

4914

93 B/16W

GEOLOGY OF THE "KATE" GROUP

CARIBOO MINING DIVISION

93 G/1W

93 B/16W

93 G/1 W

J.R. Fraser

January, 1974

Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. **4914** MAP.....

TABLE OF CONTENT

	<u>Page</u>
Location	1
# 1 Location Map	2
Claims	3
Topography & Vegetation	4
Regional Geology	5
Property Geology	7
- General Statement	7
- Lithology	7
- Mineralization	10
- Alteration	11
- Structure	12
Statement of Qualifications	15
# 2 Claim Map	
# 3 Property Geology Map	

Location :

The Property straddles the Quesnel River at Big Canyon, approximately 5.2 miles N 74°E of the town of Quesnel. (Figure 1).

Access to the claims on the north side of the river is via Tremblay Road, also known as Quesnel Canyon Road, which leaves the Barkerville Highway 3 miles east of the junction with Highway 97.

The claims on the south side of the river are reached by the Peace River power line road; this road leaves the Gravelle Ferry Road one mile south of Dragon Lake. A rough dirt track leaves the power line road approximately 3.4 miles north of the main road and continues eastward for a distance of 4.1 miles to a large grassy meadow directly opposite Frank Mooney's cabin.



<p>NORANDA EXPLORATION COMPANY, LOCATION MAP. "KATE" PROPERTY CARIBOO MINING DIVISION Scale 1" = 4 miles</p>	<p>ment of Mines and Technical Surveys REPORT NO. 4914 #1 93 B/16W 93 G/1 W</p>
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Claims : (See Figure 2)

The property which is situated within the Cariboo Mining Division consists of 74 full-size claims, 5 fractional claims and one placer lease. Details of the claims are presented below :-

<u>Claim Name</u>	<u>Record Number</u>	<u>Record Date</u>
Ruth 9-12	56567-56570	March 24, 1970
Ruth 25	66329	March 29, 1972
Ruth 26-27	66592-66593	May 12, 1972
Ruth 28-31	66988-66991	July 14, 1972
Kate 1-4	66325-66328	March 29, 1972
Kate 5-8	66330-66333	April 7, 1972
Kate 9-10	66339-66340	April 7, 1972
Kate 11-12	67098-67099	July 19, 1972
Kate 13-14	67100-67101	July 25, 1972
M & S 1-2	57863-57864	May 26, 1970
M & S 7-8	66341-66342	April 7, 1972
Rich 1-4	66334-66337	April 7, 1972
Daphne	66338	April 7, 1972
Kopper Nob 1-4	27581-27584	May 11, 1964
Kopper Nob 5-6	28341-28342	June 5, 1964
Ruth 32-39	67937-67944	October 11, 1972
Kate 20-45	67974-67999	October 11, 1972
QR 1Fr-5Fr.	68561-68565	December 1, 1972

The above claims are owned by Canyon Creek Holdings Ltd., The placer lease, P.M.L. # 6391, is held by F.P. Mooney and was recorded on August 21, 1963.

Topography and Vegetation :

In the vicinity of the property, the Quesnel River flows in a deep, locally steep-walled canyon cut through Tertiary and Pleistocene sediments. Within the boundaries of the property and at lower elevations in the canyon the remnants of at least three benches have been recognized; the approximate elevations of these terraces are 1650 feet, 1750 feet and 1825 feet. The depth of the canyon is approximately 400 feet and the rim to rim width is up to 5000 feet. At Big Canyon, the channel in which the river presently flows exposes bed rock and in several places is only 200 feet wide.

Relief on the property is approximately 900 feet; the lowest elevation, 1600 feet, is at river level at the western boundary of the claim block and the highest, 2500 feet, is at the northern extremity of the claims.

Vegetation over much of the property consists of moderate to dense stands of mixed spruce, fir and birch; minor cottonwood is present along the river. In general, the underbrush is not thick.

