SNAKEHEAD PROPERTY
WERNECKE MOUNTAINS, YUKON

GEOLOGY AND GEOCHEMISTRY
N.T.S. 106-C-13, 106-D-16

DECEMBER 1977

J.L. Hardy
H.W. Marsh

Lat. 64-52
Long 134-00

CLAIMS

CLAIM NAME	RECORD NUMBERS*	EXPIRY DATE
CORD 1-72	Y97639 to Y97710	January 5, 1978

*Mayo Mining District

LOCATION

Snakehead Creek Area, Y.T.

U.T.M.

7193000m N
547000m E
Zone 8

DATES

August 8 - 28, 1977

090303

This report has been examined by the Geological Evaluation Unit and is recommended to the Commissioner to be considered as representation work in the amount of $14,400.00

Resident Geologist or
~~Resident Mining Engineer~~

Considered as representation work under Section 53 (4) Yukon Quartz Mining Act.

B. R. BAXTER
Supervising Mining Recorder

for Commissioner of Yukon Territory

SUMMARY

The Snakehead property, consisting of the 72 claim Cord Group, is located in the Wernecke Mountains of the Yukon Territory. Attention was attracted to the area on the basis of regional stream sediment anomalies for lead and zinc, and two high assay values from random grab samples.

During 1976, highly anomalous lead and zinc values were found in both stream sediments and soils in the area. The source of these metals was not determined due to talus cover, though it was anticipated that stratabound and stratiform mineralization existed in pyritiferous shales.

In 1977, detailed soil sampling and stratigraphic mapping took place over a three week period. The purpose of this mapping was to further define metal-rich areas through dual geological and geochemical approaches. The mapping determined the structural complexities of the underlying geology and proved the close relationship between soil anomalies and geology.

The property is underlain by Helikian Units 1 and 2: pyritiferous carbonaceous mudstones/siltstones and dolostones respectively. They are typically well bedded, except where

axial plane cleavage destroys bedding continuity. Deformation is frequently intense, as expressed in extremely tight isoclinal folds on an outcrop scale. The contact between units is conformable and gradational within a regressive sequence, but to the northeast the units are in fault contact.

All lead and zinc mineralization occurs within distorted and contorted pyrite or pyrrhotite-rich mudstone/silstones. Thickest mineralized widths are less than 8 cm. Because of the complex isoclinal nature of the folding, lateral extent is not possible to estimate accurately.

Geochemical sampling of talus fines indicates a high local zinc and lead background within the map area. It is suspected these high values represent a concentration of metal values resulting from the mixing of the mudstone and siltstones with small weakly mineralized sulphide lenses. Most of the Pb-Zn mineralization present on the property is outlined by the geochemical sampling, however, the high metal values do not outline areas of further interest.

The restricted stratigraphic and lateral extent of observed mineralization despite its admittedly high grade locally, precludes the likelihood that economic thicknesses and concentrations of lead or zinc sulphides are present on the Snakehead property. High geochemical values are accounted for by the known modes of mineralization. For these reasons, no further work is recommended on the property, as no economic target exists.

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MAPS

1. INTRODUCTION

From August 2 to 28, 1977, a programme of detailed geological mapping and talus fines sampling was carried out by a seven to nine person crew based on the Cord claims, located in the area of Snakehead Creek in the eastern Yukon.

The purpose of this project was to assess the potential of the property for stratabound lead-zinc mineralization. The results of the programme are discussed in the report which follows.

1.1 LOCATION AND ACCESS

The Snakehead property is located in the eastern Yukon along the northeastern boundary of the Wernecke Mountains, approximately 165 km northeast of Mayo as shown on the location map (L-6485). Centred on $134^{o}00'$N, $64^{o}52'$W the property is 18 km southwest of Fairchild Lake and 5 km east of the headwaters of Snakehead Creek.

The property is accessible by helicopter only. Personnel and equipment were moved to Fairchild or Gillespie Lake by float equipped fixed-wing aircraft based from Mayo. A 206B or 500C helicopter also based at Mayo was then used to ferry the equipment to and from the camp on the main branch of Snakehead Creek. Weekly grocery flights were to Gillespie Lake, from which a locally based B2 helicopter delivered supplies to the camp.

All work on the property was completed on foot, except for three days when helicopter set outs were available.

1.2 TOPOGRAPHY, VEGETATION AND CLIMATE

The Cord group lies in the Wernecke Mountains, transitional between the northwest trending MacKenzie Mountains and the east trending South Ogilvie Range. The average relief on the property is 1220 metres, and the maximum elevation is 2140 metres a.s.l.. Slopes are mostly on the order of forty degrees but in places are near vertical.

The claims are completely above tree line with only isolated arctic willow and scrub spruce present in creek valleys. Ice from continental and/or alpine glaciers has modified the shape of river valleys and left lateral and ground moraines in several areas. To the southeast, permanent icefields and rock glaciers are common. Patterned ground is typical on lower reaches, and geliflunction knobs are visible in several areas.

Rainfall is in the order of 40 cm annually with about 21 cm falling in the summer months. Snowfall averages 160 cm per year.

1.3 PROPERTY AND CLAIM STATUS

The Snakehead property at present consists of 72 mutually contiguous claims known as the Cord group. Anniversary dates and record numbers are given in Table I below.

TABLE I

SNAKEHEAD CLAIM STATUS

CLAIM NAME	RECORD NUMBER	ANNIVERSARY DATE
CORD 1-72	Y97639-Y97710	January 5, 1978

2. HISTORY

2.1 HISTORY PRIOR TO RIOCANEX WORK

In 1974, Cordilleran Engineering completed a reconnaissance stream sediment survey over the eastern Yukon for Rio Tinto Canadian Exploration Ltd. The samples from the area of the present Cord group provided lead values in excess of 500 ppm and zinc values greater than 1000 ppm. Two random chip samples yielded assays of up to 13% combined Pb and Zn. (See Cordilleran Engineering Ltd. Report - Bonnet Plume Project 1974).

In 1975, because of the activity of other companies in the region, the Cord group was staked by Cordilleran Engineering for Rio Tinto. No follow up work was attempted until 1976.

2.2 RIOCANEX WORK 1976

A detailed account of the 1976 Riocanex programme is provided in an internal company report titled:

SNAKEHEAD PROPERTY
WERNECKE MOUNTAINS, YUKON
GEOLOGY AND GEOCHEMISTRY
NTS 106C13, 106D16
OCTOBER, 1976

A.G. TROUP
H.W. MARSH

Work in 1976 involved detailed stream sediment sampling over the entire property, reconnaissance soil sampling over areas highlighted by field analyses of the samples, and reconnaissance mapping over the area of the property. A number of rock chip samples were collected from pyrite-bearing beds.

The programme established that a high regional background exists for lead and zinc in stream sediments and soils. No source for the anomalies could be discovered due to the limited nature of the survey, and the extensive talus cover. There was a strong positive association between high geochemical values and black shales, presenting the possibility of stratiform shale-hosted lead-zinc mineralization. Isolated occurrences of stratiform pyrite were noted and sampled - yielding some noteworthy Pb and Zn assays.

2.3 RIOCANEX FIELD PROGRAMME, 1977

Field work began on August 8, 1977 and continued until August 28, 1977. During that interval, the following work was completed:

(1) The claim block was mapped on a scale of 1:5000 using a topographic base with a 20 m contour interval and altimetres for elevation control.

(2) Talus fines samples were collected over most of the property using line orientation which minimized the amount of outcrop traversed.

(3) Rock chip samples were collected from pyrite-rich beds and representative beds with visible base metal mineralization to obtain estimates of best grade, and to evaluate the possible genesis of mineralization by metamorphic enrichment of the pyrite bearing beds.

(4) All outcrops of Unit I were thoroughly prospected.

The results of the mapping and sampling are shown on the accompanying drawings.

All equipment was removed from the field at the end of the field programme.

3. GEOLOGY

3.1 GENERAL GEOLOGY

The Snakehead property is located at the northeastern edge of the 1:250,000 scale Nash Creek sheet (Green (1961)). The geology as described in GSC Memoir 364 (1972) shows the property straddling the contact between map Units 1 and 2, both of Helikian age. The lower Unit 1 consists of grey and black argillites, slates, and phyllites with minor quartzites, conglomerates, and dolostones. The upper Unit 2 is composed of orange weathering grey dolostones with minor phyllites and quartzites. In most places the contact with Unit 1 is conformable, though to the northeast it is fault bounded.

