

Shag Claims
Golden Mining Division
N.T.S. 82 J/11^W & 12^E

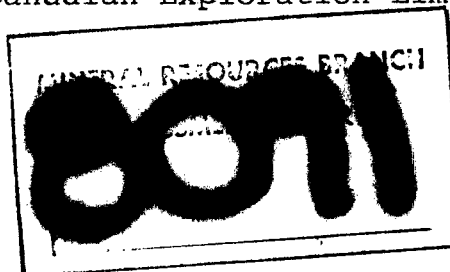
D. Bending August 1979

'80 #139-# 8091
#

Work Performed on the Shag Claims

<u>CLAIMS</u>	<u>RECORD NO.</u>	<u>RECORDED</u>
Shag 1-8	158 - 165	August 29, 1977

Latitude: 50°38'N Longitude: 115°30'W
Operator: Rio Tinto Canadian Exploration Limited



Shag Claims
Golden Mining Division
N.T.S. S 2 J/11 and 12

D. Bending

August 1979

Summary

The 1979 field programme on the Shag Claims consisted of remapping the geology in the vicinity of an occurrence of replacement sphalerite with minor galena at a dolostone-limestone contact (the C-4 showing), soil sampling over the C-4 showing, and prospecting along key contacts associated with soil lead-zinc anomalies detected in 1978. Three new showings were discovered, providing indication that the C-4 showing and vicinity should be tested by drilling. The contact zone along which C-4 type showings occur, was detected by mapping in Queen Mary Creek south of Shag Claims. The largest lead anomaly on the property, despite further prospecting, remains unexplained.

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<u>Drawing (DWG.) No.</u>	<u>Description</u>	<u>Location in Report</u>
L-6526	Location Map	after page 1
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G-8688	Geology - Shag Claims	in pocket
G-6603	Correlation of Monarch-Kicking Horse, Marvel and Shag	after page 15
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G-7537	C-4 showing - Detailed geology section	in pocket
G-6599	Regional Geological Setting	addendum #1
<u>Figures</u>		
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2	Queen Mary Creek - Geology and Follow up.	after page 17

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1. INTRODUCTION

This report describes a two-week investigation of the Shag claims prior to further drilling. The programme was directed at prospecting of unexplained geochemical anomalies and reappraisal of certain aspects of the stratigraphy, notably regional correlation. Stratigraphic descriptions contained in this report are taken, with minor modifications, from Riocanex report no. 547.

2. LOCATION AND ACCESS (Dwg. L-6526)

The claims are located near $50^{\circ}38'N$, $115^{\circ}30'W$, in the Albert River Drainage about 35 km east of Radium. The north end of the claims can be reached by logging roads, about 65 km from Canal Flats or 60 km from Radium. Higher elevations and the southern parts of the claim group are best approached by helicopter which is available through Okanagan Helicopters in Cranbrook and Golden, or Bow Helicopters in Fairmont.

3. PREVIOUS WORK

Initial work is summarized in the report on the 1977 programme by C. Graf (RioCanex No. 526). The 1977 programme provided a stratigraphic framework through regional mapping of Cambrian Formation boundaries at a scale of 1:50,000.

In 1978, a five man crew, of which the writer was party chief, spent six weeks on the property, producing a 1:10,000 scale geological map and a soil sample survey covering accessible areas. Eight zinc-lead showings were discovered and observed to occur along two key stratigraphic interfaces termed the "C-4 Horizon" and "BM Horizon". The BM horizon was subsequently tested with three short drill holes.

The soil survey detected numerous zinc soil anomalies and one significant lead anomaly not associated with known mineralization (RioCanex report no. 547).

Leech (1979) released an open file map covering the area on a 1:126,720 scale.

4. DESCRIPTION OF CLAIMS

Eight claim blocks consisting of 127 claims were staked in 1977 (Dwg. C-8687).

<u>Claim Name</u>	<u>No. of Units</u>	<u>Record No.</u>	<u>Recording Date</u>
Shag 1	20	158	Aug 29, 1977
2	12	159	"
3	20	160	"
4	20	161	"
5	12	162	"
6	18	163	"
7	15	164	"
8	10	165	"

5. 1979 FIELD PROGRAMME

The 1979 field programme in the Shag area consisted of follow up prospecting on soil anomalies, detailed mapping of the C-4 showing, soil sampling over the C-4 showing on a 5 x 6 metre grid, remapping of the key contact that hosts the C-4 showing, extrapolation of this contact to Queen Mary Creek, and stream silt sampling to help define the southern extensions of mineralization off the claims. The writer and an assistant camped for seven days along the upper parts of Shag Creek, near the center of the claim block, and, on three days, approached parts of the property from the road below.

6. GEOLOGY

The geology of the Shag claims is displayed at 1:10,000 scale in Dwg. 8688 and in diagrammatic section Figure 1.

6.1 Regional Geology

The major formations in the area of interest are the Middle Cambrian Cathedral carbonates, laterally equivalent Chancellor Group shales and limestones, Steven Formation and Sullivan Formation shaley limestones, Eldon Formation dolostones, and the Upper Cambrian McKay Group shales. These are mapped according to definitions outlined in the 1977 study. The showings are hosted by dolostones of the Cathedral Formation within 1 km of the north-south trending Chancellor facies front.

The rich Monarch-Kicking Horse deposits are hosted by the Cathedral Formation 50 km north, in Yoho National Park, in a similar position with respect to the facies front but lower in the section. It is probable that this position in the section is within several hundred feet of the Albert River. The idea that it comprises the lower part of the lowest dolostone unit exposed on the property is likely to be true but is not firmly established. These deposits represent a clearly different style of mineralization but demonstrate the availability of metals and potential for concentration in this belt.

6.2 Geology of the Shag Claims

To facilitate interpretations and improve stratigraphic control on the mineralized zones, the Cathedral Formation

was subdivided into nine mappable units on the basis of a combination of depositional and diagenetic features. Overall stratigraphic relationships are shown idealized in Figure 1.

6.2.1 Stratigraphy (See Addendum #1 for alternative interpretation)

Albert River Dolostone (C1): Base of the exposed section. Pale grey variably crystalline massive dolostone.

Thin Limestone (C2): Limestone and dolostone facies equivalents with dolomitic facies dominating northeastward away from the facies front. Approximate unit thickness about 50m. The lower contact of the limestones is very porous with modern caves. The limestone is dark grey, finely crystalline, uniformly bedded, subtidal lime mudstone, and the dolostone is pale creamy-grey, sucrosic, uniform and massive.

BM Host Dolostone (C3): A generally uniform cyclic intertidal dolostone; mostly light grey, variably (mostly fine) crystalline, burrowed, laminated birdseye textured or intraclastic dolomite mudstone; 120-130m of generally uniform cyclic intertidal dolostone. Burrowed, delicate laminae, stylolites, and intraclastic zones are common. The upper contact is marked by a pronounced transgression. This is reflected in a change from pale, finely crystalline dolostone through dark grey, burrowed and birdseye textured rocks (with some sedimentary boundinage and slump textures) to dark bioclastic packstone limestones.

This transgression, especially the lower parts of the dark birdseyed beds and packstones, hosts the BM type mineralization. It is the first of a series of minor fluctuations in water depth that mark the boundary

between the BM Host Dolostone and the Dividing Limestone.

Dividing Limestone (C4): 20-30m of diverse, usually recessive limestones, and shaly limestones; more massive beds are burrowed and may be notably silty. This unit displays more tectonism than rocks above and below.

Second Dolostone (C5): Is about a 40m generally intertidal to supratidal dominantly sucrosic dolostone. It has been observed to display a consistent general pattern where mapped in detail.

The base is a gradational transition marked by a sequence shallowing upward from massive and bedded limestones through intercalated finely crystalline, grey dolostone and burrowed dolomitic limestone (occasionally oncolitic) to a more uniform sequence of dolostones that show striking cyclicity (1-2m cycles) in places. Cross-cutting recrystallization fronts disrupt the cyclic pattern in some areas, allowing uniform pale sucrosic dolostones to lie closely along strike with a cyclic sequence of dark birdseye textured, pseudobreccia, and pale sucrosic dolostones.

