85-235-13708

GEOLOGICAL, GEOCHEMICAL, GEOPHYSICAL REPORT ON

DUSTY MAC-85 GROUP

OSOYOOS MINING DIVISION, B.C.

82E/5E

Lat. 49° 21', Long. 119° 32'

Owned by:

DUSTY MAC MINES LIMITED
ESSO RESOURCES CANADA LIMITED

Operator:

ESSO RESOURCES CANADA LIMITED

By:

Walter Melnyk

Esso Resources Canada Limited
1600 - 409 Granville Street
Vancouver, B.C. V6C 1T2

April 15, 1985

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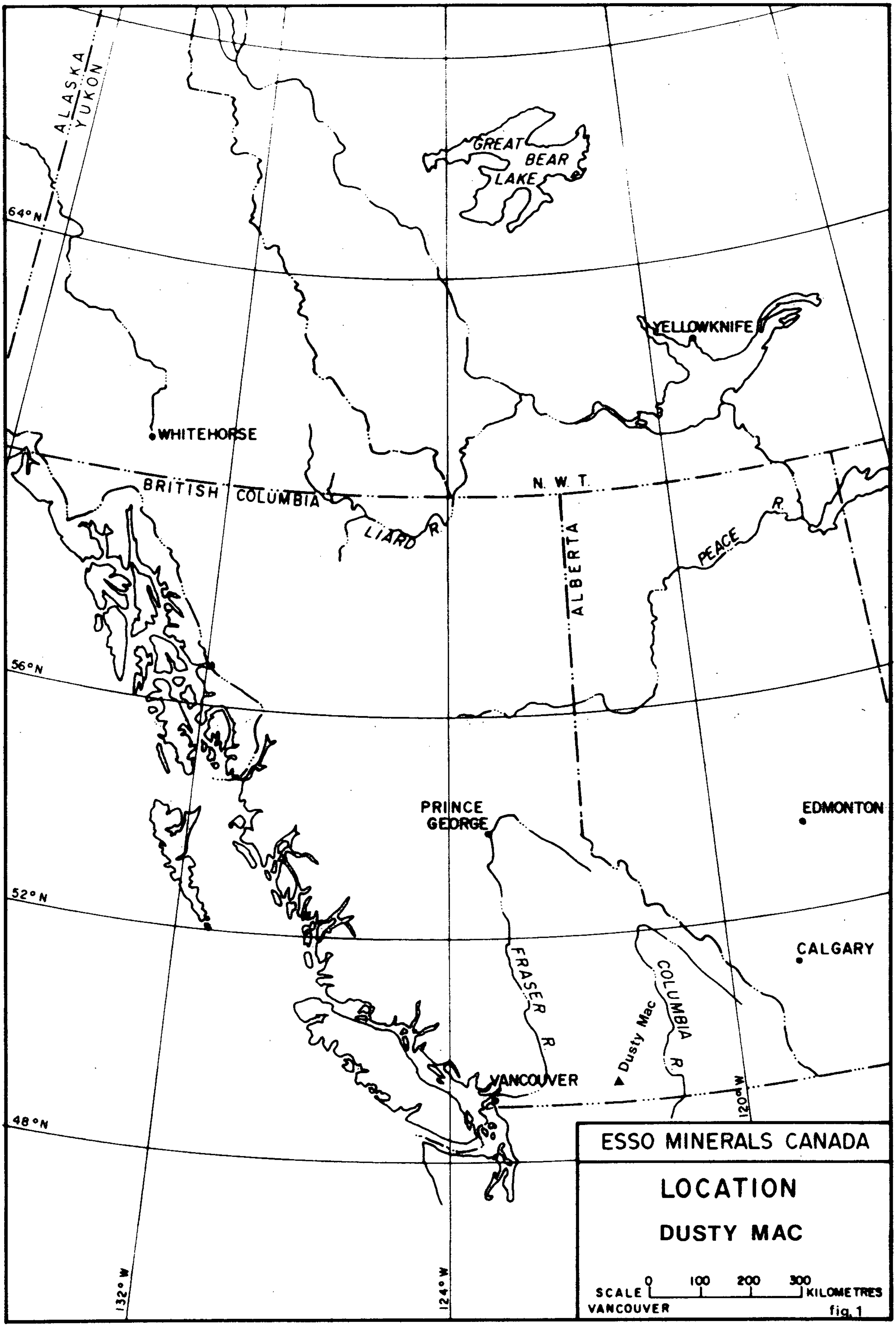

ALASKA
YUKON
GREAT BEAR LAKE
64° N
YELLOWKNIFE
WHITEHORSE
BRITISH COLUMBIA
N. W. T.
LIARD R.
PEACE R.
ALBERTA
56° N
PRINCE GEORGE
EDMONTON
52° N
FRASER R.
COLUMBIA R.
CALGARY
Dusty Mac
VANCOUVER
48° N
120° W
132° W
124° W
ESSO MINERALS CANADA
LOCATION
DUSTY MAC
SCALE 0 100 200 300 KILOMETRES
VANCOUVER
fig. 1

SUMMARY

The Dusty Mac property consists of eleven, two post claims, seven fractions, and a production lease owned by Dusty Mac Mines Ltd. Under an agreement dated June 13, 1984, Esso Minerals Canada optioned the property and has the right to earn 80% interest in the property by performing $1,000,000 of exploration work prior to December 31, 1988.

A three man crew employed by Esso conducted a surface exploration program on the Dusty Mac property during a two month period in 1984. Work consisted of linecutting, geological mapping, geochemical soil sampling, lithogeochemical sampling, assay sampling, and geophysical surveys including VLF-EM and MAG. Except for the linecutting which was contracted to Bema Industries, all work was done by Esso personnel.

The property is located near the eastern margin of the Tertiary White Lake Basin, 1.5 km east of Okanagan Falls in the Okanagan Valley. The property is underlain by an Eocene assemblage of volcanic and sedimentary rocks structured in a homoclinal attitude striking northwesterly and dipping northeasterly. The Dusty Mac orebody is hosted by a lahar unit of the White Lake Formation and consists of a gently dipping quartz breccia lens measuring 200 x 50 x 9m. Total ore milled during a ten month period in 1975-76 was 93,653 tonnes grading 6.89 gm/Tonne Au and 146.59 gm/Tonne Ag.

Soil geochemistry indicates that F, Au, Ag, and Mo are good indicators of Dusty Mac style mineralization. A large area of elevated intermittent geochem values encompasses the pit and western zone. Large areas to the northwest and southeast of the pit are covered by substantial thicknesses of overburden discounting the validity of soil geochemistry as an exploration tool.

Whole rock analysis suggests that the Dusty Mac ore-body is encapsulated in a zone of K_2O enrichment and the rubidium/strontium ratio is substantially increased over the ore-body.

Assay sampling resulted in negligible values from areas of intense quartz-sericite alteration in the adit area. The 'A' zone quartz breccia ran 0.227 oz/T Au, 62.07 oz/T Ag over 1.0m. The northwest breccia assayed nil in precious metals. All remnants of quartz-breccia in the pit were sampled and ran from 0.029 to 0.860 oz/T Au, and 1.08 to 15.74 oz/T Ag. Wall rock samples collected from the pit resulted in a distinct anomalous precious metal halo shrouding the ore-zone.

Geophysical surveys including VLF-EM and MAG were run on the property in an attempt to determine structure. The results proved inconclusive.

RECOMMENDATIONS

A second phase exploration program is proposed for the Dusty Mac property in 1985. The program will consist of 800m of percussion drilling and 200m of diamond drilling. Percussion drilling will test known auriferous zones and areas covered by extensive overburden. The diamond drill hole will test a hypothesis of a down faulted extension of the Dusty Mac ore-body immediately northeast of the pit.

The proposed drill holes are allocated as follows:

1) Southeast extension of Dusty Mac - 3 holes

This drilling will test the strike trend of Dusty Mac mineralization to the southeast in the vicinity of percussion hole 457. This drill hole located 180m southeast of the pit encountered 1.5m of 0.035 oz/T Au at a depth of 25.9-27.4m.

2) Hole 272 Area - 1 hole

This area is located 420m southwest of the pit. A short angle hole, DDH 272, encountered 3.1m of 0.04 oz/T Au at a depth of 6.1-9.2m. This hole tested a moderately sericitized zone. One drill hole is planned to test the down dip extension of this zone to the northeast.

3) Hole 466 Area - 2 holes

This area is located 240 meters southwest of the pit. A vertical percussion hole, 466, intersected 5.2m of 0.356 oz/T Au from 2.4-7.6m. This hole was drilled near an exposure of brecciated quartz veins. Two drill holes are planned to test the northeasterly down dip extension of this mineralization.

