GEOLOGICAL AND GEOCHEMICAL REPORT

ON THE

ROO 1-7 CLAIM GROUP

LOCATED IN EAST KOOTENAY DISTRICT
FORT STEELE MINING DIVISION

N.T.S.: 82G/2W, 3E

49° 01'N LATITUDE
115° 00'W LONGITUDE

BY RICK KEMP
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(NO PERSONAL LIABILITY)
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NOVEMBER 1992

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1. LOCATION AND ACCESS

The Roo property is comprised of seven mineral claims totalling 134 units located in the Fort Steele Mining Division on NTS mapsheet 82G/2W,3E. The property is located approximately five kilometres northeast of the Roosville US-Canada border crossing and seventy kilometres southeast of Cranbrook, in the East Kootenay district of Southeastern British Columbia centered at 49° 01' North latitude and 115° 00' West longitude. (Figure - 1)

Access is obtained from Highway 93 which connects Cranbrook and Fernie to Northwestern Montana and passes within one kilometre to the west of the Roo-1 claim. A Forestry access road departs east off Highway 93 along Phillips Creek and together with spur roads provides good access to the Roo 1-3,6 and 7 mineral claims.

2. TOPOGRAPHY AND PHYSIOGRAPHY

The Roo 1-3, 6 and 7 claims lie almost entirely within the Phillips Creek drainage, confined mainly to the northwestern part of the watershed. The Roo 4 and 5 claims are partially confined to the Rainbow Creek drainage system. Topography is moderately steep with elevations over 2280 metres on the ridge which separates the Phillips - Rainbow Creek drainage from the Wigwam drainage on the Roo 2 and 5 claims. (Figure - 2)

Vegetation consists of lodgepole pine, Douglas Fir, Ponderosa Pine and alder with undergrowth best developed on north facing slopes.

3. PREVIOUS WORK

The first reported work on the Roo property dates from 1902, with four claims

> "on a lead which can be traced for miles along the mountain side. The ore is rich sulphide of copper with much black oxide, and lies between syenite and porphyry walls. The work for this year consists of: Georgia, shaft continued 10 feet; Copper Giant, 12 feet of shaft; Montana, 50 feet of tunnel, and Belle Vue, shaft continued to a depth of 50 feet" (BCDM, 1902).

These workings were directed at quartz-chalcopyrite-chalcocite-barite veins. No further work is documented until 1967, but Wolfhard (1967) reports a total of four short shafts, four adits up to 30 metres in length and six open cuts completed before 1940, with shipment of one carload of barite in the 1920's or 1930's.

In 1967, Cominco re-evaluated the copper occurrences for their porphyry potential with geological mapping, soil sampling and five bulldozer trenches. They concluded that the veins were economically uninteresting, but recognized significant stratabound disseminated mineralization associated with the contact between sandstone and stromatolitic dolomite (Wolfhard, 1967). However, Cominco believed the mineralization to be due to syenitic dyking and allowed their claims to lapse.

ROO 1-7 CLAIMS

PROPERTY LOCATION MAP

FORT STEELE MINING DIVISION, B.C.

0 100 200 MILES

0 100 200 300 KILOMETRES

NORANDA EXPLORATION

Drawn.	N.T.S.	Date.	FIG. No.
J. W.	82 G/2W,3E	JUNE, 1991	1.

The Roo 1-3 claims were staked in 1989 by Equity Engineering Ltd. and optioned to Teck Corporation Ltd. which carried out geological mapping, sampling, soil geochemical surveys and excavated eight backhoe trenches totalling 250 metres within an area 80m x 100m. Best results from the trenching program returned 1.93% copper and 579 ppm cobalt across 6.0 metres.

In 1990, Teck carried out additional geological mapping and sampling and drilled 605.6 metres of NQ core in eight holes. The drilling was carried out from three drill sites spaced approximately 570m apart on the Roo-1 claim. Copper mineralization was intersected in each of the 3 drill site areas with best results reporting 0.806% Cu over 11.0m core width. Teck dropped its option upon completion of the drill program.

In August 1991 Equity Engineering Ltd. expanded their land holdings to include the Roo 4-7 claims totalling 74 units.

4. OWNER-OPERATOR

All of the 134 units comprising the Roo property are currently owned by Noranda Exploration Company, Limited (no personal liability) and Norex is the operator of the property. (Figure - 2)

The following is a list of claims comprising the Roo property.

Claim Name	Record #	Anniversary Date	Owner
Roo-1	210596	Apr. 26/2000	Noranda Exploration Company, Limited
Roo-2	210597	Apr. 26/2000	Noranda Exploration Company, Limited
Roo-3	210598	Apr. 26/2000	Noranda Exploration Company, Limited
Roo-4	303598	Aug. 31/1994	Noranda Exploration Company, Limited
Roo-5	303599	Aug. 30/1994	Noranda Exploration Company, Limited
Roo-6	303600	Aug. 28/1995	Noranda Exploration Company, Limited
Roo-7	303601	Aug. 28/1995	Noranda Exploration Company, Limited

5. ECONOMIC POTENTIAL

Copper mineralization is confined to the upper portion of a sedimentary sequence characterized by conglomerates at the base grading upwards through mixed volcanics to pebbly quartzite. The sequence is capped by a prominent stromatolitic dolomite horizon.

All of the eight drill holes completed in 1990 by Teck Explorations Ltd. were collared below the stromatolite horizon leaving approximately 20 metres of potentially mineralized stratigraphy untested at the top of the sedimentary sequence. To date, wide space drilling over a strike length of 1200m has intersected encouraging copper and cobalt results in three drill holes. The zone remains open to extension in all directions.

6. REGIONAL GEOLOGY

The Belt/Purcell Supergroup comprises up to 15,000 metres of Middle Proterozoic clastic and carbonate sediments, which extend over the East Kootenay area of south-eastern British Columbia, northern Idaho and northwestern Montana. They were deposited in an intracratonic basin, which may have been related to rifting. In the Galton Range of the East Kootenays, on the eastern margin of the Rocky Mountain Trench, this sequence consists of Helikian sandstones, argillites and dolomites (Figure 3).

The Siyeh Formation (Unit 7) is composed predominantly of fine-crystalline dolomite and limestone, with thin upper and lower members of green argillite. Overlying the Siyeh Formation are up to 180 metres of basaltic flows (Unit 5b) termed the "Purcell Lavas" by Price (1961) and the "Nicol Creek formation" by Hoy and Carter (1988). This unit includes pillowed, vesicular or amygdaloidal flows ranging from andesite to basalt in composition.

The Sheppard Formation (Unit 8), termed the "lower member of the Gateway Formation" by Leech (1960) and subdivided into the Snowslip and Sheppard Formation by Whipple (1984), unconformably overlies the Nicol Creek Formation, with a total thickness of approximately 50 metres. It consists of a basal conglomerate overlain by "light-coloured, dolomitic and quartzitic, fine-or medium-grained quartz sandstone, dolomite and oolitic dolomite (Whipple's Snowslip Fm.). The upper part (Whipple's Sheppard Fm.) comprises light-coloured very fine crystalline dolomite, sandy and silty dolomite, and stromatolitic dolomite with minor amounts of dolomitic sandstone" (Price, 1961).

The Gateway Formation upper member (Unit 8) is composed of about 300 metres of greenish grey and grey argillaceous siltstones in thin beds with partings of red argillite. Salt casts, mud-cracks, ripple marks and intraformational conglomerates are common.

The Phillips Formation (Unit 9) consists of 200 metres of red and purplish red quartz sandstone and siltstone, with partings of argillite and micaceous argillite. These are gradational into the overlying Roosville Formation (Unit 10), which consists of over 1000 metres of green and grey argillite, siltstone and sandstone with lesser argillaceous and stromatolitic dolomite.

7. PROPERTY GEOLOGY

A total of eighteen man days were spent on the Roo property between July 12th to July 27th and August 9th and 10th, 1992.

A total of 11.2 km of stratigraphic mapping focused on evaluating the Lower Sheppard horizon, host to copper sulphide enrichment, and to understand its relations to the surrounding stratigraphy and controls of mineralization. The results of the 1992 mapping program are illustrated on figure 4 at 1:10,000 scale.

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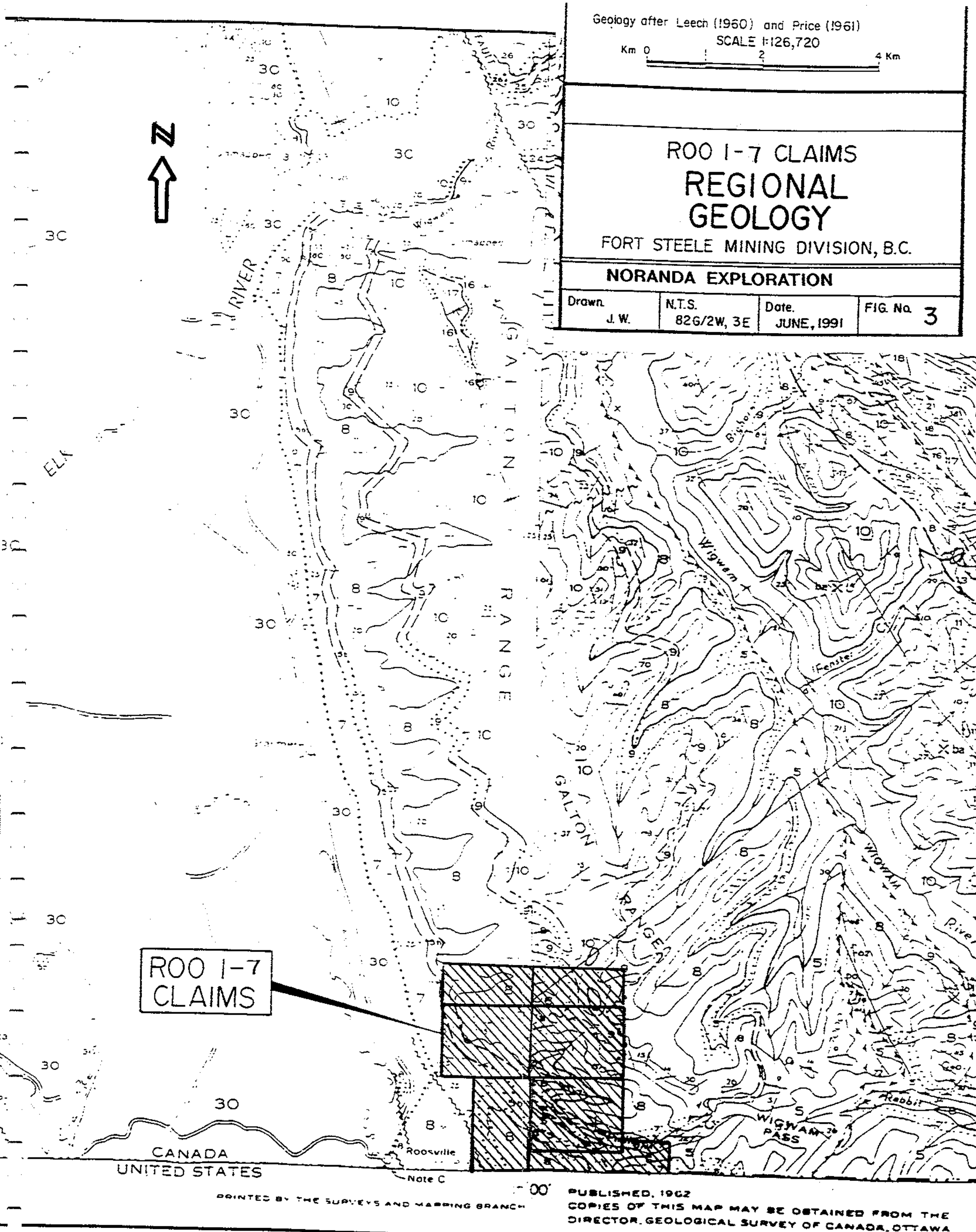
Geology after Leech (1960) and Price (1961)
SCALE 1:126,720
Km 0 1 2 4 Km
ROO 1-7 CLAIMS
REGIONAL GEOLOGY
FORT STEELE MINING DIVISION, B.C.
NORANDA EXPLORATION
Drawn. J. W.
N.T.S. 82G/2W, 3E
Date. JUNE, 1991
FIG. No. 3
N
ROO 1-7 CLAIMS
ELK RIVER
GALTON RANGE
WIGWAM RIVER
WIGWAM PASS
Roosville
CANADA
UNITED STATES
Note C
PRINTED BY THE SURVEYS AND MAPPING BRANCH
PUBLISHED, 1962
COPIES OF THIS MAP MAY BE OBTAINED FROM THE DIRECTOR, GEOLOGICAL SURVEY OF CANADA, OTTAWA

