	18	250	1.0					
2154	20	20	130	0.2					
2155	20	10	170	0.2					
2156	16	8	60	0.2					
2157	18	10	66	0.2					
2158	22	14	120	0.2					
2159	20	14	100	0.2					
2160	16	16	62	0.2					
2161	10	6	32	0.2					
2162	12	34	500	0.2					
2163	22	70	310	0.2					
2164	28	20	46	0.6					
2165	30	20	60	0.4					
2166	20	18	64	0.4					
2167	22	24	72	0.4					

Sample Number (Location)	Soil								
	Cu	Pb	Zn	Ag	Ba	Mo	Hg		
2168	18	8	34	0.4					
2169	20	2	36	0.2					
2170	16	6	30	0.4					
2171	26	8	65	0.4					
2172	24	58	290	0.6					
2173	52	160	460	2.6					
4500	100	22	440	3.4					
4501	70	20	330	2.2					
4502	62	12	290	1.8					
4503	24	6	150	0.2					
4504	110	22	270	2.6					
4505	56	17	130	1.2					
4506	18	10	100	0.4					
4507	150	42	600	5.6					
4508	58	18	320	2.0					
4509	64	18	130	1.2					
4510	10	2	72	0.2					
4511	24	6	80	0.6					
4512	100	14	310	0.6					

Sample Number (Location)	Soil Cu	Pb	Zn	Ag	Ba	Mo	Hg		
4513	52	14	250	1.8					
4514	44	8	140	1.4					
4515	46	12	130	0.3					
4516	12	12	120	0.2					
4517	38	8	110	0.4					
4518	8	2	50	0.2					
4519	20	32	240	0.2					
4520	24	8	100	0.4					
4521	4	10	200	1.4					
4522	62	8	140	2.4					
4523	30	22	160	1.0					
4524	28	24	340	0.2					
4525	10	14	140	0.2					
4526	14	18	170	0.2					
4527	12	4	60	0.2					
4528	14	4	70	0.2					
4529	16	8	64	0.2					
4530	12	6	50	0.2					
4531	16	10	120	0.2					

Sample Number (Location)	Soil Cu	Pb	Zn	Ag	Ba	Mo	Hg		
4532	14	8	44	0.2					
4533	14	6	82	0.2					
4534	16	6	56	0.2					
4535	18	6	60	0.2					
4536	12	4	66	0.2					
4537	12	18	140	0.2					
4538	20	16	140	0.2					
4539	14	12	120	0.4					
4540	10	2	150	0.2					
4541	14	24	170	0.2					
4542	12	8	80	0.2					
4543	12	4	86	0.2					
4544	12	10	70	0.2					
4545	16	8	64	0.2					
4546	14	6	50	0.4					
4547	12	6	32	0.2					
4548	12	4	90	0.2					
4549	12	14	120	0.2					
4550	12	14	120	0.2					

Sample Number (Location)	Soil Cu	Pb	Zn	Ag	Ba	Mo	Hg		
4551	12	30	210	0.2					
4552	14	20	140	0.2					
39701	22	12	66	0.2	600				
39702	18	6	38	0.2	420				
39703	22	12	32	0.2	400				
39704	16	6	32	0.2	340				
39705	20	24	70	0.2	480				
39706	20	28	88	0.2	500				
39707	20	20	54	0.2	500				
39708	18	14	46	0.2	660				
39709	18	8	28	0.2	520				
39710	20	16	58	0.2	620				
39711	22	14	74	0.2	460				
39712	38	42	1600	0.2	520				
39713	16	30	600	0.2	280				
39714	26	16	80	0.2	580				
39715	18	16	58	0.2	580				
39716	16	14	58	0.2	620				
39717	16	12	48	0.2	580				

120

Sample Number (Location)	Soil Cu	Pb	Zn	Ag	Ba	Mo	Hg		
39718	20	12	78	0.2	640				
39719	18	14	62	0.2	660				
39720	16	16	76	0.2	540				
39721	18	16	140	0.2	540				
39722	18	44	360	0.2	580				
39723	20	88	2000	0.2	460				
39724	20	26	700	0.2	580				
39725	28	34	3400	0.2	680				
39726	20	42	650	0.2	680				
39727	20	14	170	0.2	640				
39728	18	16	74	0.2	600				
39729	16	20	76	0.2	580				
39730	16	14	64	0.2	680				
39731	16	12	54	0.2	600				
39732	26	500	9000	0.2	400				
39733	32	450	6500	0.2	460				
39734	26	86	3800	0.2	440				
39735	24	170	460	0.2	6800				
39736	30	66	280	0.2	6300				