Regional Geology :

The property is situated within an irregularly shaped area of low relief known as the Fraser Basin, a sub-division of the very extensive Interior Plateau physiographic division of British Columbia. The surface of the basin, which is gently rolling and poorly drained, lies below the 3000 foot contour and is deeply incised by the Fraser River and its tributaries. Glacial deposits mantle much of the basin and as a consequence outcrop is scarce.

Geologically, the property is located within the boundaries of the Quesnel Trough, a long, narrow, north-westerly trending strip of dominantly Lower Mesozoic, mainly volcanic rocks. It is flanked by older and highly deformed rocks of the Omineca Geanticline on the northeast and the Pinchi Geanticline on the southwest. The former is represented by the metasediments of the Lower Paleozoic Cariboo Group and the latter by the largely sedimentary Pennsylvanian to Permian Cache Creek Group. The Mesozoic rocks of the Trough in this area consist of Upper Triassic and Lower Jurassic volcanics and sediments and intrusive rocks which fall into two general age categories, 100 million years and 200 million years. Tertiary rocks are extensive and may be divided into two distinct units, a lower Tertiary sedimentary and fragmental group and an upper Tertiary division consisting of basaltic plateau lavas.

The dominant structural features of the area are northwest trending faults and fractures. These faults, many of which are strands of the much larger Pinchi Fault, both bound and occur within the Trough. One such fault follows much of the valley of the Quesnel River east of Dragon Mountain and passes within one mile of the property.

Regional Geology - continued

The largest base metal occurrence in the area is situated on the southwest slope of Mouse Mountain, approximately 3 miles north-east of the property. Here, chalcopyrite occurs as fracture fillings and disseminations in granodiorite and metavolcanics. In 1955 and 1956, a carload of hand-sorted ore, averaging $5\frac{1}{2}\%$ Cu., was produced and shipped to the Tacoma smelter. The only producing property in the region is the Gibraltar copper deposit located 34 miles south-southeast of Quesnel.

Property Geology :General Statement

Due to thick glacial deposits, outcrop on the property is scarce and is restricted to the banks of the Quesnel River, road cuts along the river, stream channels, trenches and small areas that have been stripped during placer operations. Rusty weathering, cemented Tertiary gravels are also present but are thinner and much less extensive; these gravels are the source of much of the placer gold in the area. Over much of the property, the Tertiary and Pleistocene deposits are in excess of 100 feet thick.

Upper Triassic and Lower Jurassic sediments and volcanics have been intruded by irregular masses of feldspar quartz-biotite porphyry, quartz porphyry and fine grained diorite. The ages of the intrusive rocks are not known but it appears that the quartz porphyry is younger than the feldspar-quartz-biotite porphyry. Contacts, when seen, are rarely exposed for more than a few feet. Due to the paucity of outcrop, lithological distinctions within the volcanic and sedimentary sequence are not shown on the map. Dykes of andesite and a dark grey biotite-rich rock are generally restricted to the feldspar-quartz-biotite porphyry.

Lithology

The most abundant intrusive exposed on the property is the feldspar-quartz-biotite porphyry, a non-magnetic rock that ranges in colour from medium greenish or bluish grey to dark purplish grey to light pinkish grey. This rock type may contain up to 15% feldspar (plagioclase) phenocrysts, 10% quartz phenocrysts and 7% biotite although the latter two are not always present.

Property Geology - Lithology -- continued

The groundmass ranges from fine grained to aphanitic. The feldspar phenocrysts are white, buff or light greenish grey, depending on the degree of alteration, and have an average size of approximately 4 mm. The quartz phenocrysts are usually milky and are up to 5 mm in diameter. Hydrothermal alteration has destroyed much of the biotite, but where it is present, it occurs as subhedral books with an average grain size of 2 mm. In outcrop, this porphyry often has a very weathered appearance and exposed surfaces are usually light brown to pink.