These lateral variations occasionally prevent conclusive subdivision of this unit from the more widespread cyclic dolostone suite.

This generally cyclic sequence is overlain by uniformly light creamy tan-to-grey sucrosic dolostone with occasional interbeds of darker dolostone. This package represents a shallower intertidal environment.

Overlying this dolostone package is a supratidal facies with light creamy grey-to-tan locally rust-stained sucrosic to coarsely crystalline dolostone with occasional pods of pseudobreccia, zebroid textures, and vuggy, heavily recrystallized zones that may contain masses of rusty, weathering, ferroan dolomite. Near the upper contact calcite-filled open spaces and small breccia pods may be prominent. Bedding is usually massive.

The uppermost contact zone hosts the C-4, Pieces, Redbed, Crackle, Rush, Stripes, Red Bed type float, and Christmas showings and appears to be associated with lead and zinc soil anomalies unrelated to known lead-zinc occurrences.

Cliff and Step Limestone (C6): A sequence of limestones and shaly limestones that varies from 100m to about 160m in thickness.

This variability in thickness indicates that some parts are laterally equivalent to some of the bounding dolostone units. Parts of this unit are equivalent to the Steven Shale as mapped in Assiniboine creek exposures, and the transitional dolomitic rocks near the upper contact are partly equivalent to Eldon Formation.

Top Dolostone (C7): 30-100 metres of sucrosic to coarsely crystalline pale tan and creamy coloured dolostone, equivalent to Eldon Formation.

The lower contact zone is a transition from a dark grey crystalline limestone through a zone of oncolites and burrow-mottled dolomitic limestone to a gradually paler sucrosic dolostone. The upper parts of the package are characterized by breccias cemented by ferroan dolomite

(and occasional pyrite), zebroid beds and lenses, coarsely recrystallized pockets and white calcite masses.

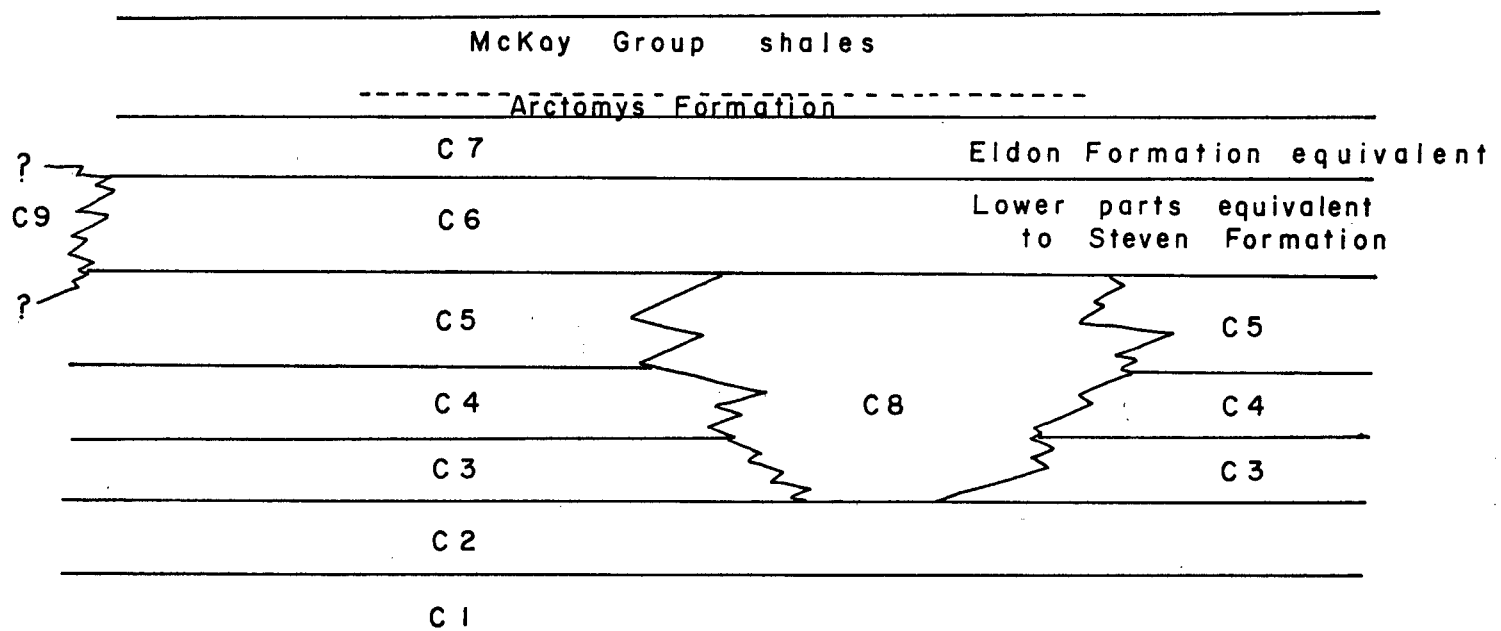
Cyclic Dolostone (C8): In places a prominently cyclic dolostone with dark algal and pale sucrosic textures occupies up to 250m of section and appears to abut on the more widespread and uniform units. This represents a locally emergent part of low "arch" that persisted when minor fluctuations in water depth caused pronounced variations in lithology. This has probably been accentuated by reflux. This shows a lateral equivalence to the Second Dolostone, Dividing Limestone and the upper parts of the BM Host Dolostone that renders mapping of these contacts ambiguous in places.

Eastern Transgressive Dolostone (C9): Along the southeast side of the property, the Cliff and Step Limestone Unit shows a laterally equivalent irregular facies change to a pale crystalline dolostone not readily distinguishable from the supratidal facies above it. This posed a problem of mapping that was solved arbitrarily by projecting idealized contacts. Further work in Queen Mary Creek will probably show this is a localized phenomenon, and the C-4 horizon will be mappable.

At the top of the Cathedral Formation as mapped, a prominent red marker bed has been observed from Queen Mary Creek to Mount Brussilov. This is more extensive than the Arctomys Formation as previously mapped by Graf (1977) but is equivalent. It is a rust-coloured unit, usually shaly, 2-3m thick, that contains lenses of a sparry

S. E.

N. W.



SUMMARY OF STRATIGRAPHIC RELATIONSHIPS ON SHAG

Figure 1

(See Addendum No. 1 for an Alternative Interpretation)

crystalline limestone (apparently an algal packstone) with iron oxide cement.

6.2.2 Structural Geology

Structural geology of the Shag Claims is characterized by three styles of response to compression and a monoclinial flexure along the Chancellor-Cathedral facies front.

Chancellor and McKay shales and carbonates are cleaved, isoclinally folded, and internally thrust faulted, with deformation especially complex near contacts with the more competent Cathedral carbonates. Deformation within the Cathedral Formation is dominated by a monoclinial flexure that strikes parallel to the facies front in all the areas mapped. Within this context, styles of deformation vary considerably and are influenced by rock type and position in the section relative to heavily tectonized McKay Group rocks. The Cliff and Step Limestone, the uppermost limestone unit, is characterized in places by small s-folds, overturned folds, and small thrusts indicating compressive forces perpendicular to the N-S trending facies front. These areas are characterized by white quartz veins and calcite tension gashes. The competent dolostone units bounding this limestone are almost completely undisturbed apart from pervasive fracturing. A more subtle contrast can be noted in other Limestone units lower in the section, with gently folded limestones bounded by relatively unyielding massive dolostones.

Steep N-S trending oblique normal faults of small displacement (one has been mapped with about 25m of throw; most are only 1-3m if measurable) can be observed in several

locations near the Shag Claims.

Large scale thrusts are not generally apparent in the Cathedral although a thrust with hundreds of meters of throw can be observed in isoclinally folded Cliff and Step Limestone and Top Dolostone along the east flank of Mount Soderholm five km north of the claims. Small scale bedding plane slips are pervasive in the upper limestone units.