Recent section measuring and local mapping by Bell and Delaney has shown the claims to be underlain by Units B and C, with both units intruded by one or more diatremes (Bell and Delaney, 1977). Group B is 2100-4500 metres thick on a regional basis, though only the lower portion of the unit: pyritic silty mudstones with coarsening upward cycles of mudstone-siltstone-sandstone (Ba) exists on the claim block. Group B is gradational into Group C, which is upwards of 2000 metres thick regionally. The latter consists of calcareous argillites, limy lenses within dolostone, cherty dolostones, dolomitic shales and stromatolitic dolostones. No small scale map has yet been produced to illustrate the distribution of these units.

Preliminary mapping by Riocanex in 1976, had shown that this work was reasonably accurate. The property does in fact overlie rock Units 1 and 2, though the contact is displaced by as much as 2.5 km from that shown on the 1:250,000 scale map. The sequence has been severely folded and faulted in both Racklan and Columbian orogenies.

Mapping in 1977 was carried out by means of pace and compass traverse using altimeters for elevation control. Geology was plotted directly on a 1:5000 scale base map. The results of the mapping are shown in drawing G-8479.

3.2 STRATIGRAPHY

Detailed mapping on the Snakehead property has shown only two units in the stratigraphic column, both of presumed Helikian age. No estimation of local stratigraphic thickness are possible as neither unit is fully exposed. The generalized stratigraphic column is shown below with increasing age.

<u>PROTEROZOIC</u> (?)

DIATREME: Discordant heterolithic rubble breccia, surrounded by zones of silification and/or carbonatization which may extend up to 200 m from the bodies; fragment size from more than 100 m in diameter to finely comminuted matrix; trace chalcopyrite, abundant specular hematite and magnetite.

<u>HELIKIAN</u>

UNIT 2: Grey dolostones, weathering yellow-grey, brown, orange, to brick red; well bedded to massive (2 cm to 2m); locally with chert lenses and well developed domal to laterally linked stromatolites, shallows upwards with cross beds, mudcracks and silt content increasing upward.

2(a) siltstones and mudstones, black, locally pyritic and highly carbonaceous; well bedded (1mm to 4 cm), recessive; maximum to 15% of the sequence.

UNIT 1: Black mudstones and siltstones, commonly carbonaceous, locally siliceous, variably banded.

1(a) pyrite/pyrrhotite-rich mudstones and siltstones, most often melanterite coated.

1(b) dark green-grey phyllites, locally pyrite or chlorite rich, axial plane cleavage totally to partly obscuring bedding.

1(c) black dolostones, variable weathering colours, totally recrystallized but medium grained, locally stromatolitic; rare white to pink dolostones.

1(d) limestones, black, totally recrystallized but medium grained.

1(e) silica-rich lithologies, possibly of metasomatic origin; often bleached to light grey or white colour; includes "siliceous mudstones", "banded cherts", "bleached siliceous dolostones", "siliceous siltstones".

3.3.1. DIATREME

Large discordant heterolithic breccias of presumed Proterozoic or possibly Cretaceous age are exposed in several localities. They cross-cut both map units, though the faulted contact between Units 1 and 2 has been exploited in one area. Both breccias and surrounding country rock are typically silicified, feldspathized and carbonatized. Coarse disseminated specular hematite and crystalline magentite are abundant. Iron-rich dolomite and siderite are common as cement, and as apparent fragments within the breccia. Quartz is a frequent cement, with barite as a rare constituent. The angular fragments composing the breccia range from more than 100 metres in diameter down to a finely comminuted matrix. Compositions include sandstone, talcose mudstone, jasper, quartz lutite, siltstone, mudstone, claystone, and quartz monzonite, as well as feldspar phenocrysts. A trace of chalcopyrite is present locally in the matrix, and may be accompanied by malachite. No uranium mineralization was noted, though a scintillometer was used in the field.

The smaller diatreme bodies shown are of uncertain extent due to lack of outcrop, but there are several distinctly separate pipes. Because of the large size of some of the fragments, as well as the 'cold' intrusive nature of the contact, the edges of the diatreme within the dolostone may be difficult to define except by the extremely coarse and centripetal nature of the cementing carbonate.

3.2.2 UNIT 2

Unit 2 consists of a thick sequence of yellow, grey, orange, brown to brick red weathering black dolostones with minor limestones and siltstone/mudstones. The variation in weathering colour is related to differences in iron abundance within the dolomite. Pyrite is ubiquitous as anhedral disseminations, and euhedral cubes up to 3 mm in diameters. Typically the dolostones are well bedded from 2 cm to 1.5 m, though massive beds may be present. Millimetre thick silt bands are common.

There are few primary textures preserved with the exception of sporadic stromatolites. Generally these are planar or low amplitude laterally linked hemispheroids, suggesting an intertidal origin. Several areas show isolated domes of 1-2' amplitude and sparse digitate stromatolites which could indicate a subtidal environment, though conceivably of local extent.

Chlorite is present at some levels in the dolostones, concentrated along bedding plane surfaces. Recrystallized rubble breccias are local developments. Malachite stained quartz/dolomite veins containing traces of chalcopyrite are common, but tend to be irregular and discontinuous. In one area a bed of barite crystal hash is present within otherwise typical dolostones. Black chert nodules compose up to 20% of some beds. Siderite, dolomite and quartz veins are common.

The interbedded mudstones and siltstones (sub unit 2a) are typically black and finely banded with uniform bedding. They may compose up to 15% of the sequence though their abundance is underestimated as they weather recessively. Massive soft sediment slump breccias are present in several areas along the northeast map border. The sequence shallows upwards as evidenced by decrease in pyrite content, thickness of bedding planes, and increase in silt content, as well as by the presence of cross bedding and mudcracks higher in the sequence. Intraformational conglomerates are rare.

The lower contact with map Unit 1 is marked by a gradual increase in the amount of fine clastics over dolostones, a decrease in bedding thickness, and increase in the amount of pyrite in the sequence. It is thus somewhat arbitrarily placed and much of the clastic and dolostone sequence may be considered as a transition zone between Units 1 and 2.

3.2.3 UNIT 1

Map Unit 1 consists of highly carbonaceous mudstones and siltstones, with minor limestones and dolostones in the transition zone. Locally the former have been metamorphosed to green-grey phyllites (sub unit 1b) with a characteristic silky sheen. These phyllites probably represent lower parts of the Unit 1 sequence - in thrust fault contact with the rocks of Unit 2 and those of the transition zone.

The mudstones and siltstones are typically iron sulphide rich (sub unit 1a). Pyrite and pyrrhotite are present in adjacent beds with an apparently random distribution, suggesting an original depositional difference due to differing sulphur fugacities in adjoining beds. Pyrite is found in amounts varying from discrete cubes (up to 4 mm in diameter) to massive concentrations forming up to 80% of individual beds. Powdery melanterite coatings are ubiquitous.

Generally the tectonism has promoted only pyrite remobilization, so bedding in pyrite rich beds is still uniform and lacking in meso-scale folding, even where lead and zinc sulphides are present. However, where pyrrhotite is the iron sulphide, grain size is generally coarser, and millimetre scale folding is the norm. Banded pyrrhotite may terminate abruptly within a bed though the banding may be continuous through barren and pyrrhotite rich portions of the bed. Carbonate content of these beds is typically much higher than those containing pyrite, and aided in remobilization. Mudstone bands within the sulphides often show well-defined thickening towards fold limbs. Banding in the sulphides themselves may be defined by slight changes in colour, grain size and composition as sphalerite and/or galena may be present. Lithoplastic mudstone breccias are common.

Elongated streaky quartz lenses may be present as part of a foliated pattern in pyrite rich lithologies. Fibrous quartz eyes typically displace the banded sulphides, and may contain galena and/or sphalerite between the fibres. Small amounts of chalcopyrite may be associated with the pyrrhotite. Sporadic malacite development was observed. All mudstones and siltstones are well and uniformly bedded on a 5 mm to 6 cm scale. Tight outcrop-scale folding is typical and pervasive axial plane cleavage may locally obscure bedding. Slip surfaces are commonly accentuated by graphite and chlorite.