A description of the property geology is as follows;

The Siyeh Formation (Unit 7) consisting mainly of buff/brown to light orange-green weathering is the oldest formation exposed on the property. The unit is thinly laminated with alternating beds of grey-black argillite and green to buff colored dolomitic siltstone and sandstone. Locally beds of dolomitic limestone exhibit molar tooth structures and is interbedded with dark grey or black argillite. Ripple marks, mud cracks and flute casts are present. The top of the Siyeh is exposed in contact with the overlying Upper Shepphard Fm on the properties eastern border along stratigraphic section #S-16.

The Purcell lavas (Unit 5b) lie conformably above the Siyeh sediments. In the Phillips Creek area the unit has a dark green and purple to reddish hue and typically forms high relief outcrops. The lowest exposed member is a porphyritic andesite containing aggregates of tabular and radiating plagioclase phenocrysts up to 8cm long. The unit grades up section into amygdaloidal flows.

Intraformational agglomerate and volcanic sandstone is present in the upper portions of the sequence and consists of lenticular beds of angular to sub rounded volcanic detritus. The base of the Purcell lava is not exposed and where mapped is at least 200m thick. A conspicuous thinning of the unit occurs to the east of the claim group where it eventually pinches out against the underlying Siyeh Fm west of stratigraphic section #S-17.

The succeeding Shepphard Formation unconformably overlies the Purcell lavas and can be subdivided into three units.

The lower Shepphard (Unit 8c) varies from 13m to at least 76m in thickness where mapped and consists of a basal conglomerate with clasts of amygdaloidal basalt. Clasts reach 14cm in size, are subrounded and clast supported. The matrix consists of fine grained volcanic detritus and the unit is mottled grey-blue to purple in color. The basal conglomerate fines upward into an interbedded-volcanic pebbly sandstone and siltstone unit with a purple to reddish hue and exhibits rhythmic banding and graded bedding. Coarse fractions contain subrounded to subangular fragments dominated by volcanic clasts. Rare diagenetic pyrite crystals are found in siltstone interbeds.

On the Roo property, the top of the lower Shepphard horizon is characterized by arkosic sandstone and pebbly arkosic sandstone capped by a purple mudstone. The unit varies in thickness up to 55m, is recessive and is seen to pinch out to the east of stratigraphic section #S-1. The upper 20m of the unit is variably mineralized with chalcopyrite, pyrite, bornite, chalcocite and for the purpose of this report is referred to as the Roo Horizon (Unit 8b). The Roo Horizon consists of fine to medium grained arkosic sandstone which has a distinctive clotty ankerite and fracture controlled hematite alteration imparting a reddish-brown hue. The unit is composed of equigranular sand size particles, quartz (40%) and feldspar (60%). Arkosic sandstone is interbedded with coarse pebbly sandstone layers,

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is poorly sorted and non-graded. Subround to subangular polymictic fragments of quartz (70%) fine grained green (25%) and dark shard-like fragments (5%) to 3cm are matrix supported by arkosic sandstone. A pebbly quartzite dominates the upper portions of the sequence. The top of the Roo Horizon is capped by a purple mudstone and is fine grained and cross cut by randomly orientated ankerite filled dessication cracks.

The Upper Sheppard (Unit 8a) is marked by the first appearance of stromatolitic dolomite which is present across the property and ranges in thickness from 30m to 64m and forms highly resistant outcrop ridges.

The Upper Sheppard contains at least two distinct stromatolite horizons, one at its base and a second near the top of the sequence. These two units are separated by thickly bedded quartz arenite and minor argillite, siltstone and thinly bedded stromatolite horizons. Cross bedding and ripple marks are common in the section. A thinly bedded quartz arenite horizon caps the sequence, the top of which is recessive and not exposed.

The Gateway Formation (Unit 8) conformably overlays the Upper Sheppard Formation and attains a thickness of approximately 457m. Greenish grey and grey argillaceous siltstones are dominant and occur in thin beds with partings of dark red argillite. Abundant casts of cubic salt crystals, mud cracks and ripple marks are common to the section. The base of the Gateway is recessive lacking outcrop exposure.

7.1 DISCUSSION

Stratigraphic mapping along the Phillips Creek drainage basin has recognized a unique setting for the development of the Lower Sheppard horizon (8b,c) and copper sulphide enrichment.

A northerly trending, steep westerly dipping fault was active during the deposition of the lower Sheppard Formation and is hypothesized to be a rift related normal fault along the eastern edge of a north trending graben. This fault has down dropped stratigraphic sections S1-3, S8-S12, S14, and S19 on the western side relative to stratigraphic sections S4-S7 and S16-S18 on its eastern side. Approximately 80m of vertical displacement occurred during the deposition of the lower Sheppard Formation (8b,c) and possibly another 12m during the deposition of the Upper Sheppard Formation (8a). The Fault Scarp marked the edge of a basin during Lower Sheppard time allowing the deposition of a basal volcanic conglomerate and waterlain alluvial fan equivalent volcaniclastics, the Roo horizon and a purple mudstone. Vertical displacement along the fault diminished during deposition of the Upper Sheppard formation. The Gateway Formation and all units higher up section have not been displaced along the "Syn-Sheppard fault".

The Roo horizon lies entirely within the Lower Sheppard volcaniclastic basin, lying west of the Syn-Sheppard fault. It has been mapped in most stratigraphic sections which cut the Lower Sheppard Formation and may be present in the remaining lower Sheppard sections, however due to its recessive nature, it may not be exposed.

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Its thickness in individual stratigraphic sections is not proportional to the total thickness of the Lower Sheppard formation, rather, it appears to have cut into and reworked the pre-existing volcaniclastics.

From these observations the following sequence of events for deposition of the Phillip Creek stratigraphy on the Roo claim is proposed.

1) Deposition of the Siyeh Formation siltstones and dolomites (Unit 7)
2) Initiation of rifting, normal faulting between S-16 and S-17.
3) Extrusion of Purcell rift basalts and intraformational sediments into the rift basin (Unit 5b)
4) Continued normal faulting, formation of a subaerial fault (Syn-Sheppard fault) Scarp S4-S7. Weathering, hematization and erosion of the basalts forming the Scarp.
5) Deposition of hematized volcaniclastics in a subsiding fault-bounded basin west of S4 (conglomerate and interbedded pebbly volcanic sandstone and siltstone (Unit 8c)
6) Displacement diminishes along Syn-Sheppard fault. Topographic relief along fault scarp is small; erosion and clastic transport from scarp diminishes. Reworking of volcaniclastics in shallow marine environment, possibly in embayment (Roo horizon, Unit 8b)
7) embayment closes off, basin becomes lagoonal. Hematitic muds settle out to form purple mudstone of uniform thickness across basin.
8) Entire area gradually becomes emergent and algal matts cover the purple mudstone tidal flat and laps onto basalts to the east of S1. (Upper Sheppard, Unit 8a)
9) Deposition of copper and cobalt mineralization in the upper part of the Roo horizon in a sabkha environment.
10) Several transgression/regressive cycles occur along a near shore environment resulting in stromatolite horizons interbedded with subaerial quartz arenite dunal horizons (Unit 8a).
11) Subsidence of entire area. Upper stromatolite horizon covers sand dunes followed by uplift and subsequent deposition of quartz arenite capping the sequence.
12) Deposition of Gateway Formation (Unit 8) and later stratigraphy.
13) Synclinal warping about a northerly trending axis which follows, the crest of the Galton Range, East-West faulting along Phillips Creek displaces copper occurrences to the north and south.

7.2 MINERALIZATION

A total of 16 rock samples were collected and submitted for 28 element ICP and Au by AA. Sample locations are illustrated on figure-4, ICP Analysis are attached as Appendix II. Mineralization on the Roo claim group occur as;

1) disseminated grains of chalcocite, bornite, chalcopyrite and pyrite with elevated geochemically anomalous values in silver, and cobalt in the upper 20m of the Roo horizon (Unit 8b) hosted by arkosic sandstone and pebbly quartzite (Samples 1564-J, O. to S., 1566C-E)
2) fracture fillings of chalcopyrite in the lower stromatolite horizon (Unit 8a) within 1.0m of its basal contact.

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3) quartz barite veins contain chalcopyrite, barite, specular hematite and malachite.
4) finely disseminated chalcopyrite and malachite stained quartz arenite at the top of the Upper Sheppard formation (Unit 8a) (Samples 1564-K).