The quartz porphyry is a relatively fine grained, pre-dominantly light grey to light pinkish grey rock of probably rhyolitic composition. This rock is characterized by the presence of small (to 2 mm), usually fractured, subhedral eyes of smoky quartz, in amounts up to 15%, set in a fine grained matrix. Small laths of feldspar are usually present and in altered specimens they may be very conspicuous. Due to the presence of the feldspar crystals, it is sometimes difficult to distinguish between this rock type and the feldspar-quartz-biotite porphyry, especially in highly weathered or altered specimens. Mafic minerals were not observed. In outcrop, the rock possesses a very blocky character and weathered surfaces range in colour from light grey to medium brown to purplish grey, the latter colour in areas of high pyrite content.

Much of the diorite exposed on the property is characterized by a fine-grained hypidiomorphic texture. When fresh, this rock is medium greenish grey and moderately magnetic; the altered variety, such as that seen on the south side of the river opposite the mouth of Canyon Creek, is a light buff colour and very weakly magnetic. Coarser grained varieties of this rock crop out in the creek guiley approximately 400 feet north of I24N/71E.

Property Geology - Lithology -- continued

The volcanic and sedimentary sequence consists of andesite, various tuffaceous rocks, grey wacke, argillite and limestone. The andesites are massive, dark green to dark greenish grey and often contain diffuse greenish phenocrysts of feldspar. Generally, the tuffs are dark greenish grey but some medium grey varieties have been observed. Both the andesites and the darker coloured tuffs are moderately to strongly magnetic.

Argillite is the most common sedimentary rock and is usually black although a small amount of a purplish grey, limy variety has been noted. The limestones are light grey to olive green and are normally fine grained except in the vicinity of intrusive rocks where re-crystallization has occurred.

There are two varieties of a dyke rock, termed a lamprophyre. Both are biotite-rich, dark grey and moderately magnetic, the distinction being based on the size of the biotite flakes. In the most common variety, the biotite grains are small, generally 1 mm or less in diameter, and sub-hedral; in the second, the biotite occurs as thin euhedral books up to 0.5 cm. in diameter. The matrix of the two varieties is aphanitic. These dykes trend east-west to northwest, rarely exceed several feet in width, often exhibit chilled selvages and readily decompose upon weathering.

The andesite occurring in the dykes is dark greenish grey, fine grained and strongly magnetic; when weathered, this rock decomposes to an olive green sand.

Property Geology - continuedMineralization

The only primary sulphides observed on the property are pyrite and chalcopyrite, the former predominating. When combined they rarely exceed 3%, by volume of the rock. Secondary minerals noted are malchite, azurite jarosite, limonite, hematite and an unidentified black, sooty copper-bearing mineral. Although surface exposures are usually intensely oxidized, the depth of oxidation probably does not exceed 10 feet.

The pyrite occurs as fracture fillings, disseminations and, in one locality, as near massive accumulations. With the exception of the latter, the most intensely pyritized rock type is the quartz porphyry exposed in the cleared area on the east side of the river between 96N and 104N. On the south bank of the river, approximately 200 feet west of the 100E baseline, massive pyrite occurs in limy sediments at the contact with the quartz porphyry.

Two grab samples of this pyrite were assayed with the following results :-

	<u>Au. (oz./T)</u>	<u>Ag. (oz./T)</u>	<u>Cu. (%)</u>
M. 3476	0.01	0.1	0.10
M. 3477	Tr.	0.2	0.05

The chalcopyrite occurs as fracture fillings, as disseminated grains and blebs and, very occasionally, as near massive patches up to several inches across. The best mineralization occurs in quartz porphyry and altered volcanics in a small area approximately 200 feet in diameter, centered 300 feet south of 100N/92E. Fracture controlled chalcopyrite ranges from very fine films on fracture surfaces to veinlets up to 1/4 inch wide.

Five major directions of copper bearing fractures have been recognized; the fracture density may attain 14 per yard but generally it is much less.