Sample Number (Location)	Soil Cu	Pb	Zn	Ag	Ba	Mo	Hg		
39737	20	14	200	0.2	2140				
39738	24	52	240	0.2	1420				
39739	56	8	220	0.2	320				
39740	28	24	180	0.2	7200				
39741	26	12	56	0.2	6600				
39742	22	38	240	0.2	640				
39743	40	6	140	0.2	1890				
39744	20	34	180	0.2	2960				
39745	22	40	280	0.2	2700				
39746	36	34	380	0.2	1820				
39747	30	30	280	0.2	1700				
39748	24	38	110	0.2	2180				
39749	14	22	130	0.2	2060				
39750	16	8	54	0.2	5500				
39526	96	16	240	1.6	2040				
39527	210	46	1400	3.8	2560				

Sample Number (Location)	Soil Cu	Pb	Zn	Ag	Ba	Mo	Hg		

APPENDIX C

ROCK GEOCHEMICAL RESULTS

SAMPLE NUMBER	Cu	Pb	Zn	Ag	Ba	Au	Hg	As	Sb	SAMPLE DESCRIPTION
169-82-R										
521	521	1170	2496	8.5	2790	7				-rusty weathering limestone with calcite/ankerite veins
526	14	20	25	0.5	230	3				-rusty weathering calcite/ankerite fault gouge with pyritic chert
528	4	10	5	0.3	1860	**L2				-highly silicified/ankeritized limestone with scarce pyrite cubes
529	17	13	10	0.3	-	L2				-white to pinkish quartz veins with minor pyrite and carbonate
530	75	16	80	0.4	750	4				-highly silicified/ankeritized fault gouge in limestone-minor pyrite
532	780	16	5	0.2		L2				-rusty weathering quartz vein with pyrite
533	15	12	20	0.2		L2				-pyritic chert (3-5% py)
534	64	100	475	1.4		4				-rusty pyritic shale (1-3% py)
535	4	10	10	0.3	17480	L2				-highly silicified limestone with minor (1-3%) pyrite
537	68	1900	295	0.7						-rusty fault gouge with minor galena
538	5960	40	20	2.0		35				-20 cm quartz vein in rusty quartzite/shale - py, ccp, mal., az.
545	247	20	30	0.1	600					-siltstone - check analysis
546	34	202	40	1.3	210					-intensely silicified/carbonatized, rusty limestone
547	6700	34	560	4.09*	130					-altered siltstone with malachite/azurite/pyrite in clacite veins
548	230	18	60	5.0	90					-intensely epidotized fault gouge
549	86	12	10	1.3	590					-red weathering polymictic conglomerate
550	29			0.2						-sheared, white calcite vein - no sulphides - green stain
551	24	36	10,000	0.8	370					-disseminated sph/gn in c.gr. recrystallized grey limestone (10-15% sph/gn)
552	44	800	3.16%	1.0	200					-similar to above but sulphides are confined to a single vein
553	4	40	1600	0.7	200					-sulphide poor recrystallized limestone
554	32	72	5.10%	1.2	200					-altered, recrystallized grey limestone with 20-25% sphalerite in calcite veins
555	4	24	1780	1.0	140					-sulphide poor, veined (ct) recrystallized limestone
556	2	22	730	0.9	140					-fine grained grey limestone with abundant veinlets of calcite
557	14	2760	2700	0.7	1310					-calcite cemented quartzite fault gouge with less than 1% galena
558	2	66	460	0.6	14700					-calcite cemented limestone fault gouge - no sulphides

NOTES : all values reported in ppm except gold and mercury in ppb and those marked %

* denotes opt

** denotes less than

APPENDIX C (Cont.)