The most encouraging economic mineralization found to date is hosted by the upper portion of the Lower Sheppard "Roo" horizon. Drilling has not yet demonstrated a vertical copper zonation within the mineralized horizon, however, there does appear to be a lateral zonation developed where the primary sulphide mineral in each drill hole area becomes more copper rich and sulphur poor towards the west. Diamond drill holes R90-7,8 contain pyrite (chalcopyrite), R90-6 contain bornite (chalcopyrite) and holes R90-4,5 contain chalcocite without sulphides. This sulphide-oxide zonation is aligned roughly perpendicular to the trend of the lower Shepphard basin over a distance of 1200m.

Mineral zonation in sedimentary copper deposits generally parallels the shoreline and therefor the observed mineral zonation could probably extend to the north and south of the 1990 drill holes parallel to the Syn-Shepphard fault.

To the south of Phillips Creek chalcopyrite mineralization has been observed in a similar setting to that tested north of Phillips Creek as defined by Teck Exploration's 1990 drill program. Pebbly quartzites near the base of the lower stromatolite host chalcopyrite mineralization.

8.0 SOIL GEOCHEMICAL SURVEYS

A total of 103 soil samples were collected from the B horizon to depths of 10cm to 30cm along selected portions of compass and chain survey lines. The majority of this work was to the south of Phillips Creek where outcrop exposure is limited.

Soil samples were analyzed for 28 element ICP and gold by AA determination at Noranda's Vancouver Lab located at 1050 Davie Street, Vancouver. Results of the survey are plotted on figure-5 at 1:10,000 scale for copper only. Analytical results are attached as Appendix II.

Based on previous work, results of 50 ppm Cu or better are considered anomalous and worthy of follow-up. South of Phillips Creek three isolated and elevated copper trends are illustrated. The two northerly anomalies (51 ppm Cu to 578 ppm Cu) overlies the Roo Horizon (Unit 8b) where chalcopyrite in outcrop has been noted. The most southerly anomaly is located at the top of the upper Shepphard (Unit 8a) in contact with the overlying Gateway formation (Unit 8). All three anomalies are open west of section S-9 and east of section S-10.

Stratigraphic mapping on sections S-4,5 found trace disseminated chalcopyrite associated with interflow conglomerates and sediments of the Purcell lava. The anomalous soil results (70 ppm to 288 ppm Cu) reflects this local enrichment.

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Copper soil anomalies on sections S-1,2 (53 ppm Cu to 632 ppm Cu) overlie the Roo horizon where disseminated chalcopyrite has been located in outcrop.

Results south of Phillips Creek have outlined three isolated and elevated copper in soil responses which require follow up to determine the limits of these open ended anomalies.

9.0 CONCLUSION AND RECOMMENDATIONS

Detailed stratigraphic mapping on widely spaced centres has defined a north trending, steep west dipping normal fault which was active during the deposition of the Lower Sheppnard Formation.

The syn-Shepphard fault is thought to be a rift related structure along the eastern edge of a north trending graben. The copper-cobalt-silver enriched Roo horizon was developed to the west of the Syn-Shepphard Fault on its basin side in a sabkaa/lagoonal Red Bed environment.

Copper occurrences and drill hole information over a distance of 1200m from section S-1 to S-3 outlines a lateral metal zonation which becomes copper rich and sulphur poor from east to west and is roughly aligned perpendicular to the trend of the lower shepphard basin. Similar styles of metal zonation have been observed in sedimentary copper deposits which tend to parallel the shoreline of ancient basin environments.

Copper mineralization is best developed within the upper 20 metres of the lower Shepphard horizon and within 1 metre of the upper Shepphard's lower contact. A second copper bearing horizon occurs at the upper Shepphard contact. Both of these copper zones are recessive, easily weathered and poorly exposed. Previous drilling by Teck Exploration failed to test the full potential of the Roo horizon with collars located below the upper contact of the Lower Shepphard horizon.

To further evaluate the full potential of the copper bearing Roo horizon, drilling is recommended with collars located above the upper Shepphard formation on sections S1, S2, S3 and should extend at depth to the base of the lower Shepphard horizon. Based on results of the initial three hole program further drilling to the north is recommended to determine the Lower Sheppard basin geometry and copper-cobalt-silver mineralization.

Further work is required to the south of Phillips Creek where outcrop sampling and soil geochemistry has defined an anomalous copper bearing horizon. Soil geochemistry and prospecting/mapping is recommended to determine the limits of the copper anomaly with trenching in areas of limited exposure.

APPENDIX I

ANALYTICAL METHOD DESCRIPTIONS FOR GEOCHEMICAL ASSESSMENT REPORTS

ANALYTICAL METHOD DESCRIPTIONS FOR GEOCHEMICAL ASSESSMENT REPORTS

The methods listed are presently applied to analyses geological materials by the Noranda Geochemical Laboratory at Vancouver.

Preparation of Samples:

Sediments and soils are dried at approximately 80°C and sieved with a 80 mesh nylon screen. The -80 mesh (0.18 mm) fraction is used for geochemical analysis.

Rock specimens are pulverized to -120 mesh (0.13 mm). Heavy mineral fractions are analyzed in its entirety, when it is to be determined for gold without further sample preparation.

Analysis of Samples:

ICP analyses for 28 elements is determined using a Leeman PS3000. For silts and soils a 0.2 g sample is digested with 3 ml of $HClO_4/HNO_3$ at a ratio of 4:1. This digestion occurs for 4 hours at a temperature of 203°C. The resulting liquid is diluted to 11 ml with water. Pulps of rock or core are weighed out at 0.4 g, and chemical quantities are doubled relative to the above noted method for digestion. Otherwise the procedure remains the same.

Gold (Au) content is determined by atomic absorption (AA), not ICP. A 10 g sample is weighed and ashed at 590°C for 3 to 5 hours. After cooling, 35 mls of aqua regia ($1HNO_3:3HCl$) is added and the samples are digested on a hot plate for 2 hours, or until 15 mls of aqueous solution is left. Dilute with water to 100 mls and add 5 mls MIBK. Addition of MIBK extracts and pre-concentrates the gold from the aqueous solution. Following this step the MIBK solution is analyzed on the AA.

Detection limits (D.L.) and low range sensitivities (L.R.S.) for ICP and AA (Au only) analyses (Noranda Vancouver Laboratory).

Element	D.L.	L.R.S.	Element	D.L.	L.R.S.
Au (ppb)	5		K (%)	0.01	
Ag (ppm)	0.2		La (ppm)	1	
Al (%)	0.02		Li (ppm)	1	
As (ppm)	2	5	Mg (%)	0.01	
Ba (ppm)	1		Mn (ppm)	1	
Be (ppm)	0.1		Mo (ppm)	1	3
Bi (ppm)	2	5	Na (%)	0.01	
Ca (%)	0.1		Ni (ppm)	1	
Cd (ppm)	0.2	0.5	P (%)	0.01	
Ce (ppm)	5		Pb (ppm)	2	5
Co (ppm)	1		Sr (ppm)	1	
Cr (ppm)	1		Ti (%)	0.01	
Cu (ppm)	1		V (ppm)	2	
Fe (%)	0.1		Zn (ppm)	1	

ACME ANALYTICAL LABORATORIES LTD.
Assaying & Trace Analysis
852 E. Hastings St., Vancouver, B.C. V6A 1R6
Telephone: 253-3158

GEOCHEMICAL LABORATORY METHODOLOGY & PRICES - 1989

Sample Preparation

S80	Soils or silts up to 2 lbs drying at 60 deg.C and sieving 30 gms -80 mesh (other size on request)	$ .85
SJ	Saving part or all reject	.45
S20R	Soils or silts - drying at 60 deg.C and sieving -20 mesh & pulverizing (other mesh size on request.)	2.00
SP	Soils or silts - drying at 60 deg.C pulverizing (approx . 100 gms)	1.50
RP100	Rocks or cores - crushing to -3/16" up to 10 lbs, then pulverizing 1/2 lb to -100 mesh (98%)	3.00
Cr	Surcharge crushing over 10 lbs	.25/lb
2PX	Surcharge for pulverizing over 1/2 lb	1.00/lb
RPS100	Same as RP100 except sieving to -100 mesh and saving +100 mesh (200gms)	3.75
RPS100 1/2	Same as above except pulverizing 1/2 the reject - additional	1.00/lb
RPS100 A	Same as above except pulverizing all the reject - additional	1.00/lb
OP	Compositing pulps - each pulp Mixing & pulverizing composite.	.50 1.50
HM	Heavy mineral separation - S.G.2.96 + wash -20 mesh	12.00
V1	Drying vegetation and pulverizing 50 gms to -80 mesh	3.00
V2	Ashing up to 1 lb wet vegetation at 475 deg.C	2.00
H1	Special Handling	17.00/hr

Sample Storage

Rejects - Approx. 2 lbs of rock or total core are stored for three months and discarded unless claimed.

Pulps are retained for one year and discarded unless claimed.

Additional storage - for 3 years $10.00/1.2 cu.ft. box
or 15 cents/sample pulp
or 5 cents/sample soil

Supplies

Soil Envelopes	4" x 6"	$125.00/thousand
Soil Envelopes	4" x 6" with gusset	$140.00/thousand Plastic
Bags	7" x 13" 4 ml	$10.00/hundred
Plastic Bags	12" x 20" 6 ml	$ 20.00/hundred
Ties		$ 2.00/hundred
Assay Tags		N/C
10% HCl		$ 5.00/liter
Dropping bottles		$ 1.00/each
Zn Test	A & B	$ 12.00/each liter

Conversion Factors

1 Troy oz = 31.10 g
1 oz/ton = 34.3 ppm = 34.3 g/tonne = 34,300 ppb
1 % = 10,000 ppm

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Assaying & Trace Analysis
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Telephone: 253-3158

GEOCHEMICAL ANALYSES - Rocks and Soils

Group 1 Digestion

.50 gram sample is digested with 3 mls 3-1-2 HCl-HNO3-H2O at 95 deg.C for one hour and is diluted to 10 ml with water. This leach is near total for base metals, partial for rock forming elements and very slight for refractory elements. Solubility limits Ag, Pb, Sb, Bi, W for high grade samples.

Group 1A - Analysis by Atomic Absorption.

Element	Detection	Element	Detection	Element	Detection
Antimony*	2 ppm	Copper	1 ppm	Molybdenum	1 ppm
Bismuth*	2 ppm	Iron	0.01 %	Nickel	1 ppm
Cadmium*	0.1 ppm	Lead	2 ppm	Silver	0.1 ppm
Chromium	1 ppm	Lithium	2 ppm	Vanadium	2 ppm
Cobalt	1 ppm	Manganese	5 ppm	Zinc	2 ppm

First Element $2.25 Subsequent Element $1.00

Group 1B - Hydride generation of volatile elements and analysis by ICP.

This technique is unsuitable for sample grading over .5% Ni or Cu. Cu Massive Sulphide.