The fracture attitudes are as follows :-

Property Geology - Mineralization -- continued

030° - 036°/36° - 63° SE
 052° - 055°/54° - 73° NE
 070° - 090°/11° - 72° S
 110° - 125°/22° - 48° SW
 158° - 176°/27°NE - 70°SW

The near massive patches mentioned above were observed in one location only (200 feet south of 100N/92+00E) and appear to be fragments derived from a large vein. These patches, which are up to 2 inches across, are contained in, and intensely veined by quartz and buff coloured carbonate. Pyrite is commonly associated with the chalcopyrite. The best surface assay, 1.32% Cu. over 13 feet, was obtained from a small hand trench, in quartz porphyry, located 400 feet south of 100N/92+70E.

Alteration

The most intense and widespread hydrothermal alteration is observed in the rocks exposed in the cleared area situated on the east side of the river between 96N and 104N; this is also the area of the most widespread and abundant sulphide mineralization. Both the volcanic rocks and the feldspar-quartz-biotite porphyry exposed here, especially in the vicinity of 96N/93E, exhibit moderate to intense argillic and carbonate (ankerite) alteration.

These rocks range from buff to light greenish grey to light pinkish grey, the latter colour being restricted to the porphyry. It is probably due to the presence of introduced potassium feldspar. Veins of buff carbonate up to 4 mm. wide are common. Original biotite in the porphyry is altered

Property Geology - Alteration -- continued

to a bright green mica. Moderate silicification and weak argillic alteration have been observed in the quartz porphyry.

Elsewhere on the property, moderate to intense argillic alteration has been noted in the feldspar-quartz-biotite porphyry, and to a lesser extent, in the quartz porphyry. In many instances, it is believed that this alteration may be attributed to processes of weathering rather than hydrothermal activities. On the north side of the river, opposite the 71 + 00E baseline, the rocks have been intensely fractured and altered to clay minerals, so much so that determination of the rock type is most difficult.

Metasomatism of the volcanics and sediments is seen in the vicinity of contacts with intrusive rocks. Epidote, brown garnet and, occasionally, biotite have been developed. Little is known of the width of these zones.

Chlorite, epidote and calcite are abundant and widespread in both the andesite and the andesite tuffs. In several outcrops, powdery red hematite is present along fracture surfaces.

Structure

Faults and fractures are the only structural elements of importance noted on the property.

Although fractures of all possible orientations have been noted, five major directions of fracturing predominate :-

Property Geology - Structure -- continued

6	010° - 020°/78°W - 84°E	easterly dips predominate
7	030° - 040°/80°NW - 65°SE	northwesterly dips predominate.
6	080° - 090°/80°S - 80°N	northerly & southerly dips equal.
5	120° - 130°/89°SW - 74°NE	southwesterly dips predominate.
5	160° - 170°/82°NW - 85°SW	westerly dips predominate

Locally, fracture densities may reach 20-36/yd. but occurrences such as these are rare.

Enclosed : Claim map; scale 1" = 400 ft.

Property Geology map; scale 1" = 400 ft.

Respectfully submitted,

A handwritten signature in cursive script, appearing to read "R.C. Heim".

R.C. Heim, P.Eng.

A handwritten signature in cursive script, appearing to read "John R. Fraser".

J.R. Fraser,
Geologist.

STATEMENT OF QUALIFICATIONS

I, John R. Fraser, of the City of Vancouver, Province of British Columbia, do certify that:

1. I have been employed as a geologist by Noranda Exploration Company, Limited continuously since June 1972, and intermittently since June 1970.
2. I am a graduate of the University of British Columbia with a Bachelor of Science degree in Geophysics (1967) and a Master of Science degree in Geology (1973).
3. I am a member of the Canadian Institute of Mining and Metallurgy, an Associate Fellow of the Geological Association of Canada and a Junior Member of the Society of Mining Engineers of the American Institute of Mining, Metallurgical and Petroleum Engineers.