Light grey silica rich bands (sub unit le) are frequent in the sequence. The amount of the silica varies widely from less than 10% interbanded with rusty weathering siltstone to perhaps 85% in chert-like bands. In one area there are white dolomitic chert bands with pyrrhotite blebs to 5 mm composing up to 15% of the rock. Their textures, as well as their sedimentary setting,within a subtidal euxinic environment preclude an origin as sandstones. On a regional basis, such cherty beds give way to unaltered lithologies of dark colour along strike. The cherty bands are thought therefore to be of metasomatic origin, by selective replacement of favourable beds by quartz-rich waters remobilized from a heat pump primed perhaps by processes initiating diatreme emplacement.

Where iron sulphides are not present, the rocks are substantially lighter in colour to pale banded green or grey and are commonly calcareous.

Dolostones within Unit 1 may be black and silty or less commonly pink and limy or siliceous. Pyrite cubes to 4 mm diameter are typical along bedding planes. Black limestones are occasional constituents (sub unit 1d).

Quartz/carbonate veins of irregular and discontinuous extent transect the rocks of Unit 1. In one location, niccolite and/or arsenopyrite were observed in two 5 cm wide irregular discontinuous dolomite veins.

Unit 1 lacks distinctive traceable stratigraphic markers and, due to the intense nature of the folding and faulting, individual beds are impossible to follow for any great distance.

3.3 STRUCTURE

Rocks of both Unit 1 and 2 have undergone considerable folding and at least local faulting. Strikes and dips on an outcrop scale are widely divergent. Chevron, Z, and S, folds may be present in the same outcrop as parallel and similar folds and may pass into one another. On a property scale, the general strike of the units averages near 130 degrees. Axial plane measurements on minor folds clustered near trends of 0 and 255 degrees, with dips generally steep to the northeast, though minor folds of other orientations are present.

The largest fault, at the contact of Unit 1 and 2, shows a gentle curvature though its basic orientation strikes 285 degrees. The displacement appears to be large but estimates are not possible. Pervasive axial plane cleavage totally obscures bedding in the phyllites, which one interpretes as being the upthrust and lower sections of Unit 1. Some of the large faults show definite warping at opposite ends.

Two fault orientations of 20 and 90 degrees are present on smaller faults. These are presumably late-stage as they show no evidence of later warp. There is no conclusive evidence of displacement along these faults, but it generally appears to be of 20 metres or less. Some of the small faults of uncertain displacement between outcrops of Units 1 and 2 may be localized facies changes within one of the units.

In summary, two distinct periods of folding and faulting are evident, corresponding possibly to the Hadrynian Racklan and Cretaceous Columbian orogenies.

3.4 GEOLOGIC HISTORY

During Helikian times, sediments in the area of the Snakehead property were deposited under subtidal euxinic conditions of a sub-basin or lagoon at the edge of the Cordilleran geosyncline. The source area was some distance away as the bulk of the terrigeneous clastics are quartz-rich. During periods of low supply of clastics, iron rich carbonates accumulated. Gradually conditions became less restricted, the iron content of the sediments as a whole decreased, and carbonates began to dominate the sequence. Their textural and sedimentological characteristics suggest deposition at first under subtidal conditions, but gradual shallowing took place. Upwards, intertidal stromatolites became at least locally well established and the contribution of silt increased. In places there was local exposure, as evidenced by sparse mud-cracks.

The Hadrynian Racklan orogeny produced the minor folds. Phyllitization took place at that time in the siltstone/mud-stones but apart from minor recrystallization, the carbonates show only minor effects. Block faulting also took place. Because of the Racklan uplift there was very little deposition in the succeeding period. Diatreme intrusion may have taken place as early as 1.5 billion years but some dates of Siluro-Devonian age have also been recorded. The possibly higher

higher geothermal gradient at the sites of such emplacement may have aided in silica remobilization to produce the observed metasomatic effects.

The Laramide orogeny then refolded the sediments, accentuating the early folding, initiating new folding, and warping the older faults. Minor faulting was also initiated, and older faults were likely reactivated.

4. GEOCHEMISTRY

4.1 SAMPLING, SAMPLE PREPARATION, AND ANALYTICAL PROCEDURE

Talus slide fine samples were collected to determine the distribution of lead and zinc. Samples were taken from lines spaced 250 m apart at stations every 20 m along the lines. Sampling was concentrated over portions of the claims underlain by favourable geology, as determined from the concurrent mapping programme. Grid orientations were chosen to maximize the number of samples which could be collected and minimize the amount of outcrop traversed.

All samples collected in 1977 were obtained by using a chisel-pointed rock hammer to dig until the finer talus fractions were reached. In only a few cases were soil horizons sufficiently well developed to enable a B horizon to be distinguished. C horizons provided the most common samples.

All samples were placed in Kraft paper envelopes and shipped to the Rio Tinto laboratory in North Vancouver. They were oven dried at 60^{o} C, sieved to minus 80 mesh, and the over size material discarded. After digestion with a 1:2 mixture of hot hydrochloric and nitric acid, analyses were completed by atomic absorption spectrophotometer. Results, expressed in PPM for lead and zinc, were determined by Mr. E.F. Paski, Jr.

4.2 PRESENTATION AND DISCUSSION OF RESULTS

Talus slide fine results are showing on Drawings GC-8581 and GC-8582, with sample locations shown in Drawing L-8580, all at a scale of 1:5000.

Statistical computations were carried out to obtain mean, standard deviation, threshold and anomalous values, and are shown below in Table II.

TABLE II

Significant metal values for talus fine sediment samples*

METAL	MEAN (x)	STANDARD DEVIATION (s)	THRESHOLD (x + 2s)	ANOMALOUS (x + 3s)
Pb	260 ppm	880 ppm	2020 ppm	2900 ppm
Zn	990 ppm	1660 ppm	4310 ppm	5300 ppm

* Population of 1706 samples, normal distribution.

Geochemical sampling of talus fine from the Snakehead property indicates a number of high values for lead and zinc within the map area.

In most cases the high values are indicative of pyrite-sphalerite-galena mineralization in small isolated lenses or are representative of a high geochemical background of lead and zinc for the mudstone and siltstones of Unit 1. High metal values found over Unit 2 may also represent a high background of the interbedded mudstones and siltstones (2a) contained within Unit 2 dolostones.

Dispersion of the geochemical anomalies is consistently along the grid lines (down slope) and rarely carries across lines. It is likely that these dispersions have resulted from the mixing of talus fines with the weak mineralization present on the property (see section 5.1). It is unlikely that the high geochemistry defines broad areas of lead-zinc mineralization.

Despite the numerous high metal values present on the Snakehead property the geochemistry results do not outline any areas of further interest.

5. MINERALIZATION

5.1 MODE OF OCCURRENCE

The bulk of the mineralization on the property lies within the Unit 1 mudstone/siltstones. There are two basic modes of occurrence. The most significant of these is as variable proportions of galena and sphalerite within a host which on surface has a powdery melanterite coating. Typically all such occurrences are stratabound, though not stratiform. The second mode of mineralization is galena and sphalerite associated with dolomite veins.

Stratabound dark brown sphalerite and galena are present in very fine to coarse grained form. There are two basic types of host:
(1) extremely iron sulphide and carbon-rich siltstones, and
(2) quartz-rich bands within such a siltstone sequence. The local stratigraphy in each case consists of interbedded pyritiferous dolostones and mudstones.

In the iron sulphide-rich siltstones (type 1) the mineralized beds contain considerable quartz and carbonate as lenses around which vague discontinuous iron sulphide and siltstone bands have draped. A pronounced foliation may be present. Pyrite is intimately associated with the sphalerite and galena except in sparse recrystallized coarse-grained bands (up to 4 mm) of almost pure spalerite. The mineralized beds contain small scale folding (less than 2 cm) and micro-brecciation outlined by changes in sulphide abundance. Non-mineralized, comparatively sulphide-poor beds above and below lack such features. Pyrrhotite is the dominant iron sulphide in cases where iron sulphide forms the bulk of the bed and micro-brecciation is well developed, but otherwise the iron sulphide is pyrite.