Element	Detection
Arsenic	0.1 ppm
Antimony	0.1 ppm
Bismuth	0.1 ppm
Germanium	0.1 ppm
Selenium	0.1 ppm
Tellurium	0.1 ppm

First Element $4.75 All Elements $5.50

Group 1C - Hg

Detection limit - 5 ppb Price $2.50

Hg in the solutions are determined by cold vapour AA using a F & J scientific Hg assembly. The aliquots of the extract are added to a stannous chloride/hydrochloric acid solution. The reduced Hg is swept out of the solution and passed into the Hg cell where it is measured by AA.

Group 1D - ICP Analysis

Element	Detection
Ag	0.1 ppm
Cd,Co,Cr,Cu,Mn,Mo,Ni,Sr,Zn	1 ppm
As,Au,B,Ba,Bi,La,Pb,Sb,Th,V,W	2 ppm
U	5 ppm
Al,Ca,Fe,K,Mg,Na,P,Ti	0.01 %

Any	2 elements	$3.25
	5 elements	4.50
	10 elements	5.50
All	30 elements	6.25

Group 1E - Analysis by ICP/MS

Element	Detection
Ga,Ge	1 ppm
Au,Bi,Cd,Hg,In,Ir,Os,Re,Rh,Sb,Te,Th,Tl,U	0.1 ppm

All Elements 15.00 (minimum 20 samples per batch or $15.00 surcharge)

Hydro Geochemical Analysis

Natural water for mineral exploration

26 element ICP - Mo,Cu,Pb,Zn,Ag,Co,Ni,Mn,Fe,As,Sr,Cd,V,Ca,P, Li,Cr,Mg,Ti,B,Al,Na,K,Ce,Be,Si				$8.00
F by Specific Ion Electrode	-	detection	20 ppb	$3.75
U by UA3	-	detection	.01 ppb	5.00
pH			.1 pH	1.50
Au	-	detection	.001 ppb	4.00

* Minimum 20 samples or $5.00 surcharge for ICP or AA and $15.00 surcharge for ICP/MS. All prices are in Canadian Dollars

ACME ANALYTICAL LABORATORIES LTD.
Assaying & Trace Analysis
852 E. Hastings St., Vancouver, B.C. V6A 1R6
Telephone: 253-3158

Group 2 - Geochemical Analysis by Specific Extraction and Instrumental Techniques

Element	Method	Detection	Price
Barium	0.100 gram samples are fused with .6 gm LiBO2 dissolved in 50 mls 5% HNO3 and analysed by ICP. (other whole rock elements are also determined)	10 ppm	$4.00
Boron	.5 g/Na2O2 fustion - 50ml in 20% HCl	2 ppm	4.00
Carbon	LECO (total as C or CO2)	.01 %	5.75
Carbon+Sulfur	Both by LECO	.01 %	6.50
Carbon (Graphite)	HCl leach before LECO	.01 %	8.00
Chromium	0.50 gram samples are fused with 1 gm Na2O2 dissolved in 50 ml 20% HCl, analysed ICP.	5 ppm	4.00
Fluorine	0.25 gram samples are fused with NaOH; leached solution is adjusted for pH and analysed by specific ion electrode.	10 ppm	4.50
Sulphur	LECO (Total as S)	.01 %	5.50
Sulphur insoluble	LECO (After 5% HCl leach)	.01 %	8.00
Tin	1.00 gram samples are fused with NH4I. The sublimed Iodine is leached with 5 ml 10% HCl, and analysed by Atomic Absorption.	1 ppm	4.00
Tl	.50 gram digested with 50% HNO3 - Dilute to 10 ml - graphite AA	.1 ppm	4.00
Tungsten	.50 gram samples are fused with Na2O2 dissolved in 20 ml H2O, analysed by ICP.	1 ppm	4.00

Group 3 - Geochemical Noble Metals

Element	Method	Detection	Price
Au*	10.0 gram samples are ignited at 600 deg.C, digested with hot aqua regia, extracted by MIBK, analysed by graphite furnace AA.	1 ppb	$ 4.50
Au** Pd, Pt, Rh	10.0 gram samples are fused with a Ag inquart with fire assay fluxes. After cupulation, the dore bead is dissolved and analysed by AA or ICP/MS.	1 ppb 2 ppb	6.00 - first element 2.50 - per additional 10.00 - for All 4

Larger samples - 20 gms add $1.50
30 gms add $2.50

Group 4A - Geochemical Whole Rock Assay

0.200 gram samples are fused with LiBO2 and are dissolved in 100 mls 5% HNO3.

SiO2, Al2O3, Fe2O3, CaO, MgO, Na2O, K2O, MnO, TiO2, P2O5, Cr2O5, LOI + Ba by ICP.

Price: $3.75 first metal $1.00 each additional $9.00 for All.

Group 4B - Trace elements

Element	Detection	Analysis	Price
Co,Cu,Ni,Zn,Sr	10 ppm	ICP	$3.75 first element or
Ce,Nb,Ta,Y,Zr	20 ppm	ICP	$1.00 additional to 4A $6.00 for All.

Group 4C - analysis by ICP/MS.

Be, Rb, Y, Zr, Nb, Sn, Cs, La, Ce, Pr, Nd, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu, Hf, Ta, W, Th, U

Detection: 1 to 5 ppm Price : $20.00 for All.

* Minimum 20 samples or $5.00 surcharge for ICP or AA and $15.00 surcharge for ICP/MS. All prices are in Canadian Dollars

APPENDIX II

ROCK AND SOIL GEOCHEMICAL RESULTS

ROCK SAMPLE DESCRIPTIONS

NORANDA VANCOUVER LABORATORY
Geochemical Analysis

Project Name & No.: ROO/EAST BELT – 121/145 Geol.: R.K. Date received: AUG. 13 LAB CODE: 9208–017
Material: 86 Soils & 10 Rx Sheet: 1 of 3 Date completed: AUG. 19
Remarks: * Sample screened @ –35 MESH (0.5 mm)
Organic, Δ Humus, S Sulfide Au – 10.0 g sample digested with aqua–regia and determined by A.A. (D.L. 5 PPB)

ICP – 0.2 g sample digested with 3 ml $HClO_4/HNO_3$ (4:1) at 203 °C for 4 hours diluted to 11 ml with water. Leeman PS3000 ICP determined elemental contents.

N.B. The major oxide elements and Ba, Be, Ce, La, Li, Ga are rarely dissolved completely from geological materials with this acid dissolution method.

T.T. No.	SAMPLE No.	Au ppb	Ag ppm	Al %	As ppm	Ba ppm	Be ppm	Bi ppm	Ca %	Cd ppm	Ce ppm	Co ppm	Cr ppm	Cu ppm	Fe %	K %	La ppm	Li ppm	Mg %	Mn ppm	Mo ppm	Na %	Ni ppm	P %	Pb ppm	Sr ppm	Ti %	V ppm	Zn ppm
54	S10 – 300	5	0.2	4.00	2	531	0.8	5	0.23	0.2	69	13	16	20	3.12	1.09	34	52	0.69	207	1	0.08	17	0.07	3	19	0.19	68	41
55	S10 – 325	5	0.2	3.87	2	675	0.8	5	0.29	0.2	51	11	15	20	2.93	0.67	23	47	0.47	455	1	0.19	16	0.30	6	19	0.22	56	46
56	S10 – 350	5	0.2	4.17	2	477	0.8	5	0.26	0.2	49	8	13	16	2.78	0.51	22	38	0.43	176	1	0.18	18	0.30	8	18	0.19	55	41
57	S14 – 000	5	0.2	4.85	2	305	0.8	5	0.20	0.2	44	11	11	14	3.05	0.53	18	34	0.37	604	1	0.24	20	0.17	5	16	0.20	55	43
58	S14 – 050	5	0.2	3.66	2	249	0.6	5	0.21	0.2	39	8	12	13	2.66	0.35	16	31	0.30	392	1	0.21	13	0.16	8	14	0.21	53	44
71	S19 – 000	5	0.2	4.67	2	531	0.9	5	0.20	0.2	52	13	16	24	3.53	0.67	26	44	0.76	144	1	0.11	22	0.06	4	21	0.17	61	43
72	25	5	0.2	4.43	2	463	0.8	5	0.19	0.2	48	12	14	21	3.48	0.84	23	41	0.74	248	1	0.11	21	0.10	3	15	0.16	60	46
73	S19 – 50	5	0.2	4.51	2	452	0.9	5	0.20	0.2	68	11	17	17	3.68	1.20	35	49	0.89	198	1	0.08	20	0.09	3	21	0.17	67	50
74	S19 – 75	5	0.2	5.27	2	791	1.0	5	0.25	0.2	66	11	16	19	3.82	1.11	32	53	0.88	233	1	0.07	24	0.12	7	23	0.20	70	59
75	100	5	0.2	4.26	2	604	0.9	5	0.20	0.2	66	9	13	14	3.16	1.01	30	41	0.73	136	1	0.07	18	0.05	5	16	0.15	57	36
76	125	5	0.2	3.79	2	342	0.9	5	0.12	0.2	73	8	12	13	2.89	1.30	34	45	0.79	102	1	0.03	15	0.04	2	10	0.11	54	31
77	162.5	5	0.2	4.32	2	516	0.9	5	0.22	0.2	69	8	15	14	2.93	1.10	32	45	0.71	183	1	0.08	17	0.10	6	17	0.16	58	39
78	S19 – 200	5	0.2	4.38	2	605	0.9	5	0.21	0.2	58	8	15	15	2.84	1.04	27	48	0.63	282	1	0.10	18	0.21	6	15	0.16	53	41
79	S19 – 225	5	0.2	3.71	2	363	0.9	5	0.13	0.2	73	8	13	14	2.57	1.29	33	46	0.78	102	1	0.03	14	0.04	4	8	0.11	53	27
80	S19 – 250	5	0.2	4.13	2	530	0.9	5	0.22	0.2	73	8	16	16	2.16	1.13	33	44	0.61	147	1	0.06	17	0.04	7	17	0.16	55	36