4) Hole 462 Area - 1 hole

This area is located near L1+00N and 125m southwest of the pit. Percussion hole 462 encountered 1.5m assaying 0.070 oz/T Au at a depth of 24.4-25.9m, and a 4.6m interval assaying 0.012 oz/T Au from 25.9-30.5m. One hole is planned to test the northeasterly down dip extension of these intercepts.

5) Hole 276 Area - 1 hole

This area is located near L2+00N, 160 meters northwest of the pit. Diamond drill hole 276 intersected two zones 7.6 and 6.1 meters assaying 0.020 oz/T Au at depths of 4.6-12.1m and 21.3-27.4m respectively. One hole is planned to test the northeasterly down dip extension of these intercepts.

6) Northwest extension of Dusty Mac - 7 holes

The broad till covered area to the northwest of the pit will be tested by six percussion holes collared near the base line on lines 3, 4, 6, 7, 8, 10 and 12N. This area lies on strike with Dusty Mac and represents a large untested area.

7) Adit Area - 1 hole

The adit area represents a complex zone of alteration and structure. One drill hole is planned to test the down dip extension of an intense zone of sericite alteration as observed in the vicinity of DDH 275.

8) Dusty Mac Pit Area - 1 hole

Ore vertical diamond drill hole, 200m, is planned to test the down-faulted extension hypothesis of the Dusty Mac orebody. Dusty drill hole data indicates that a substantial thickening of the orebody occurred to the northeast and was suddenly and abruptly terminated in that direction. The termination is interpreted by the writer as fault displacement in a vertical sense.

INTRODUCTION

A report is presented describing an exploration program conducted by Esso Minerals on the Dusty Mac property during the 1984 field season. The program consisted of geological mapping, geochemical sampling, and re-evaluation of existing data furnished by Dusty Mac Mines. This report will discuss program procedures and results, and will interpret available data to provide a basis for continued exploration.

OBJECTIVES

The objectives of the 1984 exploration program were as follows:

1) Define parameters controlling precious metal mineralization at Dusty Mac.

2) Define characteristic features - geological, structural, and geochemical.

3) Determine and develop a conceptual model.

4) Explore the property and relate features or characteristics derived from the study of Dusty Mac to areas exhibiting greatest potential for Dusty Mac style mineralization and thereby develop drill targets.


119°32'
SKAHA LAKE
LE
Kaleden
Orchard
BM 1478
BM 1127
DM 1
DM 2
DM 3
DM 4
DUSTY MAC OPEN PIT
Okanagan Falls
OKANAGAN FALLS PROV PARK
CHRISTIE MEMORIAL PARK
MOUNT McLELLAN
MOUNT HAWTHORNE
Tp 88
Tp 85
Shuttleworth
Creek
OKANAGAN RIVER
49°20'
N
ESSO RESOURCES CANADA LIMITED
LOCATION MAP
DUSTY MAC
Osoyoos Mining Division
82E/5E
Jan. 20, 1985
1:50,000

fig. 2

LOCATION AND ACCESS

The Dusty Mac property is located in the Okanagan Valley approximately 250 km east of Vancouver. The property is situated 19 km south of Penticton at the southern end of Skaha Lake and 1.5 km east of Okanagan Falls. The co-ordinates of the property are longitude 119° 32', and latitude 49° 20'.

The open pit and waste dumps are situated behind a large bluff locally referred to as Peach Cliff.

The village of Okanagan Falls is situated on Provincial Highway 97, approximately 5 km south of Highway 3A - 97 junction.

A paved two lane road, parallels Shuttleworth Creek east of Okanagan Falls, circles Peach Cliff to a point within 500 meters from the open pit.

Penticton is a modern community and principle supply center where all services are available including air, road, and rail.

HISTORY AND PAST PRODUCTION

The exploration history of the Dusty Mac property probably dates back to the turn of the century as witnessed by the four short adits and several open cuts at the western end of the property overlooking Okanagan Falls. The adits were driven on quartz veins which are sparsely mineralized in chalcopyrite and pyrite.

Interest in the area was revived in 1966 when native silver was discovered in quartz veins on the Dusty Mac property. The first recent claims were staked the same year and Dusty Mac Mines Ltd. acquired the property in 1968.

An exploration program was conducted by Cannon Engineering Ltd., and later by Cannon-Hicks Associates Ltd. in late 1968 and 1969 under the direction of Dusty Mac Mines. The work included surface trenching, geological mapping, diamond and percussion drilling, and a limited underground program. The program outlined 61,485 tonnes grading 7.88 gm/Tonne Au, and 170.4 gm/Tonne Ag.

In 1970, the property was optioned to Noranda Exploration Ltd. which carried out a diamond drilling program. The program failed to add significant tonnage to the known reserves.

In 1973 Dusty Mac Mines carried out an extensive percussion drilling program of 1635.5m.

Ore reserves based on 3319m of diamond drilling in 76 holes and 4642m in 221 percussion holes estimated in October, 1974 at 120,280 tonnes grading 7.06 gm/tonne Au and 123.4 gm/tonne Ag, plus 21,521 Tonnes indicated grading 4.59 gm/Tonne Au and 57.59 gm/Tonne Ag.

In April, 1975 an agreement was reached for custom milling ore at the Dankoe mill. Production started August 1, 1975 and ceased in June, 1976. The ore-body was mined by open pit at 318 tonnes per day. Total ore milled was 93,653 tonnes grading 6.89 gm/Tonne Au and 146.59 gm/Tonne Ag. Total production was 581,551 gms Au, 10,180.367 gms Ag, 2,880 kg copper, and 1,527 kg Pb.

Milling was completed June 9, 1976 and reclamation of the mine area was finished on September 21, 1976.

Further property exploration was carried out in 1976 by Amadeus Consultants Ltd. The program consisted of geochemical soil sampling and percussion drilling over favourable structures. A total of 153 percussion holes were drilled for an aggregate of 5981m. No significant zones of mineralization were discovered.

Canex Placer Ltd. conducted 1.5 line miles of I.P. in June, 1976 under a data sharing arrangement with Dusty Mac. The results were not encouraging.

Scintrex Pty Ltd. conducted a Rapid Reconnaissance Magnetic Induced Polarization survey (RRMIP) in October, 1981. Results were inconclusive.

The Dusty Mac property remained idle until 1984 when Esso Minerals conducted a surface sampling and mapping program in the vicinity of the open pit and to the northwest encompassing previously known mineralized areas.

CLAIM STATUS

Prior to Esso's involvement with Dusty Mac Mines, the Dusty Mac property consisted of 11 full size two-post claims, seven fractions, and a production lease as follows:

CLAIM NAME	RECORD #	EXPIRY DATE
Au 2 Fr.	24347	86/12/17
Au 5 Fr.	24349	86/12/17
Au 6 Fr.	24350	86/12/17
Au 7 Fr.	24351	86/12/17
Au 9 Fr.	24353	86/12/17
Au 10 Fr.	24354	86/12/17
Au 11 Fr.	24355	86/12/17
At Last	19501	86/04/13
JG 1	21688	86/01/25
JG 2	21689	86/01/25
JG 3	21690	86/01/25
JG 4	21691	86/01/25
JG 8	21695	86/01/25
JG 10	21697	86/01/25
JG 11	21698	86/01/25
JG 12	21699	86/01/25
JG 13	22403	86/06/28
JG 14	22425	86/07/03
Prod. Lease	Lot 4079-S	85/04/09

The Production Lease P-3 (Lot 4079-S) consists of the following claims:

Au 1 Fr	24346
Au 3 Fr	24348
J Gus 1	22468
J Gus 3	22532
JG 5	21692
JG 7	21694
JG 9	21696
JOE 1	22689
HUNT 7 Fr	24289
HUNT 22 Fr	24305
CLAIRE 1 Fr	30580

A Bill of Sale dated June 23rd, 1984 transfers ownership of the above listed claims from Dusty Mac Mines to Esso Minerals Canada. Similarly a Bill of Sale dated June 27, 1984 transfers ownership of Production Lease P-3 (Lot 4079-S) from Dusty to Esso. The Production Lease expires April 9, 1985.

On April 4, 1984 Esso staked 4 claims, DM 1-4, blanketing the above Dusty Mac Mines claims and Production Lease. The DM 1-4 claims comprise 70 contiguous units.