Quartz lenses may widen to form nearly continuous bands (type 2) within the siltstone sequence. Small scale isoclinal and recumbant folding is pronounced but totally lacking in consistent orientation. Fibrous quartz composes the main part of the bands, which show marked pinching and swelling, though of average 1-5 cm in thickness. Interbedded pyritic siltstones within such a sequence are irregular but average less than 0.5 cm in width. The quartz bands themselves are complex in structure, though they frequently have a central millimetre scale sphalerite and pyrite band, across which the fibres are not continuous. Individual fibres are frequently warped. Sphalerite and/or galena with trace chalcopyrite, are often found between individual fibres. Mineral abundance is variable within individual beds. On the average, galena composes from 0-35% of the band; sphalerite makes up 0-10%, and chalcopyrite 0-5%.

Sphalerite and galena are typically discrete from one another, though they may co-exist. Sphalerite may increase in grade towards some local fold axes, though this may be a function of increased visibility due to coarser grain size at the crests. In general, chalcopyrite is anhedral and irregular in distribution. It tends to associate more closely with galena than sphalerite and to be present in close association with pyrite. Malachite staining may be well developed.

Of less importance than the occurrence in iron sulphide-rich siltstones is the occurrence of sphalerite with some galena and trace of chalcopyrite in dolomite veins cutting Unit 1. The veins (hair width to 6 cm) are irregular and discontinuous and do not extend more than 1 metre beyond mineralized beds. Sulphides can vary from the latest to earliest stage of the paragenetic sequence in the vein. Grades are highly erratic.

A single grain of galena was observed in a dolostone of Unit 2. The galena surrounded a 2 mm grain of anhedral pyrite. No other mineralization was recorded in this unit. In view of the low porosities and probable physiochemical environment of dolostone deposition, no significant mineralization would be anticipated.

The abundance of lead and zinc sulphides in all cases is irregular. When mineralization can be followed along strike, it lacks continuity. Maximum apparent mineralized width is 6 cm, though beyond that, very fine-grained brown sphalerite may be disseminated in pyritiferous siltstones above and below the coarser grained iron sulphide-rich beds. Maximum observed mineralized width in both types of stratabound occurrence is 8 cm.

5.2 CHIP SAMPLING

Four rock chip samples were taken during the course of the programme, all nearly perpendicular to bedding. The purpose of the sampling was to assess whether metamorphic remobilization of background values of lead and zinc in bedded pyrite could yield (1) high lead and zinc values and (2) account for the large geochemical anomalies. Sampling was also carried out to determine grade over the greatest observed widths.

The samples were placed in numbered plastic bags and shipped to the Bondar-Clegg laboratory in North Vancouver for assay. Samples were pulverized to -200 mesh, and analyzed on the atomic absorption spectrometer after digestion with hot aqua regia. The results and a brief description of each sample are given below in Table III.

TABLE III

CHIP SAMPLE RESULTS

Assay Number	Description	%Pb	%Zn	%Cu
201898	Banded pyritic mudstone; well bedded; uniform	0.07	0.03	-
201899	Banded siltstone with pyrite, arsenopyrite, and sphalerite	0.04	7.30	-
201900	2.1 m trench sample including dolostone, siltstone and pyritic siltstone; all somewhat oxidized; includes 201899 above to give maximum mineralized width	0.99	1.20	-
202151	Fibrous quartz bands with sphalerite, galena, and minor chalcopyrite, plus pyrite; tight isoclinal and recumbant folds.	0.66	1.78	0.06

5.3 GENESIS OF MINERALIZATION

The present form of mineralization at Snakehead is believed to be the result of tectonic remobilization of an initially lower grade synsedimentary mineralization.

The original sediments were formed under euxinic conditions with a source of abundant sulphur from the surrounding sea waters. The metals could have been derived from the sediments being deposited or have been introduced along basement lineaments within the area. The last is plausible at least on a regional basis. As the area has a long history of tectonic instability and hence a potential for "hot-spot" activity. In either case, continued compaction and brine concentration by diagenetic dewatering, could have supplied lead and zinc to the horizon for an extended period during diagenesis.

Later, during the Hadrynian Racklan orogeny and Cretaceous Columbian orogenies, tectonism capitalized on the highly mobile sulphide-rich beds to produce intense localized folding and micro-brecciation of competant beds within the sequence. At this time the marked foliation developed in some beds, while in others the sulphides recrystallized and migrated into areas of dilatancy. This explains the higher concentrations at some fold crests or within fibrous quartz bands.

The lack of consistency of the migration indicates the complex nature of the folding and the dilatant zones which existed. This complexity is illustrated by the rapid changes in fold orientation on a centimetre scale as well as by marked differences in local fold style. The mineralized veins developed as "sweat-outs" by remobilization of sulphides into open fractures created where competancy had been exceeded.

6. CONCLUSIONS

The 1977 field programme permits the following observations:

(1) Extremely high values of lead and zinc are present in talus fines over the Snakehead property.

(2) There is a strong association between the highest metal values and black mudstone/siltstone horizons.

(3) High-grade galena and sphalerite, sometimes with minor chalcopyrite, exist in pyrite or pyrrhotite-rich beds, over a restricted lateral and stratigraphic extent.

(4) Best grades of lead and zinc are present in contorted, microbrecciated, or disturbed lithologies.

(5) Maximum mineralized width and grade observed were 2.1 metres of 0.99% Pb and 1.20% Zn.

These factors support the conclusion that while high grades of lead and zinc sulphide are present in several locations within Unit 1, the extent was not of economic import. The probable origin of the mineralization, mainly as a metamorphic concentration product from the pyrite beds, precludes the possibility of development of extensive deposits. The known sedimentary setting of the area mitigates against volcanogenic pod-type sulphides as facies equivalents. There is thus no potential for a deposit of the tonnage and grade of lead-zinc necessary for an economic deposit in the Snakehead area.

7. RECOMMENDATIONS

All potential host rocks on surface have been thoroughly examined. In view of the preceeding conclusions, there are no economic targets on the Cord claims of the Snakehead property. For this reason, no further work is recommended.

Respectively submitted,

RIO TINTO CANADIAN EXPLORATION LTD.

J.L. Hardy, B.Sc.

H.W. Marsh, B.Sc., P.Eng.

APPENDIX A

Assay Results

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To: Rio Tinto Canadian Exploration

PAGE No. 1

615 - 555 Burrard Street
Vancouver, B.C.
V7X 1M8

REPORT No A27 - 978

DATE: October 19, 1977

BONDAR-CLEGG & COMPANY LTD.

CERTIFICATE OF ASSAY

Samples submitted: October 13, 1977
Results completed: October 19, 1977

PROJECT: 8623

I hereby certify that the following are the results of assays made by us upon the herein described ore samples.

MARKED	GOLD		SILVER	Cu	Pb	Zn					TOTAL VALUE PER TON (2000 LBS.)
	Ounces per Ton	Value per Ton	Ounces per Ton	Percent	Percent	Percent	Percent	Percent	Percent	Percent	
201898			-	-	0.07	0.03					
201899			0.20	<0.01	0.04	7.30					
201900			0.15	<0.01	0.99	1.20					
202151			0.19	0.06	0.66	1.78					
202152			-	0.05	0.04	0.22					

Registered Assayer, Province of British Columbia

APPENDIX B

GEOCHEMICAL RESULTS

RIO TINTO CANADIAN EXPLORATION LIMITED

LABORATORY REPORT

PARTS PER MILLION

LAB Nº.	SAMPLE Nº. (NMBR)		Pb	Zn						COMMENTS
1	7711001		730	1800						
2	2		620	1550						
3	3		610	1380						
4	4		440	770						
5	5		830	1700						
6	6		41	145						
7	7		107	280						
8	8		240	590						
9	9		160	375						
10	10		47	150						
1	11		50	180						
~~2~~	~~STD1~~		~~29~~	~~860~~						
3	12		51	165						
4	13		23	106						
5	14		76	270						
6	15		40	175						
7	16		36	152						
8	17		21	98						
9	18		30	142						
20	19		31	158						
1	20		43	188						
~~2~~	~~BLANK~~		~~ND~~	~~ND~~						
3	21		14	66						
4	22		1070	10500						
5	23		410	5500						
6	24		280	3400						
7	25		260	3400						
8	26		100	465						
9	27		145	710						
30	28		120	590						
1	29	130	~~[illegible]~~	570						
2	30	350	~~[illegible]~~	4000						
3	31	320	~~[illegible]~~	3400						
4	32	320	~~[illegible]~~	3400						
5	33	330	~~[illegible]~~	3300						
6	34	250	~~[illegible]~~	1170						
7	35	260	~~[illegible]~~	1350						
8	36	240	~~[illegible]~~	910						
9	37		1080	3200						
40	7711038		44	140						