T.T. No.	SAMPLE No.	Au ppb	Ag ppm	Al %	As ppm	Ba ppm	Be ppm	Bi ppm	Ca %	Cd ppm	Ce ppm	Co ppm	Cr ppm	Cu ppm	Fe %	K %	La ppm	Li ppm	Mg %	Mn ppm	Mo ppm	Na %	Ni ppm	P %	Pb ppm	Sr ppm	Ti %	V ppm	Zn ppm
107	S23 – 000	35	0.2	4.56	2	1089	1.1	5	0.41	0.2	57	7	12	14	3.71	0.78	21	41	0.50	511	1	0.21	20	0.08	6	25	0.20	50	51
108	12.5	5	0.2	3.80	2	702	0.8	5	0.48	0.2	46	6	12	14	2.61	0.50	17	34	0.40	428	1	0.29	19	0.09	4	24	0.19	41	45
109	25	5	0.2	4.67	2	523	1.1	5	0.14	0.2	72	10	18	14	3.49	1.31	34	53	0.81	281	1	0.06	20	0.05	6	13	0.15	62	47
110	S23 – 37.5	5	0.2	4.99	2	888	1.0	5	0.33	0.2	63	9	19	21	3.26	0.89	29	48	0.62	294	2	0.15	24	0.06	7	25	0.23	63	72
111	S23 – 050	5	0.2	4.06	2	566	0.9	5	0.22	0.2	49	8	14	21	2.70	0.53	22	37	0.43	252	2	0.15	16	0.06	5	18	0.20	49	46
112	1500 – 50E	5	0.2	4.38	2	517	0.8	5	0.29	0.2	43	11	11	17	2.37	0.43	18	39	0.34	166	1	0.28	14	0.09	6	21	0.25	47	31
113	100	5	0.2	3.77	2	440	0.8	5	0.23	0.2	49	9	12	13	2.62	0.56	22	33	0.37	224	1	0.19	14	0.23	5	19	0.20	49	38
114	150	5	0.2	3.90	2	452	0.7	5	0.20	0.2	45	9	15	11	2.67	0.54	20	37	0.35	183	1	0.20	16	0.17	8	19	0.25	55	42
115	1500 – 200E	5	0.2	4.77	2	498	0.9	5	0.20	0.2	58	17	13	19	3.58	0.88	27	41	0.52	154	1	0.21	23	0.16	4	20	0.22	64	50
116	1500 – 250E	5	0.2	5.37	2	481	1.2	5	0.21	0.2	70	16	12	19	3.81	1.23	32	42	0.65	181	1	0.09	23	0.09	7	18	0.20	62	63
117	300	5	0.2	4.32	2	626	0.9	5	0.22	0.2	54	13	12	16	3.28	0.96	24	43	0.54	291	1	0.16	23	0.16	5	17	0.19	57	47
118	350	5	0.4	3.83	2	343	0.8	5	0.13	0.2	59	12	13	22	3.12	0.82	27	39	0.52	289	1	0.09	18	0.06	8	13	0.18	53	41
119	400	5	0.4	3.63	2	322	1.0	5	0.20	0.2	78	14	12	48	3.12	1.36	35	36	0.59	649	1	0.03	16	0.05	7	8	0.10	47	26
120	1500 – 450E	5	0.2	4.24	2	423	1.0	5	0.16	0.2	62	11	18	24	3.73	1.19	30	53	0.65	196	1	0.07	17	0.08	6	14	0.15	60	36
121	1500 – 500E	5	0.2	3.79	2	413	0.9	5	0.19	0.2	50	10	17	15	2.80	0.69	24	41	0.40	163	1	0.21	15	0.12	5	19	0.22	55	43
122	550	5	0.2	4.41	2	878	0.9	5	0.25	0.2	78	11	19	20	3.47	1.26	39	50	0.67	292	1	0.08	14	0.13	3	24	0.19	70	42
123	600	5	0.2	3.48	2	713	0.6	5	0.25	0.2	37	13	12	14	2.76	0.54	17	37	0.34	164	1	0.30	16	0.16	2	23	0.22	55	41
124	1500 – 650E	5	0.2	3.62	2	591	0.9	5	0.19	0.2	72	11	12	17	2.99	1.27	33	39	0.55	299	1	0.05	11	0.12	3	15	0.13	51	31
125	1505 – 50W	5	0.2	4.01	2	427	0.8	5	0.13	0.2	55	23	16	73	3.33	0.90	28	45	0.53	471	1	0.12	19	0.11	7	15	0.20	64	46
126	1505 – 100W	5	0.2	4.00	2	356	0.8	5	0.16	0.2	51	10	13	16	2.79	0.80	23	38	0.50	179	1	0.17	15	0.13	4	12	0.16	51	38
127	150	5	0.2	4.11	2	813	0.8	5	0.30	0.2	61	17	17	21	3.02	0.76	29	48	0.53	718	1	0.16	15	0.20	7	20	0.21	58	46
128	200	5	0.2	4.64	2	615	0.9	5	0.23	0.2	50	19	16	26	3.41	0.61	23	48	0.45	205	1	0.22	19	0.11	9	20	0.25	64	42
129	300	5	0.2	4.19	2	395	1.0	5	0.13	0.2	71	13	14	34	3.74	1.08	34	52	0.98	335	1	0.04	16	0.06	5	10	0.13	60	45
130	1505 – 350W	5	0.2	4.40	2	1017	0.9	5	0.44	0.2	69	39	16	51	3.26	0.71	29	43	0.57	911	1	0.14	21	0.15	9	23	0.19	56	43
131	1505 – 400W	5	0.4	4.61	2	1705	1.0	5	0.39	0.2	72	46	14	277	3.30	0.65	26	31	0.44	269	1	0.28	34	0.06	4	35	0.21	54	42
132	1505 – 450W	5	0.2	4.01	3	902	0.8	5	0.29	0.2	55	30	13	139	2.80	0.55	21	30	0.37	385	1	0.23	26	0.15	2	26	0.19	50	36

T.T. No.	SAMPLE No.	Au ppb	Ag ppm	Al %	As ppm	Ba ppm	Be ppm	Bi ppm	Ca %	Cd ppm	Ce ppm	Co ppm	Cr ppm	Cu ppm	Fe %	K %	La ppm	Li ppm	Mg %	Mn ppm	Mo ppm	Na %	Ni ppm	P %	Pb ppm	Sr ppm	Ti %	V ppm	Zn ppm
138	400W – 12.5	5	0.2	4.88	2	1625	1.2	5	0.47	0.2	90	76	16	230	4.27	0.89	34	43	0.53	729	2	0.24	38	0.08	13	32	0.23	62	45
139	25	5	0.4	5.42	8	2657	1.3	5	0.43	0.2	86	126	17	578	5.06	1.30	38	47	0.69	778	4	0.11	56	0.08	34	38	0.20	74	59
140	400W – 37.5	5	0.2	4.95	2	1007	1.5	5	0.24	0.2	102	21	17	110	4.83	1.47	47	48	0.80	677	1	0.05	26	0.07	9	18	0.15	69	38
141	400W – 50	5	0.2	4.68	2	473	1.3	5	0.14	0.2	78	14	17	53	4.07	1.70	38	50	0.82	230	1	0.04	18	0.05	2	13	0.13	65	33
142	1566 – A Rx	5	0.2	2.38	26	7160	1.5	9	10.47	0.2	118	30	77	365	3.12	1.59	32	32	6.14	2243	6	0.08	14	0.04	15	250	0.05	55	43
143	B	5	0.2	2.90	2	393	1.3	5	0.62	0.2	130	10	161	21	4.12	1.92	67	27	0.64	443	1	0.02	10	0.05	2	11	0.13	54	34
144	C	5	0.2	2.10	12	777	0.9	5	5.68	0.3	151	47	81	3865	1.95	1.34	52	17	3.27	939	4	0.04	16	0.04	7	69	0.04	46	13
145	D	5	0.2	4.23	14	388	1.1	5	1.35	0.2	106	48	83	2303	1.94	2.53	46	28	1.02	491	2	0.02	52	0.06	2	16	0.09	62	13
146	E	5	0.2	3.99	11	309	1.0	5	1.72	0.3	157	13	71	2294	1.77	2.38	71	25	1.16	455	5	0.03	21	0.05	6	18	0.08	55	11
153	1566 – J Rx	5	0.2	6.36	2	275	1.2	5	3.30	0.2	77	34	14	50	8.79	3.59	25	46	1.98	684	4	0.05	45	0.14	2	55	0.14	151	48

7205-017

White - Office
Yellow - Field

№ 1566

NORANDA EXPLORATION COMPANY, LIMITED

LAB Norex Vancouver

CERT. NO.

PROJECT NO. Roo #124 E. Belt #121

PROPERTY Roo East Belt

GRID REFERENCE

N.T.S.

DATE Aug 11/92

SAMPLE REPORT

SAMPLE #	DESCRIPTION	TYPE	WIDTH	ASSAYS			CO-ORDINATES		SAMPLER
A	Pebbly Volc. S.S. - Cpy Veinlet in S.S. Layer	GRAB		30 ele	ment ICP	+ Au	Roo #	145	RK
B	Pebbly Volc. S.S. Reddish-Purple Coloration - Hosting 1566-A	GRAB.					Roo #	145	"
C	Same location As 1564-O Py/Cpy/Malachite Arkose	SELECTED GRAB	0.2m				Roo #	145	"
D	Same loc. As 1564-S Malachite/TrCpy Pebbly Arkose	GRAB.					Roo #	145	"
E	Same loc As 1564-R Malachite/Cpy/Py Pebbly Arkose	SELECT GRAB					Roo #	145.	RK
J	(358352) Pebbly Arkose. No Visible Sulphide - Spec. Hem. 15%	grab.	Section-14				Roo	145	DC
K									
L									
M									
N									
O									
P									
Q									
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T									
U									
V									
W									

Norex Form: C:\forms\Samprep.frm

NORANDA VANCOUVER LABORATORY
Geochemical Analysis

Project Name & No.: ROO – 145 | Geol.: R.K. | Date received: JULY 28 | LAB CODE: 9208–001
Material: 58 SOILS, 9 CORES & 10 RX | Sheet: 1 of 2 | Date completed: JULY 30
Remarks: * Sample screened @ –35 MESH (0.5 mm)
¤ Organic, Δ Humus, S Sulfide | Au – 10.0 g sample digested with aqua–regia and determined by A.A. (D.L. 5 PPB)
ICP – 0.2 g sample digested with 3 ml $HClO_4/HNO_3$ (4:1) at 203 °C for 4 hours diluted to 11 ml with water. Leeman PS3000 ICP determined elemental contents.
N.B. The major oxide elements and Ba, Be, Ce, La, Li, Ga are rarely dissolved completely from geological materials with this acid dissolution method.