The influence of structure on mineralization is unclear. Fractures appear to have influenced C-3 and BM Extension mineralization.

7. MINERALIZATION

Thirteen occurrences of zinc and lead sulphides have been observed on the claims. Two of these, the C-3 and C-4 showings were discovered by the Graf crew in 1977. Eight more, the BM, BM Extension, Pieces, Redbed, Crackle, Box, Bush, and Christmas showings were discovered in 1978. Follow up soil lead-zinc anomalies and remapping of part of the C-4 horizon in 1979 has revealed three new showings, the Stripes, Redbed-type float, and BM fractures.

The "Stripes" and "Redbed type Float" showings occur along strike from the C-4 showing southwest of Shag Creek, along the upper margins of an extensive zinc soil anomaly detected in the 1978 survey. The reader is referred to DWG 3.

The "Stripes" showing as exposed consists of numerous talus blocks with fracture fillings and bed-like replacements of ZnS. One large block, believed to be approximately in place, displays three bed-like belts of 15-30% reddish orange, 0.2-0.5 cm sphalerite. Each bed is about 25 centimetres thick, over a total exposed thickness of over 1 metre. These belts display a relic pseudobreccia texture and are separated by more uniformly crystalline grey dolostone with only traces of sphalerite. Exposure is poor, but the cyclicity, high grade of some selected grab samples (up to 80% sphalerite), and apparent lateral continuity of the mineralization are very encouraging features.

The "Redbed-type float" showing is known only as float containing 3-5% red sphalerite in talus blocks up to 0.8 metres across. The texture is a relic pseudobreccia,

like the Stripes showing. Few samples have been found but those seen lack the grade and bed-like appearance of the Stripes replacements. As indicated by the name, the appearance of the mineralization is very similar to the Redbed types of showings across the canyon of Shag Creek. Although no galena has been observed to date, the soil sample that drew attention to the location contains 650 ppm lead and probably indicates galena occurrences in the showing.

The C-4 showing was examined closely in 1979 as part of a programme to evaluate the C-4 horizon as a drilling target (see Dwg. G-7537). The most attractive feature of the showing as presently exposed is the galena-sphalerite-sparry dolomite cemented breccia pod exposed in the southwest face. The exposure indicates that the attractive mineralization is only a lense but weak indications of a linear trend and improvement to the southwest are encouraging. The richest grab samples observed at the showing occur in a small bedding plane shear in the northeast face. The role of this type of structure as an influence on the C-4 showing is unknown. One significant feature of the occurrences is the fact that the hangingwall limestone is bounded above by another dolostone bed which itself contains sphalerite and galena. This area is one mapped in 1978 as characterized by lateral facies changes. The combination of an attractive style of mineralization with the potential for vertical repetitions along an interfingering contact are ample reasons to recommend drilling along the projected trend.

The C-4 showing has no soil lead-zinc expression in the 1978 survey. To understand how attractive it is

compared to highly anomalous areas along strike the immediate vicinity of the showing was soil sampled on a 5 x 10 metre grid. This grid also lacked a significant soil lead-zinc expression. The occurrences could have lacked soil geochemical expression for a variety of reasons, notably topography, the likelihood of transported overburden in the valley bottom, the significant presence of mineralization only along a cigar-like feature that is only exposed in the stream cut, or simply too little mineralization for soil expression.

BM Fractures is fracture fillings and related replacements identical to those of the BM extension and need no further descriptions (See Riocanex report no. 547).

8. DISCUSSION

Five significant conclusions have developed from work on the Shag claims in 1979.

(1) The soil anomalies near the C-4 showing, shown in Dwg. G-6602, the grade of the Stripes occurrence, the likelihood of repetition and lateral continuity of these replacement beds as illustrated by the Stripes showing, and the attractive habit and grade of parts of the C-4 showing indicate widespread, possibly attractive mineralization along this key contact. The mineralized bodies may be planar, elipsoidal, or cigar-shaped.

(2) High zinc values persist well above known mineralization in the BM Extension area and indicate widespread, blind, untested mineralization along the BM Horizon. The locally high grades noted along the C-4 Horizon and lateral continuity of the BM Extension are features that indicate the potential for sphalerite bodies of attractive grade and size. The BM horizon remains largely untested despite drilling around the known exposure.

(3) Intensive prospecting of the lead anomaly, (1100S-600W) west of the BM showing, has revealed no exposed mineralization. The very porous, recrystallized dolostones there may contain some small blind galena replacements. The area is steep and irregularly exposed. Further attempts, if any are made, to find the source of the lead could be by hand trenching.

(4) The "C-4 Horizon" does crop out in the western wall of the middle Queen Mary Creek valley. No mineralization was discovered during the day of prospecting.

(5)* The lower exposed parts of the Albert River Dolostone unit (C1) are texturally similar to the central parts of the rock unit hosting the Monarch-Kicking Horse deposits in Yoho Park. The potential size, habit and grade of these deposits is very attractive and if this type of mineralization occurs in the area it represents the best target for large, rich orebodies. Zinc-lead showings are widespread on the property and geochemical data indicate it is a regional centre of mineralization. Testing for this is a much higher risk than drilling the exposed horizons but potential returns are also very high. DWG. G-6603 is a tentative correlation that supports this discussion.

* See Addendum #1 for alternative conclusion.

9. RECOMMENDATIONS

It is recommended that:

- (1) The C-4 "Horizon" be tested by at least four drill holes, located as indicated on Dwg. G-6602.
- (2) The BM "horizon" be tested by drilling along the "BM Extension" and probably also up Shag Creek, to look for lateral improvements in grade and thickness.
- (3) The open zinc-lead soil anomaly southwest of the BM showing, up the hill along the C-4 horizon, be soil sampled and prospected. The zinc anomaly that is continuous along the upper parts of the valley is disrupted by slides from Avalanche ridge but the mineralization probably continues along the same key contact.
- (4) The Albert River Dolostone, not covered by the 1978 soil survey or property prospected, be examined carefully and traversed by six soil lines to investigate the possibility of mineralization along this section.
- (5) Soil anomalies in lead along line 1000 south from the 1978 survey be hand trenched prior to negating the lead anomaly as a target. Other methods, such as examining heavy mineral concentrates in the seasonal streams draining the area, should also be attempted to evaluate the significance of this anomaly.

10. REFERENCES

Graf 1977

Graf Lead Zinc Reconnaissance, Southern
Rocky Mountains

Riocanex Report No. 526

Bending 1979

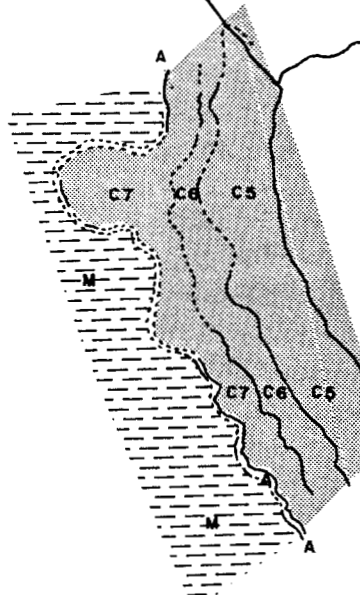
Shag Claims

Riocanex Report No. 547






SHAG CLAIMS

NOTE: See Addendum I for alternative stratigraphic interpretation



LEGEND Units noted were observed during 1979 reconnaissance

-  McKay Formation
-  Arctomys Formation
-  Cathedral Formation (as mapped in 1978)

- C7 TOP DOLOSTONE (equivalent to Eldon Formation)
- C6 CLIFF & STEP LIMESTONE (partly equivalent to Steven Formation)
- C5 SECOND DOLOSTONE

GEOLOGICAL CONTACTS
— OBSERVED - - - - - INFERRED

N.T.S. 82J/II

SCALE 1:50,000



RIO TINTO CANADIAN EXPL. LTD.