Dated at Vancouver
This 8th day of
January, 1974



John R. Fraser

Geologist

Noranda Exploration Company, Limited
(No Personal Liability)

COST OF QUESNEL RIVER PROJECT

GEOLOGY

A. Salaries

Employees : J. Fraser, W. McFarlane, D. Schneider
 Time : May 1 - December 31
 No. of Man Days : 93
 Cost per Man Day: \$26.66
 Cost : 93 x 26.66 \$2,479.78

B. Cost of Fuel, Accomodation and Supplies

<u>Payee</u>	<u>V/N</u>	<u>Amount</u>	
Noranda Personnel (Exp. Acc.)	4816, 4916, 5022, 5041 5093, 5107, 5197, 5275 5850	729.27	
Hotel Burrard	4990	21.00	
Fountain Motor Hotel	4986, 5287, 5150	351.20	
Super Value Store	5292, 5190	<u>215.04</u>	\$1,316.51

C. Ground Transportation

Shell Canada, Imperial Oil Standard Oil, Gulf Oil	5196, 5294, 5457, 5653, 5661, 5752, 6211	113.07	
Westminister Auto Lease	5291 (Parttime)	420.00	
Hammond Ltd.	6335	<u>16.94</u>	\$ 550.01

D. Air Transportation

Pacific Western Airlines 4773, 4995, 5178, 5458 \$ 180.20

E. Sundry

Bus Line Pick Up	5429	7.50	
Chapman Transport	5318	15.84	
B.C. Telephone	4750, 4937, 5299, 5733, 5830	<u>132.56</u>	\$ 155.90

Total Cost Geology for Total Claims \$4,682.40

Proportion to be allocated to Q.R. - Alpha Group \$2,000.00
 Proportion to be allocated to Q.R. - Beta \$2,600.00

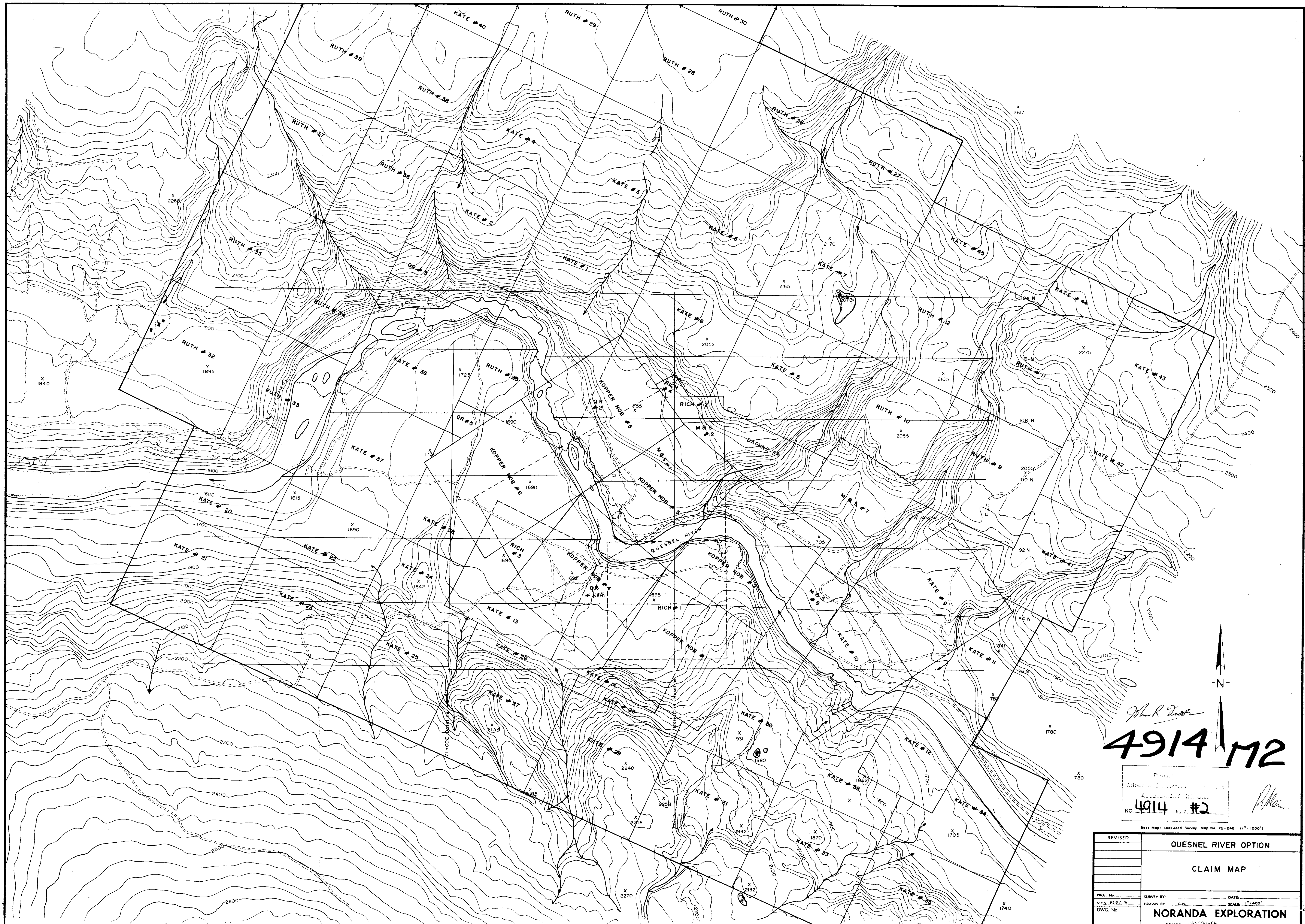
Declared before me at the *City*
 of *Edmonton*, in the
 Province of British Columbia, this *27th*
 day of *March* 1974, A.D.

Dan E. Pegg

G. J. Kelly SUB-MINING RECORDER
 A Commissioner for taking Affidavits within British Columbia
 A Notary Public in and for the Province of British Columbia

KATE # 39
(OFF MAP)

RUTH # 31
(OFF MAP)

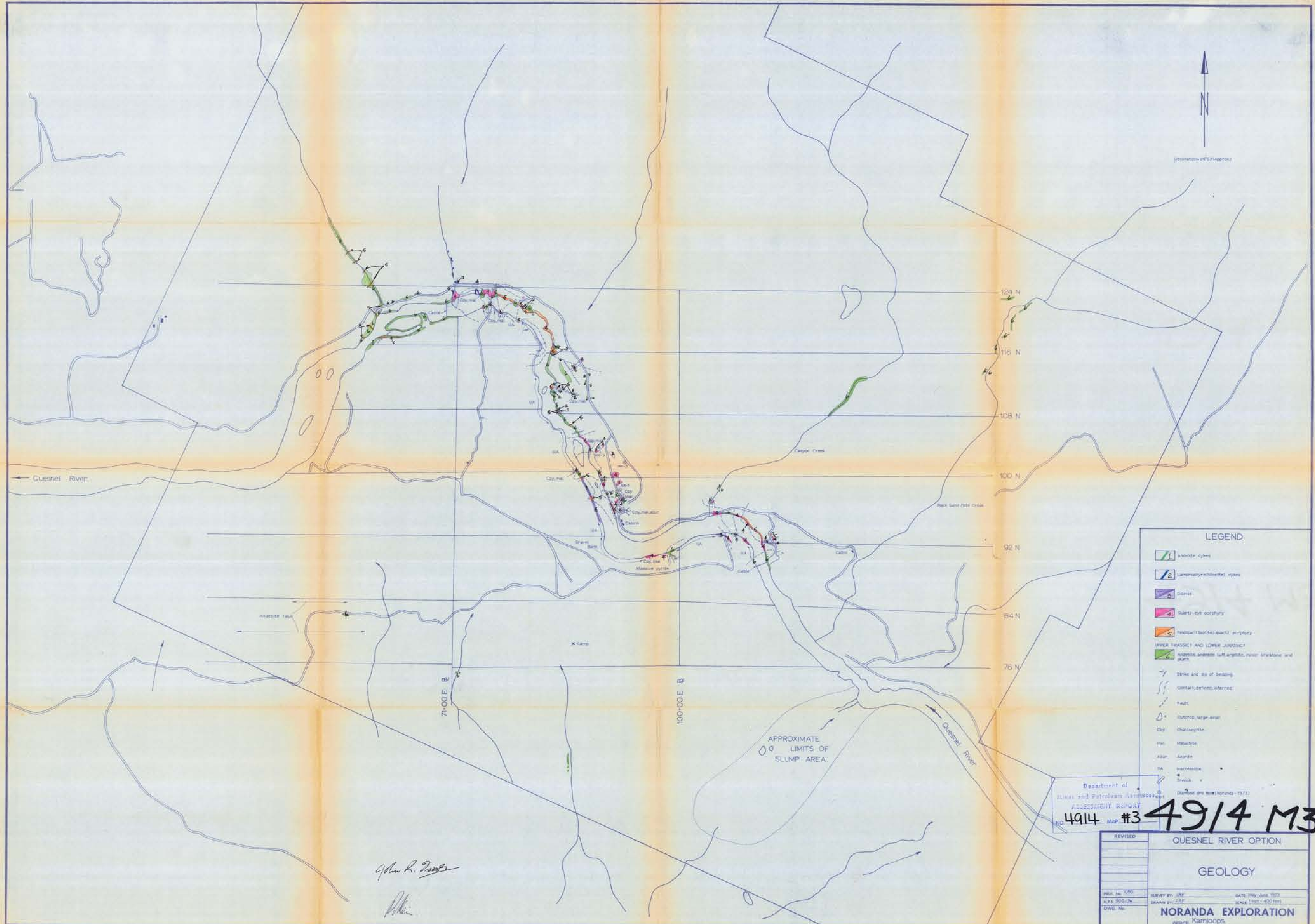
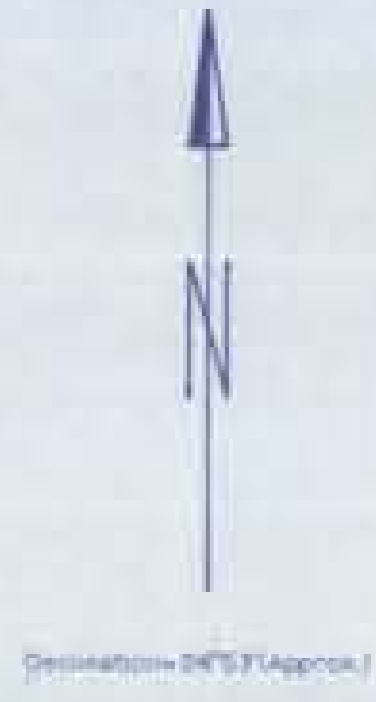


John R. Fisher
4914 M2

4914 M2 #2

Base Map: Lockwood Survey Map No. 72-248 (1" = 1000')

REVISED	QUESNEL RIVER OPTION	
	CLAIM MAP	
PROJ. No.	SURVEY BY:	DATE:
NTS 939/1W	G.A.	1" = 400'
DWG No.	NORANDA EXPLORATION	
	VANCOUVER	



LEGEND

	Andesite dykes
	Lamprophyre/diabase dykes
	Diorite
	Quartzite porphyry
	Felsoparadioritic porphyry
UPPER TRIASSIC AND LOWER JURASSIC	
	Andesite andesite (alt. argill. minor limestone and shales)
	Strike and slip of bedding
	Contact defined inferred
	Fault
	Duromic large, small
	Chalcocite
	Muscovite
	Aurifer
	Successive
	Trench
	Diastrophism (see Noranda - 1973)

APPROXIMATE
LIMITS OF
SLUMP AREA

Department of
Energy and Petroleum Resources
ASSESSMENT REPORT
4914 MAP #3 **4914 M3**

John R. Foster
AKH

REVISED	QUESNEL RIVER OPTION	
GEOLOGY		
FILE NO. 1090	REVISED BY: JRF	DATE 1982 June 1973
MTX 3932/M	DRAWN BY: JRF	SCALE 1:100,000
DWG. No.	NORANDA EXPLORATION Office: Kamloops	