CLAIM NAME	UNITS	RECORD #	EXPIRY DATE
DM-1	18	2013	85/05/04
DM-2	20	2014	85/05/04
DM-3	20	2015	85/05/04
DM-4	12	2016	85/05/04

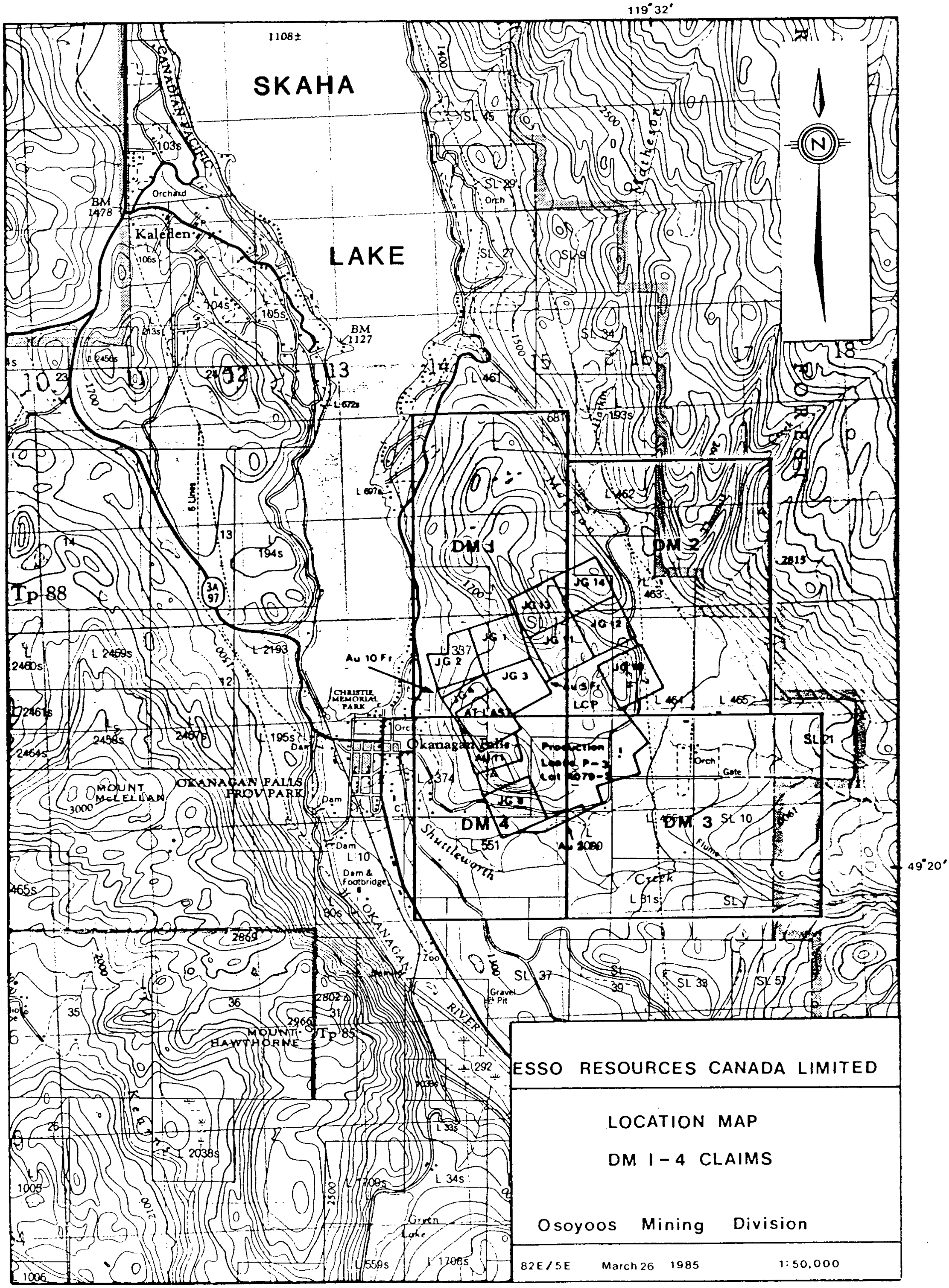

119°32'
49°20'
SKAHA
LAKE
Kaleden
Orchard
CANADIAN PACIFIC
Tp 88
Tp 85
Okanagan Falls
OKANAGAN FALLS PROV PARK
CHRISTIE MEMORIAL PARK
MOUNT McLELLAN
MOUNT HAWTHORNE
OKANAGAN RIVER
Shuttleworth Creek
Matheson
Au 10 Fr
Au 5 Fr
Au 2080
DM 1
DM 2
DM 3
DM 4
JG 1
JG 2
JG 3
JG 8
JG 10
JG 11
JG 12
JG 13
JG 14
ATLAS
LCP
Production Lease P-3 Lot 4079-S
Green Lake
Gravel Pit
Dam & Footbridge
ESSO RESOURCES CANADA LIMITED
LOCATION MAP
DM I-4 CLAIMS
Osoyoos Mining Division
82E/5E
March 26 1985
1:50,000

fig. 3

WORK DONE

The 1984 exploration program conducted by Esso on the Dusty Mac property commenced June 5 and was completed August 9. A four-man crew conducted all the field work.

Work consisted of a geochemical survey, geological survey, geophysical survey and linecutting. The geochemical survey consisted of 485 soil samples, 252 rock chip samples and 82 assay samples. The geophysical surveys consisted of VLF-EM and Magnetometer covering the entire grid of 22 km^2. Geological mapping at a scale of 1:2,000 was done over the entire grid of 22 km^2. The Dusty Mac open pit was also geologically mapped at a scale of 1:250. Linecutting consisted of 25 cut line kilometers.

Linecutting was contracted to Bema Industries, Langley, B.C.

COST STATEMENT

Field Personnel:	Geologist	62 days @ $230	$ 14,260
	Technician	28 days @ $215	6,020
	Student	62 days @ $95	5,890
	Student	9 days @ $95	855
		Sub Total:	$ 27,025
Food:	2 men @ $25/day for 62 days		$ 1,500
	1 man @ $25/day for 28 days		700
	1 man @ $25/day for 9 days		225
		Sub Total:	$ 2,475
Accomodation:	2 men @ $15/day for 62 days		$ 930
	1 man @ $20/day for 28 days		560
	1 man @ $20/day for 9 days		180
		Sub Total:	$ 1,670
Vehicle Rental:	4 wheel drive @ $1,100/month		$ 2,226.02
Transportation:	Gasoline and airfare		$ 2,000
Equipment & Supplies:			$ 1,000
Laboratory Analysis:			
	485 Soil Samples analysed for Cu, Pb, Mo, Zn, Ag, As, F, Au @ $21.90		$ 10,621.50
	25 Soil Samples analysed for Te, Tl, Se, Ba Sr @ $22.50		$ 562.50
	252 Rock chip analysed for whole rock, Au, Ag, Rb, Sr @ $44		$ 11,088.00
	82 Assays Au, Ag @ $19.75		$ 1,619.50
		Sub Total:	$ 23,891.50
Contract Jobs:	Linecutting 25 km @ $180/km		$ 4,500

Report Preparation:		
	Geologist 20 days @ $230	$ 4,600
	Draftsman 10 days @ $215	2,150
	Reproduction	500
	Sub Total:	$ 7,250
Supervision:	District Geologist 9 days @ $310	$ 2,790

TOTAL EXPLORATION EXPENDITURE: $ 74,827.52

REGIONAL GEOLOGY

Introduction

The interior of British Columbia is characterized by many fault bounded Tertiary basins which form a belt 160 kms wide and 800 kms long from the Republic mining district to Babine Lake in central British Columbia. The basins are typically infilled with felsic-mafic volcanic and sedimentary rocks of Eocene age.