SHAG CLAIMS

QUEEN MARY CREEK

GEOLOGY

D.B. / b.w.

NOV 1979

FIG. 2

Addendum #1

Reappraisal of Stratigraphy

Reappraisal of Stratigraphy

After writing this report, D. Bending further investigated the regional stratigraphic correlation around the Shag claims and came to the following conclusions.

The units mapped on the Shag claims are actually higher in the regional stratigraphy than initially believed. The seven main units mapped as Cathedral Formation in 1978 have been reallocated equivalent formations.

- Unit 7 Top Dolostone = Lyell Fm.
- Unit 6 Cliff & Step Limestone = Sullivan Fm.
- Unit 5 Second Dolostone = Waterfowl Fm. and
probably Arctomys equivalent
- Unit 4 Dividing Limestone = Pika Fm.
- Unit 3 BM Host Dolostone = Eldom Fm.
- Unit 2 Thin Limestone = Stephen Fm.
- Unit 1 Albert River Dolostone = Cathedral Fm.

This can be made to agree with the regional map by G.B. Leech (GSC, 1979) by extending his contacts onto the Shag claims.

By this framework, the Albert River Dolostone exposed at Shag would represent the top of the Cathedral Formation. Using an ideal thickness of 1200 feet for the Cathedral Formation, the setting of the Monarch-Kicking Horse deposits would lie 400-900 feet below the Albert River exposures. This clearly negates the attractiveness of exploring for a Monarch-Kicking Horse setting at Shag.

APPENDIX II

Geochemical Results

Rio Tinto Canadian Exploration Limited

LABORATORY REPORT

SAMPLE TYPE (✓)

Soil &/or Stream Sediments

Rock

Water

Results Sent To R. Lange

At Office.

Date Reported 14 Sept '79

Acct. No. 8201

Project Name SHAG?

Size Fraction -80 mesh

Extraction HNO₃-HCl.

Sample Wt. 0.6 g, Volume 12 ml

Analytical Method A.A.

Analyst(s) E.R.P.

DISTRIBUTION

Log Normal

Normal

STATISTICAL SUMMARY

(Value for \bar{x} and σ in ppm)

Element		Ag	Pb	Zn				
No. of Samples		59	59	59				
Mean. \bar{x}								
Std. Dev. σ								
$\bar{x} + 2\sigma$								

Comments : _____

Report No. 79-163

Page 1 of 3

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RIO TINTO CANADIAN EXPLORATION LIMITED

LABORATORY REPORT

PARTS PER MILLION

LAB NO.	SAMPLE NO. (NMBR)		Ag	Pb	Zn				COMMENTS
1	7929101		ND	95	236				
2	102		ND	16	34				
3	103		ND	14	14				
4	104		ND	13	32				
5	105		ND	18	44				
6	106		ND	17	27				
7	107		ND	16	36				
8	108		ND	9	20				
9	109		ND	19	38				
10	110		ND	39	44				
1	111		ND	8	7				
2	STD 1		0.1	28	960				
3	112		0.1	16	12				
4	113		ND	22	56				
5	114		ND	16	17				
6	115		ND	14	39				
7	116		ND	14	38				
8	117		0.1	15	22				
9	118		ND	22	34				
20	119		ND	20	52				
1	120		0.1	16	16				
2	BLANK		ND	ND	ND				
3	121		ND	25	22				
4	122		0.1	20	25				
5	123		ND	15	47				
6	124		ND	20	58				
7	125		ND	11	18				
8	126		ND	20	21				
9	127		ND	16	22				
30	128		ND	15	58				
1	129		ND	20	48				
2	130		ND	14	27				
3	131		0.1	58	195				
4	132		ND	18	26				
5	133		0.1	18	26				
6	134		ND	10	14				
7	135		ND	12	38				
8	136		ND	10	25				
9	137		ND	15	25				
40	138		0.1	14	50				

RIO TINTO CANADIAN EXPLORATION LIMITED

LABORATORY REPORT

PARTS PER MILLION

LAB NO.	SAMPLE NO. (NMBR)	Ag	Pb	Zn					COMMENTS
4	1	7929139	ND	10	32				
	2	140	ND	29	90				
	3	141	ND	19	55				
	4	142	ND	17	68				
	5	143	ND	9	19				
	6	144	ND	23	58				
	7	145	0.1	16	105				
	8	146	0.1	12	72				
	9	147	ND	10	44				
5	0	148	ND	16	24				
	1	149	ND	21	74				
	2	150	ND	19	66				
	3	STD 3	1.0	370	285				
	4	151	ND	10	58				
	5	152	ND	58	130				
	6	153	ND	19	96				
	7	154	ND	11	15				
	8	155	0.1	14	55				
	9	156	ND	18	45				
6	0	157	ND	22	118				
	1	158	0.1	16	78				
	2	159	ND	17	122				
	3	BLANK	ND	ND	ND				
	4	7929107	0.1	18	37				
	5	119	ND	20	58				
	6	128	ND	16	62				
	7	140	0.1	20	90				
	8	157	ND	24	114				
	9								
7	0								
	1								
	2								
	3								
	4								
	5								
	6								
	7								
	8								
	9								
8	0								

APPENDIX III

Statement of Qualifications

STATEMENT OF QUALIFICATIONS

D. A. G. Bending

Academic

1976	B.Sc., Geology	University of Oregon
1977 to present	M.Sc. Programme	University of Toronto

Practical

1978-1979 (Summers)	Rio Tinto Canadian Exploration Ltd. Party Chief on Exploration for Mississippi Valley-type Lead and Zinc occurrences, S.E. British Columbia, Property examination and area selection.
1976-1977	Gulf Resources and Chemical Mine and Exploration Geologist Kellog, Idaho

APPENDIX IV
COST STATEMENT

COST STATEMENT
B.C. SHAG CLAIMS
23 July to 21 October 1979

GENERAL COSTS
23 July - 21 October 1979

SUPPLIES

130 man days @ \$4.08 \$ 530

FOOD & ACCOMMODATION

130 man days @ \$18 2,340

RENTAL EQUIPMENT

Traeger SSB50C radio, 31 Aug-21 Oct,
52 days @ \$6 \$ 312
Redhawk, 4WD Jimmy, 23 Jul-21 Oct,
90 days @ \$22 1,980 2,292

FIXED WING

Universal Travel Agency, 6 Jul-2 Oct,
6 trips, Van/Canal Flats, return 729

HELICOPTER

Crowsnest, CF AHH, 31 Jul,
1.9 hrs @ \$323 \$ 629.50
Okanagan, 206B, 18 Jul-24 Sep,
18.4 hrs @ \$375 6,884.65 7,514

RIOCANEX EQUIPMENT

130 man days @ \$3 390

REPORT PREPARATION

2,886

TOTAL GENERAL COSTS

\$16,681

TRENCHING

SALARIES & WAGES

24 Sep-14 Oct, 3 men, 6 man days
@ \$42/man day \$ 252

BENEFITS @ 20%

50

GENERAL COSTS

6/130 X \$16,681 769

TRENCHING TOTAL

\$ 1,071

GEOCHEMISTRY

SALARIES & WAGES

4 Aug, 1 man, 1 man day
@ \$48 48

BENEFITS @ 20%

10

ANALYSIS

Riocanex Lab, 59 soils for Ag, Pb,
Zn @ \$3.60 212

GENERAL COSTS

1/130 X \$16,681

128

GEOCHEMISTRY TOTAL

\$ 398

GEOLOGY

SALARIES & WAGES

23 Jul-21 Oct, 7 men, 44 man days
@ \$50/man day

\$ 2,200

BENEFITS @ 20%

440

GENERAL COSTS

43/130 X \$16,681

5,518

GEOLOGY TOTAL

\$ 8,158

DIAMOND DRILLING

SALARIES & WAGES

9 Sep-21 Oct, 7 men, 80 man days
@ \$50/man day

\$ 4,000

BENEFITS @ 20%

800

DIAMOND DRILLING CONTRACT

Longeyar Canada, 17 Sep-26 Oct,
456.29 m @ \$111/m

50,856

HELICOPTER MDB, DEMOBILIZATION & MOVES

Bow, 206B, 15-21 Sep, 11 hrs @ \$360	\$ 4,072	
Okanagan, 206B, 27 Sep-22 Oct, 23 hrs @ \$375	<u>12,881</u>	16,953