REPORT Nº. 77-97

RIO TINTO CANADIAN EXPLORATION LIMITED

LABORATORY REPORT

PARTS PER MILLION

LAB NO.	SAMPLE NO. (NMBR)		Pb	Zn						COMMENTS
41	7711039		29	75						
2	40		26	66						
3	41		86	175						
4	42		33	110						
5	43		23	66						
6	44		12	72						
7	45		16	85						
8	46		10	70						
9	47		24	185						
50	48		27	165						
1	49		16	130						
2	50		28	215						
~~3~~	~~STD2~~		~~380~~	~~260~~						
4	51		25	155						
5	52		400	850						
6	53		180	560						
7	54		130	355						
8	55		220	475						
9	56		840	1900						
60	57		1140	3500						
1	58		1180	3800						
2	59		1270	3500						
~~3~~	~~BLANK~~		~~ND~~	~~ND~~						
4	60		1470	2900						
5	61		1080	5000						
6	62		1330	1350						
7	63		1300	930						
8	64		1750	1120						
9	65		580	1600						
70	66		480	1000						
1	67		540	2900						
2	68		440	2700						
3	69		730	4500						
4	70		340	1800						
5	71		350	2900						
6	72		440	4200						
7	73		530	4700						
8	74		310	3000						
9	75		136	2800						
80	7711076		133	3000						

REPORT NO. 77-97

RIO TINTO CANADIAN EXPLORATION LIMITED

LABORATORY REPORT

PARTS PER MILLION

LAB Nº.	SAMPLE Nº. (NMBR)		Pb	Zn						COMMENTS
81	7711 077		220	3800						
2	78		250	2900						
3	79		190	2800						
4	80		185	3300						
5	81		172	2800						
6	82		160	3300						
7	83		155	4100						
8	84		135	3700						
9	85		120	3800						
90	86		160	4200						
1	87		290	4200						
2	88		190	6100						
3	89		59	275						
~~4~~	~~STD 3~~		~~4~~	~~56~~						
5	90		73	375						
6	91		87	400						
7	92		88	310						
8	93		118	350						
9	94		92	250						
100	95		117	730						
1	96		210	3400						
2	97		175	2600						
3	98		138	540						
~~4~~	~~BLANK~~		~~[illegible]~~	~~[illegible]~~						
5	77 11 099		135	405						
6	7711 100		105	265						
7	1		116	300						
8	2		123	320						
9	3		165	415						
110	4		183	475						
1	5		250	780						
2	6		350	1400						
3	7		960	4800						
4	8		3100	8300						
5	9		1040	3400						
6	10		1100	4000						
7	11		970	2800						
8	12		1850	4800						
9	13		3500	7300						
120	77111 14		17	88						

REPORT Nº. 77-97

RIO TINTO CANADIAN EXPLORATION LIMITED

LABORATORY REPORT

PARTS PER MILLION

LAB Nº.	SAMPLE Nº. (NMBR)		Pb	Zn					COMMENTS
121	771115		12	75					
2	16		13	72					
3	17		18	105					
4	18		16	114					
5	19		14	94					
6	20		16	98					
7	21		14	85					
8	22		18	90					
9	23		15	98					
130	24		15	158					
1	25		27	105					
2	26		33	154					
3	27		22	125					
4	28		21	98					
~~5~~	~~STD 1~~		~~29~~	~~870~~					
6	29		33	102					
7	30		14	63					
8	32		13	88					
9	33		17	73					
140	34		16	56					
1	35		17	50					
2	36		39	130					
3	37		18	64					
4	38		13	78					
~~5~~	~~BLANK~~		~~nil~~	~~nil~~					
6	39		16	81					
7	40		15	76					
8	41		20	88					
9	42		17	72					
150	43		37	142					
1	44		21	100					
2	45		43	155					
3	46		37	122					
4	47		23	88					
5	48		43	82					
6	49		29	88					
7	50		37	106					
8	51		39	114					
9	52		45	104					
160	771153		45	130					

REPORT Nº. 77-97

RIO TINTO CANADIAN EXPLORATION LIMITED

LABORATORY REPORT

PARTS PER MILLION

LAB Nº.	SAMPLE Nº. (NMBR)		Pb	Zn							COMMENTS
161	77 111 54		38	122							
2	55		59	145							
3	56		45	108							
4	57		58	64							
5	58		86	66							
6	59		140	114							
7	60		150	180							
8	61		62	58							
9	62		132	90							
170	63		300	720							
1	64		190	610							
2	65		180	152							
3	66		360	750							
4	67		1140	3300							
5	68		175	400							
~~6~~	~~STD 2~~		~~380~~	~~255~~							
7	69		124	245							
8	70		570	4000							
9	71		140	600							
180	72		38	225							
1	73		31	580							
2	74		21	270							
3	75		22	148							
4	76		38	82							
5	77		87	78							
~~6~~	~~BLANK~~		~~ND~~	~~ND~~							
7	78		45	84							
8	79		38	104							
9	80		33	138							
190	81		28	106							
1	82		16	48							
2	83		26	54							
3	84		36	98							
4	85		37	105							
5	86		18	55							
6	87		23	48							
7	88		17	52							
8	89		17	37							
9	90		17	36							
200	77 111 91		33	58							

REPORT Nº. 77-97

RIO TINTO CANADIAN EXPLORATION LIMITED

LABORATORY REPORT

PARTS PER MILLION

LAB Nº	SAMPLE Nº (NMBR)		Pb	Zn					COMMENTS
201	7711192		35	46					
2	93		37	68					
3	94		23	46					
4	95		410	2900					
5	96		94	128					
6	97		39	92					
7	98		28	68					
8	7711199		34	135					
9	7711200		41	75					
210	2		1470	4900					
1	3		6000	10000					
2	4		230	435					
3	5		180	370					
4	6		670	1900					
5	7		390	830					
6	8		1070	3500					
~~7~~	~~STD 3~~		~~6~~	~~56~~					
8	9		900	3700					
9	10		830	3300					
220	11		1200	3900					
1	12		800	3600					
2	13		1050	3300					
3	14		1400	18000					
4	15		1330	3400					
5	7711216		1420	3600					
~~6~~	~~BLANK~~		~~ND~~	~~ND~~					
7	7711008		230	610					
8	23		420	8600					
9	38		44	138					
230	52		360	860					
1	68		430	3000					
2	83		155	4300					
3	98		142	550					
4	113		3500	7600					
5	128		23	105					
6	145		44	154					
7	159		140	113					
8	174		22	275					
9	189		17	36					
240	7711205		180	365					

REPORT Nº 77-97

RIO TINTO CANADIAN EXPLORATION LIMITED

LABORATORY REPORT

PARTS PER MILLION

LAB Nº.	SAMPLE Nº. (NMBR)		Pb	Zn						COMMENTS
1	7711217		780	3600						
2	18		690	3000						
3	19		870	3400						
4	20		1230	3400						
5	21		950	2600						
6	22		1410	3600						
7	23		1100	3000						
8	24		250	850						
9	25		250	455						
10	26		240	600						
1	27		280	560						
~~2~~	~~STD 1~~		~~29~~	~~870~~						
3	28		141	325						
4	29		97	360						
5	30		52	290						
6	31		55	155						
7	32		79	225						
8	33		146	1370						
9	34		130	1430						
20	35		109	1050						
1	36		147	1150						
~~2~~	~~BLANK~~		~~ND~~	~~ND~~						
3	37		130	1110						
4	38		190	940						
5	39		300	1750						
6	40		300	2600						
7	41		420	4000						
8	42		107	870						
9	43		220	1180						
30	44		70	700						
1	45		220	3300						
2	46		310	1200						
3	47		3000	340						
4	48		90	415						
5	49		59	170						
6	50		84	225						
7	51		250	1900						
8	52		65	285						
9	53		420	1750						
40	7711254		310	3400						