ROCK GEOCHEMICAL RESULTS

SAMPLE NUMBER	Cu	Pb	Zn	Ag	Ba	Au	Hg	Sb					SAMPLE DESCRIPTION
559	2	38	120	0.6	820								-very fine grained grey siltstone(?), highly altered
560	4	24	2800	0.4	1280								-limestone fault breccia with less than 1% sulphides (sphalerite?)
561	2	20	185	1.0	460								-white, calcite cemented, grey limestone fault breccia, no sulphides
562	2	10	200	0.6	1320								-highly altered recrystallized grey limestone
563	2	36	90	0.6	5.4%								-altered limestone - calcite and barite veins
564	4	12	30	0.4	7.4%								-barite vein in highly altered limestone
565	4	54	450	0.2	3430								-quartz/calcite cemented, dark, fine grained limestone - no sulphides
566	8	86	300	0.3	1100								-similar to above
567	16	1280	370	9.5	530								-intensely brecciated and carbonatized quartzite fault gouge
568	4	20	30	0.2	570								-similar to above - less alteration
569	84	22	20	0.3	320								-foliated, coarsely veined altered quartzite with hematite
570	1	8	30	0.3	460								-green weathering light green massive rock - epidote
571	2	10	20	0.2	13.0%								-intensely altered (barite) limestone or quartzite fault gouge
572	2	20	810	0.7	2690								-quartz/calcite veins in extensively veined, grey limestone
573	2	4	60	0.6	960								-similar to above but with sulphide weathering pits
574	308	24	110	0.4	580								-epidote sample from fault with few remnant sulphides
575	6	16	270	0.7	1290								-heavily veined/brecciated siltstone/dolostone - veins are barren
576	4	16	75	0.5	360								-calcite cemented, brecciated, fetid dolostone/limestone
577	4	20	310	0.5	1060								-heavily veined/brecciated grey dolostone/limestone
578	570	1.46%	19.00%	17.0	1000								-highly brecciated (quartz/calcite), extensively altered, laminated grey siltstone (10-20% sulphides)
579	30	284	2640	0.6	550								-extensively dolomitized, grey rock, original rock type unknown
580	6	48	470	0.4	10250								-extensively chloritized/silicified rock; original rock type unknown, minor barite
581	86	236	1700	0.9	460								-grey weathering, brecciated, dark grey siltstone - veinlets of calcite/dolomite
582	24	52	500	0.7	3020								-grey to dark weathering black, organic-rich cherty shale
583a	78	26	510	1.6	1510								-as above
583b	82	64	780	1.4	-								-as above
584	40	20	240	1.2	1490								-black shale, laminated, no rust, neg. zinc zap

NOTES : See page 1

APPENDIX C (Cont.)

ROCK GEOCHEMICAL RESULTS

SAMPLE NUMBER	ELEMENTS Cu	Pb	Zn	Ag	Ba	Au	Ag	Sb					SAMPLE DESCRIPTION
585	108	12	215	1.6	1240								-very black, organic-rich fissile shale - scarce graptolites, neg. zinc zap
586	66	22	400	1.4	1350								-black fissile shale, organic-rich, with white coating, neg. zinc zap
587	26	18	165	1.1	1560								-as above
1061	32	42	130	3.4	690	23							-interbedded black siltstone/shale
1062	84	32	160	3.0	-	16							-fault gouge
1063	620	200	170	2.2	-	11							-calcite vein with green stain
1064	57	36	260	2.7	350	7							-black chert with rusty bands
1065	40	56	240	2.8	-	L2							-fault gouge
1066	60	108	65	15.5	5450	74							-black siltstone
1067	29	24	70	1.4	-	14							-fault breccia
1068	44	42	90	-	2180								-black chert
1069	30	28	210	-	780								-black chert with pyrite
1070	48	30	30	-	4690								-as above
1071	28	44	25	0.8	11810	25							-highly weathered quartz/calcite vein (+ barite?)
1073	9	26	10	0.4	1440	9							-calcite vein
1074	9	24	10	0.4	750	7							-calcite vein with grey laminations
1075	12	20	20	-									-dark grey to black chert
1076	12	22	30	-	420								-dark grey limestone
1077	20	20	100	-									-dark grey chert
1078	68	70	620	-									-black chert with calcite vein
1079	10	28	115	0.3	370	4							-quartz vein
1080	104	4160	-	3.0	-	8							-calcite crystals in fault gouge
1081	22	46	85	-	1190								-black, rusty weathering chert
1082	21	174	1280	-									-black, rusty chert
1086	9	32	35										-dark grey siltstone
1088	10	30	15										-dark grey limestone
1092	6	20	10	0.3	280	3							-sheared, white calcite vein
1093	72	28	10	1.3	720	6							-fault gouge

NOTES : See bottom of page 1.

APPENDIX C (Cont.)