ASSAYS

Bondar-Clegg Lab 11 core for Ag, Pb, Zn, Cd @ \$25		275
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GENERAL COSTS

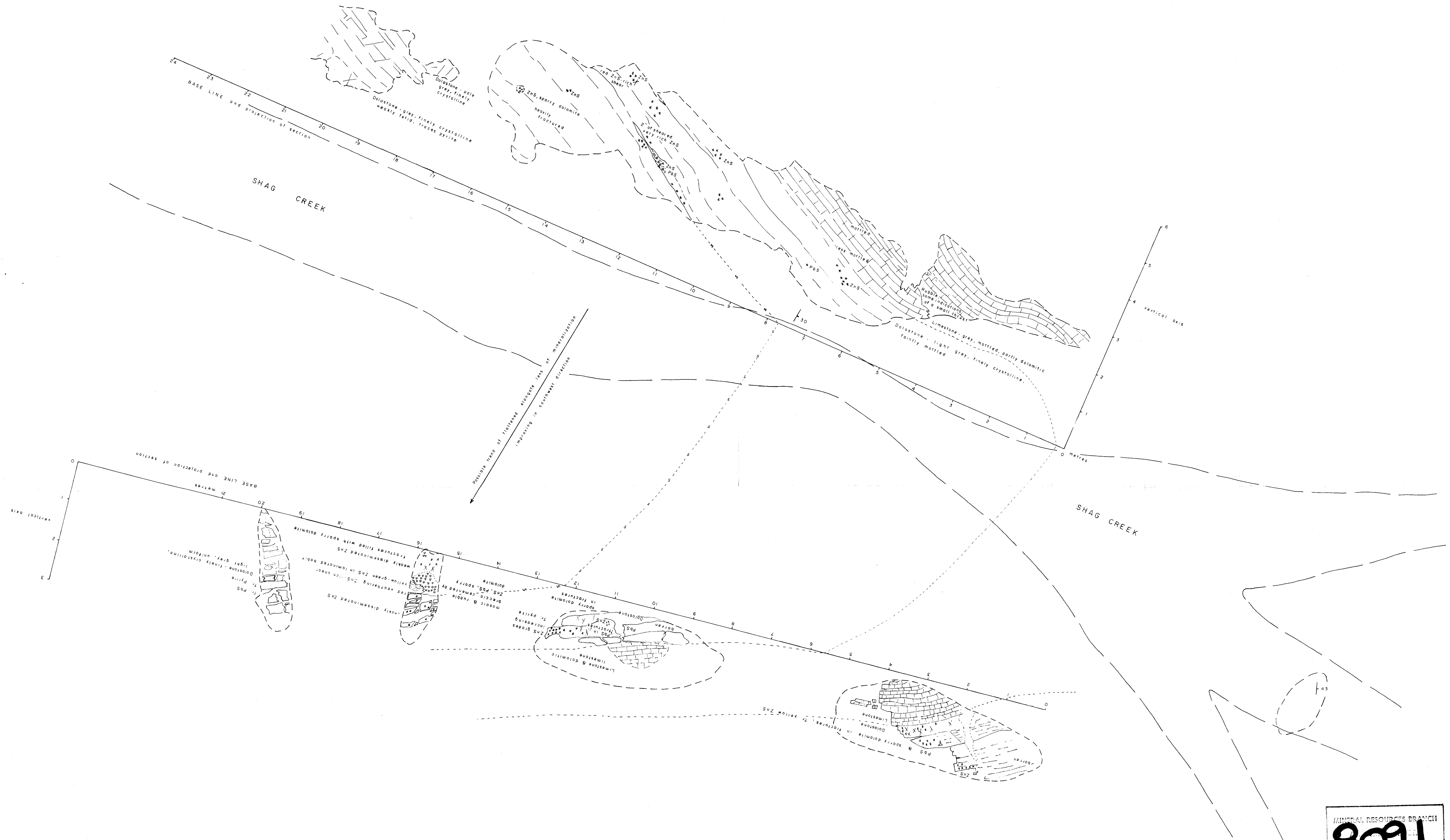
80/130 X \$16,681		<u>10,265</u>
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<u>DIAMOND DRILLING TOTAL</u>		\$ <u>83,149</u>
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<u>TOTAL COSTS</u>		\$ <u>92,776</u>
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COSTS APPORTIONED
TO CLAIMS

<u>CLAIM</u>	<u>UNITS</u>	<u>GEOLOGY</u>	<u>TRENCHING</u>	<u>DRILLING</u>	<u>GEOCHEMISTRY</u>	<u>TOTAL</u>
SHAG 1	20	1,284.73				1,284.73
2	12	770.83				770.83
3	20	1,284.73		20,051.30		21,336.03
4	20	1,284.73	1,071.00	63,097.70	398.00	65,851.43
5	12	770.83				770.83
6	18	1,156.25				1,156.25
7	15	963.54				963.54
8	<u>10</u>	<u>642.36</u>				<u>642.36</u>
TOTALS	127	8,158.00	1,071.00	83,149.00	398.00	92,776.00



Base lines, providing coordinates for detailed soil grids, are plotted in plan view and projections of trenced exposures are shown on the vertical planes of the base lines.

MINERAL RESOURCES BRANCH
8091

LEGEND

- | | | |
|-------------------------------|--|----------------------------------|
| Dolomite | inferred lithologic contact | inferred trace of shear |
| Limestone, variably dolomitic | isolated spot or dissemination of PbS (Galena) or ZnS (Sphalerite) | creek banks (at time of mapping) |
| Limits of exposures | crackle breccia, footnoted with cement type | |
| Tr. Trace of mineralization | rubble or mosaic breccia | |

N.T.S. 82 J / 12

SCALE
 1 : 50



RIO TINTO CANADIAN EXPLORATION LIMITED

SHAG CLAIMS

C - 4 SHOWING

DETAILED GEOLOGY - SECTIONS

D.B. / b.w.