REPORT Nº. 77-98

LABORATORY REPORT

PARTS PER MILLION

LAB NO.	SAMPLE NO. (NMBR)		Pb	Zn						COMMENTS
41	7711255	380	~~HA~~	1030						
2	56	110	122	415						
3	57	122	24	235						
4	58	24	29	90						
5	59	29	19	108						
6	60	19	7	140						
7	61		7	200						
8	62		18	160						
9	63		17	230						
50	64		16	255						
1	65		18	185						
2	66		13	150						
~~3~~	~~STD2~~		~~380~~	~~270~~						
4	67		35	138						
5	68		20	172						
6	69		19	180						
7	70		25	260						
8	71		11	220						
9	72		12	125						
60	73		7	90						
1	74		7	100						
2	75		13	98						
~~3~~	~~BLANK~~		~~ND~~	~~ND~~						
4	76		9	92						
5	77		6	75						
6	78		16	152						
7	79		14	138						
8	80		30	155						
9	81		8	40						
70	81		8	56						
1	83		8	58						
2	84		6	56						
3	85		7	50						
4	86		12	70						
5	87		15	60						
6	88		15	75						
7	89		19	85						
8	90		38	56						
9	91		46	95						
80	7711292		36	98						

REPORT NO. 77-98

RIO TINTO CANADIAN EXPLORATION LIMITED

LABORATORY REPORT

PARTS PER MILLION

LAB Nº.	SAMPLE Nº. (NMBR)	Pb	Zn
81	7711293	22	112
2	94	24	114
3	95	22	98
4	96	22	125
5	97	27	140
6	98	32	175
7	99	35	230
8	300	54	260
9	301	114	335
90	302	96	650
1	303	88	1300
2	304	92	1170
3	305	122	5500
~~4~~	~~STD 3~~	~~5~~	~~56~~
5	306	118	4700
6	307	131	5200
7	308	107	3400
8	309	160	3500
9	310	167	3000
100	11	230	2600
1	12	230	2900
2	13	220	1670
3	14	400	2600
~~4~~	~~BLANK~~	~~ND~~	~~ND~~
5	15	350	1070
6	16	430	1350
7	17	340	1040
8	18	120	470
9	19	126	2600
110	20	145	580
1	21	220	920
2	22	86	475
3	23	104	840
4	24	720	4400
5	25	440	1320
6	26	240	1380
7	27	280	1950
8	28	41	240
9	29	65	365
120	7711330	37	178

REPORT Nº. 77-98

RIO TINTO CANADIAN EXPLORATION LIMITED

LABORATORY REPORT

PARTS PER MILLION

LAB Nº	SAMPLE Nº (NMBR)		Pb	Zn						COMMENTS
121	7711331		53	640						
2	32		43	560						
3	33		66	690						
4	34		32	275						
5	35		67	325						
6	36		42	360						
7	37		69	720						
8	38		112	1300						
9	39		72	630						
130	40		240	860						
1	41		77	470						
2	42		116	880						
3	43		103	680						
4	44		112	670						
5	~~STD 1~~		~~28~~	~~870~~						
6	45		146	920						
7	46		94	1480						
8	47		240	1200						
9	48		129	570						
140	49		35	325						
1	50		133	880						
2	51		95	970						
3	52		103	960						
4	53		39	180						
~~5~~	~~BLANK~~		~~ND~~	~~ND~~						
6	54		93	770						
7	55		220	1550						
8	56		160	1270						
9	57		127	930						
150	58		151	1030						
1	59		142	760						
2	60		141	1100						
3	61		250	1350						
4	62		220	1430						
5	63		102	660						
6	64		126	770						
7	65		830	4800						
8	66		142	670						
9	67		84	400						
160	7711368		146	560						

REPORT Nº 77-98

RIO TINTO CANADIAN EXPLORATION LIMITED

LABORATORY REPORT

PARTS PER MILLION

LAB Nº.	SAMPLE Nº. (NMBR)		Pb	Zn					COMMENTS
161	7711369		120	370					
2	70		250	465					
3	71		58	330					
4	72		73	335					
5	73		102	390					
6	74		470	1480					
7	75		106	1040					
8	76		71	660					
9	77		158	3300					
170	78		129	1000					
1	79		103	760					
2	80		131	1170					
3	81		173	1400					
4	82		560	3000					
5	83		540	3600					
~~6~~	~~STD 2~~		~~370~~	~~260~~					
7	84		210	1850					
8	85		510	3600					
9	86		280	1750					
180	87		175	1130					
1	88		350	4300					
2	89		310	1850					
3	90		730	3600					
4	91		1310	3300					
5	92		2000	2600					
~~6~~	~~BLANK~~		~~ND~~	~~ND~~					
7	93		2300	3600					
8	94		1430	4700					
9	95		920	4200					
190	96		930	8800					
1	97		1550	7400					
2	98		380	3000					
3	99		940	7000					
4	400		320	3400					
5	401		1180	6600					
6	402		460	2600					
7	403		500	3000					
8	404		167	550					
9	405		540	8400					
200	7711 406		1100	5500					

REPORT Nº. 77-98

RIO TINTO CANADIAN EXPLORATION LIMITED

LABORATORY REPORT

PARTS PER MILLION

LAB Nº.	SAMPLE Nº. (NMBR)		Pb	Zn						COMMENTS
201	7711407		730	3500						
2	8		75	810						
3	9		65	570						
4	10		40	225						
5	11		42	205						
6	12		87	330						
7	13		310	1000						
8	14		30	135						
9	15		67	155						
210	16		47	160						
1	17		67	125						
2	18		50	190						
3	19		23	102						
4	20		29	112						
5	21		22	90						
6	22		11	54						
~~7~~	~~STD 3~~		~~3~~	~~55~~						
8	23		13	52						
9	24		8	40						
220	25		10	50						
1	26		7	40						
2	27		11	50						
3	28		24	115						
4	29		6	43						
5	7711430		14	66						
~~6~~	~~BLANK~~		~~ND~~	~~ND~~						
7	7711223		1090	3200						
8	7711236		149	1100						
9	7711252		62	265						
230	7711268		18	168						
1	7711282		9	54						
2	7711296		25	123						
3	7711311		230	3100						
4	7711325		430	1330						
5	7711340		240	870						
6	77113656		166	1290						
7	7711370		250	460						
8	7711384		190	1800						
9	7711398		390	3200						
240	7711414	30	[illegible]	128						

REPORT Nº. 77-98

RIO TINTO CANADIAN EXPLORATION LIMITED

LABORATORY REPORT

PARTS PER MILLION

LAB Nº.	SAMPLE Nº. (NMBR)		Pb	Zn						COMMENTS
1	7711431		11	50						
2	32		41	122						
3	33		51	125						
4	34		17	62						
5	35		5	33						
6	36		6	30						
7	37		26	66						
8	38		27	76						
9	39		11	32						
10	40		4	28						
1	41		41	92						
2	42		4	28						
~~3~~	~~STD 1~~		~~27~~	~~840~~						
4	43		84	175						
5	44		36	100						
6	45		88	195						
7	46		43	98						
8	47		40	88						
9	48		78	160						
20	49		47	126						
1	50		38	98						
2	51		50	150						
~~3~~	~~BLANK~~		~~ND~~	~~ND~~						
4	52		33	86						
5	53		64	144						
6	54		49	110						
7	55		60	125						
8	56		44	108						
9	57		127	285						
30	58		39	92						
1	61		86	235						
2	62		103	315						
3	63		69	420						
4	64		108	830						
5	65		92	1650						
6	66		45	600						
7	67		40	580						
8	68		29	460						
9	69		16	225						
40	7711470		23	250						

REPORT Nº. 77-99

RIO TINTO CANADIAN EXPLORATION LIMITED

LABORATORY REPORT

PARTS PER MILLION

LAB No.	SAMPLE No. (NMBR)		Pb	Zn						COMMENTS
41	7711471		510	1380						
2	72		270	1100						
3	73		97	~~640~~	365					
4	74		128	~~[illegible]~~	640					
5	75		270	~~640~~	880					
6	76		540	~~850~~	2900					
7	77		60	3200						
8	78		240	4800						
9	79		54	310						
50	81		23	102						
1	82		27	132						
2	83		18	76						
3	70A		21	94						
~~4~~	~~5102~~		~~380~~	~~265~~						
5	71A		14	175						
6	72A		17	160						
7	7711473A		17	165						
8	7711651		570	1580						
9	52		620	1530						
60	53		89	335						
1	54		64	225						
2	55		96	1300						
3	56		117	630						
~~4~~	~~BLANK~~		~~ND~~	~~ND~~						
5	57		119	640						
6	58		104	640						
7	59		25	180						
8	60		93	660						
9	61		52	245						
70	62		46	300						
1	63		28	163						
2	64		136	[illegible]	790					
3	65		76	470						
4	66		48	305						
5	67		56	275						
6	68		29	215						
7	69		18	220						
8	70		16	135						
9	71		22	195						
80	7711672		16	148						