T.T. No.	SAMPLE No.	Au ppb	Ag ppm	Al %	As ppm	Ba ppm	Be ppm	Bi ppm	Ca %	Cd ppm	Ce ppm	Co ppm	Cr ppm	Cu ppm	Fe %	K %	La ppm	Li ppm	Mg %	Mn ppm	Mo ppm	Na %	Ni ppm	P %	Pb ppm	Sr ppm	Ti %	V ppm	Zn ppm
13	S1 – 000 Soil	5	0.2	4.97	52	413	1.4	5	0.25	0.2	60	21	16	36	3.45	1.54	30	30	0.57	674	1	0.05	22	0.08	7	17	0.13	60	63
14	100	5	0.2	4.86	2	624	1.3	5	0.12	0.2	79	11	14	22	3.39	1.59	37	40	0.59	297	1	0.04	23	0.07	8	10	0.11	55	52
15	200	5	0.2	3.89	3	211	0.9	5	0.07	0.2	73	5	14	10	2.08	1.42	35	49	0.62	198	1	0.05	12	0.05	14	9	0.10	51	41
16	300	5	0.2	4.99	2	363	1.6	5	0.22	0.2	71	14	13	30	5.17	1.22	31	54	0.76	1131	1	0.05	27	0.09	56	12	0.13	57	63
17	S1 – 400	5	0.2	5.12	2	744	1.0	5	0.22	0.2	56	10	15	17	2.87	0.92	26	39	0.63	346	1	0.10	16	0.07	12	17	0.21	56	55
18	S1 – 500	5	0.2	4.28	2	570	1.0	5	0.30	0.2	71	10	13	19	2.51	1.26	34	34	0.59	285	1	0.05	20	0.06	6	15	0.13	49	49
19	600	5	0.2	4.75	2	529	0.9	5	0.18	0.2	61	8	14	28	2.07	1.31	30	38	0.54	167	1	0.05	20	0.04	6	13	0.16	54	71
20	700	5	0.2	5.01	2	812	1.1	5	0.28	0.2	64	15	14	10	2.74	1.53	32	34	0.60	419	1	0.05	24	0.06	8	16	0.16	57	72
21	800	5	0.2	5.08	2	969	1.2	5	0.41	0.2	64	17	15	16	2.69	1.03	27	32	0.51	713	1	0.09	24	0.11	7	23	0.20	53	87
22	S1 – 900	5	0.2	5.34	2	888	1.3	5	0.35	0.2	68	15	14	12	3.13	1.38	31	35	0.59	680	1	0.06	25	0.07	8	21	0.16	50	71
23	S1 – 1000	5	0.2	4.57	2	903	0.9	5	0.40	0.2	65	12	16	13	2.60	1.09	32	34	0.56	571	1	0.05	23	0.06	6	21	0.16	54	75
24	1100	5	0.2	4.51	2	1214	1.1	5	0.52	0.2	65	13	13	17	2.55	1.09	28	31	0.54	1710	1	0.09	18	0.11	8	26	0.16	48	86
25	1150	5	0.2	4.87	2	708	1.2	5	0.34	0.2	63	13	14	11	2.88	1.54	29	34	0.59	226	1	0.06	21	0.06	6	19	0.16	55	51
26	1200	5	0.2	3.58	2	549	0.8	5	0.24	0.2	62	6	12	10	1.94	1.25	30	31	0.47	164	1	0.04	13	0.03	5	12	0.12	43	30
27	S1 – 1250	5	0.2	4.70	2	749	1.1	5	0.29	0.2	62	10	12	12	2.45	1.24	29	33	0.49	892	1	0.04	18	0.07	4	16	0.15	45	62
28	S1 – 1300	5	0.2	5.02	2	841	1.2	5	0.29	0.2	62	11	12	19	2.77	1.23	31	39	0.58	545	1	0.06	19	0.08	7	17	0.16	48	67
29	1350	5	0.4	4.52	2	810	1.0	5	0.48	0.2	62	9	12	14	2.54	1.11	27	37	0.55	690	1	0.05	15	0.07	4	18	0.15	46	54
30	1400	5	0.2	3.98	2	660	0.9	5	0.30	0.2	59	8	12	16	2.40	1.02	27	32	0.51	504	1	0.04	14	0.04	5	16	0.14	46	48
31	1450	5	0.2	4.28	2	1027	1.0	5	0.42	0.2	63	11	17	24	2.60	0.96	28	38	0.54	1454	1	0.06	14	0.08	8	19	0.15	50	59
32	S1 – 1500	5	0.2	4.34	2	1133	0.9	5	0.49	0.2	60	10	14	18	2.51	0.98	26	38	0.54	1103	1	0.12	14	0.11	9	21	0.17	50	66
33	S1 – 1550	5	0.2	4.21	2	645	1.0	5	0.28	0.2	72	8	13	24	2.65	1.46	33	39	0.60	255	1	0.05	12	0.04	5	15	0.14	51	37
34	1600	5	0.2	3.45	4	859	0.8	5	0.42	0.2	52	7	11	15	2.16	0.86	20	29	0.44	1123	1	0.11	10	0.07	9	18	0.16	39	98
35	1650	5	0.2	4.04	2	992	0.9	5	0.42	0.2	63	11	12	21	2.69	1.09	27	30	0.51	496	1	0.08	13	0.04	8	21	0.15	45	44
36	1758	5	1.0	5.12	17	1300	2.2	5	0.85	0.2	83	123	13	632	6.62	2.08	42	39	0.82	2575	3	0.04	108	0.11	50	22	0.12	57	60
37	S1 – 1800	5	0.4	4.99	7	490	1.3	5	0.37	0.2	72	35	8	333	4.49	1.10	37	31	0.53	388	1	0.13	34	0.05	21	29	0.16	42	37
38	S1 – 1850	5	0.2	4.84	2	1717	1.4	5	0.89	0.2	74	40	11	43	5.93	1.53	36	45	0.74	1535	1	0.07	21	0.13	12	38	0.16	86	63
39	S2 – 000	5	0.2	3.79	4	667	1.0	5	0.25	0.2	77	10	11	19	3.05	1.31	36	36	0.64	531	1	0.04	12	0.04	8	14	0.12	50	44
40	15	5	0.2	4.25	4	1062	1.3	5	0.62	0.2	78	11	12	22	4.00	1.52	34	40	0.81	1031	1	0.04	12	0.06	12	18	0.11	53	49
41	35	5	0.2	4.97	2	1083	1.4	5	0.45	0.2	71	10	14	19	4.07	1.53	35	36	0.67	429	1	0.05	11	0.06	8	24	0.14	53	49
42	S2 – 70	5	0.2	4.20	2	790	1.2	5	0.33	0.2	81	18	11	48	3.83	1.58	41	50	0.89	495	1	0.04	13	0.05	10	14	0.11	58	48
43	S2 – 93	5	0.2	2.35	2	528	0.6	5	0.42	0.2	36	7	7	34	1.88	0.56	14	19	0.36	133	1	0.59	12	0.03	4	29	0.11	31	26
44	125	5	0.2	4.78	2	1263	1.4	5	0.60	0.2	93	17	5	53	4.67	1.91	43	32	0.59	1349	1	0.08	12	0.11	14	24	0.15	38	57
45	S2 – 175	5	0.2	4.70	2	1119	1.4	5	0.73	0.2	88	16	10	45	4.16	1.29	41	35	0.55	1428	1	0.07	14	0.08	14	36	0.17	50	91
46	S4 – 000	5	1.2	4.03	11	510	1.9	5	9.31	0.2	55	22	8	78	3.29	2.14	30	41	1.04	975	2	0.04	13	0.13	5	24	0.07	101	16
47	S4 – 83 Soil	5	0.6	5.33	3	1461	1.5	12	0.55	0.2	75	90	9	288	7.98	1.88	40	43	0.71	1480	2	0.05	52	0.09	16	25	0.17	116	41