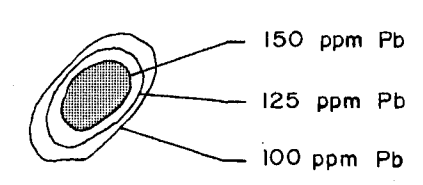
NOV. 1979

DWG. G - 7537

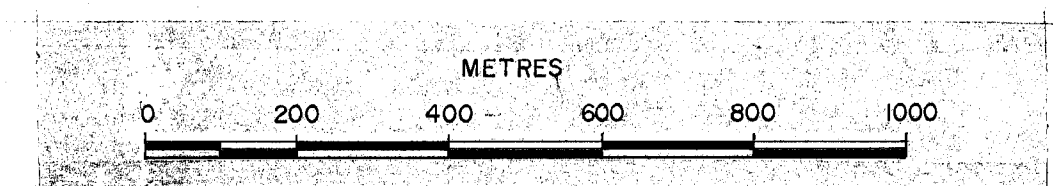


MINERAL RESOURCES BRANCH
8091

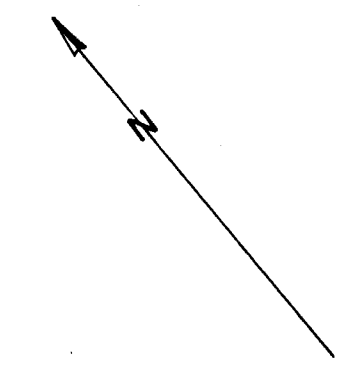
LEGEND

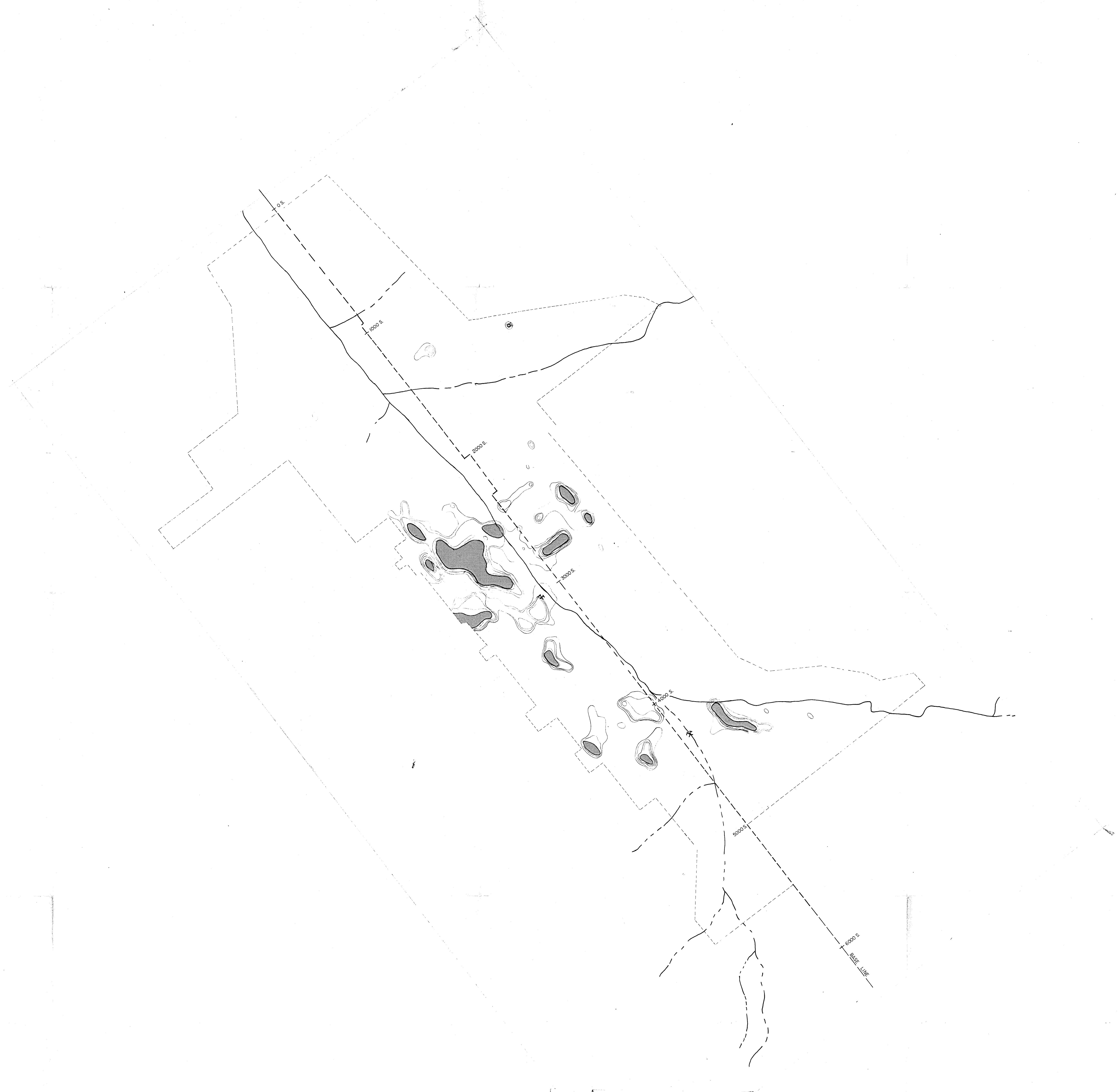


N.T.S. 82 J / 11, 12



RIO TINTO CANADIAN EXPLORATION LIMITED		
SHAG CLAIMS		
SOIL SAMPLE RESULTS: LEAD ISOPLETHS		
D. B.	NOV. 1978	DWG. GC - 8631

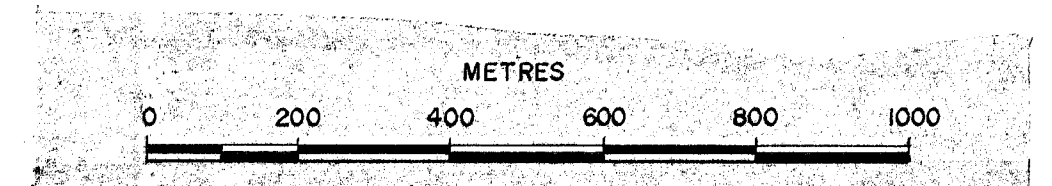




LEGEND

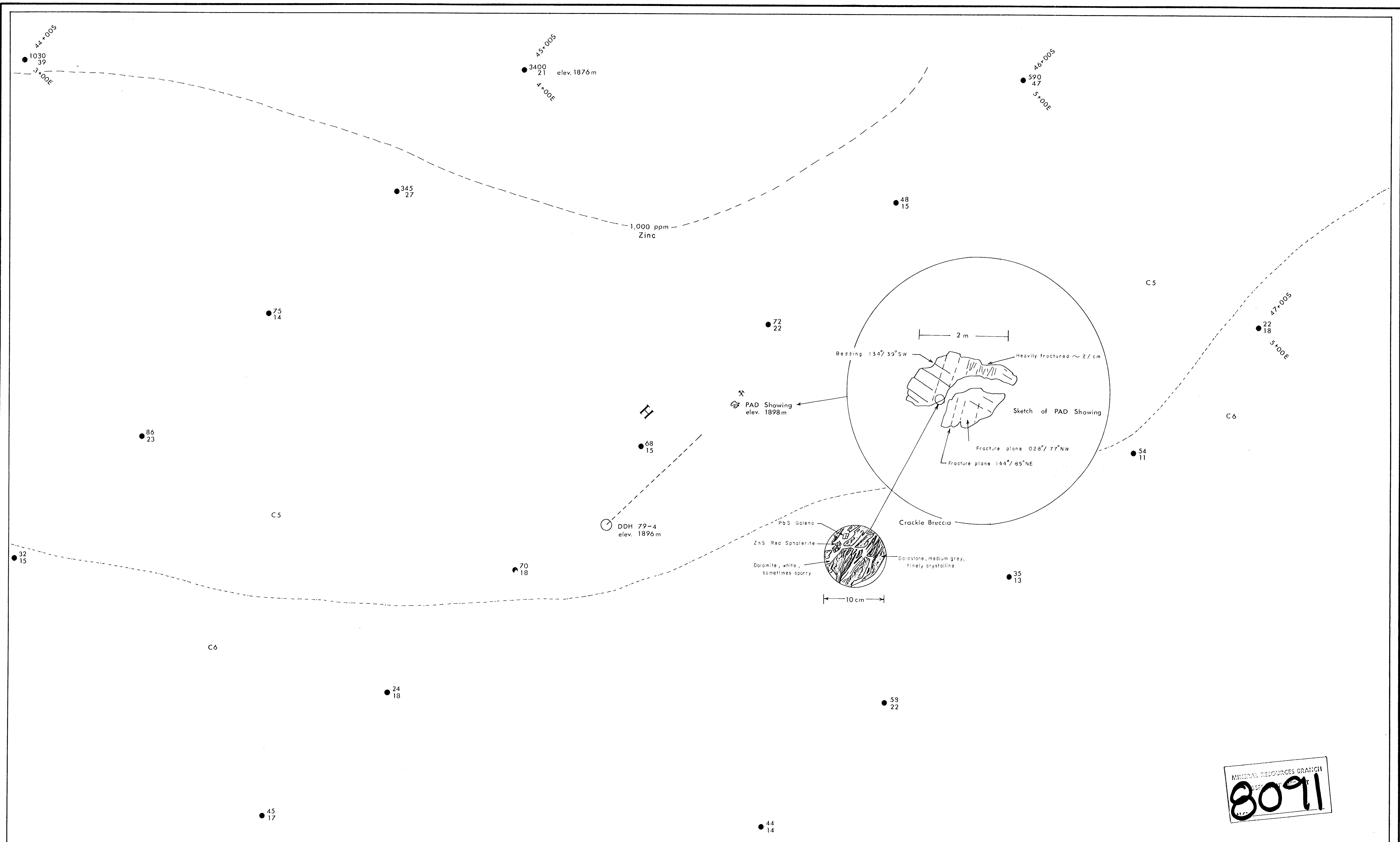
- 1000 ppm Zn
- 800 ppm Zn
- 600 ppm Zn
- 400 ppm Zn
- x Zinc & Lead occurrences

N.T.S 82 J / 11, 12

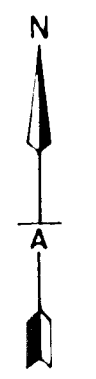


MINERAL RESOURCES BRANCH
8091

RIO TINTO CANADIAN EXPLORATION LIMITED		
SHAG CLAIMS		
SOIL SAMPLE RESULTS :		
ZINC ISOPLETHS		
D. B.	NOV. 1978	DWG. GC - 8632



MINERAL RESOURCES BRANCH
8091

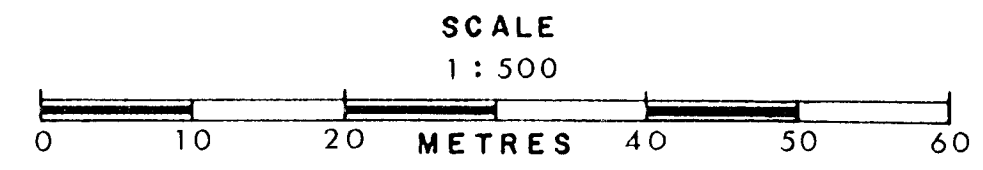


● 345/27 Soil Sample Results Zinc Lead
 --- 1,000 ppm --- Zinc Isopleth - Anomalous
 H Helicopter landing pad

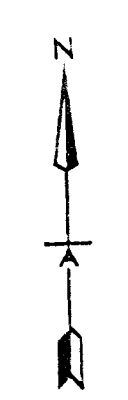
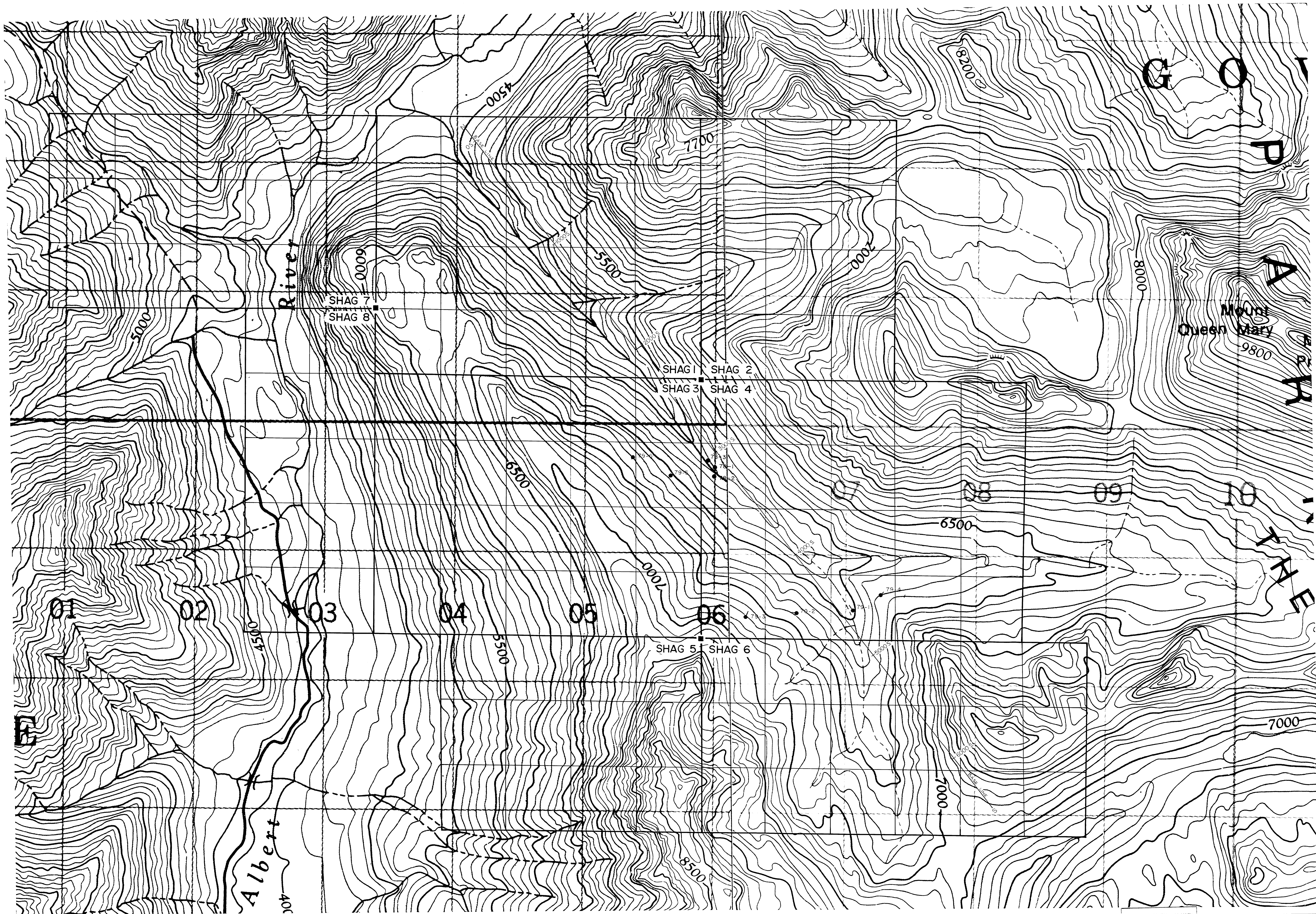
○ DDH 79-4 Diamond Drill hole & horizontal projection altitude 044°-69° depth 72.4m
 - - - - - Inferred lithologic contact - control in this area is weak due to a lack of outcrop

Middle Cambrian
 [C] Cathedral Formation
 C6 Cliff & Step Limestone
 C5 Second Dolostone

N. T. S. 82J-11

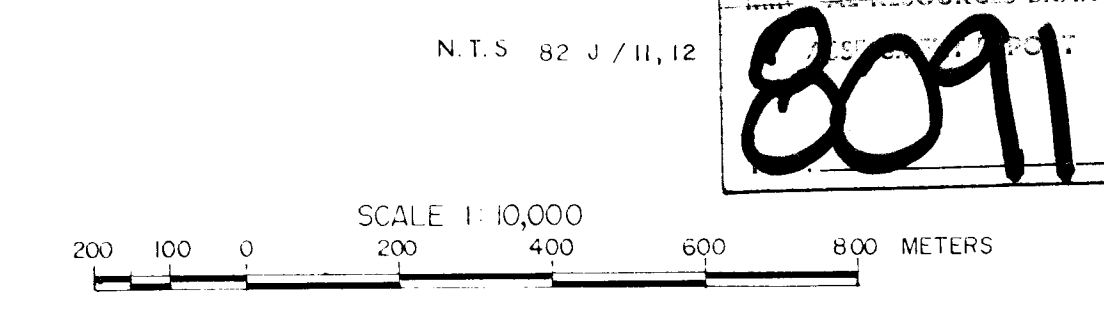
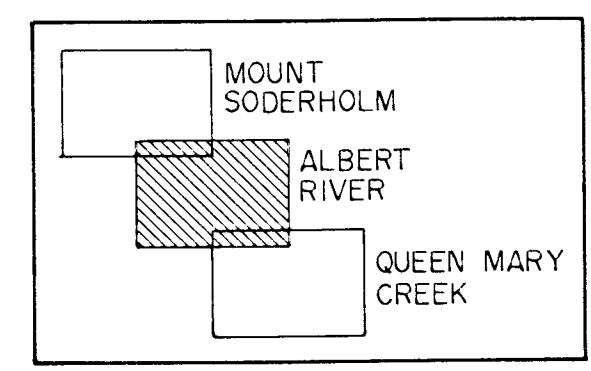