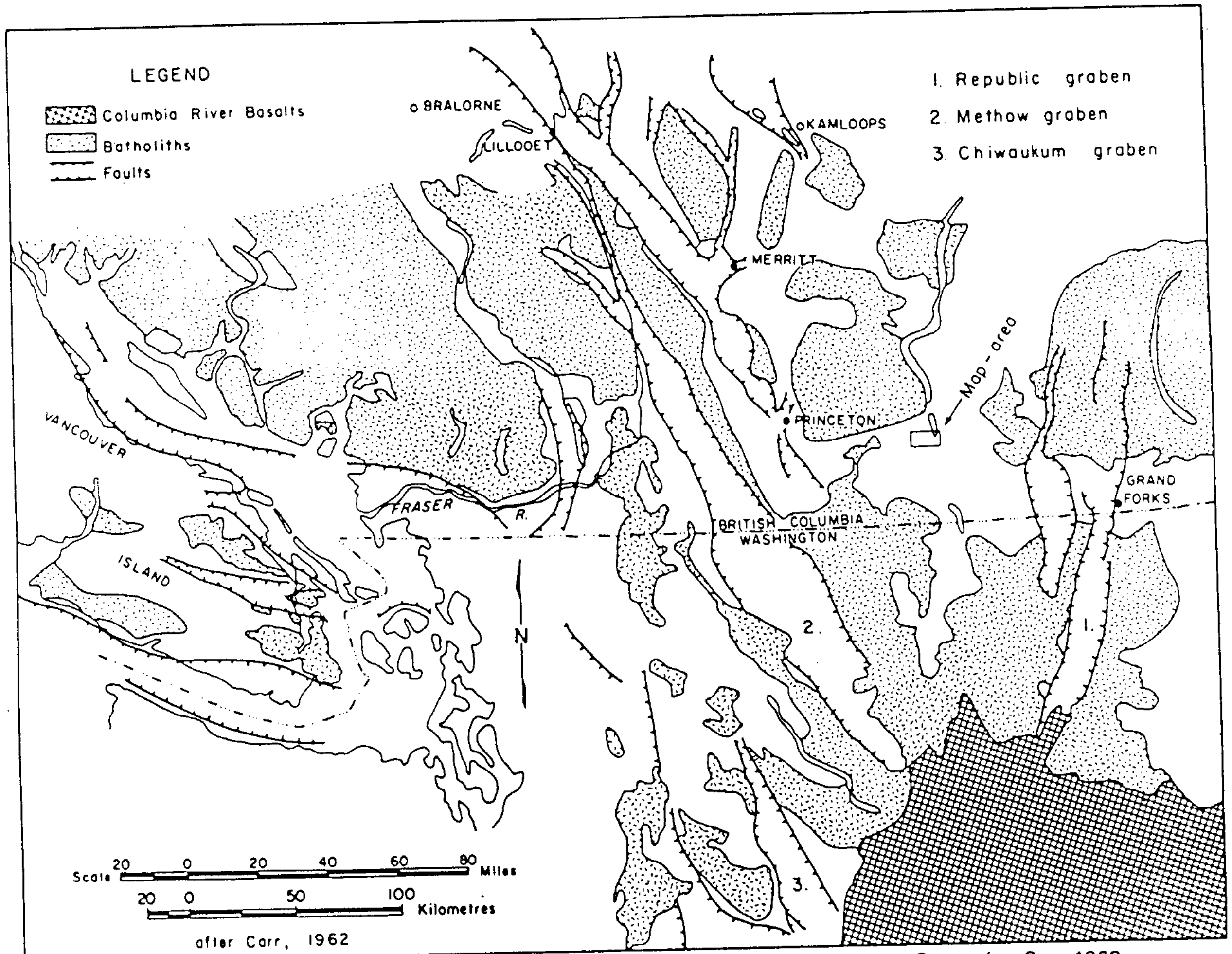
The name Penticton Group has been proposed for Eocene volcanic and sedimentary rocks of the Okanagan-Boundary region. The Group consists of six well-defined formations having an aggregate thickness of about 2500 meters in the type area near Penticton. At the base are polymictic conglomerates and breccias referred to as the Springbrook Formation and coeval beds of the Kettle River Formation consisting of granite boulder conglomerate, rhyolite, breccia, and tuffaceous sedimentary rocks. Above this is the Marron Formation composed mainly of thick andesite, trachyte, and phonolitic lava flows, succeeding upward by dacitic and andesitic domes of the Marama Formation. This is followed by volcanic breccias and lacustrine and fluvial sedimentary rocks of the White Lake Formation and, uppermost, the Skaha Formation consisting of a landslide complex and fanglomerate beds. The Group rests unconformably on pre-Tertiary granitoids, metamorphosed Mesozoic sedimentary and volcanic rocks, and older schists and gneisses.

Lithologies and Distribution

Springbrook Formation:

The Springbrook Formation is composed of soils, alluvium, talus, stream and lake deposits and tuffaceous materials that accumulated in valleys before and during the early extrusions of the Marron volcanic rocks. The thickness of Springbrook varies from 60 to 200m over short distances. Where the Springbrook formation is thick, the basal beds are or conglomerate containing large angular boulders. These beds grade upward into conglomerates composed of smaller, more rounded and better sorted materials. Uppermost strata include beds of polished pebbles, tuffaceous sandstones and silts.

In the western part of the White Lake basin, Springbrook beds dipping 10 to 15 degrees east are overlain with some angular unconformity by Marron volcanic rocks dipping up to 5 degrees east. This slight unconformity represents only a short time interval because the contact between the two formations is generally smooth.



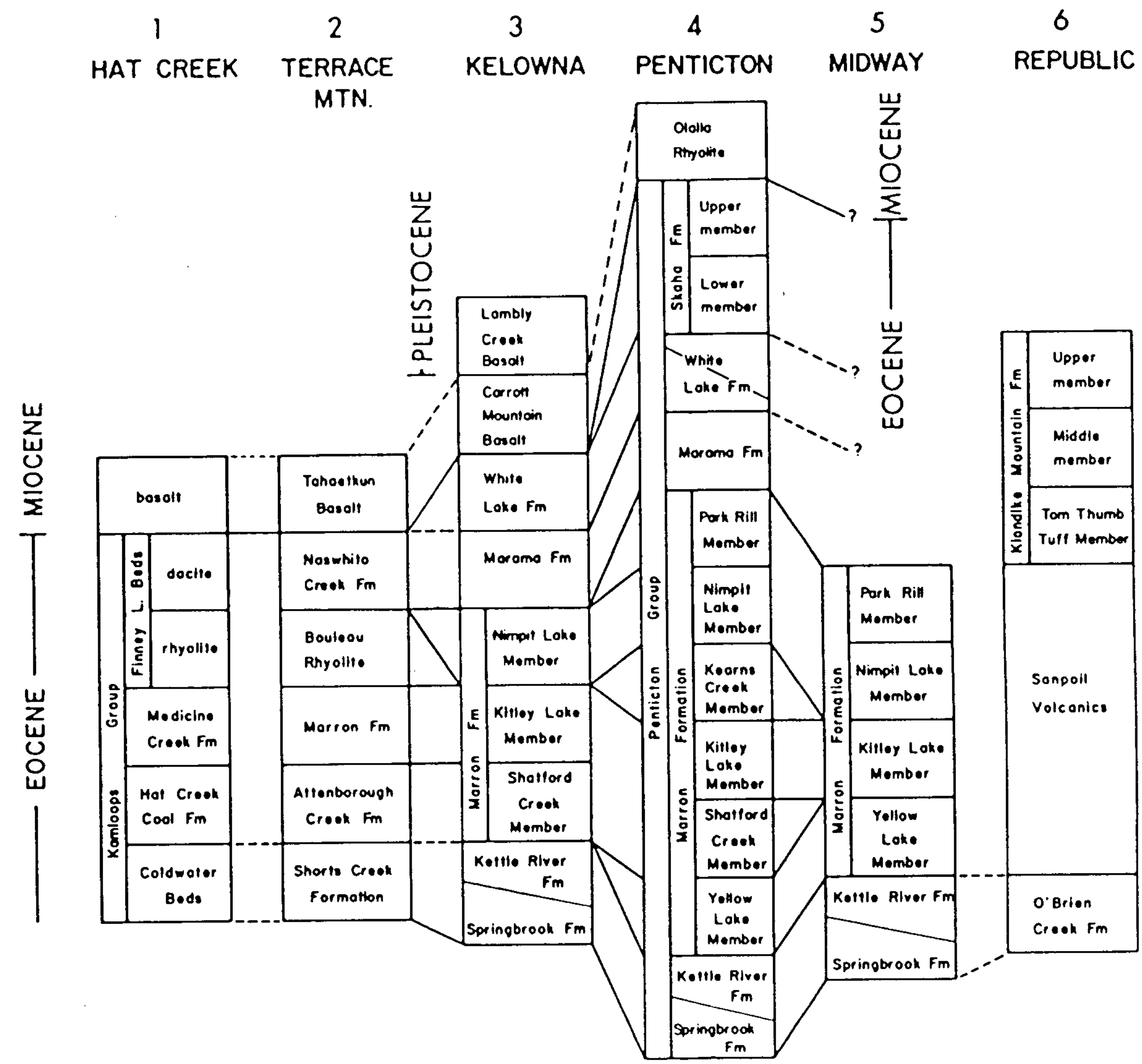
Grabens of southwestern British Columbia and northern Washington State, after Carr, 1962