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RIO TINTO CANADIAN EXPLORATION LIMITED

LABORATORY REPORT

PARTS PER MILLION

LAB Nº.	SAMPLE Nº. (NMBR)		Pb	Zn							COMMENTS
81	7711673		19	100							
2	74		48	5600							
3	75		67	6500							
4	76		50	5000							
5	77		63	4300							
6	78		127	6500							
7	79		60	7400							
8	80		75	9200							
9	81		93	3000							
90	82		56	4800							
1	83		54	6600							
2	84		67	2600							
3	85		153	810							
4	86		93	760							
~~5~~	~~STD3~~		~~5~~	~~58~~							
6	87	64	~~NA~~	850							
7	88	96	~~64~~	680							
8	89	185	~~96~~	1050							
9	90	540	~~185~~	1720							
100	91		460	1380							
1	92		22	210							
2	93		22	180							
3	94		16	120							
4	95		22	100							
~~5~~	~~BLANK~~		~~ND~~	~~ND~~							
6	96		18	120							
7	97		13	122							
8	98		35	100							
9	99		9	240							
110	700		16	125							
1	701		13	128							
2	702		19	115							
3	703		16	126							
4	704		11	104							
5	705		22	152							
6	706		30	132							
7	707		14	118							
8	708		14	27x							
9	709		11	80							
120	7711710		14	65							

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RIO TINTO CANADIAN EXPLORATION LIMITED

LABORATORY REPORT

PARTS PER MILLION

LAB Nº.	SAMPLE Nº. (NMBR)		Pb	Zn						COMMENTS
121	7711711		5	86						
2	12		53	110						
3	13		66	172						
4	14		12	156						
5	15		32	92						
6	16		19	138						
7	17		51	138						
8	18		63	225						
9	19		33	300						
130	20		78	138						
1	21		43	140						
2	22		34	123						
3	23		35	168						
4	24		3	136						
5	25		19	590						
~~6~~	~~STD1~~		~~27~~	~~860~~						
7	26		30	340						
8	27		22	66						
9	28		34	93						
140	29		40	86						
1	30		34	140						
2	31		62	205						
3	32		79	225						
4	33		54	165						
5	34		68	240						
~~6~~	~~BLANK~~		~~ND~~	~~ND~~						
7	35		98	250						
8	36		79	250						
9	37		82	235						
150	38		41	410						
1	39		57	175						
2	40		44	190						
3	41		83	295						
4	42		23	68						
5	43		15	60						
6	44		25	158						
7	45		24	126						
8	46		17	94						
9	47		19	138						
160	7711748		18	160						

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RIO TINTO CANADIAN EXPLORATION LIMITED

LABORATORY REPORT

PARTS PER MILLION

LAB No.	SAMPLE No. (NMBR)		Pb	Zn						COMMENTS
161	7711749		33	74						
2	50		11	94						
3	51		18	122						
4	52		19	92						
5	53		31	98						
6	54		25	105						
7	55		27	106						
8	56		23	128						
9	57		11	85						
170	58		12	122						
1	59		45	110						
2	60		84	165						
3	61		65	130						
4	62		118	355						
5	63		131	355						
6	64		980	4600						
~~7~~	~~STD 2~~		~~380~~	~~260~~						
8	65		390	2800						
9	66		470	1730						
180	67		670	1650						
1	68		520	1730						
2	69		670	1950						
3	70		610	[illegible]						
4	71		450	1700						
5	72		430	1550						
6	73		340	1350						
~~7~~	~~BLANK~~		~~ND~~	~~ND~~						
8	74		360	1100						
9	75		330	1470						
190	76		330	910						
1	77		240	3000						
2	78		240	410						
3	79		620	1470						
4	80		133	330						
5	81		139	475						
6	82		143	500						
7	83		133	470						
8	84		153	[illegible]	1060					
9	85		123	[illegible]	420					
210	7711786		84	345						

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RIO TINTO CANADIAN EXPLORATION LIMITED

LABORATORY REPORT

PARTS PER MILLION

LAB Nº.	SAMPLE Nº. (NMBR)		Pb	Zn					COMMENTS
201	7711787		75	390					
2	88		74	490					
3	89		94	1200					
4	90		114	3200					
5	91		117	1050					
6	92		220	1450					
7	93		240	1700					
8	94		280	1530					
9	95		700	2800					
210	96		270	5400					
1	97		490	2900					
2	98		141	3200					
3	99		460	1430					
4	800		360	1530					
5	801		490	1680					
6	802		590	2900					
7	803		770	4300					
~~8~~	~~STD 3~~		~~6~~	~~56~~					
9	804		650	2900					
220	805		103	190					
1	806		510	1300					
2	807		980	2800					
3	808		1180	3400					
4	809		150	570					
5	7711 810		1260	3600					
~~6~~	~~BLANK~~		~~ND~~	~~ND~~					
~~7~~	~~7711436~~		~~8~~	~~30~~					
~~8~~	~~452~~		~~34~~	~~82~~					
~~9~~	~~468~~		~~28~~	~~450~~					
~~230~~	~~483~~		~~20~~	~~80~~					
~~1~~	~~661~~		~~51~~	~~240~~					
~~2~~	~~675~~		~~65~~	~~6600~~					
~~3~~	~~690~~		~~510~~	~~1700~~					
~~4~~	~~706~~		~~32~~	~~132~~					
~~5~~	~~720~~		~~77~~	~~135~~					
~~6~~	~~736~~		~~80~~	~~250~~					
~~7~~	~~752~~		~~22~~	~~90~~					
~~8~~	~~767~~		~~650~~	~~1650~~					
~~9~~	~~783~~		~~134~~	~~460~~					
~~240~~	~~7711800~~		~~360~~	~~1550~~					

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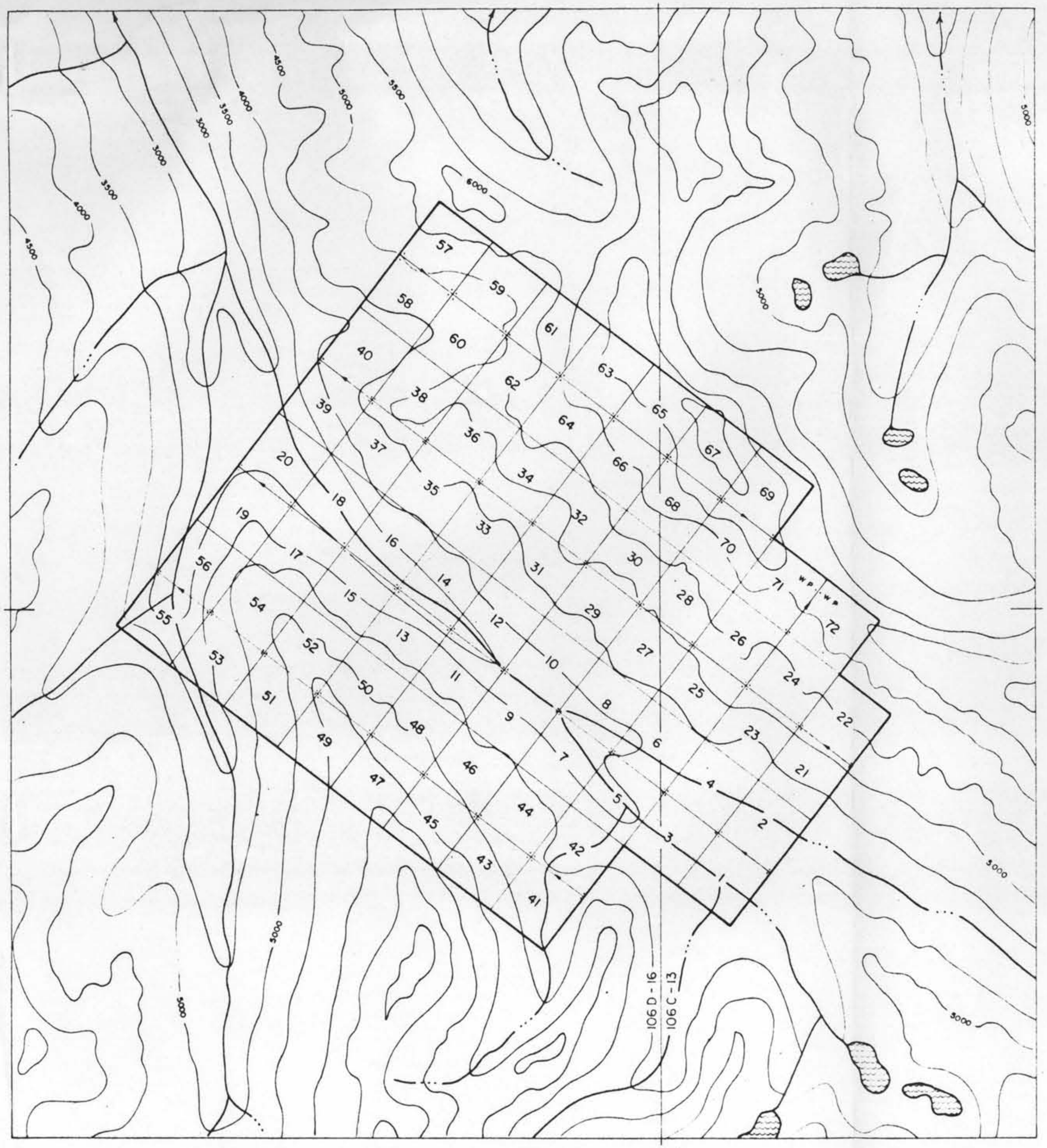