ROCK GEOCHEMICAL RESULTS

SAMPLE NUMBER	ELEMENTS Cu	Pb	Zn	Ag	Ba	Au	As	Sb	Hg				SAMPLE DESCRIPTION	
1094	18	18	10	0.3	180	L2							-quartzite with minor pyrite	
1095	3	14	20	0.7	240	L2							-green fault gouge	
1097	15	30	35	-	390								-grey siltstone	
1098	58	24	65	-	440								-grey siltstone	
1099	11	24	25	-	270								-dark grey fissile siltstone	
1100	12	20	60	-	560								-foliated black shale	
1102	8	16	10	0.1	140	L2	12						-fault gouge	
1103	20	260	1310	1.5	980	2	25						-carbonate vein material - 5-10% sulphides	)
1104	13	545	1120	1.4	730	L2	62						-as above - 5% sulphides	)
1105	8	324	2940	0.5	15410	2	21						-chip sample (3 m) across carbonate vein (bottom of vein)	)
1106	6	88	945	0.3	710	5	12						-dark grey laminated shale beside carbonate vein	)
1107	16	96	3000	0.3	49.0%	L2	15						-rusty (3% sulphide), calcite/barite vein	) Quartz/Carbonate Vein
1108	4	8	100	0.2	40.0%								-composite sample of barite vein	)
1109	99	1220	10000	0.9	6590								-galena bearing carbonate vein (5% sulphides)	)
1110	20	2810	8100	1.3	4660								-chip sample across top of vein (3 m wide)	)
1121	11	170	535	0.1	1630	8	10						-calcite vein from base of trench (see Map 2, Note 3)	)
1122	10	136	305	0.3	1110								-dark grey, fine grained limestone with tiny calcite veins	)
1123	24	78	240	0.4	1510								-dark grey, argillaceous limestone	) Trench Samples
1124	20	16	70	0.4	1130								-dark grey, fissile shale	) L11,200
1125	19	48	195	0.6	1720								-calcareous black chert (?) with scarce calcite veins	) 10,950E
1126	45	40	115	0.3	1470								-dark grey limestone with calcite veinlets	
1127	5.50%	2.90%	8200	31.0	1340	5	15	30	3600				-fault gouge with malachite/azurite stain	
													-calcite vein with few sulphides	

NOTE : See bottom of page 1

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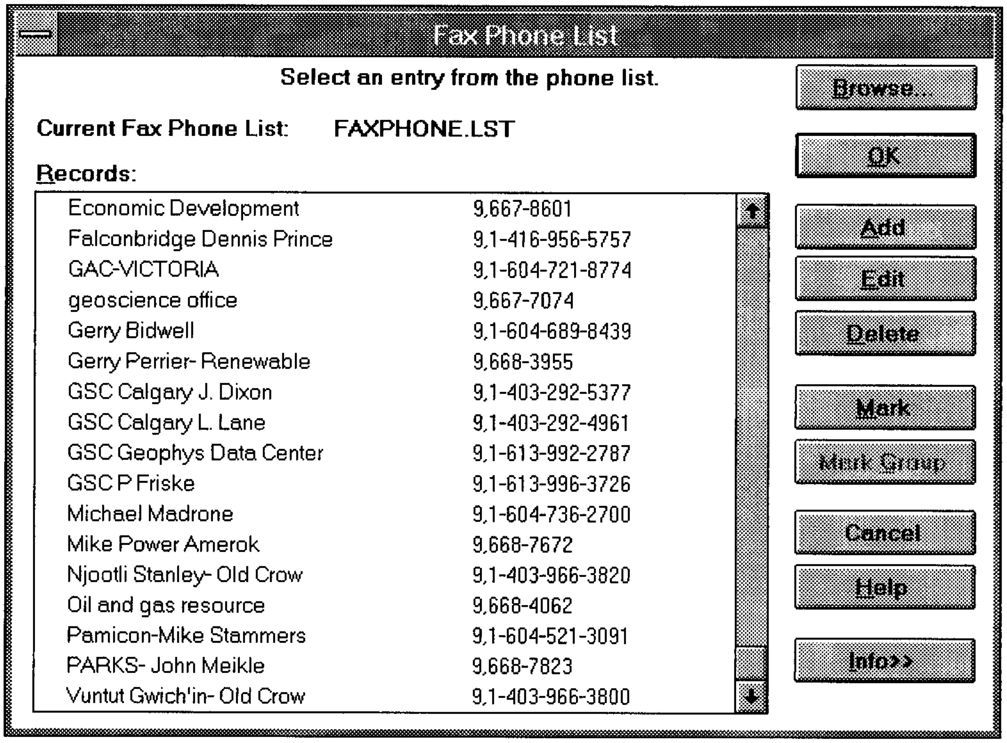

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Economic Development 9,667-8601
Falconbridge Dennis Prince 9,1-416-956-5757
GAC-VICTORIA 9,1-604-721-8774
geoscience office 9,667-7074
Gerry Bidwell 9,1-604-689-8439
Gerry Perrier- Renewable 9,668-3955
GSC Calgary J. Dixon 9,1-403-292-5377
GSC Calgary L. Lane 9,1-403-292-4961
GSC Geophys Data Center 9,1-613-992-2787
GSC P Friske 9,1-613-996-3726
Michael Madrone 9,1-604-736-2700
Mike Power Amerok 9,668-7672
Njootli Stanley- Old Crow 9,1-403-966-3820
Oil and gas resource 9,668-4062
Pamicon-Mike Stammers 9,1-604-521-3091
PARKS- John Meikle 9,668-7823
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Date:	Time:	Name:	Phone #:	Status:
06-26-95	11:16 AM	Dave Downing -Oil an	9,668-4062	OK
06-26-95	10:36 AM	GSC P Friske	9,1-613-996-3726	OK
06-23-95	11:57 AM	Mike Power Amerok	9,668-7672	OK
06-22-95	05:08 PM	Gerry Bidwell	9,1-604-689-8439	OK
06-22-95	05:01 PM	Gerry Bidwell	9,1-604-689-8439	Error
06-22-95	01:52 PM	kelly	9,668-7758	OK
06-20-95	09:01 AM	Anne Tempelman-Kluit	9,1-604-224-5582	OK

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GSC Calgary L. Lane	9,1-403-292-4961

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TOUCHE 1-56 CLAIMS

GEOLOGY MAP

NORANDA EXPLORATION COMPANY LIMITED

091403

MAP 1

LEGEND

ORDOVICIAN SILURIAN

3 ROAD RIVER FORMATION
- a Limestone and minor shale
- b Siltstone
- c Black graptolitic shale, chert and limestone

2 UNNAMED CLASTIC FORMATION
- a Grey shale
- b Black shale

MIDDLE CAMBRIAN

1 UNNAMED CLASTIC FORMATION
- a Quartzite (pyritiferous)
- b Chert pebble conglomerate
- c Quartzite and shale
- d Limestone and calcareous mudstone
- e Conglomerate (lithic)
- f Interbedded sandstone, siltstone and shale

SYMBOLS

- Outcrop (large, small)
- Regolith
- Bedding with attitude
- Foliation with attitude
- Fold axis with plunge
- Anticline, Syncline
- Geological contact (defined, assumed)
- Fault (defined, with relative movement and downthrown side: interpreted)
- Vein (Ct-calcite: Qt-quartz: Bt-barite)
- Claim boundary
- Soil grid baseline with crosslines
- Stream

SCALE

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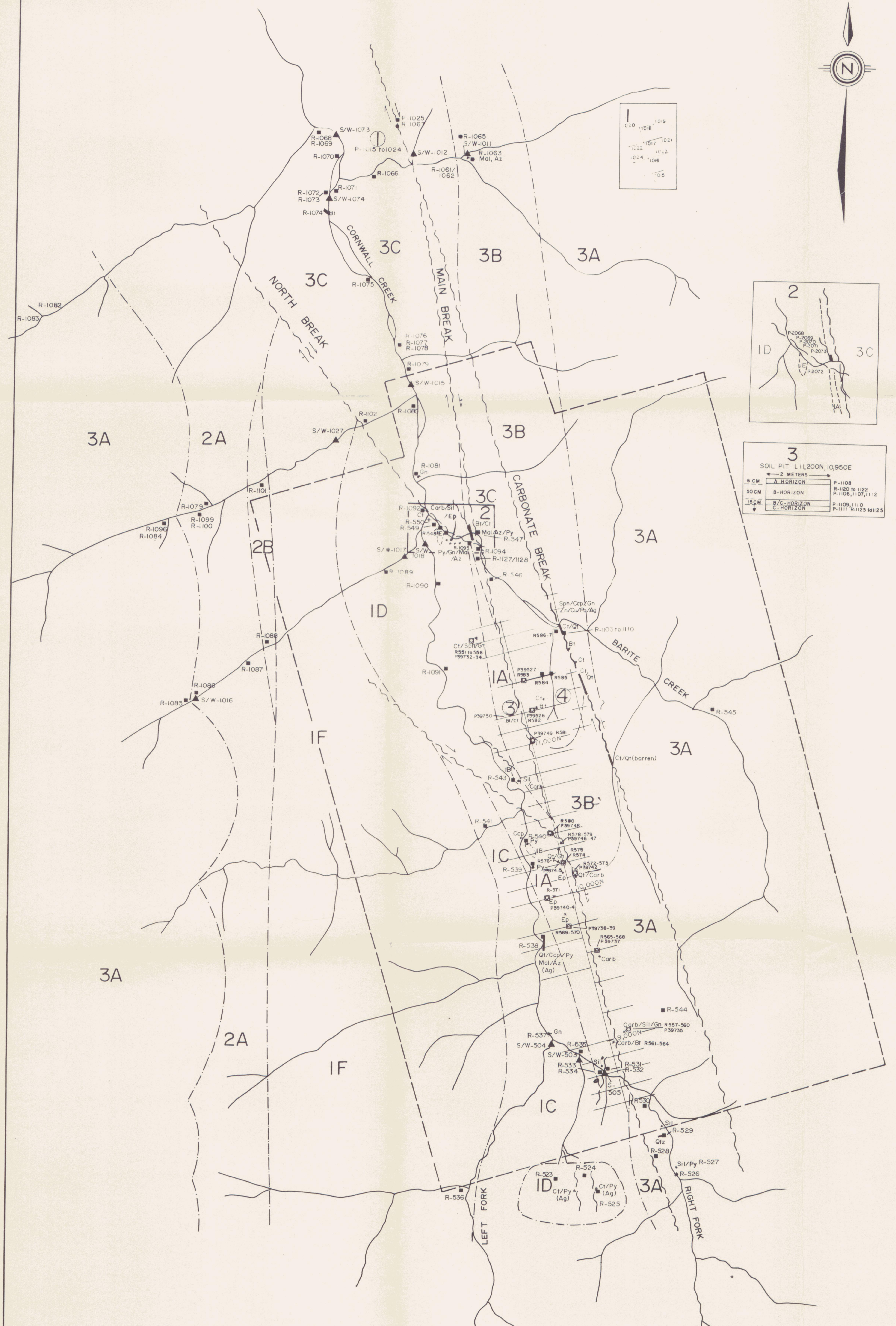

TOUCHE 1-56 CLAIMS SAMPLE AND MINERAL OCCURRENCE LOCATION MAP

091403

NORANDA EXPLORATION COMPANY LIMITED

MAP 2

LEGEND

ORDOVICIAN SILURIAN

3 ROAD RIVER FORMATION
- a Limestone and minor shale
- b Siltstone
- c Black graptolitic shale, chert and limestone

2 UNNAMED CLASTIC FORMATION
- a Grey shale
- b Black shale

MIDDLE CAMBRIAN

1 UNNAMED CLASTIC FORMATION
- a Quartzite (pyritiferous)
- b Chert pebble conglomerate
- c Quartzite and shale
- d Limestone and calcareous mudstone
- e Conglomerate (lithic)
- f Interbedded sandstone, siltstone and shale

SYMBOLS

- Anticline
- Geological contact
- Fault (with relative movement and downthrown side)
- Mineral occurrence (vein, outcrop, float)
- Claim boundary
- Soil grid baseline with crosslines
- Stream

Cu–Copper	Pb–Lead
Zn–Zinc	Ag–Silver
Ba–Barium	
Az–Azurite	Mal–Malachite
Bt–Barite	Ct–Calcite
Py–Pyrite	Qt–Quartz
Sil–Silicification	
Carb–Carbonatization	
Ep–Epidotization	

- Rock sample
- Soil sample
- Silt sample
- Soil/Rock pit

NOTES

1 See sketch this map.
2 See sketch this map.
3 See sketch this map.
4 Sample locations and numbers on maps 3 and 4
5 Soil/Rock pit descriptions in text.