fig. 4

TERTIARY FORMATIONS

	Thickness Range in Feet
SKAHA FORMATION	
UPPER MEMBER .... Essentially a fanglomerate with large boulders and blocks of Tertiary and pre-Tertiary rock.	0 to 600
LOWER MEMBER .... Mainly slide breccia with some intercalated conglomerate and tephrite (augite porphyry).	0 to 300
WHITE LAKE FORMATION	
UPPER MEMBER .... Mainly light-coloured pyroclastic rocks, volcanic breccia (Indian Head breccia) with some sedimentary rocks and tephrite (augite porphyry).	0 to 300
MIDDLE AND LOWER MEMBERS .... Interdigitated sedimentary and volcanic rocks; White Lake sedimentary rocks consist of volcanic sandstone and conglomerate with some coal; White Lake volcanic rocks consist of feldspar porphyry lavas, lahars, and pyroclastic rocks.	0 to 3,500
MARAMA FORMATION	
NOT SUBDIVIDED .... Predominantly rhyolite and rhyodacite lava with some pyroclastic rocks and local basal conglomerate.	0 to 1,000
MARRON FORMATION	
PARK RILL MEMBER .... Mainly merocrystalline and glassy andesite lava.	200 to 1,500
NIMPIT LAKE MEMBER .... Mainly trachyte and trachyandesite lava.	400 to 1,000
KEARNS CREEK MEMBER .... Mainly pyroxene-rich vesicular basaltic andesite lava.	0 to 400
KITLEY LAKE MEMBER .... Mainly trachyte and trachyandesite lava.	1,000
YELLOW LAKE MEMBER .... Mainly anorthoclase lava, augite porphyry lavas (phonolites), and pyroclastic rocks.	500 to 1,800
SPRINGBROOK FORMATION	
NOT SUBDIVIDED .... Mainly boulder conglomerate overlying valley talus with fragments of underlying pre-Tertiary rocks.	0 to 700

fig. 5



Correlation chart of major Tertiary units.

fig. 6

Marron Formation:

Mapping by B. N. Church, has provided the basis for a five-fold subdivision of this formation. The Marron Formation represents an accumulated thickness over 1200m of agglomerate, and feldspathic flows intercalated with thin interbeds of conglomerate, sandstone, and soil. The Marron Formation rests with slight angular unconformity on Springbrook conglomeratic beds.

Yellow Lake Member - The name Yellow Lake Member is applied to alkali-rich volcanic rocks that form the lowermost unit of the Marron Formation. The appearance of these rocks varies greatly within the map-area but most varieties can be broadly classified as anorthoclase-augite porphyry with the composition of a mafic phonolite. Many rocks contain rhomb-shaped phenocrysts of anorthoclase.

Kitley Lake Member - The Kitley Lake Member consists of felspar porphyry lavas with minor pyroclastic rocks composed mainly of trachyite and trachyandesitic clasts. The Kitley Lake Member conformably overlies the Yellow Lake Member.

Kitley Lake rocks form conspicuous, thick trachyte flows in the lower part of the Marron Formation. Lavas are commonly non-vesicular and cream coloured where fresh, but where badly weathered, surfaces are mottled with brownish red hues or dark grey with bleached white feldspar phenocrysts.

Kearns Creek Member - The Kearns Creek Member, a distinct basalt andesite unit occurs with apparent conformity, near the middle part of the Marron succession overlying the Kitley Lake Member.

The unit consists of dark brown, vesicular, basaltic andesite lava and flow breccia. Typically these rocks have abundant pyroxene phenocrysts and a few scattered laths of plagioclase. Areas underlain by this unit are generally low lying and covered with a brown, granular regolith, the rocks being readily weathered and eroded.

Most vesicles in the lava are filled with chlorite, chalcedony, and some calcite.

Nimpit Lake Member - The Nimpit Lake rocks are chemically similar to the Kitley Lake trachyte and trachyandesite lavas but differ in texture and stratigraphic position. The Nimpit Lake Member forms the upper part of the Marron Formation overlying the Kearns Creek basaltic andesites with apparent conformity.

The unit is variable in thickness, ranging from 60 to 300m.

The flows are trachytes that are commonly yellowish or cream coloured where fresh, non-vesicular, and contain scattered small phenocrysts of pyroxene and radiating plagioclase glomerophenocrysts set in a fine crystalline matrix.

Park Rill Member - The Park Rill Member is the uppermost unit of the Marron Formation and rests conformably in the Nimpit Lake trachytes. The unit varies markedly in thickness, ranging from 60 to 450 meters.

The Park Rill volcanic rocks are mostly dark brown, non-vesicular andesite lavas. The unit is generally massive. The rock is typically merocrystalline, containing about equal parts glass and crystals measuring about 1 millimeter in diameter.

Marama Formation:

The Marama Formation is a unit characteristically composed of rhyolitic and rhyodacitic rocks that unconformably overlies the Marron Formation and underlies the White Lake Formation. The maximum observed thickness of the Marama Formation is about 1000 feet.

The lowermost beds of the Marama Formation consist of conglomerate, minor sandstone, and shale with seams of pyroclastic rocks intercalated throughout.

Thick rhyodacite-dacite lavas constitute the upper part and bulk of the Marama Formation. Generally, the rocks are varicoloured in shades of grey, light brown, and cream. Some weathered, light brown phases of rhyodacite resemble vitric Park Rill andesite.

Rhyodacite is commonly brittle, non-vesicular, and tends to cleave into thin plates perpendicular to the bedding surface.

Marama rocks rest with angular unconformity on the Marron formation.

White Lake Formation:

The White Lake Formation consists of a thick succession of lake and stream sediment and volcanic rocks that overlap units of the older Tertiary volcanic pile and, in turn, are overlain unconformably by younger sedimentary rocks and breccias.

Most of the sedimentary rocks lie west and north of White Lake, whereas the volcanic rocks are centred east and northeast of White Lake and near Okanagan Falls. The thickest section of White Lake strata, about 1000 meters thick is located near the Observatory site.

White Lake beds exposed near White Lake are divisible into three members. The lower and middle members contain interdigitated sedimentary and volcanic deposits; the upper member consists mainly of volcanic rocks with some intercalated sedimentary rocks.

Lithology of the White Lake sedimentary rocks is diverse. They are intercalated with many lenses and layers of pyroclastic rock. The tuffaceous layers are generally non-fissile and light coloured. Thinly bedded shales and mudstones are commonly folded and compressed below thick pyroclastic deposits probably owing to sudden deposition and loading.

Medium and coarse clastic sedimentary rocks are prominently exposed on ridge crests and bluffs. They are commonly massive but locally thinly bedded or flaggy. Cross-beds, most commonly of festoon type, are well developed in some sandstones. Mudstones comprise much of the sedimentary facies of White Lake Formation but, due to their recessive nature, are commonly poorly exposed. The rocks are thinly bedded and range in colour from light to dark grey - commonly dark colour indicates a high content of carbonaceous matter. Some mudstones are turbid and show little evidence of planer fabric; conversely, well-laminated zones and graded beds are not uncommon.

In the north limb of the White Lake syncline, volcanic rocks have a total thickness of about 900 meters. The lowest member, about 460 meters thick, consists of thin feldspar porphyry lava flows and abundant lahar and pyroclastic deposits containing some accidental fragments of Marama rhyodacite. The middle member, about 365 meters thick, consists of a few feldspar porphyry lava flows and much lahar and agglomerate. The upper member, about 90 meters thick, consists mainly of brown augite porphyry lava and breccia containing small quartz xenoliths and a few blocks of granite.

Except near Skaha Lake, where underlying Marama rocks are as much as several hundred meters thick in places, White Lake beds appear to have been deposited on a deeply eroded surface. In places north of the Dusty Mac property, the sedimentary rocks rest directly on Park Rill andesite.

Skaha Formation:

The Skaha Formation consists of two members, a lower one composed mainly of slide breccia and some volcanic rock, and an upper one composed of coarse boulder block conglomerate (fanglomerate).

The lower member consists of three facies: basal breccia, augite porphyry, and granite breccia. The breccias appear to be the product of several slides originating in terrain underlain by pre-Tertiary rock composed mainly of fragments of the shoemaker, Old Tom, and Vaseaux Formations.

The augite prophyry is massive, dense, dark brown, and contains characteristic large enhedral augite crystals embedded in a fine-grained matrix. Structures such as columnar jointing, flow breccia, and amygdules are only locally well developed.

The granite breccia facies consists of slide debris, mainly slabs and blocks of granite and some aplite, and a few beds of granite boulder conglomerate and arkose. These rocks rest discordently on basal Skaha slide debris.