31/07 GP

T.T. No.	SAMPLE No.	Au ppb	Ag ppm	Al %	As ppm	Ba ppm	Be ppm	Bi ppm	Ca %	Cd ppm	Ce ppm	Co ppm	Cr ppm	Cu ppm	Fe %	K %	La ppm	Li ppm	Mg %	Mn ppm	Mo ppm	Na %	Ni ppm	P %	Pb ppm	Sr ppm	Ti %	V ppm	Zn ppm
48	S4 – 113 Soil	5	0.4	6.41	2	2557	1.6	9	0.95	0.2	64	32	10	70	8.41	2.81	34	48	0.93	1200	1	0.04	31	0.08	2	45	0.14	117	41
51	S4 – 154	5	0.2	5.68	2	1690	1.3	5	0.33	0.2	69	40	13	96	5.60	2.40	35	42	0.92	291	1	0.04	27	0.06	2	25	0.13	94	37
52	S5 – 000	5	0.2	4.41	2	726	1.3	5	0.37	0.2	70	14	14	39	3.57	1.45	35	30	0.58	1278	1	0.05	16	0.07	9	13	0.12	54	40
53	S5 – 50	5	0.4	4.73	2	832	1.5	5	0.28	0.2	65	14	11	73	4.87	1.62	35	37	0.64	1160	1	0.04	20	0.11	5	14	0.14	65	36
54	S8 – 000	5	0.2	3.76	2	483	0.9	5	0.21	0.2	59	8	12	15	2.51	1.08	29	39	0.63	215	1	0.08	15	0.06	4	13	0.13	49	37
55	S10 – 000	5	0.2	3.83	3	305	1.0	5	0.09	0.2	67	11	10	25	2.93	1.34	34	36	0.66	112	1	0.04	15	0.04	6	8	0.10	51	32
56	50	5	0.4	3.85	4	229	1.0	5	0.34	0.2	56	18	14	28	3.50	0.84	28	43	0.55	555	1	0.07	17	0.05	20	14	0.15	57	51
57	100	5	0.4	5.02	2	279	1.6	5	0.20	0.2	64	13	13	57	5.02	0.81	30	34	0.43	715	1	0.14	18	0.07	8	17	0.17	58	36
58	150	5	0.2	3.58	3	305	0.9	5	0.11	0.2	61	11	13	64	3.29	1.04	30	33	0.55	197	1	0.05	17	0.05	4	12	0.12	54	32
59	S10 – 200	5	0.4	4.45	2	286	1.0	5	0.16	0.2	49	20	10	21	4.46	1.29	26	41	0.58	152	1	0.07	37	0.05	4	15	0.15	70	36
60	S10 – 225	5	0.2	3.92	5	436	1.0	6	0.17	0.2	61	29	12	110	3.31	1.03	32	36	0.53	264	1	0.09	25	0.07	9	15	0.15	57	41
61	250	5	0.2	3.64	6	631	0.9	5	0.31	0.2	53	39	16	438	3.15	0.73	29	36	0.42	531	1	0.15	37	0.08	9	20	0.21	58	40
62	S10 – 275	5	0.2	4.20	3	673	0.8	5	0.33	0.2	36	19	13	178	2.63	0.41	18	30	0.32	317	1	0.25	23	0.35	6	21	0.21	51	35
63	S11 – 000	5	0.2	5.11	2	807	1.1	5	0.31	0.2	41	12	9	17	5.15	1.40	26	39	0.62	544	1	0.09	23	0.11	2	23	0.21	72	63
64	1480 – 50W	5	0.4	3.91	2	451	0.9	5	0.18	0.2	50	19	15	18	3.06	0.79	27	40	0.50	621	1	0.13	17	0.17	7	16	0.19	59	44
65	1480 – 100W	5	0.2	4.36	2	439	1.0	5	0.16	0.2	48	10	14	18	3.32	0.85	27	41	0.59	203	1	0.13	17	0.21	5	14	0.18	60	45
66	150	5	0.2	4.22	2	736	0.8	5	0.37	0.2	48	13	14	23	2.76	0.58	23	37	0.46	335	1	0.22	19	0.16	7	23	0.20	54	42
67	200	5	0.2	3.96	2	454	0.9	5	0.18	0.2	66	15	14	23	3.01	0.99	34	47	0.67	150	1	0.08	16	0.05	5	17	0.16	62	36
68	250	5	0.4	4.07	3	348	0.8	5	0.18	0.2	46	10	14	17	2.73	0.54	24	36	0.40	128	1	0.21	16	0.08	6	16	0.20	53	33
69	1480 – 300W	5	0.2	3.95	2	337	1.1	5	0.15	0.2	62	14	12	29	3.86	1.41	32	47	0.98	352	1	0.04	14	0.11	5	7	0.10	59	43
70	1480 – 350W	5	0.2	4.21	4	841	1.1	5	0.18	0.2	61	28	14	29	3.66	1.09	33	44	0.61	251	1	0.09	19	0.14	8	15	0.16	68	39
71	400	5	0.2	4.09	8	1229	1.1	5	0.21	0.2	49	53	16	77	3.50	0.81	28	42	0.48	316	1	0.16	27	0.26	9	19	0.19	63	46
72	1480 – 450W Soil	5	0.2	4.18	8	981	1.1	5	0.23	0.2	51	33	16	67	4.57	0.87	31	46	0.71	249	1	0.10	23	0.16	12	20	0.16	81	38
73	1564 – A Core	5	1.2	3.80	20	303	1.3	8	1.18	0.2	107	95	60	247	5.32	2.30	56	26	0.84	691	3	0.02	53	0.05	93	9	0.07	41	15
74	B	10	1.6	3.02	96	265	1.2	5	1.94	0.2	113	386	60	501	6.91	1.84	56	20	1.06	1129	12	0.02	114	0.05	70	16	0.07	29	24
75	C	5	0.4	3.67	17	371	1.6	5	3.63	0.2	135	149	24	709	5.49	2.33	58	24	1.60	1767	9	0.03	75	0.10	15	34	0.08	26	22
76	D	5	0.2	6.60	2	408	2.4	5	1.29	0.2	166	60	7	790	6.48	4.01	74	36	0.74	1755	1	0.03	23	0.17	2	9	0.12	13	25
77	E	5	0.8	2.86	14	270	1.1	10	1.14	0.2	98	77	90	206	6.76	1.76	53	22	0.60	884	8	0.02	42	0.04	80	8	0.06	38	15
78	F	5	0.2	3.27	8	575	1.2	5	2.85	0.2	97	16	52	28	2.92	2.02	35	26	0.55	485	4	0.03	15	0.07	3	12	0.08	56	17
79	G	10	0.8	3.41	47	1514	1.6	6	0.54	0.2	135	177	84	1739	3.11	2.06	66	23	0.36	358	8	0.02	41	0.06	14	8	0.08	49	16
80	H	5	0.4	4.82	8	871	1.7	5	2.88	0.2	160	41	11	116	4.70	2.91	66	24	0.68	716	1	0.03	14	0.11	2	15	0.12	15	27
81	I Core	5	0.2	3.07	4	217	1.1	5	1.80	0.3	64	6	91	19	2.04	1.77	18	14	0.74	365	2	0.03	8	0.05	2	7	0.05	40	10
82	J RX	5	4.4	2.47	133	259	1.2	18	0.22	0.2	144	1023	29	7956	4.77	1.64	68	19	0.25	286	32	0.02	1054	0.15	70	8	0.07	30	18
83	K	5	0.4	3.63	6	239	1.4	5	0.37	0.4	73	4	90	1154	0.77	1.99	27	25	0.41	162	1	0.02	10	0.09	5	5	0.06	46	13
84	L	5	0.2	4.12	9	9505	1.2	5	5.14	0.2	93	27	23	37	5.85	2.59	34	30	2.63	1139	1	0.07	37	0.13	2	876	0.12	72	20
85	M	5	0.2	6.16	3	1509	1.5	5	2.55	0.2	75	43	19	137	8.90	3.74	38	37	3.02	814	1	0.04	30	0.32	2	75	0.12	128	21
86	N	5	0.2	2.16	7	180	1.2	5	2.36	0.3	66	6	54	13	2.00	1.39	20	25	1.26	533	1	0.02	9	0.04	2	31	0.06	36	14
87	O	5	0.2	1.69	27	4189	0.8	8	3.05	0.4	116	83	90	651	1.69	1.08	46	14	1.70	678	3	0.04	18	0.04	17	97	0.04	38	12
88	P	5	0.2	2.88	16	2360	1.0	5	1.47	0.2	117	119	66	387	1.75	1.77	47	19	0.73	398	2	0.03	23	0.05	24	18	0.07	53	12
89	Q	5	0.4	4.03	36	542	1.5	12	0.21	0.2	146	56	52	273	1.97	2.46	68	35	0.48	170	9	0.02	33	0.06	28	11	0.08	54	16
90	R	5	0.4	3.79	40	615	1.6	14	0.33	0.2	141	128	55	678	2.41	2.34	62	34	0.49	198	19	0.02	43	0.07	38	15	0.07	50	18
91	1564 – S RX	5	0.2	3.17	13	173	1.1	9	2.45	0.4	130	13	93	1074	1.78	1.90	54	24	1.47	577	3	0.02	19	0.04	9	25	0.06	53	16

Nº 1564

White - Office
Yellow - Field

NORANDA EXPLORATION COMPANY, LIMITED

LAB NoRex Vancouver PROJECT NO. 145 PROPERTY Rio N.T.S. 82G/2W, 3

CERT. NO. GRID REFERENCE DATE August/9[illegible]

SAMPLE REPORT

SAMPLE #	DESCRIPTION Ank = Ankerite SS = Sandstone CC = chalcocite Alt'd = Altered MAL = MALACHITE	TYPE	(METER) WIDTH	ASSAYS			CO-ORDINATES		SAMPL
A DDH	R90-7; 4.6m-6.6m Arkosic Pebbly SS, Ankerite Alt'd 1-3% Py	CORE	2.0	3 element w/ [illegible]					RL
B DDH	R90-7; 13.1m-14.9m Arkosic S.S. Ankerite Alt'd, CC? 1-3% Py	CORE	1.2						
C DDH	R90-7; 14.9m-16.9m As Above, Possible CC. Py-~~1%~~ 1-3%	CORE	2.0	Rush Cu					
D DDH	R90-7; 17.4-18.8m CC, MAL 1%, Py 1-3% Arkosic SS	Core	1.4						
E DDH	R90-8; 6.1-8.1 Pebbly Arkosic SS, ANKERITE Alt'd Py 1-3%	Core	2.0						
F DDH	R90-2; 16.2-16.8 Arkosic SS TR Ankerite Alt'd <TR Py	CORE	0.6						
G DDH	R90-2; 16.8-18.9 FAULT, ANKERITE Alt'd, CC?	Core	2.1						
H DDH	R90-2; 18.9-19.9 ARKOSIC SS <TR Py	Core	1.0						
I DDH	R90-5; 6.1-6.2 Arkosic SS. TR MAL. Possible CC	Core	0.1						
J	CPy, MAL, Py BASE OF STROM in SS Arkosic Upslope of DDH 7,8	GRAB							
K	TR MAL, <1% CC?, Qtz Ankerite ABOVE STROM. horizon	GRAB							
L	Boulder Conglomerate w Spec. Hem + Py Euhedral Py	GRAB							
M	Grey Amyg. basalt - Alt'd Brown Color, Strong Ank. TR Cpy, 2-3% Py	GRAB							
N	ARKOSIC SS TR Py, Ankerite Alt'd, 1-3% Spec Hem	GRAB							
O	Quartz Pebbly SS 2% CC, 1% CPy Malachite	Chip/Grab	1.0						
P	Quartz Pebbly SS CC? <1% CPy	Chip/Grab	1.0						
Q	Quartz Pebbly Arkosic SS. 1% CC, <1% CPy	Chip/Grab	1.5						
R	SA Q better Cpy 1%, CC? 1%	GRAB							
S	COARSE Pebbly ARKOSIC SS, 10m [illegible] of Q.R. 1% CC 1% CPy	GRAB/chip	30 cm						
T									
U									
V									
W									

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APPENDIX III

STATEMENT OF COSTS

NORANDA EXPLORATION COMPANY, LIMITED
STATEMENT OF COSTS

PROJECT: Roo DATE: November, 1992

TYPE OF REPORT: Geological, Geochemical

a) Wages:
No. of Mandays : 18
Rate per Manday: $675.00
Dates From : July 12-27, August 9,10
Total Wages : 18 x $675.00 $12,150.00

b) Food & Accommodations:
No. of Mandays : 18
Rate per Manday: $93.60
Dates From : July 12-27, August 9,10
Total Costs : 18 x $93.60 $ 1,684.00

c) Transportation:
No. of Mandays : 18
Rate per Manday: $127.31
Dates From : July 12-27, August 9,10
Total Costs : 18 x $127.31 $ 2,291.58

d) Instrument Rental:
Type of Instrument:
No. of Mandays :
Rate per Manday:
Dates From :
Total Costs :

Type of Instrument:
No. of Mandays :
Rate per Manday:
Dates From :
Total Costs :

e)	Analysis: (See attached schedule)	$ 1,682.00
f)	Cost of preparation of Report: Author : 1350 Drafting: 600 Typing : 300	$ 2,250.00
g)	Other: Contractor	
	TOTAL COST	$20,058.38
h)	Unit Costs for Geology, Geochemistry (2 men) No. of Mandays: 36 No. of Units : 20,058.38 Unit Costs : $557.18/man day Total Cost : 36 x $557.18	$20,058.38

NORANDA EXPLORATION COMPANY, LIMITED
(CORDILLERA DIVISION)

DETAILS OF ANALYSES COSTS

PROJECT: Roo

ELEMENT	NO. OF DETERMINATIONS	COST PER DETERMINATION	TOTAL COSTS
Soil	103	14.00	$1,442.00
Rock	16	15.00	240.00

Analysis by 28 element ICP and Au by AA.