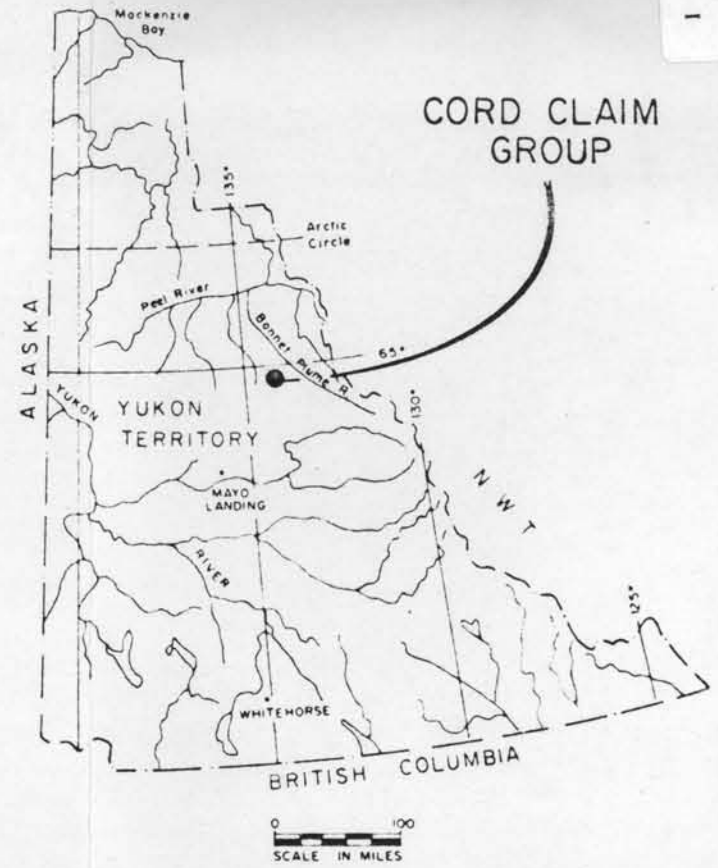

NOTES:

TAG NUMBERS Y97639 – Y97710

TOPOGRAPHIC BASE AFTER DEPARTMENT OF INDIAN AFFAIRS AND NORTHERN DEVELOPMENT MAPS 106C-13 & 106D-16.

MAGNETIC DECLINATION (1975) 34° 30' E.

SYMBOLS

- · CLAIM POST LOCATION
- WP WITNESS POST
- —•— DIRECTION OF LOCATION LINE

RIO TINTO CANADIAN EXPLORATION LIMITED

LOCATION PLAN
CORD 1–72 CLAIMS

SNAKEHEAD CREEK AREA, N.T.S 106C-13 & 106D-16
MAYO MINING DISTRICT, YUKON TERRITORY

CONTOUR INTERVAL 500'

1500 0 1500 3000 4500 6000 7500 9000 10 500
SCALE IN FEET

D.W.G. L.-6485

DEC. 1977

LEGEND

PROTEROZOIC

3 DIATREME : Discordant heterolithic rubble breccia, surrounded by zones of silicification and /or carbonatization.

HELIKIAN

2 UNIT 2 : Grey dolostones, well bedded to massive. Local chert lenses.
- 2(a) : Siltstones and mudstones, black, locally pyritic and highly carbonaceous.

1 UNIT 1 : Black mudstone and siltstones, commonly carbonaceous, locally siliceous
- 1(a) : Pyrite / pyrrhotite - rich mudstones and siltstones
- 1(b) : Dark green - grey phyllites, locally pyrite or chlorite rich
- 1(c) : Black dolostones, locally stromatolitic, rare white to pink dolostone
- 1(d) : Black limestones
- 1(e) : Silica - rich lithologies, possibly of metasomatic origin. Includes "siliceous mudstone", "banded cherts", "bleached siliceous dolostones" and "siltstones".

Outcrop
Float
Geological contact (observed, inferred)
Fault (definite, approximate, assumed)
Cu, Pb, Zn ...... Copper, Lead, Zinc
Chl ...... Chlorite, more than 5%, present on slip and bedding plane surfaces
Stromal ...... Stromatolitic, biostrome

90°, 90° ...... Strike and dip of bedding, clevage
63° ...... Strike and dip of Axial plane (minor fold)
Shear zone
CORD 3 | CORD 1 / CORD 4 | CORD 2 ...... Claim post and name

N.T.S 106-C-13, 106-D-16

SCALE 1: 5000

FEET 500 250 0 500 1000 1500 FEET

METRES 100 50 0 100 200 300 400 METRES

CONTOUR INTERVAL 20 METRES

RIO TINTO CANADIAN EXPLORATION LIMITED		
SNAKEHEAD PROPERTY		
GEOLOGY		
DEC. 1977	J.H. / y.m	DWG. G.-8591

LEGEND

771 2520 Talus fines sample location number

N.T.S. 106-C-13, 106-D-16

SCALE 1:5000

FEET 500 250 0 500 1000 1500 FEET

METRES 100 50 0 100 200 300 400 METRES

CONTOUR INTERVAL 20 METRES

RIO TINTO CANADIAN EXPLORATION LIMITED

SNAKEHEAD PROPERTY

TALUS FINES SAMPLING LOCATION NUMBERS

DEC. 1977 | J.H. / a.b. | DWG. G.C.-8588

LEGEND

86, 71, 90, 68 — Talus fines sample results p.p.m. Pb

N.T.S 106 - C - 13 , 106 - D - 16

SCALE 1: 5000

FEET 500 250 0 500 1000 1500 FEET

METRES 100 50 0 100 200 300 400 METRES

CONTOUR INTERVAL 20 METRES

RIO TINTO CANADIAN EXPLORATION LIMITED		
SNAKEHEAD PROPERTY		
TALUS FINES SAMPLING RESULTS **ppm Pb**		
DEC. 1977	J.H. / y.m.	DWG. G.C. - 8590

LEGEND

98
95
95
96

Talus fines sample results p.p.m. Zn

N.T.S 106-C-13, 106-D-16

SCALE 1:5000

FEET 500 250 0 500 1000 1500 FEET

METRES 100 50 0 100 200 300 400 METRES

CONTOUR INTERVAL 20 METRES

RIO TINTO CANADIAN EXPLORATION LIMITED

SNAKEHEAD PROPERTY

TALUS FINES SAMPLING RESULTS
ppm Zn

DEC. 1977	J.H./y.m.	DWG. G.C. - 8589