The upper member of the Skaha Formation is the youngest Tertiary unit in the White Lake basin and consists of coarse sedimentary rock of mixed provenance. It rests on an erosion surface of moderate to low relief Skaha basal breccia, augite porphyry, and upper beds of White Lake Formation.

GENERAL STRUCTURE

Studies of the Tertiary basins (Church, 1973, 1975) have indicated that they have been influenced during the course of their development by major normal faults - some of which show vertical displacement of several hundreds of meters.

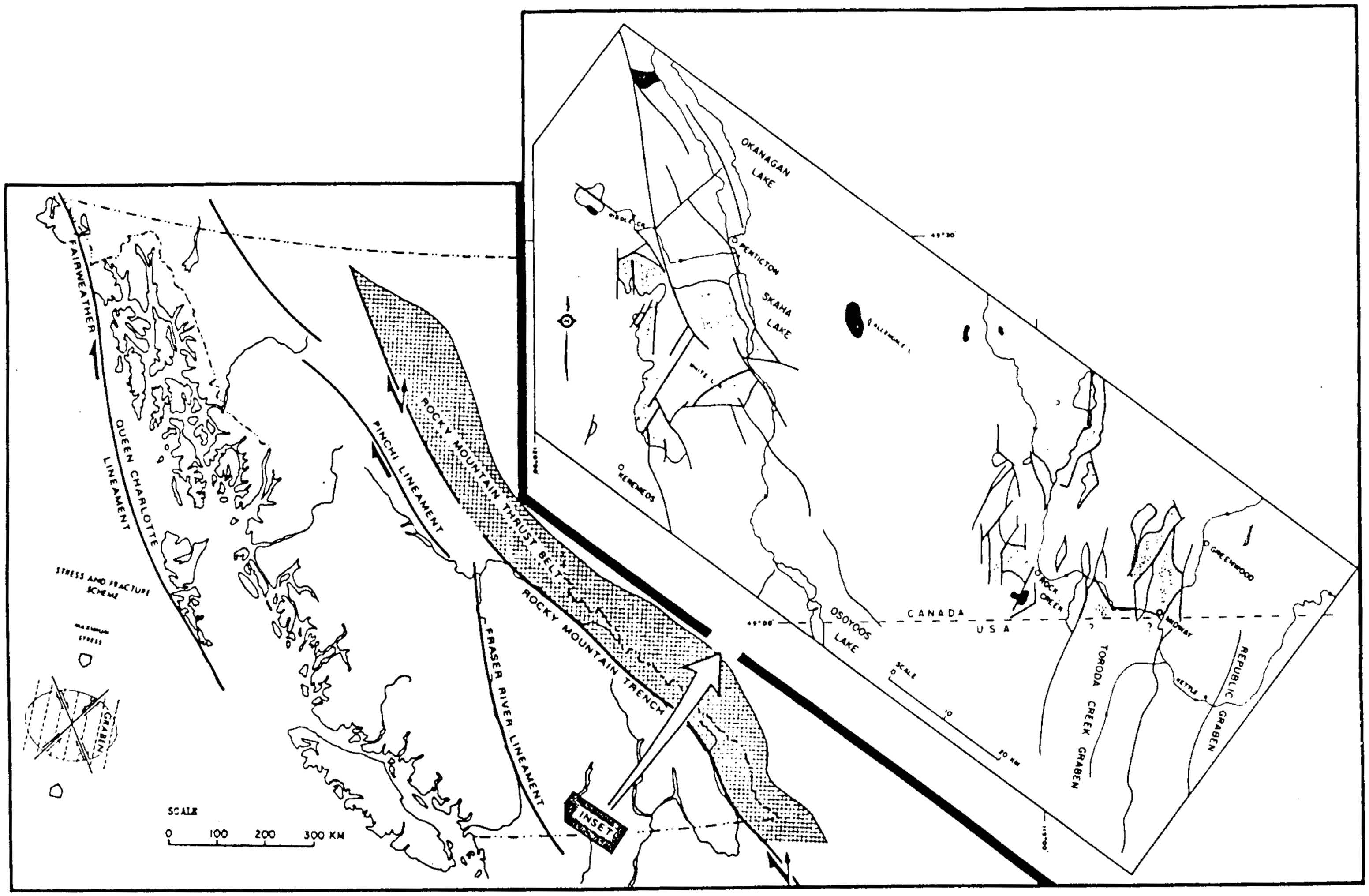
In general, structural control of the Tertiary outlies seem to relate to a herring-bone pattern of conjugate shears of NE and NW orientation. These appear to be important elements in a north/south stress scheme responsible for many northerly trending graben structures extending across the interior of the Province.

Tertiary Rocks in the vicinity of the White Lake map area are intersected by gravity faults. The region is divided into three structural zones by the Marron fault system which follows Marron Valley southeasterly to Marron Lake; here it splits into a weak easterly trending branch which passes into the Okanagan Valley, and a strong southwesterly trending branch which passes near Twin Lakes and extends into the Similkameen Valley.

Structural zone A, the area west of the Marron fault and the Twin Lakes branch, is relatively simple. Typically, the strata here are thin, dip gently east, and are displaced mainly by northerly trending gravity faults with easterly down throw.

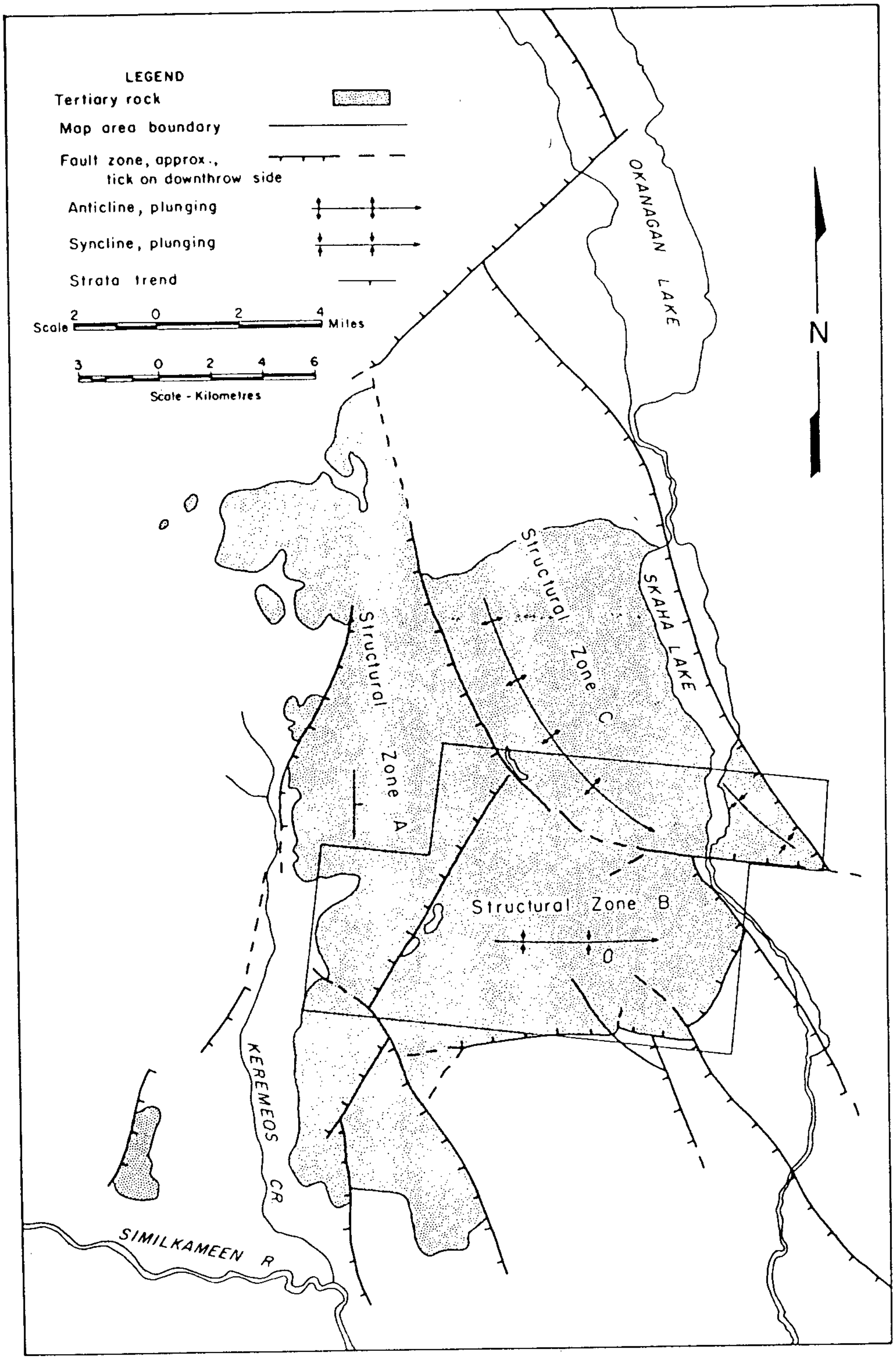
Structural zone B, the area between the Twin Lakes branch and the easterly trending branch of the Marron fault system, is somewhat complex. The strata are folded to form the White Lake syncline which is open and plunges gently to the east. The beds are cut by gravity faults of widely varying trends which show mainly westerly or northerly down throw. Reverse faults are developed where strata are especially thick such as on the north limb of White Lake syncline. Some northerly trending faults in the southeast part of zone B show strike-slip displacement.