APPENDIX IV

STATEMENT OF QUALIFICATIONS

STATEMENT OF QUALIFICATIONS

I, Richard Kemp, of the City of Vancouver, Province of British Columbia, do hereby certify that:

1) I am a geologist, residing at #111 - 2455 York Avenue, Vancouver, B.C.

2) I am a graduate of the Haileybury School of Mines (1974) Mining Technician Diploma and hold a B.Sc. Geology degree from Lakehead University (1981).

3) I have worked in mineral exploration in Canada and internationally since 1974 as a mining technician and since 1981 as a geologist.

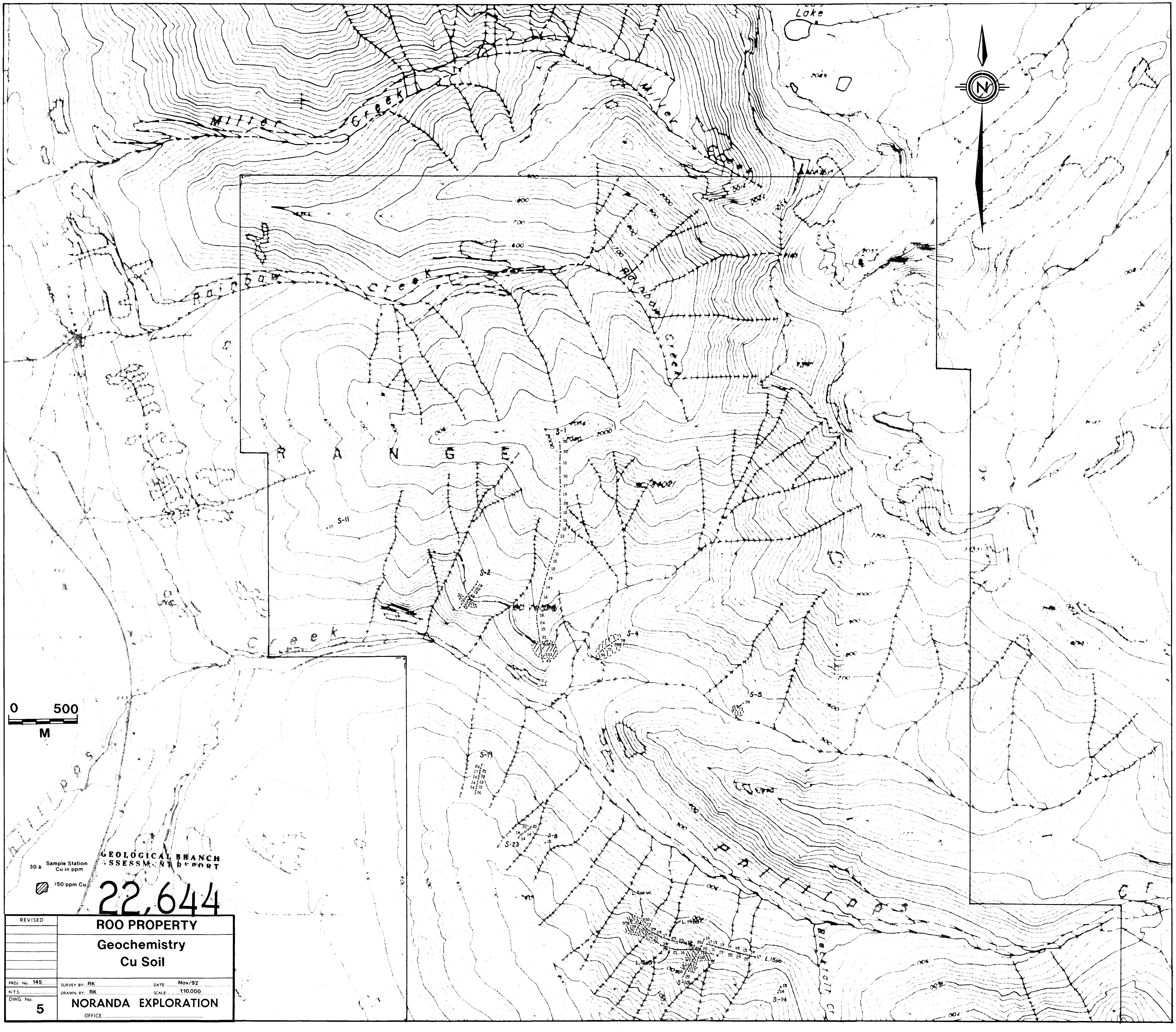
4) The work described in this report was conducted under my supervision and I have prepared this report based on the field observations of those contracted by Noranda Exploration Company, Limited.

5) I have been continuously employed by Noranda Exploration Company, Limited since 1982.

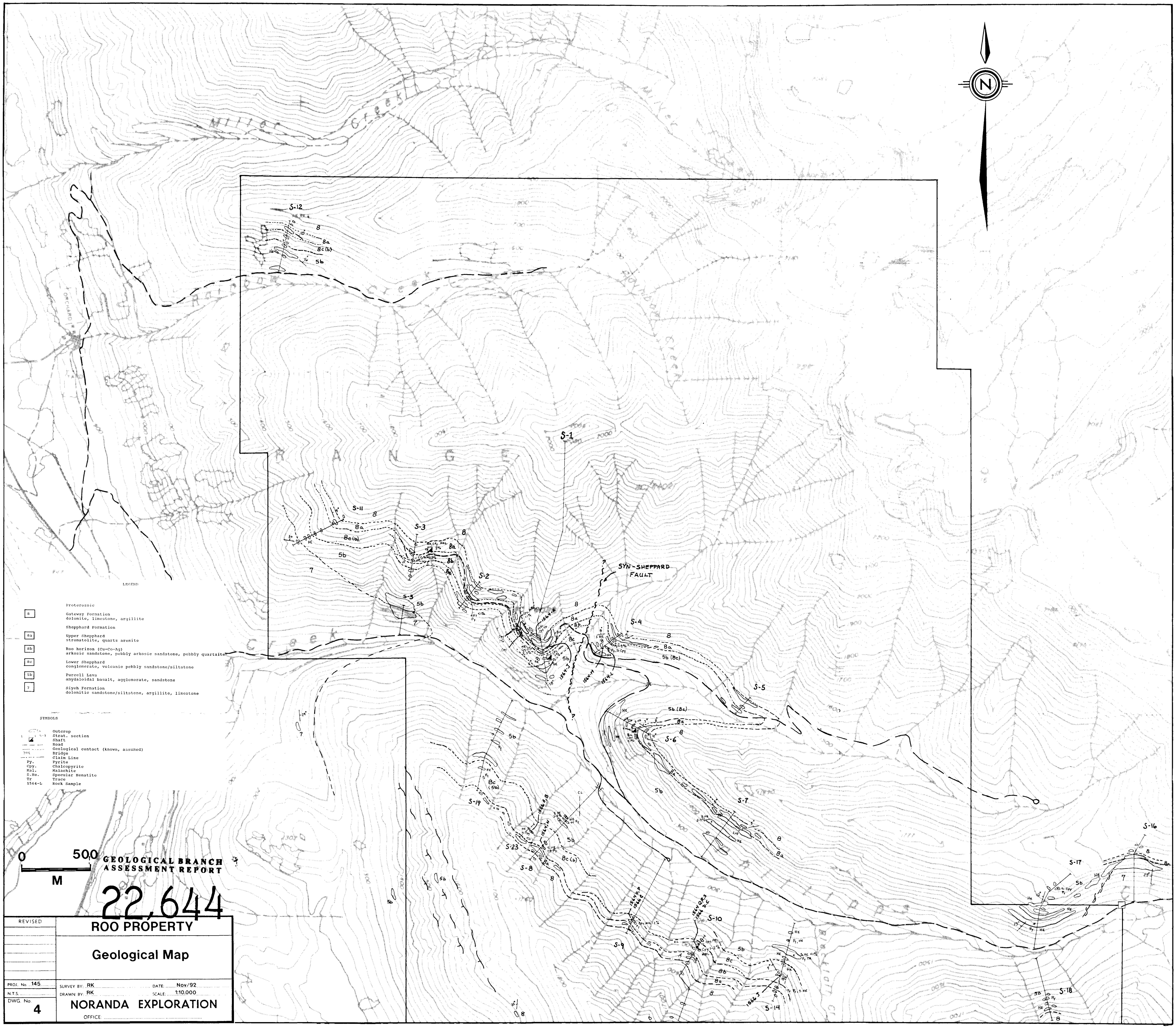
6) I have no interest in the property nor do I expect to receive any.

R. Kemp

Richard Kemp



Lake
Miller Creek
Miller Creek
Rainbow Creek
Rainbow Creek
R A N G E
Creek
S-1
S-2
S-4
S-5
S-11
S-19
S-8
S-23
S-14
L.1500
0 500
M
30 Δ Sample Station Cu in ppm
>50 ppm Cu
GEOLOGICAL BRANCH
ASSESSMENT REPORT
22,644
REVISED
ROO PROPERTY
Geochemistry
Cu Soil
PROJ. No. 145
N.T.S.
DWG. No.
5
SURVEY BY: RK
DRAWN BY: RK
DATE: Nov/92
SCALE: 1:10,000
NORANDA EXPLORATION
OFFICE:



Miller Creek
S-12
S-1
R A N G E
S-11
S-3
S-2
SYN-SHEPPARD FAULT
S-4
S-5
S-6
S-7
S-19
S-23
S-8
S-9
S-10
S-14
S-16
S-17
S-18
LEGEND
Proterozoic
8 Gateway Formation
dolomite, limestone, argillite
Shepphard Formation
8a Upper Shepphard
stromatolite, quartz arenite
8b Roo horizon (Cu-Co-Ag)
arkosic sandstone, pebbly arkosic sandstone, pebbly quartzite
8c Lower Shepphard
conglomerate, volcanic pebbly sandstone/siltstone
5b Purcell Lava
amydaloidal basalt, agglomerate, sandstone
7 Siyeh Formation
dolomitic sandstone/siltstone, argillite, limestone
SYMBOLS
Outcrop
Strat. section
Shaft
Road
Geological contact (known, assumed)
Bridge
Claim Line
Py. Pyrite
Cpy. Chalcopyrite
Mal. Malachite
S.He. Specular Hematite
Tr Trace
1564-L Rock Sample
0 500
M
GEOLOGICAL BRANCH
ASSESSMENT REPORT
22,644
REVISED
ROO PROPERTY
Geological Map
PROJ. No. 145
N.T.S.
DWG. No. 4
SURVEY BY: RK
DATE: Nov/92
DRAWN BY: RK
SCALE: 1:10,000
NORANDA EXPLORATION
OFFICE: