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1987 FINAL REPORT
ON THE
MULLIGAN CLAIM

Squamish Area, Vancouver Mining Division

NTS 92G/11E ~~10/76~~
Lat. 49°41'N Long. 123°04'W
24" 12"

by

G. McTaggart, Associate Geologist
S. Gibbins, Assistant Geologist

Owned and Operated by:
Kidd Creek Mines Ltd.

**GEOLOGICAL BRANCH
ASSESSMENT REPORT**

16,495

November, 1987

Vancouver, B.C.

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SUMMARY

This report presents results of fieldwork completed on the Mulligan property in June, 1987. The property consists of one claim (8 units), wholly owned by Kidd Creek Mines Ltd., located in the Coast Range of Southwestern British Columbia, approximately 40 km north of Vancouver.

Fieldwork consisted of detailed geological mapping and lithochemical sampling of the volcanic units, and geochemical sampling of pyritic shear zones.

The property is underlain by a northwest-trending series of intermediate and felsic pyroclastic rocks and heterolithic fragmentals of the Upper Jurassic to Cretaceous Gambier Group, in contact with granodiorite of the Coast Range Intrusive Complex.

Discrimination of lithologies based on field observations is supported by geochemistry.

INTRODUCTION

Location, Access and Terrain

"The Mulligan property (Lat. 49°41'N, Long. 123°04'W) is located in southwestern British Columbia, about 7 km east-southeast of the port of Squamish (Figure 1). The claim is situated on Ray Creek, a tributary of the Stawamus River (Figure 2).

Access to the main area of the claim is by a logging road which turns south up the hill from the B.C. Hydro line maintenance road. This road winds its way up the hill ending up in the Ray Creek basin. Access to the extreme west end of the claim is by B.C. Hydro line access roads on either side of Ray Creek. The southwest corner must be approached from a road running north from the second Stawamus River bridge.

Terrain on the claim is varied with elevations ranging from 400 m to 1250 m. The steepest topography is situated in the western part of the claim. Forty degree slopes are common here; Ray Creek canyon is particularly hazardous. Upper Ray Creek basin is relatively flat with alpine swampy clearings. Most of the property is timbered; approximately 35 percent has been logged and is covered with second growth brush accompanied by partly regenerated timber.

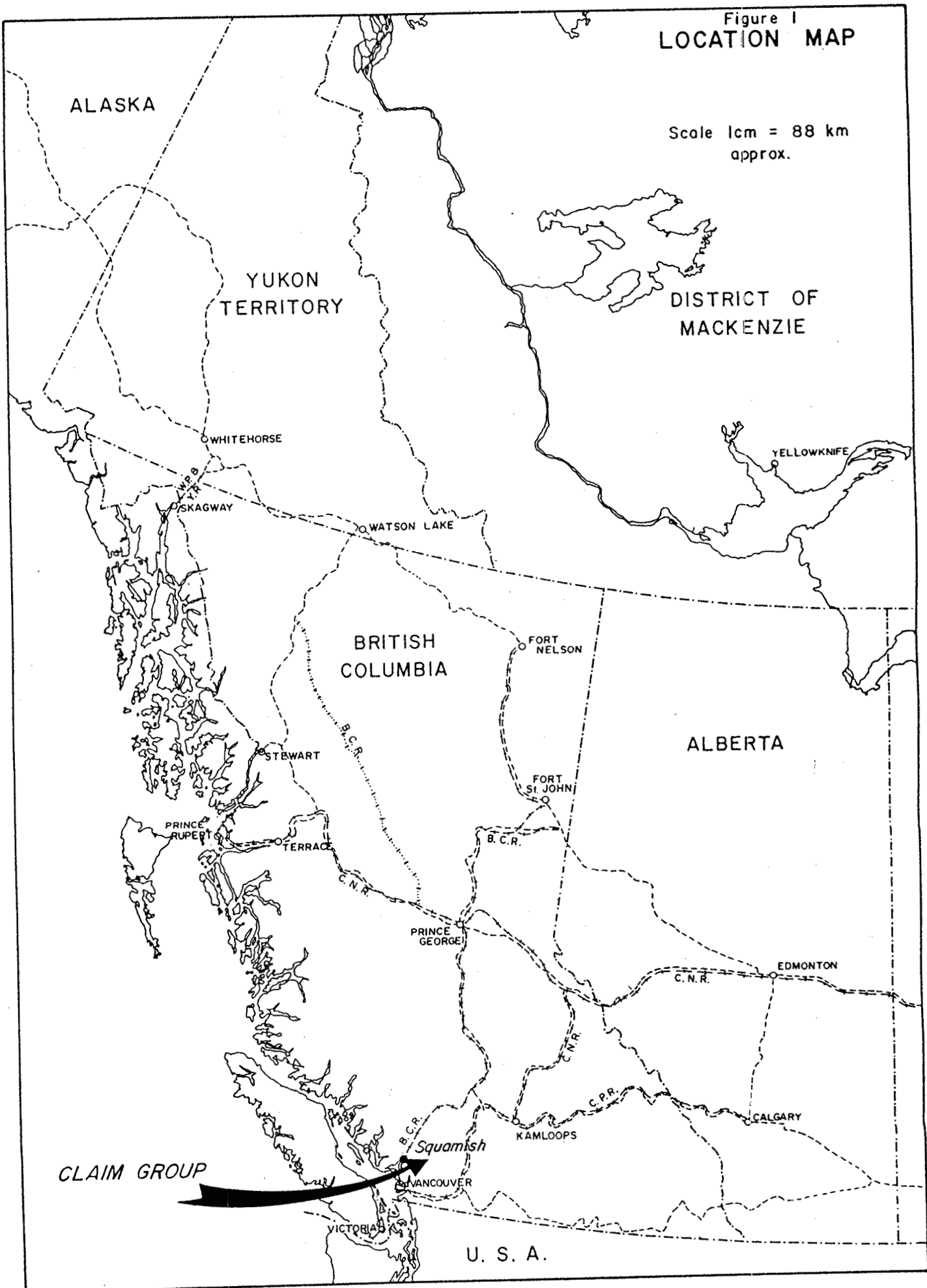
Annual periods of heavy rainfall in spring and fall characterize the moderate climate of this region. Heavy snowpack may be anticipated until early summer. By mid-October, permanent snow may be expected." (Enns and Hendrickson, 1983)

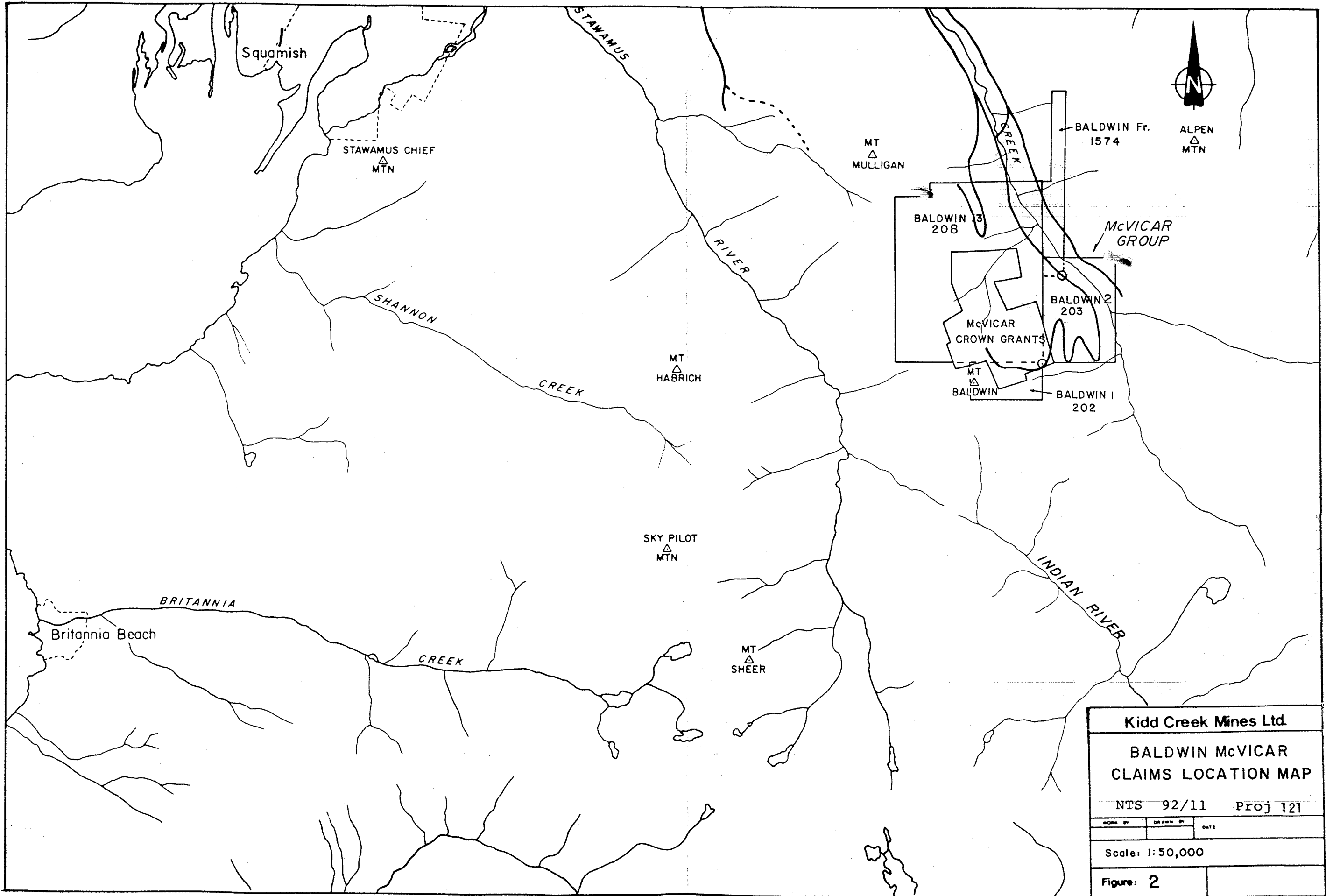
Property Definition

The Mulligan 1 currently consists of a single MGS claim comprised of 8 units (200 hectares) as shown in Figure 2. This claim was staked September 29, 1977 and recorded on October 7, 1977, and is in good standing until 1998.

Figure 1
LOCATION MAP

Scale 1cm = 88 km
approx.





Kidd Creek Mines Ltd.		
BALDWIN McVICAR CLAIMS LOCATION MAP		
NTS 92/11 Proj 121		
WORK BY	DRAWN BY	DATE
Scale: 1:50,000		
Figure: 2		

1987 Programme

Field work during June, 1987 was directed at:

- 1) determining if the geological environment of the property was suitable for the formation of massive sulphides;
- 2) determining the source of the 200 m long chargeability anomaly that exists near the centre of the property. This anomaly was outlined in the 1983 Final Report on the Mulligan Property.

The work involved detailed geological mapping at a scale of 1:1000, lithogeochemical sampling of the volcanic units, and geochemical sampling of the existing adits and trenches for Cu, Zn, Pb, Ag, Au and Ba. A pre-existing cut grid, with tie lines spaced at 200 meter intervals, provided a control fabric.

For future computer storage of numeric data, the UTM coordinates for station 5000N/1000W are given as 5,503,458N/495,577E.

REGIONAL GEOLOGY

"As shown by Figure 3, the property lies within a belt of intermediate volcanic and volcanoclastic rocks belonging to the Cretaceous Gambier Group, which forms part of the Indian River Pendant. This pendant is one of many remnants of stratified rock within the Coast Crystalline Complex. Regional grade of metamorphism is generally greenschist rank and strong contact metamorphism is present near some plutonic bodies.

The pendant, measuring about 4 km by 20 km, trends north-northwest and is connected to the Britannia Belt (10 km to the southwest) by a 'bridge' of volcanic rock. The Indian River Pendant tapers to the southeast and is in contact with younger Garibaldi volcanic rocks to the north. This pendant generally contains a greater proportion of pyroclastic material and a smaller marine sedimentary component, than the Britannia Belt.

Rocks of the Indian River Pendant probably are correlative with the upper part of the Gambier of Upper Jurassic to Lower Cretaceous age. Details of regional geology are described by Roddick (1965) and James (1929) as listed in the Bibliography." (Enns and Hendrickson, 1983)

PROPERTY GEOLOGY

Introduction

Because of overlying glacial till the majority of the outcrop exposures are located in creeks and along roads. Recent construction of a logging road - to replace the washed out existing one - from 5800N/1600W to Upper Ray Creek Basin has exposed numerous additional outcrops in an area of complex stratigraphy. With the exception of the area between L54N and L52N, traverses between tie-lines located very few outcrops. Previous mapping indicates that the western position of the property is dominated by Coast Range Granodiorite. For this reason, detailed geological mapping was restricted to the volcanic units east of 2300W.

Lithology

The property includes northwest-trending andesitic to intermediate tuffs and fragmentals, and felsic flows and tuffs (Figure 4). This sequence is in contact with granodiorite of the Coast Range Intrusive Complex along the western margin of the property, and has been intruded by mafic Garibaldi dykes.

Ten volcanic units were mapped on the property (Figure 4); their descriptions are in Appendix 2. South of Little Ray Creek, the sequence includes intercalated Aphyric Rhyolite, Andesite Tuff, Heterolithic Fragmental, and Intermediate Lapill-Ash Tuff. Heterolithic Fragmental occurs as a broad band across the central portion of the property. North of L56N, the sequence comprises numerous intercalated felsic tuffs and minor Argillite. These tuffs are all rhyolitic in composition, but can be distinguished as aphyric, quartz crystalline, feldspar crystalline, quartz-feldspar crystalline, and ash tuff units. Locally, flow banding, ash bands, and discontinuous lapilli to block trains indicate the units strike northwest.

Structure

The volcanic succession at the Mulligan property is a tilted sequence striking approximately 120° , with a moderate to steep southwest dip that averages 60° . Graded bedding in Rhyolite Ash Tuff, 40 meters north of the property boundary at 1900W, indicates an overturned sequence with stratigraphic tops to the north. Observed contacts at 160° (5725N/1400W, and 5660N/1290W) indicate the stratigraphy does not strike uniformly across the property.

A regional foliation of approximately 154/78 has been imposed on the volcanic sequence. This foliation is best developed in the

volcanic units south of Little Ray Creek, and least developed in the felsic tuffs in the north half of the property. Foliation is strongest in shear zones.

Numerous north to northwest-trending subvertical shear zones were noted in three main areas. From 1760W-1660W, south from Little Ray Creek to L52N, the regional foliation is sub-parallel to the shear zones at 160/75. In Ray Creek, from 1640W to 1520W, the foliation is oriented at 150/75, while the shears are oriented at 180/75. In Little Ray Creek, from 2310W to 2050W, the shears are sub-parallel to the foliation at 154/85, and crosscut the granodiorite. Shearing, with associated quartz-sericite alteration has destroyed original rock textures in these zones. Individual shear zones range from 2 to 5 meters in width, however, because of discontinuous outcrop exposure, an accurate strike length was not obtainable. Adits that follow the shears are from 5 to 20 meters in length.

Faulting is common on the property, and has been related to the intrusive granodiorite contact (Delancey, 1978). Ray Creek, between lines 52N and 54N, and Lower Ray Creek, appear to be controlled by larger fault structures. Creek walls are steep, highly fractured and unstable. Slickensides (5410N/2050W) give evidence of a southeast-striking, shallow, westward dipping reverse fault. Shearing and faulting of the granodiorite and volcanics at the western margin of the property have created a complex structural relationship between these units.

A more detailed resolution of the structural complexities of this area is inhibited by areas of poor outcrop exposure particularly in a 200 meter wide northwest-trending zone from L50N/1000W to L60N/2100W.

Alteration

The four alteration facies recognizable in the field are:

1. quartz-sericitization,
2. silicification,
3. sericitization,
4. epidotization.

Light green/grey to white-coloured quartz-sericite alteration is associated with the north-trending shear zones outlined in "Structure". These zones are up to 5 meters wide, and the intensity of alteration increases towards the centre of the shear, where the original rock has been altered to a quartz-sericite schist. In these shears sericite has locally been altered to a very soft, white clay, after extended interaction with ground water (eg. within the adits).

Stockwork silicification is evident in Intermediate Lapill-Ash Tuff at 5150N/1525N and 5300N/1720N. The intensity of alteration varies from moderate to strong, and where strong, precludes recognition

of the original rock type. Individual veins are up to 4 cm in width. Local, pervasive, light green-coloured sericitization of the volcanic units is weak in intensity, and occurs throughout the property.

Moderately intense sericitization of Heterolithic Fragmental (5320N/1470W) is restricted to the matrix and the rims of the fragments, making the fragment edges indistinct on fresh surfaces. Feldspar crystals in Quartz-Feldspar Crystal Tuff (5830N/1560W) have a light green colour, that likely results from sericitization.

Andesite Tuff south of 5420N exhibits up to 25% equant epidote blebs that are less than 5 mm in size on average.

Mineralization

Two types of mineralization were mapped on the property. Pyrite mineralization associated with north-trending, subvertical shears was noted in the following areas: 1760W-1660W, from Little Ray Creek south to L52N; in Little Ray Creek from 2310W-2050W; in Ray Creek from 1640W-1520W and at 1250W. Numerous old adits - in Little Ray Creek and Ray Creek, and at 5250W/1720W - and trenches - at 5220N/1700W, and 5290N/1700W - help to define the nature of the mineralization. Discrete pods to lenses, less than 50 cm wide, of up to 80% euhedral pyrite (avg. <5 mm in size) in a quartz-sericite, schistose matrix are locally found within the shears. Disseminated pyrite mineralization increases in intensity towards the centre of the shears and is discontinuous along strike. Forty three samples were taken from the adits and trenches. The highest values associated with this type of mineralization are: 14500 ppm Cu, 520 ppm Zn, 142 ppm Pb, 9.9 ppm Ag, and 130 ppb Au.

Previous mechanical stripping in the the region of 5150N/1520W exposed up to 5% disseminated chalcopyrite mineralization, associated with very intense stockwork silicification, in Intermediate Lapill-Ash Tuff. Outcrop exposure in this region is limited, and mineralization was observed in one outcrop only. Of the four samples taken from this area the best values are 2200 ppm Cu, 2.04% Zn, 800 ppm Pb, 3.5 ppm Ag, 65 ppb Au.

ROCK GEOCHEMISTRY

Introduction

Fifty-six surface samples - comprising approximately 1 kg of unweathered rock - were collected from outcrops on the Mulligan claim for whole rock analysis (Figure 5).

Whole rock geochemical analyses were performed by X-Ray Assay Laboratories of Don Mills, Ontario. Major and minor oxides and selected trace elements (copper and zinc) were analysed by X-ray fluorescence spectrometry (XRF).

Bondar-Clegg of North Vancouver analysed samples by geochemical methods for Cu, Pb, Zn, Ag, Au and Ba. An HNO_3 -HCl hot extraction and analysis by DC Plasma were used for analysis of all elements except Au and Ba. A fire assay preparation with AA finish was used for Au, and X-Ray Fluorescence was used to give a total analysis for Ba. An assay preparation method was applied to all samples. Base metal levels exceeding 3000 ppm were re-analysed.

Results for base metal analyses are listed in Appendix 3. Major oxide and trace element analytical results are listed in Appendix 4.

Results

The discrimination of rock types based on field observations is supported by geochemistry. Geochemical data from samples of volcanic rock that underlie the Mulligan claim plot in the calc-alkaline field on an AFM ternary diagram (Figure 6) and an SiO_2 - FeO/MgO diagram (Figure 7). The samples are best discriminated by plots of TiO_2 vs SiO_2 (Figure 8) and Al_2O_3 vs SiO_2 (Figure 9), in which three distinct fields - rhyolite (unit 4,5,6,7,8,9), dacite (unit 2) and andesite (unit 1) - are apparent. Samples of rhyolite and andesite from the Mulligan claim have geochemical signatures (Figure 10) similar to unaltered samples of rhyolite and andesite from the Baldwin-McVicar claims (McTaggart, Gibbins, 1987). The absence of unaltered dacite from the Baldwin-McVicar claims precludes a comparison of this rock type.

With the exception of shear zones, the intensity of alteration mapped in the field, is dominantly weak. These observations are, however, relatively unsupported by an A/CNK vs SiO_2 plot (Figure 11), in which a large percentage of samples plot in the altered field, as defined by Keith (1984). Each of the three main rock types - rhyolite, dacite and andesite - are characterized by relatively low CaO (Best, 1982). This feature is common to volcanics in this region (McTaggart, Gibbins, 1987), and is reflected in the elevated A/CNK values.

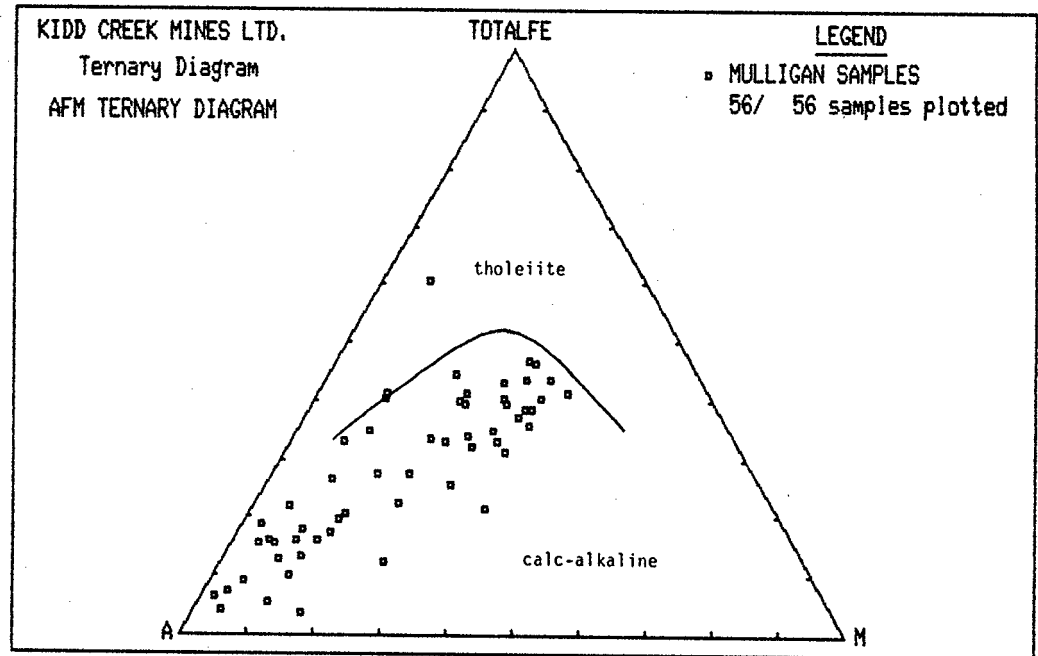


Figure 6 : AFM Ternary Diagram of Samples from Mulligan.
 TOTALFE = 0.8998 X Fe₂O₃
 M = MgO
 A = Na₂O + K₂O

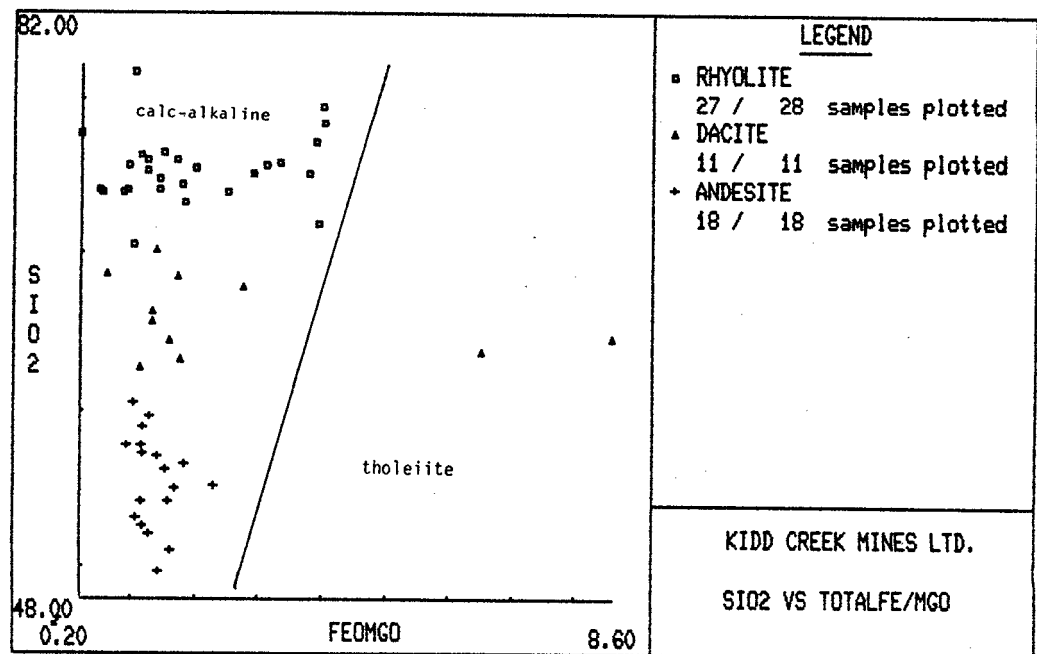
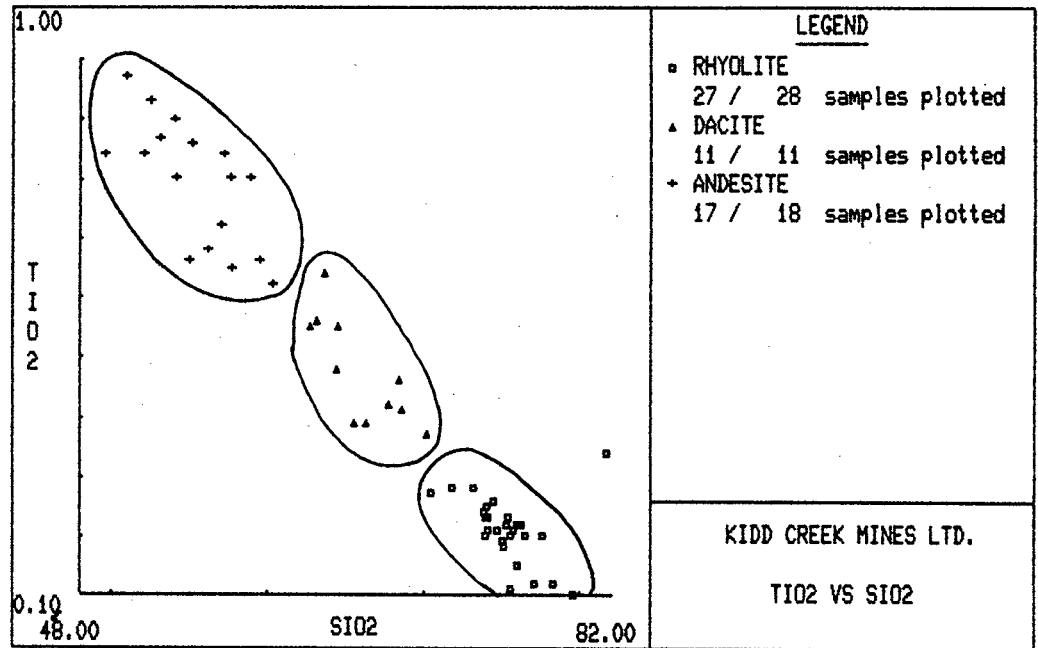
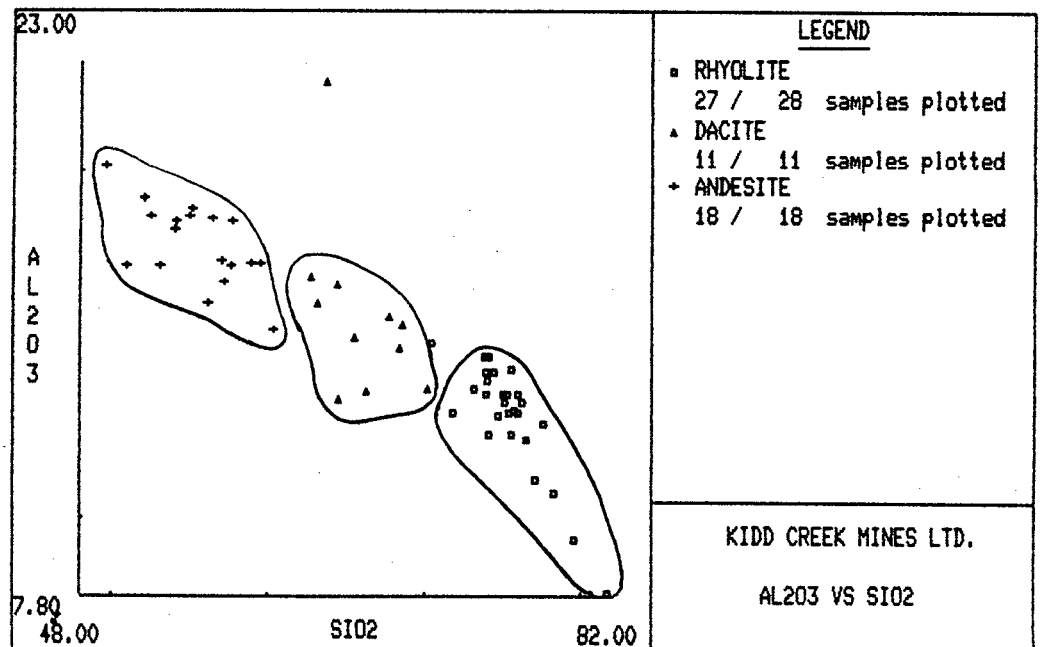


Figure 7 : SiO₂ vs FeO/MgO - Mulligan Samples.

Figure 8 : TiO₂ vs SiO₂ - Mulligan SamplesFigure 9 : Al₂O₃ vs SiO₂ - Mulligan Samples.

Mean Wt. %	Rhyolite	s.d.	Dacite	s.d.	Andesite	s.d.
SiO ₂	75.36	2.21	65.91	2.40	55.41	2.91
Na ₂ O	3.03	1.63	2.30	1.28	3.48	0.84
K ₂ O	3.13	1.11	3.48	1.23	1.81	0.79
CaO	0.51	0.36	1.19	0.97	2.50	1.60
MgO	1.01	0.63	2.51	1.28	5.27	0.94
Al ₂ O ₃	12.91	1.54	15.81	2.40	17.77	1.14
Fe ₂ O ₃	1.76	1.03	4.68	1.98	7.87	1.17
TiO ₂	0.21	0.06	0.48	0.09	0.81	0.14
P ₂ O ₅	-----	-----	0.15	0.08	0.23	0.05
Totals	97.92		96.51		95.15	
n	27		11		18	

Figure 10. Mean weight percent oxides of rhyolite, dacite and andesite, from the Mulligan Claim.

n = number of samples

s.d. = standard deviation

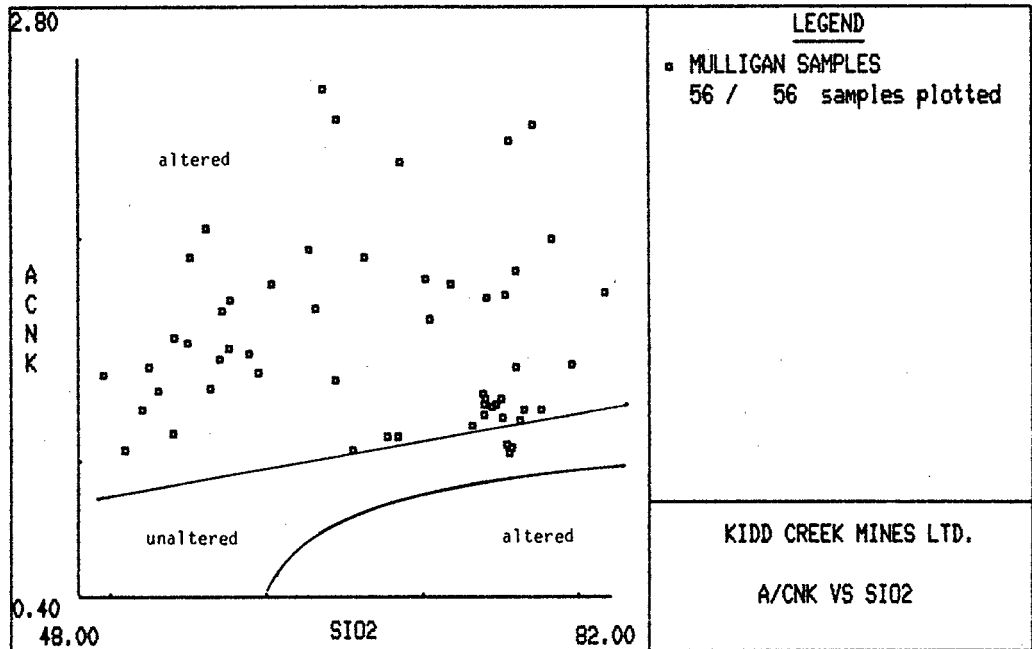


Figure 11 : A/CNK vs SiO₂ - Mulligan Samples.