Rocks only in the southern part of zone C were examined by Church. The Tertiary pile is thin on the west along the axis of an anticline and thick near the south end of Skaha Lake, site of the Okanagan Falls syncline. Both folds are open and plunge southeastward. A northerly trending reverse fault, immediately west of the south end of Skaha Lake, is possibly due to concentric folding of thick strata.



Proposed Early Tertiary stress and fracture scheme for British Columbia and (inset) distribution of downfaulted alkaline Marron volcanic rocks (stippled) and Coryell source intrusions (grid). After Church, 1978

fig. 7



Structural Subdivisions of White Lake Basin.

After Church 1973

fig. 8

Church concludes that the main structural features are:

1. the area underlain by Tertiary rocks is mostly bounded by gravity faults.

2. the Tertiary pile is thickest and structurally lowest near the Okanagan Valley.

3. beds commonly dip in an easterly direction, westerly dipping beds are few.

Folds are only locally important and are best developed where Tertiary deposits appear to be thickest. Concentrically folded beds of the White Lake and Okanagan Falls synclines probably reflect simpler underlying structures, possibly tilted fault blocks.

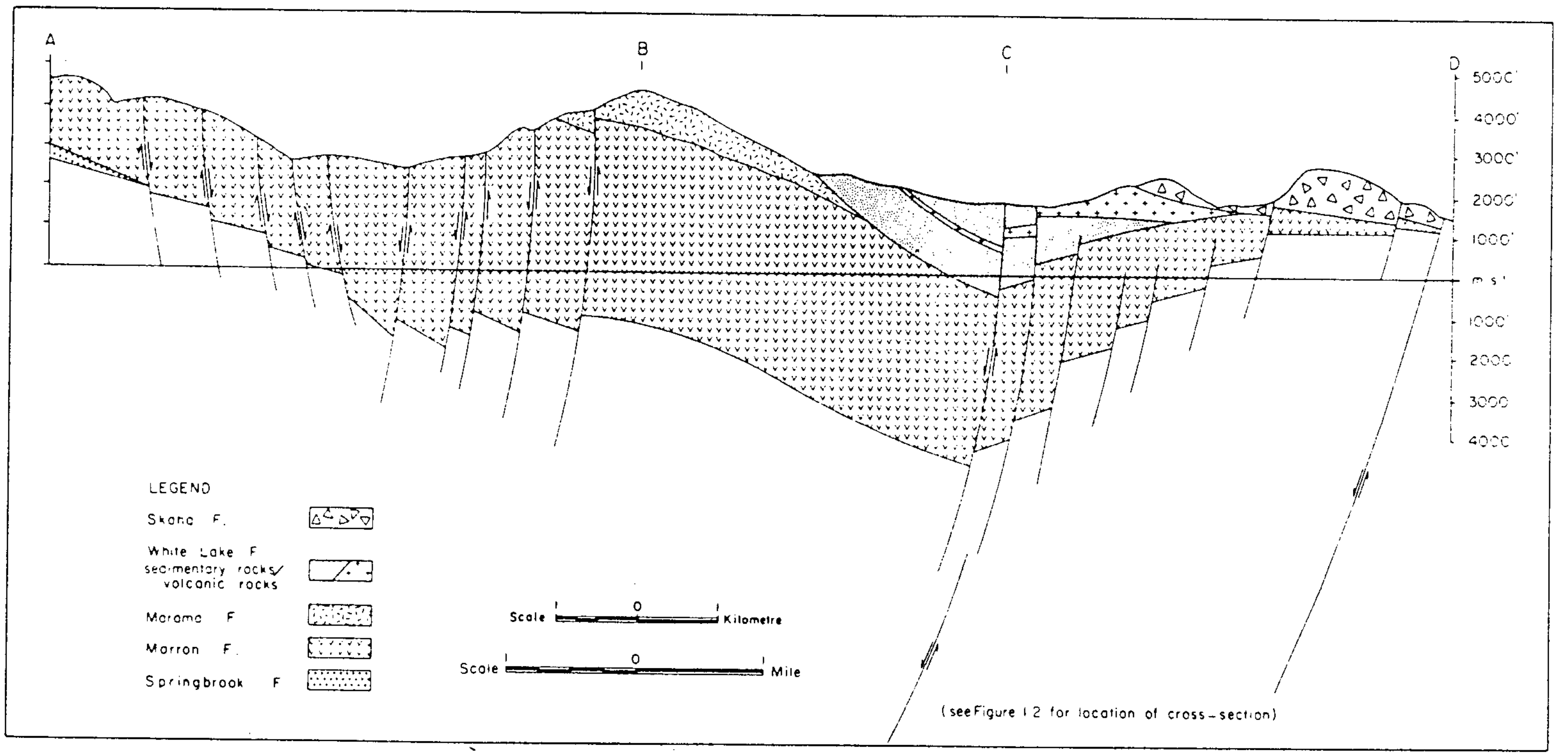


fig. 9 Cross-section of the White Lake basin (looking northeasterly).

PROPERTY GEOLOGY

Lithologies and Distribution

The Dusty Mac property occurs within a fault bounded block of Eocene terrain near the eastern margin of the White Lake Basin. This wedge of Tertiary terrain is bounded by a northwesterly trending fault along McLean creek and a westerly trending fault in the Shuttleworth creek valley. Skaha Lake lies to the west.

Mapping by N. B. Church, 1970, in the vicinity of Dusty Mac provided a geological insight into the setting of the deposit. Church mapped rocks of the White Lake Formation overlying unconformably rocks of the Marama Formation. He concluded that these formations occur on the south limb of a southeasterly trending syncline. Figure 1 illustrates Churchs' concept of the geological and structural setting of the Dusty Mac property.

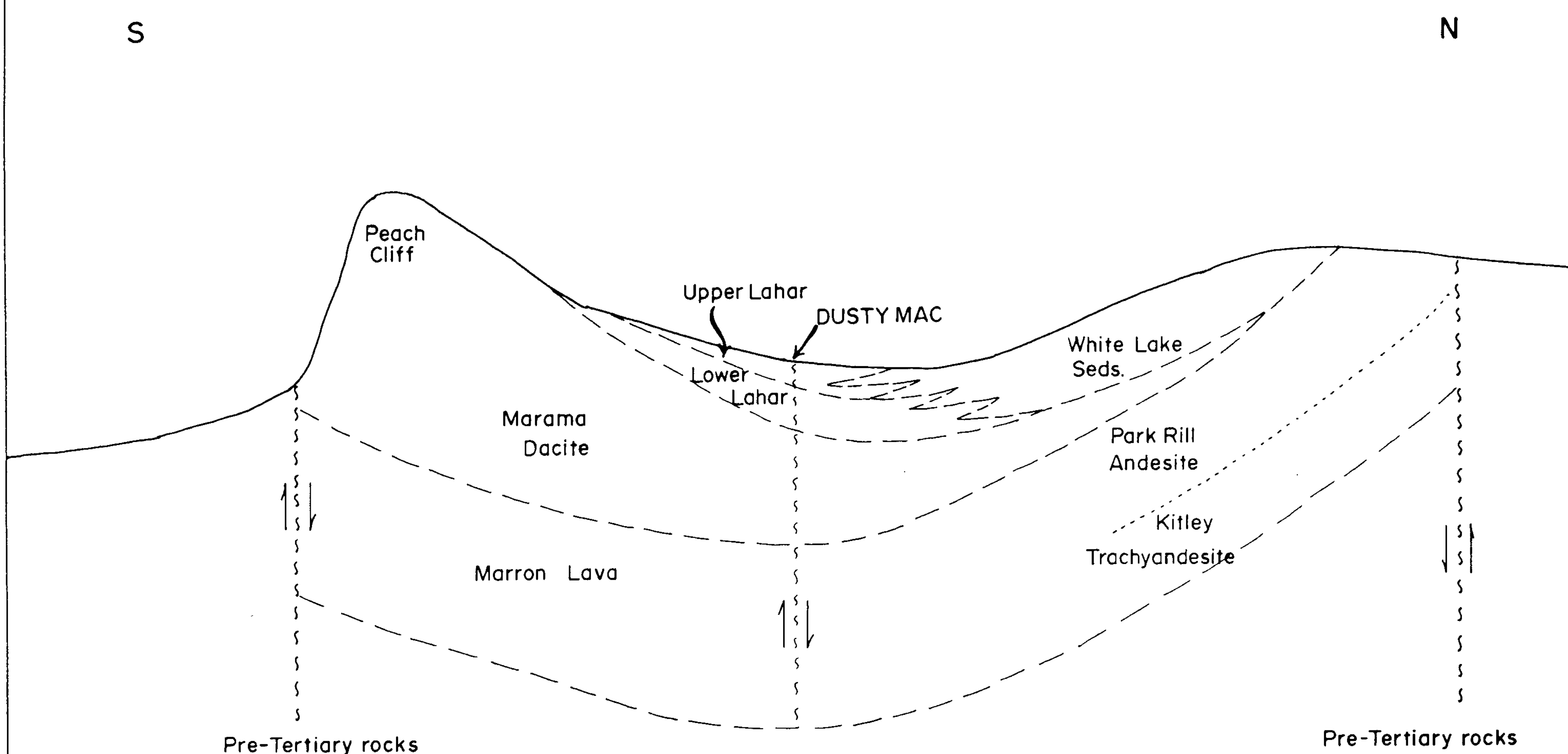
Mapping by the writer encountered rocks of the White Lake Formation underlain by Marama rocks. The units of these formations are arranged in a homoclinal sequence dipping variably to the northeast.