RIO TINTO CANADIAN EXPLORATION LIMITED		
SHAG CLAIMS		
PAD SHOWING		
GEOLOGY - GEOCHEMISTRY - DRILL HOLE LOCATION		
NOV. 79	B.H.W.	DWG. G-7529



Legal Corner Post

78-1 Hole drilled in 1978
79-1 Hole drilled in 1979 horizontal trace

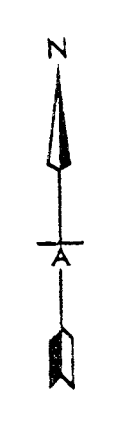
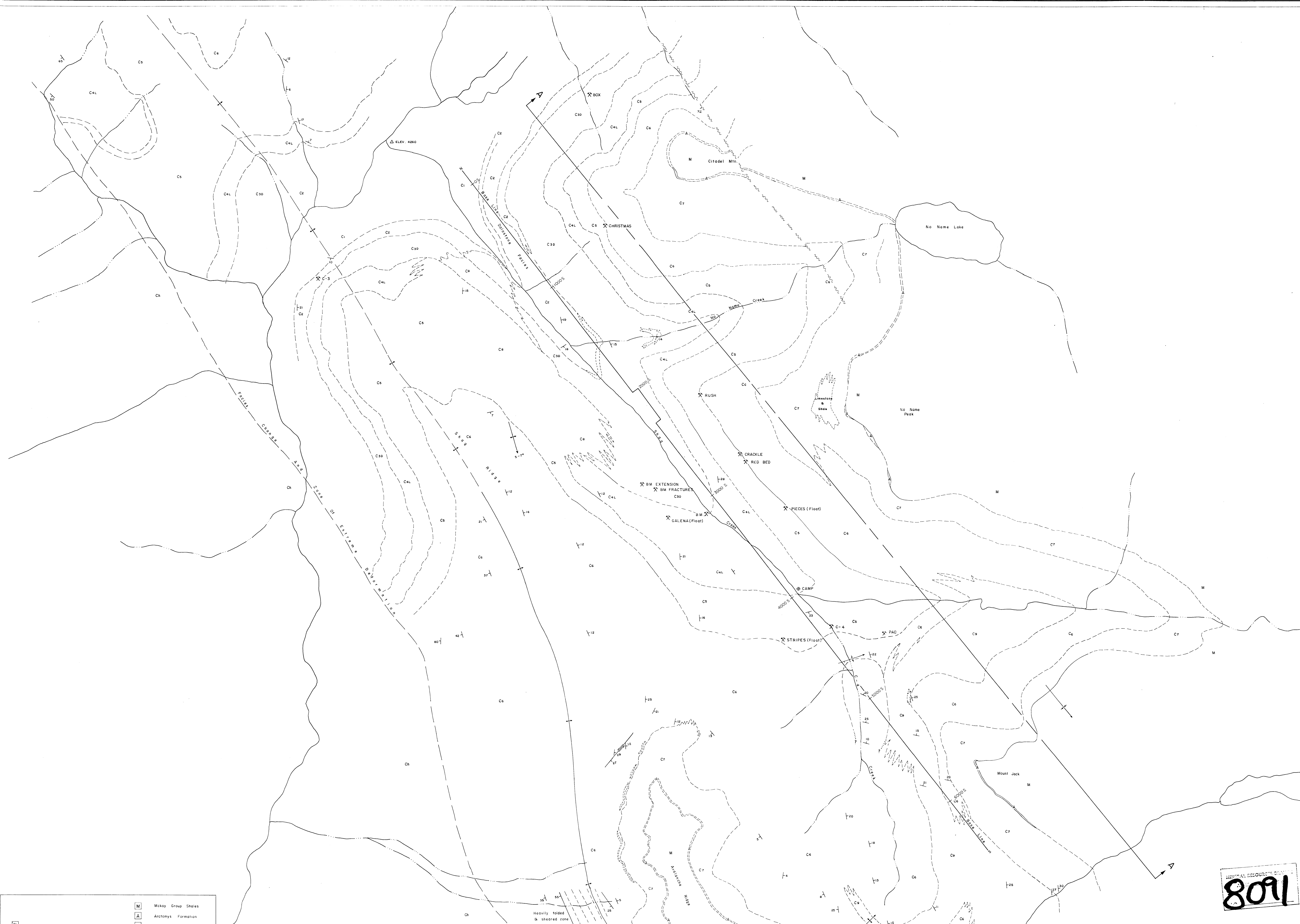


8091

NOV. 79 B.W./y.m. DWG. C-8687

RIO TINTO CANADIAN EXPLORATION LIMITED
SHAG CLAIMS - ALBERT RIVER

LOCATION OF CLAIMS & DRILL HOLES



LEGEND

Chancellor Formation
(Shale equivalent to Cathedral Formation)

M
A
C

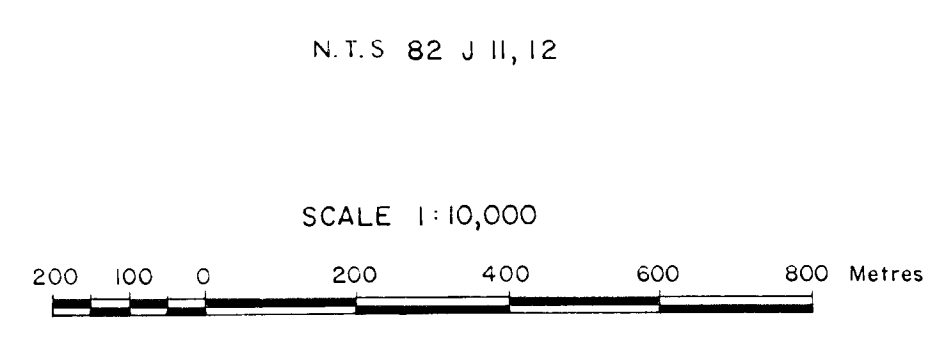
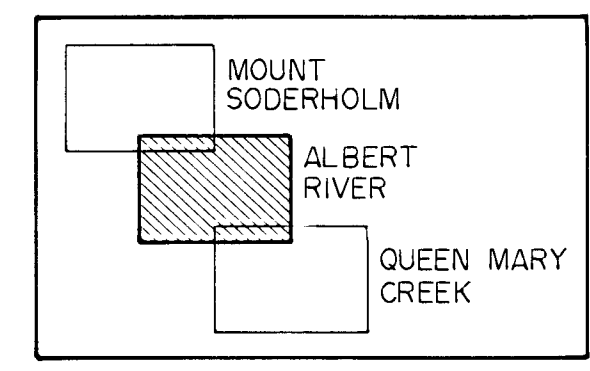
Mickey Group Shales
Arctomys Formation
Cathedral Formation

C7 Top Dolostone
C6 Cliff Step Limestone
C5 Second Dolostone
C4L, C4d Dividing Limestone, Dolostone equivalent
C3d, C3L BM Host Dolostone, Limestone equivalent
C2 Thin Limestone
C1 Albert River Dolostone

Ce Eastern Transgressive Dolostone
Cc Cyclic Dolostone

--- Geological contact inferred
— Geological contact observed
X Showing

Heavily folded & sheared zone



8091

RIO TINTO CANADIAN EXPLORATION LIMITED
SHAG CLAIMS
GEOLOGY
ALBERT RIVER SHEET
DB / s/c NOV. 1979 DWG. G - 8668
Checked by: B.H.W.