SCALE

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NORANDA EXPLORATION CO LTD
MAP 3
YUKON TOUCHE PROJECT
TOUCHE CLAIMS GRID
SOIL SAMPLE LOCATION MAP
091403
DATE OCTOBER 1982
SCALE OF METERS
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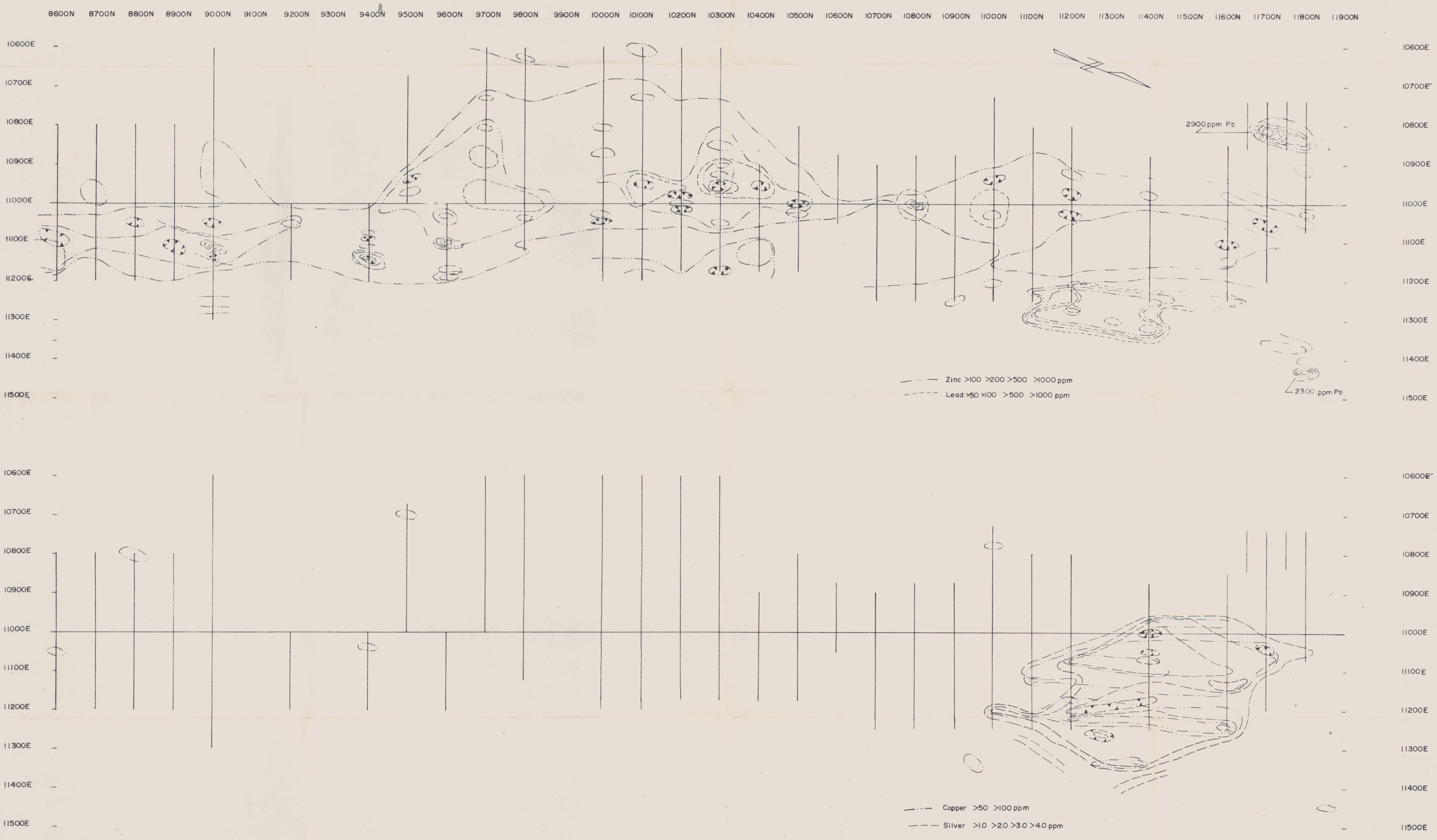

NORANDA EXPLORATION CO. LTD.

YUKON TOUCHE PROJECT
TOUCHE CLAIMS GRID
MAP 4
SOIL GEOCHEMISTRY Cu, Pb, Zn, Ag, ppm

DATE OCTOBER 1982

SCALE OF METERS

0 50 100 200 300 400 meters