$$A/CNK = (Al_2O_3/102) / ((CaO/56) + (Na_2O/62) + (K_2O/94))$$

DISCUSSION

Textures and structures observed in the volcanic rocks that underlie the Mulligan claim indicate these units formed as a result of pyroclastic eruptions. Andesite and Intermediate pyroclastics in the south half of the property are separated from felsic pyroclastics in the north half of the property by Heterolithic Fragmental. The distinguishing features of this fragmental - poor sorting, heterolithic, angular to rounded fragments, and apparent thickness up to 200 meters - are characteristic of a lahar or debris flow that has been reworked. This debris flow could mark the change from intermediate to felsic volcanism. Intercalated felsic tuffs in the north-central portion of the property appear to mantle an original topographic slope. Quartz-Feldspar Crystal Tuff (5760M/1400W) - with no internal stratification - local evidence of flow banding, and rapid thickness fluctuations - is characteristic of a hot, nuee ardente-type pyroclastic surge that drapes the topography (Easton and Johns, 1986). Rhyolite Ash Tuff - because of its lateral extent (greater than 1200 meters) is likely a series of ignimbrite sheets. Locally, there is evidence to indicate these pyroclastics occurred as falls (good sorting of fragments in Intermediate Lapilli-Ash Tuff), flows (flow banding and minimal sorting in Rhyolite Ash Tuff), and surges (as above), and are likely a result of all three deposit types.

Graded ash bedding and local, thin lenses of Argillite indicate the depositional environment was at least temporarily, and/or locally, subaqueous. No evidence of a subaerial environment of deposition was mapped.

The volcanic succession - with reworked fragmentals, well-sorted air-fall tuffs, pyroclastic flows and surges - reflects a distal facies environment of deposition.

The absence of mineralization and lack of any recognizable alteration trend in the volcanic units that underlie the property suggest the potential for discovering volcanic-associated massive sulphides on the Mulligan claim is very poor.

North-trending pyritic shear zones appear to post-date the emplacement of the Coast Range Intrusive Complex and do not have any significant associated base metal and/or gold mineralization.

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- RODDICK, J.A., 1965 : Vancouver North, Coquitlam and Pitt Lake Map-Areas, B.C.; GSC Memoir 335.

STATEMENT OF QUALIFICATIONS

I, George McTaggart, an employee of Falconbridge Limited, with offices at 701-1281 West Georgia Street, Vancouver, B.C., do hereby declare that:

1. I am a graduate of Queen's University, Kingston, Ontario (1985) with an Honours B.Sc. degree in Geology.
2. I have practised my profession as an exploration geologist for 2 years since graduation, in Ontario and British Columbia.
3. I supervised the work described in this report.

Dated at Vancouver, B.C. this 19th day of November, 1987

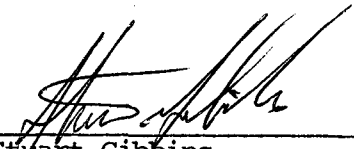

George McTaggart

STATEMENT OF QUALIFICATIONS

I, Stuart Gibbins, an employee of Falconbridge Limited, with offices at 701-1281 West Georgia Street, Vancouver, B.C., do hereby declare that:

1. I am a graduate of Carleton University, Ottawa, Ontario (1987) with an Honours B.Sc. degree in Geology.
2. I have practised my profession as an exploration geologist since graduation, in British Columbia.
3. I assisted with the work described in this report.

Dated at Vancouver, B.C. this 30th day of November, 1987



Stuart Gibbins

STATEMENT OF EXPENDITURES

SALARIES

G. McTaggart, Associate Geologist 35 days @ \$131/day	4,585.00
S. Gibbins, Assistant Geologist 32 days @ \$108/day	3,456.00
M. Whiting, Cook 16 days @ \$30/day	480.00
	<u>\$8,521.00</u>

ROOM AND BOARD

67 DAYS @ \$30/DAY	\$2,010.00
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TRANSPORTATION

Redhawk Rentals	\$1,368.38
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FIELD EXPENSES

.....	\$ 468.00
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GEOCHEMISTRY

Bondar Clegg & Co. 57 rocks @ \$18.30	\$1,043.10
X-Ray Labs 56 rocks @ \$22.65	\$1,268.40
	<u>\$2,311.50</u>

Total Expenditure	\$14,078.88
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PERSONNEL

<u>NAME</u>	<u>POSITION</u>	<u>DATES ON PROPERTY</u>
G. McTaggart	Associate Geologist	May 22 - June 29, 1987
S. Gibbins	Assistant Geologist	May 26 - June 29, 1987
M. Whiting	Cook	June 11 - June 29, 1987

APPENDIX 1
PROPERTY HISTORY AND PREVIOUS EXPLORATION

APPENDIX 1

PROPERTY HISTORY AND PREVIOUS EXPLORATION

"In the early 1900's, several open-cuts and adits were driven on lenses of massive to semi-massive pyrite outcropping in upper Ray and Little Ray Creeks. Local concentration of chalcopyrite and sphalerite are associated with a few of these showings. Claims at that time included the Bruce, Radiant and Contact groups.

In 1929, a 'Radiore Electrical Survey' was conducted in the area of Ray Creek basin by Radiant Copper Ltd. The survey indicated a number of "pyritic shear zones."

Later work focused on a copper showing at the head of the basin; (on the Crane claim) three diamond drill holes tested this showing but results were unencouraging.

In March 1977, M. Levasseur staked the Crane claims (Figure 2) over the Ray Creek basin area; assessment work included some Cat trenching on the copper showing. On October 1977, Texasgulf Inc. staked the Mulligan 1 Claim centred on Ray Creek. On March 13, 1978 the Crane claim was optioned by Texasgulf from Eagle River Mines, who had acquired the ground from M. Levasseur.

During 1978, work on the property included geological mapping at a scale of 1:5000, limited geochemical (silt and soil sampling along Ray Creek and Ray Creek basin) and limited geophysical (VLF and horizontal loop follow-up) surveys. The Crane claim option was dropped in 1979.

In 1982, the Mulligan 1 claim was covered as part of a larger airborne magnetic and VLF-EM survey flown by Aerodat Ltd. Results over the property were negative." (Enns and Hendrickson, 1983).

During the summer of 1983, work completed by Kidd Creek Mines Ltd. consisted of line cutting, geological mapping at a scale of 1:2500, soil sampling and a detailed IP/resistivity and magnetometer survey. Geological mapping revealed a northwest-trending volcanic sequence consisting of felsic to intermediate flows and related pyroclastic rocks. No significant and coherent soil anomaly was detected. The geophysical surveys delineated a moderately strong (more than 40 m sec) short strike length chargeability anomaly between lines 52N and 54N at approximately 1700W.

APPENDIX 2
DESCRIPTION OF LITHOLOGIES

APPENDIX 2

Description of Lithologies

Andesite Tuff (unit 1) occurs as lenses south of L56N with an apparent thickness up to 90 meters. Weathered surfaces are light brown to buff coloured, while fresh surfaces are medium green/grey coloured, fine grained, and contain up to 25% equant epidote blebs less than 5 mm (avg. 2 mm) in size, and 1-5% disseminated, euhedral pyrite less than 2 mm in size. Exposures in Little Ray Creek (1900W) contain up to 20% subangular to subrounded felsic ash to lapilli up to 6 cm (avg. <1 cm) in size, and indicate the unit is pyroclastic in origin.

Intermediate Lapilli-Ash Tuff (unit 2) occurs south of Little Ray Creek, with an apparent thickness up to 70 meters. Weathered surfaces are light grey to buff coloured, but appear medium blue/grey in colour where exposed in the creeks. Gradations from up to 80% subangular to subrounded felsic lapilli less than 6 cm (avg. <2 cm) in size, to fine tuffaceous ash, in a dacitic matrix are observable at 5390N/1680W and 5165N/1520W. At 5450N/1920W, 5020N/1580W there is up to 25% subangular to rounded siliceous lapilli (avg. < 0.5 cm), in a dacitic to andesitic matrix.

Heterolithic Fragmental (unit 3) occurs as a thick band, with an apparent thickness up to 200 meters, that trends northwest across the central portion of the property, and as a lense at 5250N/1720W with an apparent thickness up to 50 meters. Although this unit may contain up to 80% fragments (5430N/1600W), it averages 30%. The fragments include 80% subangular to subrounded and ovoid felsic ash to blocks up to 30 cm (avg. <8 cm), and 5% grey-coloured, subangular, cherty blocks <10 cm. Other fragment types include flow banded felsic blocks up to 20 cm, elongated intermediate blocks up to 50 cm, a hyaloclastite block 40 cm in size, and an ovoid pyritic-sulphide fragment 2x1 cm. The matrix is rhyolitic to dacitic in composition, fine grained, and contains 1-5% disseminated, euhedral pyrite, < 1 mm in size. Because the fragment types are quite diverse in origin and their shapes are generally rounded, this unit is probably a debris flow that has been reworked.

Lenses of Aphyric Rhyolite (unit 4) - each with an apparent thickness less than 50 m - occur throughout the property. Weathered surfaces are white and at 5970N/1390W it exhibits bands less than 50 cm wide of 70%, densely-packed, angular rhyolitic breccia that may represent an original talus slope deposit. Fresh surfaces are light grey/green in colour, and very fine grained. This unit could be a massive flow.

Quartz-Feldspar Crystal Tuff (unit 5) occurs in the NE quadrant of the property as lenses with an apparent thickness up to 70 meters.

This unit has light grey/white weathered and fresh surfaces, contains 10-20% subangular to angular, randomly oriented quartz crystals up to 5 mm (avg. 2-3 mm), and 5-20% white, angular to fragmented feldspar crystals 2-3 mm in size. Feldspar crystals have locally been altered (5840N/1540W) and have a light olive-green colour. Wavy flow banding (1540N/1490W) indicates this unit is a pyroclastic flow.

Quartz Crystal Tuff (unit 6) outcrops in the NE quadrant of the property, and forms three northwest-trending lenses, each with an apparent thickness less than 20 meters. This unit has a white to grey-white weathered surface, and consists of 10-20% angular to fragmented quartz crystals up to 5 mm in size in a light grey to white coloured, very fine grained, rhyolitic matrix, with 1-5% disseminated euhedral pyrite less than 1 mm. Its spatial association with flow banded, Quartz-Feldspar Crystal Tuff suggest it is a pyroclastic flow.

Feldspar Crystalline Rhyolite (unit 7) is exposed along the road at 5640N/1390W, and consists of 15-25% white, subangular to fragmented feldspar crystals less than 1 cm in size. Weathered surfaces are dark green with a white, mottled appearance, while fresh surfaces are medium green/grey in colour, very fine grained, and rhyolitic. This unit could be a feldspar porphyritic dyke, or a feldspar crystal tuff.

Three small exposures of Rhyolite Volcaniclastic (unit 8) occur in the NE quadrant of the property. This unit consists of 20-30%, poorly sorted, subrounded to ovoid rhyolitic clasts <2 mm to 3 cm in size, 20% of which are quartz crystalline. The matrix is very fine grained, light green/grey in colour, and rhyolitic to dacitic in composition. The very limited extent of this unit, and well-rounded, poorly sorted nature of the clasts suggest it is a conglomerate that formed in topographical depressions.

Rhyolite Ash Tuff (unit 9) is areally the most extensive unit mapped on the property, and outcrops north of Little Ray Creek, with an apparent thickness up to 230 meters. This unit consists of 5 to 15% massive to flow-banded, subangular to rounded, felsic lapilli to blocks less than 30 cm (avg. <15 cm). Locally (ie. L60N/1500W), the lapilli and blocks are oriented in discontinuous trains that define the bedding attitude. Outcrop adjacent to the road at 6035N/1960W exhibits alternating green and white ash bands less than 3 mm wide. A fining upward sequence from felsic ash to light grey to black ash occurs at 6045N/1910W. This unit has minor, local flow banding (5510N/1030W), and at 5959N/1030W contains 5%, purplish, subrounded to rounded jasperoidal fragments less than 2 cm in size. The presence of flow banding, and broad areal extent, of this unit suggest it is a pyroclastic flow.

Thin lenses of very fine grained black Argillite (unit 10) have an apparent thickness less than 20 meters. This unit is fine grained, very fissile, and moderately sheared, with up to 5% disseminated euhedral pyrite <0.5 mm. Locally it may be finely interbedded with light-grey coloured felsic ash.

Coast Range Granodiorite (unit 11) was mapped west of 2030W on Little Ray Creek. The rock weathers light to medium brownish-grey with a light green-grey fresh surface. The unit is medium to coarse grained, weakly foliated as expressed in 10-15% chloritized hornblende, with less than 1% finely disseminated euhedral pyrite.

Sub-vertical, fine grained, mafic Garibaldi Dykes (unit 12) less than 50 cm wide cross, cut the volcanic stratigraphy. Their extent is related to three occurrences on the property.

APPENDIX 3
GEOCHEMICAL RESULTS (METAL ANALYSES)

MULLIGAN PROJECT - 1987 BASE AND PRECIOUS METAL ANALYSES

SAMPLE	CU ppm	PB ppm	ZN ppm	AG ppm	AU ppb	BA ppm
AD02801	1450.00	200.00	4500.00	2.30	35.00	2200.00
AD02802	2200.00	840.00	20400.00	3.50	65.00	3800.00
AD02803	14500.00	142.00	520.00	9.90	130.00	1100.00
AD02805	110.00	11.00	115.00	0.70	80.00	1100.00
AD02807	41600.00	18.00	7100.00	48.00	25.00	220.00
AD02808	415.00	84.00	710.00	2.30	20.00	950.00
AD02812	194.00	18.00	285.00	1.10	40.00	1100.00
AD02813	6.00	2.00	8.00	0.20	15.00	1300.00
AD03105	890.00	82.00	4800.00	1.20	55.00	3200.00
AD03110	31.00	57.00	43.00	1.40	15.00	1200.00
AD03111	22.00	37.00	192.00	0.20	-5.00	1000.00
AD03112	14.00	38.00	160.00	0.10	-5.00	1100.00
AD03113	12.00	42.00	30.00	0.20	-5.00	980.00
AD03114	20.00	8.00	48.00	-0.10	-5.00	1200.00
AD03115	15.00	86.00	29.00	0.50	5.00	900.00
AD03116	98.00	7.00	255.00	-0.10	-5.00	720.00
AD03117	640.00	20.00	120.00	0.70	-5.00	1100.00
AD03118	47.00	9.00	28.00	0.60	10.00	1300.00
AD03119	2600.00	6.00	111.00	0.60	-5.00	980.00
AD03120	192.00	19.00	70.00	0.30	-5.00	1300.00
AD03121	26.00	9.00	39.00	0.20	-5.00	1200.00
AD03122	45.00	18.00	35.00	0.30	-5.00	1100.00
AD03123	113.00	13.00	192.00	0.10	-5.00	1500.00
AD03124	24.00	13.00	138.00	0.10	-5.00	810.00
AD03125	11.00	21.00	60.00	0.70	5.00	1000.00
AD03126	19.00	4.00	240.00	-0.10	-5.00	1000.00

MULLIGAN PROJECT - 1987 BASE AND PRECIOUS METAL ANALYSES

SAMPLE	CU ppm	PB ppm	ZN ppm	AG ppm	AU ppb	BA ppm
AD03127	32.00	20.00	93.00	0.10	-5.00	1300.00
AD03128	75.00	14.00	1100.00	0.10	-5.00	1300.00
AD03129	96.00	28.00	2600.00	0.60	-5.00	310.00
AD03130	8.00	6.00	38.00	0.20	-5.00	900.00
AD03131	19.00	40.00	131.00	0.80	30.00	500.00
AD03132	120.00	33.00	290.00	0.10	-5.00	1200.00
AD03133	38.00	30.00	178.00	0.80	-5.00	1500.00
AD03134	122.00	10.00	64.00	0.10	-5.00	2300.00
AD03135	940.00	7.00	620.00	0.60	-5.00	820.00
AD03139	32.00	15.00	11.00	2.20	20.00	160.00
AD03140	94.00	112.00	38.00	4.80	40.00	170.00
AD03141	21.00	12.00	20.00	1.00	30.00	110.00
AD03142	420.00	8.00	8.00	0.40	-5.00	1200.00
AD03143	30.00	14.00	150.00	0.30	-5.00	690.00
AD03146	17.00	2.00	490.00	-0.10	-5.00	460.00
AD03147	12.00	13.00	90.00	-0.10	10.00	4100.00
AD03148	24.00	3.00	140.00	-0.10	-5.00	1300.00
AD03150	10.00	6.00	180.00	-0.10	-5.00	500.00
AD03152	31.00	4.00	160.00	-0.10	-5.00	940.00
AD03153	280.00	14.00	126.00	0.40	-5.00	1200.00
AD03155	75.00	7.00	430.00	-0.10	-5.00	1500.00
AD03156	13.00	6.00	270.00	-0.10	-5.00	600.00
AD03158	1160.00	100.00	95.00	4.00	320.00	700.00
AD03188	230.00	141.00	225.00	0.60	25.00	1600.00
AD03190	300.00	16.00	2750.00	0.60	-5.00	5100.00
AD03191	73.00	59.00	240.00	0.40	-5.00	1900.00

MULLIGAN PROJECT - 1987 BASE AND PRECIOUS METAL ANALYSES

SAMPLE	CU ppm	PB ppm	ZN ppm	AG ppm	AU ppb	BA ppm
AD03192	6150.00	15.00	33.00	4.30	45.00	750.00
AD03193	117.00	7.00	51.00	0.30	5.00	1400.00
AD03194	73.00	5.00	39.00	0.10	-5.00	1500.00
AD03195	130.00	6.00	129.00	0.30	-5.00	1600.00
AD03200	92.00	124.00	75.00	1.40	110.00	2800.00

APPENDIX 4

MAJOR OXIDE AND TRACE ELEMENT ANALYTICAL RESULTS

MULLIGAN PROJECT WHOLE ROCK ANALYTICAL DATA - 1987

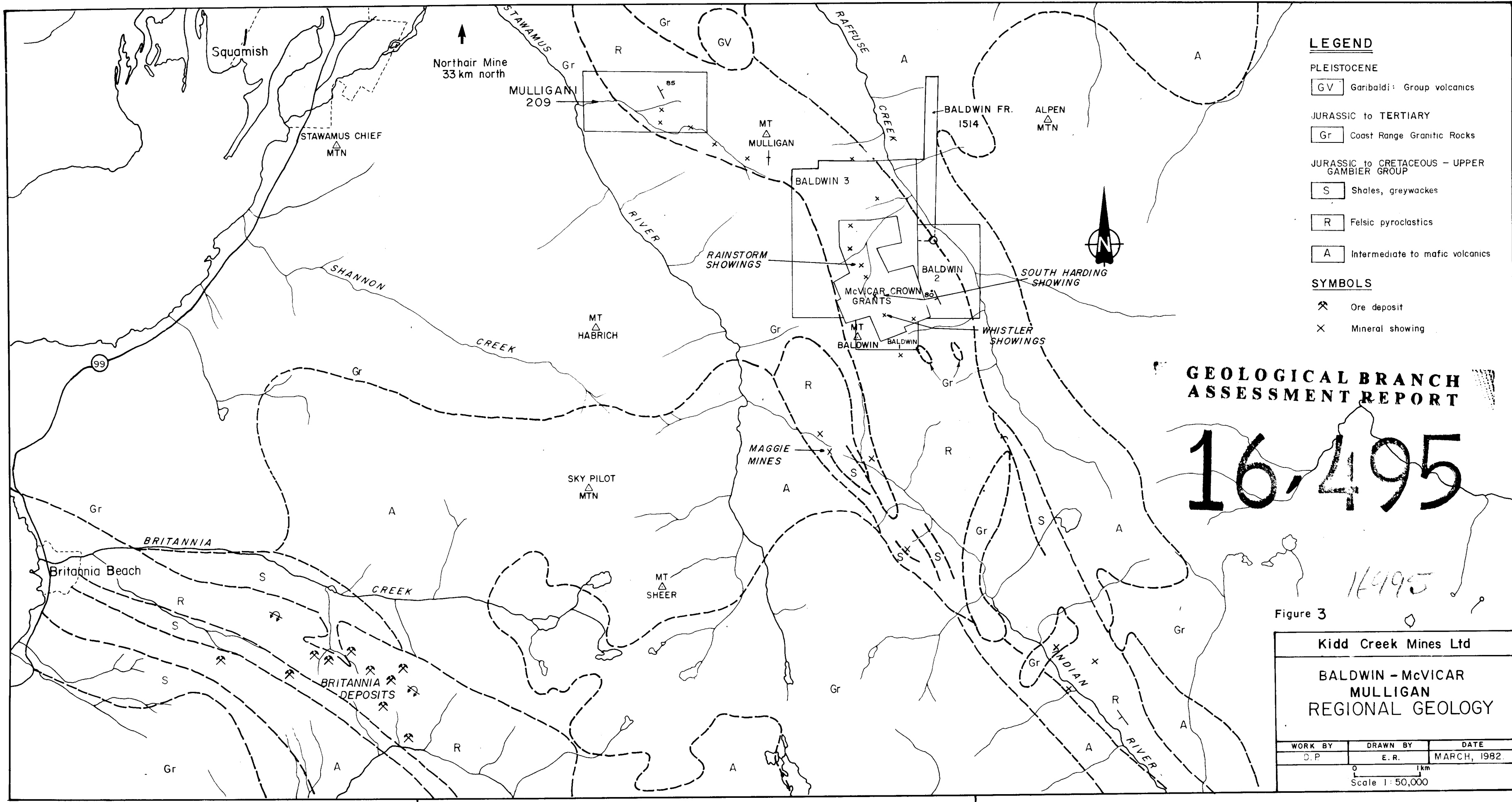
SAMPLE	SiO2 %	Al2O3 %	CaO %	MgO %	Na2O %	K2O %	Fe2O3 %	MnO %	TiO2 %	P2O5 %	CR2O3 %	LOI %	RB ppm	SR ppm	Y ppm	ZR ppm	NB ppm	BA ppm	CU ppm	ZN ppm
AD02804	63.60	22.50	0.52	0.25	0.16	6.66	1.81	0.01	0.64	0.38	-0.01	3.31	106.00	29.00	-10.00	41.00	-10.00	1050.00	37.00	14.00
AD02806	73.20	13.70	0.58	1.05	3.86	4.10	2.15	0.04	0.28	0.08	0.01	1.00	51.00	269.00	20.00	134.00	13.00	1610.00	25.00	29.00
AD02809	79.50	9.43	0.24	0.41	0.40	5.05	1.82	0.07	0.10	0.03	0.01	1.77	57.00	109.00	21.00	37.00	20.00	7340.00	29.00	208.00
AD02810	70.20	13.70	0.38	2.76	2.25	2.90	4.30	0.19	0.37	0.11	-0.01	2.85	55.00	43.00	44.00	111.00	16.00	1160.00	125.00	158.00
AD02811	74.70	12.90	0.70	1.31	3.84	2.41	2.08	0.08	0.21	0.05	-0.01	1.54	61.00	255.00	22.00	115.00	32.00	1000.00	43.00	60.00
AD03101	60.30	15.30	0.64	6.08	2.97	2.26	6.98	0.40	0.62	0.19	0.01	4.31	59.00	81.00	13.00	127.00	25.00	1890.00	113.00	246.00
AD03102	75.50	12.40	0.20	0.88	0.12	4.16	3.05	0.06	0.11	0.03	-0.01	3.08	91.00	-10.00	20.00	69.00	12.00	1570.00	240.00	69.00
AD03103	74.10	12.40	0.46	2.65	2.56	1.91	2.76	0.17	0.23	0.06	0.01	2.39	44.00	69.00	29.00	105.00	22.00	1320.00	44.00	162.00
AD03104	66.30	13.60	0.42	4.23	2.66	1.84	6.29	0.26	0.39	0.11	0.01	4.08	48.00	40.00	36.00	102.00	24.00	657.00	112.00	256.00
AD03106	53.10	17.10	3.68	7.10	3.42	0.58	8.59	0.56	0.87	0.21	-0.01	4.39	21.00	249.00	-10.00	20.00	12.00	227.00	149.00	397.00
AD03107	73.90	13.50	0.41	0.58	3.93	3.32	1.62	0.07	0.20	0.05	-0.01	1.31	-10.00	221.00	-10.00	150.00	22.00	1860.00	33.00	60.00
AD03108	75.00	13.50	0.29	0.51	3.52	3.88	1.65	0.07	0.19	0.04	-0.01	1.08	52.00	249.00	32.00	148.00	20.00	2590.00	46.00	39.00
AD03109	75.10	13.30	0.34	0.39	3.77	3.90	1.64	0.07	0.18	0.04	-0.01	1.16	38.00	247.00	40.00	144.00	16.00	2370.00	58.00	122.00
AD03136	52.10	19.10	5.68	5.58	2.01	1.74	8.04	0.44	0.84	0.19	-0.01	4.24	40.00	431.00	35.00	25.00	11.00	817.00	115.00	354.00
AD03137	63.10	16.10	1.48	3.04	2.14	3.06	6.02	0.26	0.56	0.13	-0.01	3.85	56.00	158.00	30.00	78.00	24.00	1650.00	54.00	148.00
AD03138	57.00	17.30	2.19	4.87	3.63	1.74	7.69	0.57	0.72	0.19	-0.01	4.24	39.00	213.00	-10.00	37.00	27.00	1080.00	177.00	340.00
AD03144	57.20	16.70	1.30	5.71	3.68	1.41	7.50	0.47	0.84	0.24	-0.01	4.31	29.00	141.00	19.00	59.00	18.00	577.00	105.00	349.00
AD03145	54.00	18.20	5.06	4.45	3.08	1.81	7.85	0.36	0.90	0.27	-0.01	3.93	41.00	348.00	-10.00	39.00	15.00	1050.00	79.00	179.00
AD03149	56.20	16.10	0.69	5.90	2.95	1.60	10.10	0.44	0.68	0.14	-0.01	5.31	37.00	76.00	15.00	46.00	13.00	630.00	57.00	303.00
AD03151	57.60	17.10	1.25	5.51	4.67	1.27	5.76	0.41	0.80	0.18	-0.01	4.85	37.00	238.00	14.00	33.00	-10.00	730.00	44.00	217.00
AD03154	68.60	15.50	0.20	3.84	1.85	2.93	2.62	0.11	0.41	0.08	-0.01	3.77	57.00	54.00	-10.00	156.00	13.00	1060.00	36.00	114.00
AD03157	52.50	18.60	3.39	6.26	3.28	1.42	8.24	0.50	0.93	0.18	-0.01	4.54	48.00	182.00	14.00	48.00	20.00	523.00	54.00	210.00
AD03159	73.80	14.60	0.65	0.90	3.68	3.64	0.55	0.03	0.24	0.06	0.01	1.31	45.00	280.00	18.00	118.00	11.00	1550.00	20.00	48.00
AD03160	76.00	13.50	0.41	0.76	3.92	2.15	1.44	0.05	0.22	0.06	0.01	1.39	44.00	229.00	-10.00	103.00	14.00	704.00	26.00	46.00
AD03161	75.30	13.50	0.35	1.08	2.24	3.12	1.50	0.05	0.22	0.05	-0.01	1.77	62.00	139.00	22.00	120.00	18.00	1100.00	46.00	34.00
AD03162	75.50	14.20	0.39	0.37	7.32	0.83	0.39	0.02	0.20	0.04	0.01	0.77	-10.00	285.00	-10.00	127.00	16.00	484.00	26.00	22.00

MULLIGAN PROJECT WHOLE ROCK ANALYTICAL DATA - 1987

SAMPLE	SiO2 %	Al2O3 %	CaO %	MgO %	Na2O %	K2O %	Fe2O3 %	MnO %	TiO2 %	P2O5 %	CR2O3 %	LOI %	RB ppm	SR ppm	Y ppm	ZR ppm	NB ppm	BA ppm	CU ppm	ZN ppm
AD03163	77.60	12.70	0.28	1.32	5.13	1.28	0.31	0.01	0.20	0.02	-0.01	1.08	34.00	293.00	16.00	132.00	28.00	694.00	32.00	11.00
AD03164	58.90	17.20	1.33	4.96	4.76	1.23	6.51	0.35	0.80	0.21	-0.01	4.16	50.00	173.00	-10.00	52.00	18.00	373.00	67.00	183.00
AD03165	59.50	17.20	1.62	4.09	4.72	1.47	5.91	0.25	0.66	0.23	-0.01	3.93	46.00	231.00	24.00	32.00	24.00	533.00	41.00	121.00
AD03166	55.00	18.60	2.13	3.88	2.46	3.87	7.35	0.36	0.66	0.32	-0.01	4.39	72.00	217.00	18.00	45.00	15.00	2360.00	262.00	192.00
AD03167	76.00	13.00	0.06	0.97	1.74	3.74	1.35	0.04	0.15	0.02	-0.01	2.31	86.00	91.00	17.00	195.00	18.00	1580.00	21.00	25.00
AD03168	49.60	20.10	4.12	5.90	2.49	2.62	9.37	0.70	0.84	0.29	-0.01	4.16	64.00	203.00	11.00	70.00	24.00	1610.00	138.00	252.00
AD03169	54.10	18.40	1.63	6.05	4.61	1.15	7.81	0.59	0.80	0.26	-0.01	4.00	28.00	217.00	16.00	52.00	19.00	710.00	42.00	274.00
AD03170	74.10	14.60	0.75	2.01	2.51	2.69	1.11	0.03	0.21	0.04	0.01	1.93	59.00	245.00	14.00	137.00	20.00	921.00	33.00	21.00
AD03171	73.90	14.10	0.88	1.04	4.09	3.05	1.02	0.04	0.23	0.05	0.01	1.24	57.00	279.00	15.00	107.00	21.00	1330.00	27.00	19.00
AD03172	64.40	16.60	2.54	2.51	2.89	2.58	4.46	0.08	0.48	0.17	-0.01	2.39	77.00	202.00	18.00	86.00	-10.00	784.00	54.00	43.00
AD03173	76.50	12.20	0.81	0.70	2.38	4.15	1.18	0.03	0.20	0.05	0.02	0.85	74.00	203.00	12.00	95.00	20.00	1430.00	18.00	-10.00
AD03174	75.40	13.00	1.12	0.30	3.29	4.18	0.67	0.03	0.23	0.06	0.02	0.85	58.00	242.00	-10.00	72.00	14.00	1340.00	15.00	10.00
AD03175	68.40	14.80	2.06	1.87	4.05	2.64	3.62	0.04	0.46	0.14	0.01	1.62	46.00	359.00	22.00	86.00	-10.00	677.00	63.00	17.00
AD03176	67.70	15.70	1.92	1.13	4.27	3.34	3.48	0.03	0.42	0.14	0.01	1.16	55.00	432.00	12.00	82.00	24.00	855.00	32.00	12.00
AD03177	75.70	13.10	0.20	0.19	4.20	4.64	0.70	0.02	0.21	0.05	0.02	0.47	52.00	132.00	-10.00	104.00	11.00	1180.00	23.00	-10.00
AD03178	74.00	13.90	1.64	1.21	3.49	1.94	1.93	0.06	0.25	0.07	0.01	1.31	54.00	302.00	14.00	77.00	12.00	754.00	35.00	23.00
AD03179	76.20	13.30	0.93	0.96	4.96	1.28	1.22	0.03	0.22	0.07	0.02	1.08	28.00	258.00	17.00	110.00	23.00	576.00	41.00	19.00
AD03180	65.50	15.10	2.92	2.69	3.06	3.66	3.98	0.10	0.39	0.13	0.01	1.62	36.00	372.00	-10.00	82.00	-10.00	907.00	67.00	46.00
AD03181	62.70	16.90	0.50	4.26	1.94	4.19	5.47	0.07	0.55	0.14	0.01	3.46	89.00	54.00	31.00	99.00	-10.00	638.00	35.00	67.00
AD03182	56.40	18.50	2.42	3.96	4.56	1.85	8.03	0.08	1.20	0.31	-0.01	2.77	49.00	400.00	17.00	115.00	12.00	580.00	26.00	90.00
AD03183	57.70	18.40	2.29	5.57	2.68	1.98	7.18	0.12	0.65	0.19	-0.01	3.46	39.00	374.00	34.00	83.00	12.00	450.00	91.00	110.00
AD03184	74.40	14.10	0.22	0.47	4.17	3.80	0.93	0.02	0.26	0.07	0.01	0.93	43.00	202.00	21.00	89.00	-10.00	1100.00	25.00	-10.00
AD03185	70.40	15.00	0.86	2.19	2.57	3.11	2.54	0.06	0.27	0.07	-0.01	2.16	56.00	206.00	-10.00	99.00	-10.00	773.00	37.00	63.00
AD03186	81.70	7.93	0.34	2.43	1.52	1.27	2.85	0.07	0.34	0.08	-0.01	1.70	41.00	61.00	-10.00	20.00	15.00	434.00	40.00	30.00
AD03187	51.00	17.10	5.21	5.40	3.39	1.12	9.70	0.34	0.97	0.28	-0.01	4.16	27.00	187.00	15.00	47.00	20.00	291.00	161.00	364.00
AD03189	78.30	10.70	0.06	0.61	0.79	3.62	2.72	0.05	0.12	0.02	-0.01	2.23	77.00	197.00	19.00	83.00	20.00	10600.00	56.00	45.00

MULLIGAN PROJECT WHOLE ROCK ANALYTICAL DATA - 1987

SAMPLE	SI02 %	AL2O3 %	CAO %	MGO %	NA2O %	K2O %	FE2O3 %	MNO %	TIO2 %	P2O5 %	CR2O3 %	LOI %	RB ppm	SR ppm	Y ppm	ZR ppm	NB ppm	BA ppm	CU ppm	ZN ppm
AD03196	64.50	13.40	0.19	0.99	0.04	4.49	9.42	0.07	0.55	0.16	0.01	6.00	98.00	-10.00	12.00	43.00	13.00	1970.00	71.00	57.00
AD03197	77.10	11.10	0.04	0.84	0.07	3.88	3.63	0.07	0.12	0.02	-0.01	2.93	88.00	25.00	22.00	101.00	19.00	5230.00	55.00	1100.00
AD03198	55.10	18.80	0.44	3.52	3.25	3.39	9.02	0.40	0.86	0.27	-0.01	4.85	77.00	57.00	31.00	53.00	12.00	1030.00	336.00	238.00
AD03199	71.80	13.00	0.42	1.09	1.73	3.34	4.77	0.09	0.28	0.06	-0.01	3.39	79.00	82.00	17.00	110.00	11.00	1600.00	52.00	38.00



- LEGEND**
- PLEISTOCENE
 [GV] Garibaldi: Group volcanics
- JURASSIC to TERTIARY
 [Gr] Coast Range Granitic Rocks
- JURASSIC to CRETACEOUS - UPPER GAMBIER GROUP
 [S] Shales, greywackes
 [R] Felsic pyroclastics
 [A] Intermediate to mafic volcanics
- SYMBOLS**
 ⚡ Ore deposit
 X Mineral showing

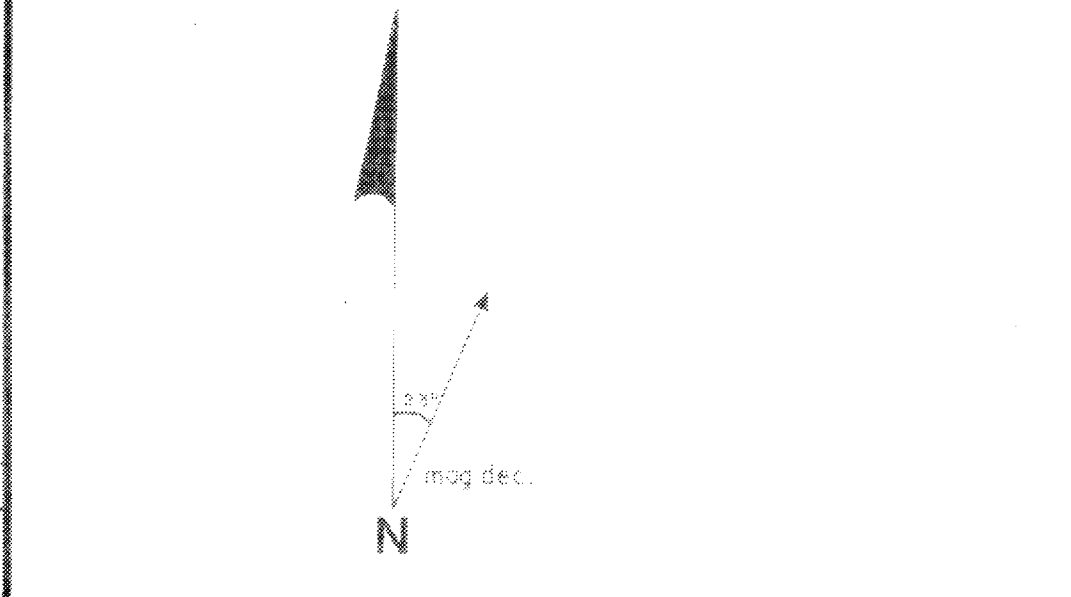
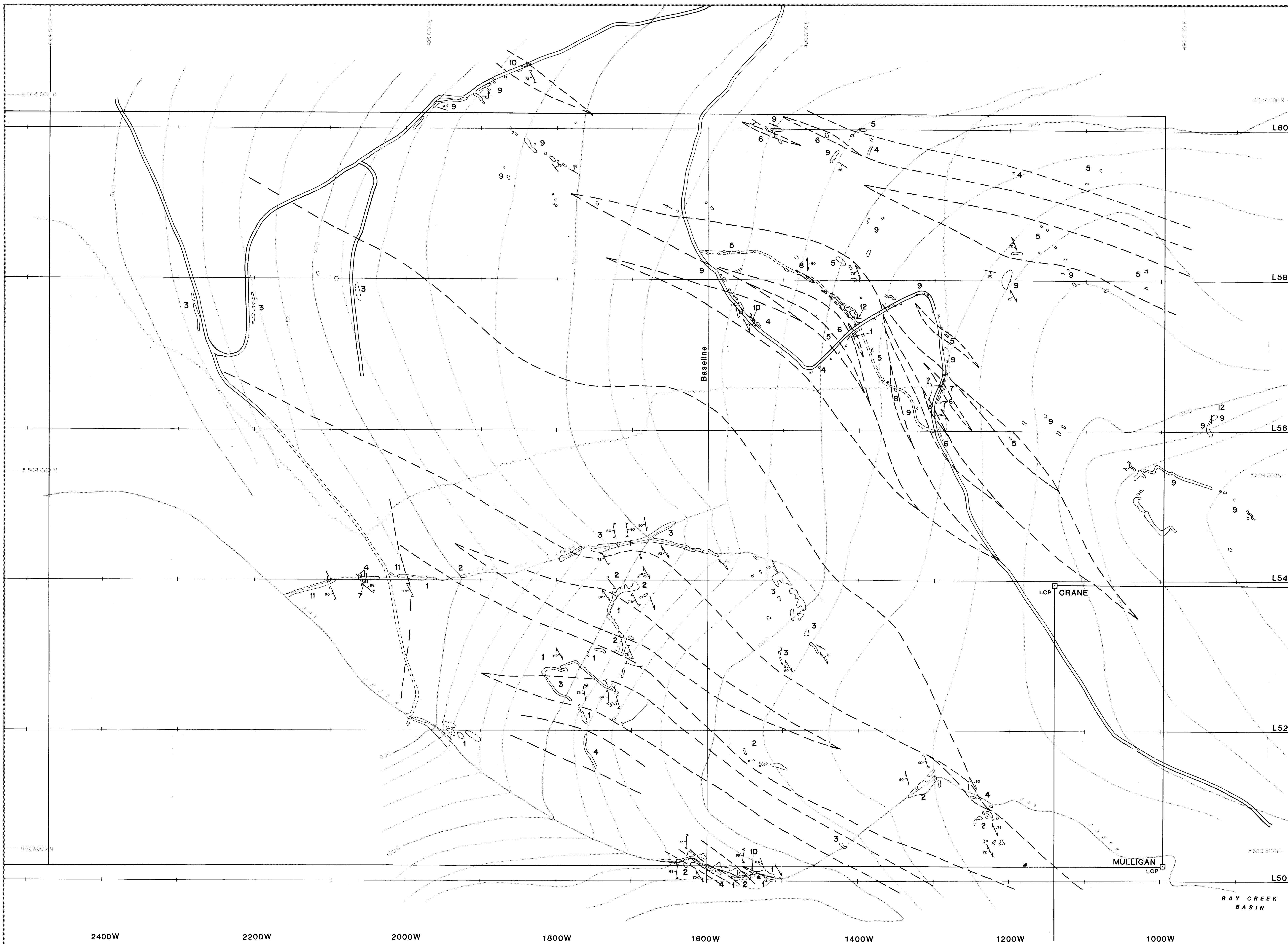
GEOLOGICAL BRANCH ASSESSMENT REPORT

16,495

Figure 3

Kidd Creek Mines Ltd		
BALDWIN - McVICAR MULLIGAN REGIONAL GEOLOGY		
WORK BY	DRAWN BY	DATE
D.P.	E.R.	MARCH, 1982.
Scale 1:50,000		

16495



LEGEND

- 12 Garibaldi dykes
- 11 Coast Range granodiorite
- 10 Argillite
- 9 Rhyolite ash tuff
- 8 Rhyolite volcanoclastic
- 7 Feldspar crystalline rhyolite
- 6 Quartz crystal tuff
- 5 Quartz-feldspar crystal tuff
- 4 Aphyric rhyolite
- 3 Metrolithic fragmental
- 2 Intermediate lapilli-ash tuff
- 1 Andesite ash tuff

- SYMBOLS**
- Road - driveable, not driveable
 - Limit of clearcut
 - Outcrop: defined, assumed
 - Foliation: dip known, unknown
 - Shear: dip known, unknown
 - Bedding: dip known, unknown, overturned
 - Flow banding: dip known, unknown
 - Contact: defined, approximate
 - Trench
 - Adit
 - Shaft

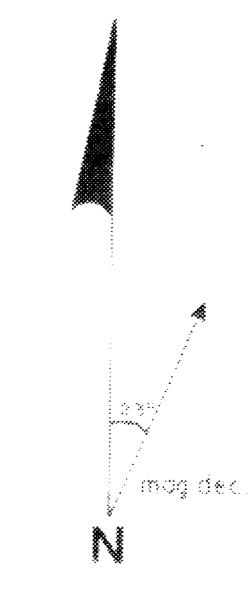
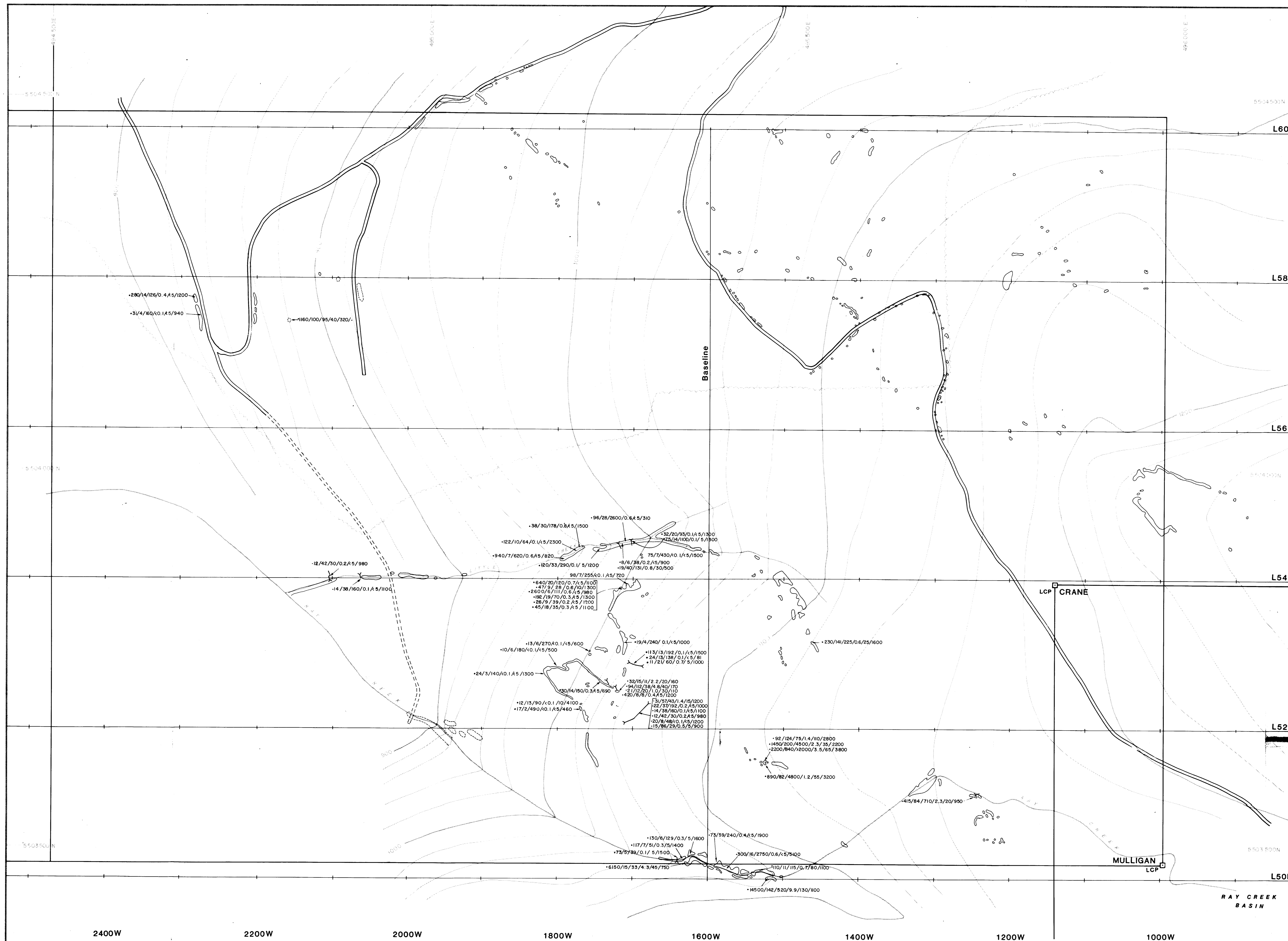
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ASSESSMENT REPORT**

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CONTOUR INTERVAL 20 m

Scale in metres 1 : 2000

FALCONBRIDGE LTD.		
MULLIGAN CLAIMS British Columbia		
GEOLOGY		
WORK BY: SG, GM		
BASED ON:		
DATE OF WORK:	PROJECT NO.	FIG. NO.:
DRAWN BY: ER	128	2
DATE: July 24 1987	N.T.S. NO.: 926/11	



L60N
L58N
L56N
L54N
L52N
L50N

5504500N
5504000N
5503500N

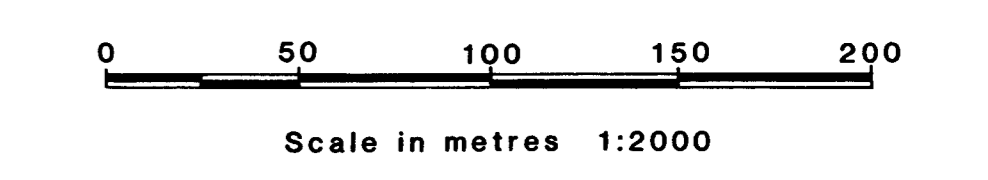
2400W 2200W 2000W 1800W 1600W 1400W 1200W 1000W

LEGEND

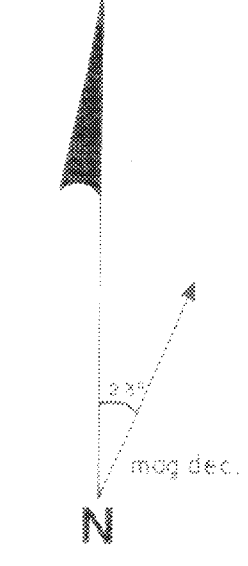
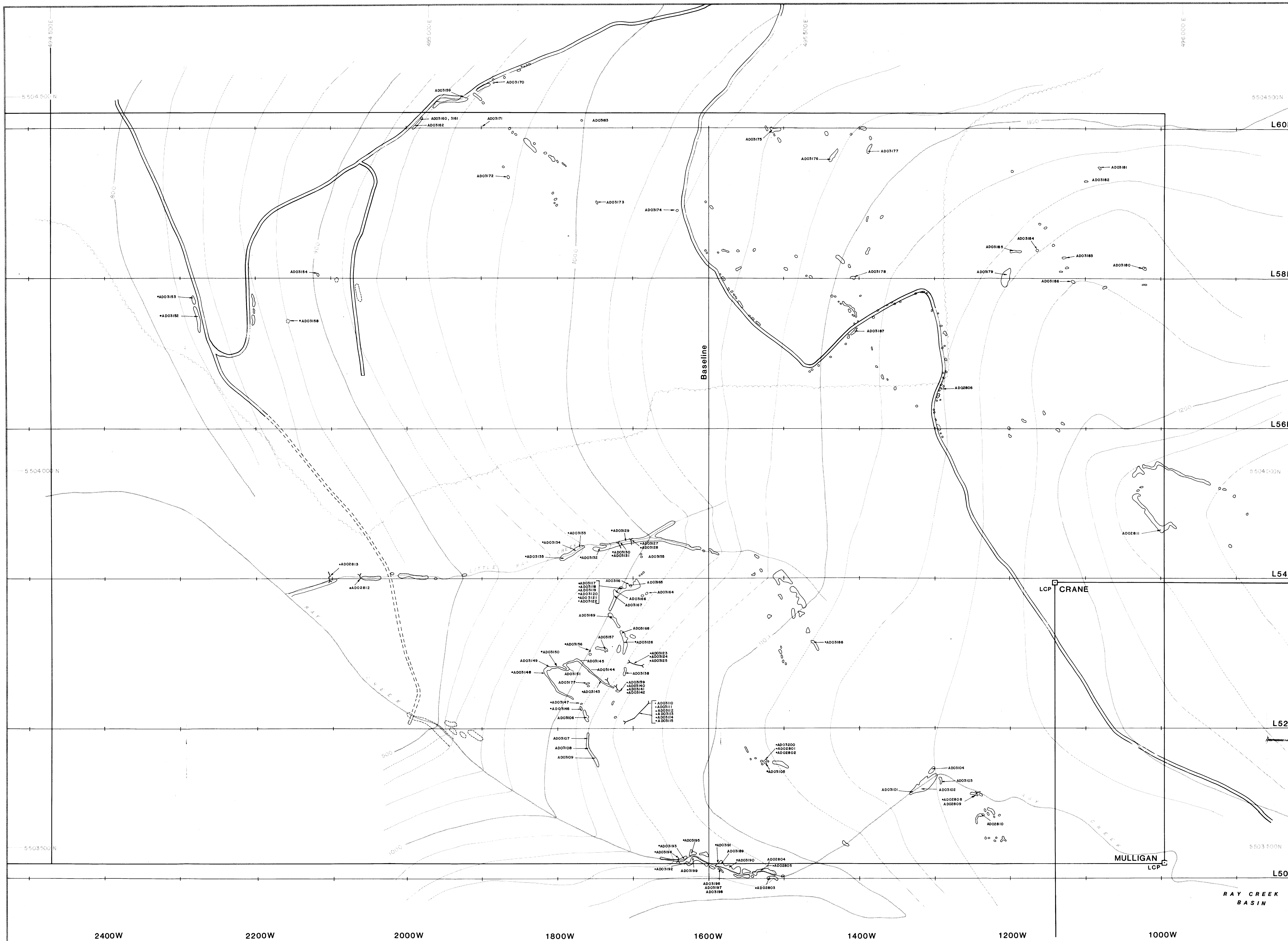
Cu	Zn	Pb	Ag	Au	Ba
ppm	ppm	ppm	ppm	ppb	ppm
130	6	128	0.3	5	1600

**GEOLOGICAL BRANCH
ASSESSMENT REPORT**

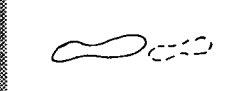
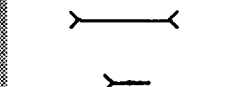
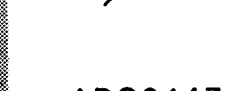
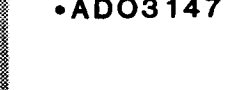

16,495



FALCONBRIDGE LTD.		
MULLIGAN CLAIMS British Columbia		
GEOCHEMISTRY RESULTS Cu, Pb, Zn, Ag, Au, Ba		
WORK BY:		
BASED ON:		
DATE OF WORK:	PROJECT NO.	FIG. NO.:
DRAWN BY: ER	128	
DATE: Aug. 25, 1987	N.T.S. NO.:	92G/11

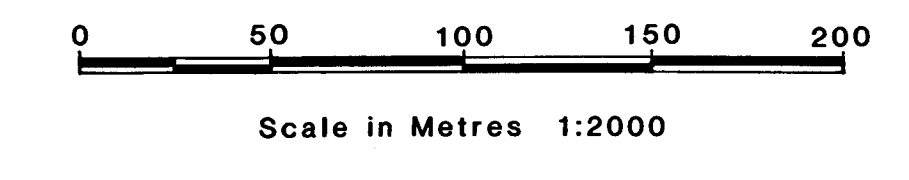


SYMBOLS

-  Outcrop: defined, approximate
-  Trench
-  Adit
-  **AD03147** Geochemical analysis
Cu, Zn, Pb, Ag, Ba, (ppm)
Au, (ppb)
-  **AD03106** Wholerock analysis

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FALCONBRIDGE LTD.		
MULLIGAN CLAIMS British Columbia		
GEOCHEMISTRY SAMPLE LOCATIONS		
WORK BY: GM, SG		
BASED ON:	PROJECT NO.	FIG. NO.:
DATE OF WORK:	128	5
DRAWN BY: ER	N.T.S. NO.:	92G/11
DATE: JULY 28, 1987		