A large hill in the southwestern portion of the property forms a distinct landmark in the district and is locally referred to as Peach Cliff. This hill is composed of maroon, buff, beige, grey dacite referred to as Marama dacite. The estimated thickness of the Marama Formation is up to 350m in the vicinity of Skaha Lake. Work in the White Lake basin by Church has led him to believe that Peach Cliff represents a truncated dacite dome with an apron of assorted debris (White Lake Formation) flanking the dome to the northeast.

A large bluff of dacite occurs 500 meters to the southwest of the open pit and several isolated 'islands' of dacite immediately to the northwest and north of the adits overlooking Okanagan Falls. Compositionally the dacites are identical indicating a common age and genetic origin. The dacite possesses a distinct colour banding which ascribes a thinly laminated character to the rock. Church has identified this feature as flow banding perpendicular to the bedding.

A period of erosion marked the time of transition between felsic volcanic activity and deposition of the overlying White Lake Formation lahars.

The three larger areas of dacite mapped in the northwestern portion of the grid demonstrate contact relationships with the lower and upper lahar units. A small exposure 20m northwest of L10+00N, 4+50W shows a sharp, clean-cut contact between the dacite and the overlying lower lahar unit. An exposure 15m northwest of L10+00N, 3+25W shows a sharp contact, $127^{o}/59^{o}$ NE, between Marama dacite and the overlying upper lahar unit. A contact at L9+00N, 2+00W between the dacite and the upper lahar unit once again is sharp but in this instance is vertical and strikes about 330^{o}.



SECTION THROUGH
DUSTY MAC
LOOKING WEST NORTHWEST

Sketch by N.B. Church

Not to scale fig. 10

The contacts between the dacite and lahar units in the northwestern corner of the grid are regular non-faulted contacts and suggest that the dacite "islands" may represent paleotopographic highs or gravity slump blocks.

Rocks overlying the Marama dacite belong to the White Lake Formation. On the property scale, they are further divided into four units consisting of a lower lahar, upper lahar, tuff breccia, and volcanic conglomerate.

The lower lahar unit overlies the Marama dacite unconformably and is distinguished from the overlying lahar by the presence of blocks of laminated Marama dacite. The similarity of the two lahar units occasionally leads to uncertainty in identification.

The lower lahar unit occupies an area adjacent to the northeastern flank of the Marama dacite and extends from L0+00 to L12+00N and beyond. Five separate isolated areas of lower lahar have been identified as occurring in a broad belt trending northwesterly and about 100-300 meters to the northeast (down slope) from the main lahar mass.

The lower lahar unit is a chaotic assemblage of mafic volcanic debris containing rounded cobbles of feldspathic trachyandesitic material contained in a muddy matrix which varies from sandy to dark chloritic, fine grained and impermeable. Cobble size varies considerably from 1 cm to 50 cm. The lower lahar is usually quite blocky with components exhibiting a crude rounding of the corners. Weathered exposures are grey-greenish to tan in colour and usually are quite rubbly.

Locally the lower lahar displays well bedded finer grained components of volcanic sandstone. Bedded, interdigitated sandstone sequences are especially prominent in the vicinity of 5+50W between L4+00N and L9+00N. The strike of the sandstone varies between 125^{o} to 153^{o} and dips 30^{o} to 46^{0} northeast.

The upper lahar unit is characteristically identical to the lower unit except that it does not have Marama dacite fragments. The upper lahar is considerably greater in thickness and extent, and hosts the Dusty Mac deposit. This unit contains distinct bands of volcanic sandstone particularly in the upper part. Excellent exposures in the pit show appreciable thicknesses of carbonaceous shale interbedded with the lahars although on a property scale, the extent of the shale is unknown because of its recessive nature.

Four separate areas of flow occur near the base of the upper lahar sequence. The flows are massive, dark, feldspathic, porphyritic, and homogeneous. The flows occur in a crude belt trending 140^{o} from L8+00N to L3+00S. The largest flow area occurs due south of the pit and extends over an area 200 x 120m. Remnants of flow material also occur in the pit, stratigraphically high in the upper lahar.

The tuff breccia unit occupies the northeastern portions of the grid from L1+00N to L14+00N, 2+00E to 6+00E and beyond. The unit forms massive, grey, formidable outcrops and provides the property with the greatest relief of 200m. The tuff breccia is uniform in texture and color and lacks bedding features or other identifiable structural characteristics. This unit is monotonous through the entire vertical and lateral extent.

In hand specimen the rock is greenish grey to maroon in color, the color resulting from the chlorite and hematite content. The rock breaks into crude irregular cohesive blocks and talus pieces are generally vaguely platey.

This unit is noticeably polymictic. Components are mainly angular and vary in size from much less than 1mm to greater than 5mm. The fragments are usually of lapilli size, up to 3cm, with finer ash material filling the interstices. The single greatest component is comprised of pieces of Penticton Group volcanic rocks. Dark fragments of basaltic to andesitic flow rocks are quite common in the tuffbreccia, often vesiculated or amygdaloidal with large 5mm irregular clots of zeolitic or chalcedonic material. Other components include small rounded 3mm buff, light brown cherty pebbles belonging to the basement Old Tom Formation. Other components include pale green altered, rounded pieces of andesitic material, dark green to black vesiculated basalt, pieces (4mm) of corroded greenish, creamy zeolitic material and feldspar crystals. Black, blocky, soft pieces, 1mm to 3mm, of shale (?) occur locally as well. Occasional fragments of white, altered rhyolitic rock are also present. The fragments are cemented by a finer grained matrix of black and dark green material consisting of chlorite, hematite and other unknown constituents. The tuff breccia is a matrix supported unit.

The volcanic sandstone, conglomerate unit occurs in the southeastern portion of the grid immediately northeast of the pit. This unit consists of tuff breccia near the contact with that unit and reworked lahars which occupy the major portion of the property to the southwest.

The basal portion of this unit consists of a thick sequence, 20 metres of moderately sorted, well bedded volcanic sandstone usually light brown in color on weathered exposures. This basal sandstone strikes approximately 320° and dips northeasterly 13-32°, significantly shallower than the sandstones and shales in the upper lahar unit. The discrepancy in bedding attitudes in the sediments of the two units suggests an uncomfortable contact.

The basal sandstones grade into a crudely deposited sequence of volcanic material which has features of the previoüsly described lahars. The conglomerate matrix is generally sandy and supports assorted volcanic detrital material. To a much lesser extent, mud-flows or lahars are present and readily identifiable.

STRUCTURE

Tertiary basins have been influenced in their development by normal faults trending northeasterly and northwesterly as a result of a north-south stress regime. This stress model is believed to be responsible for the development of the northerly trending graben structures which are common in tertiary terrains.

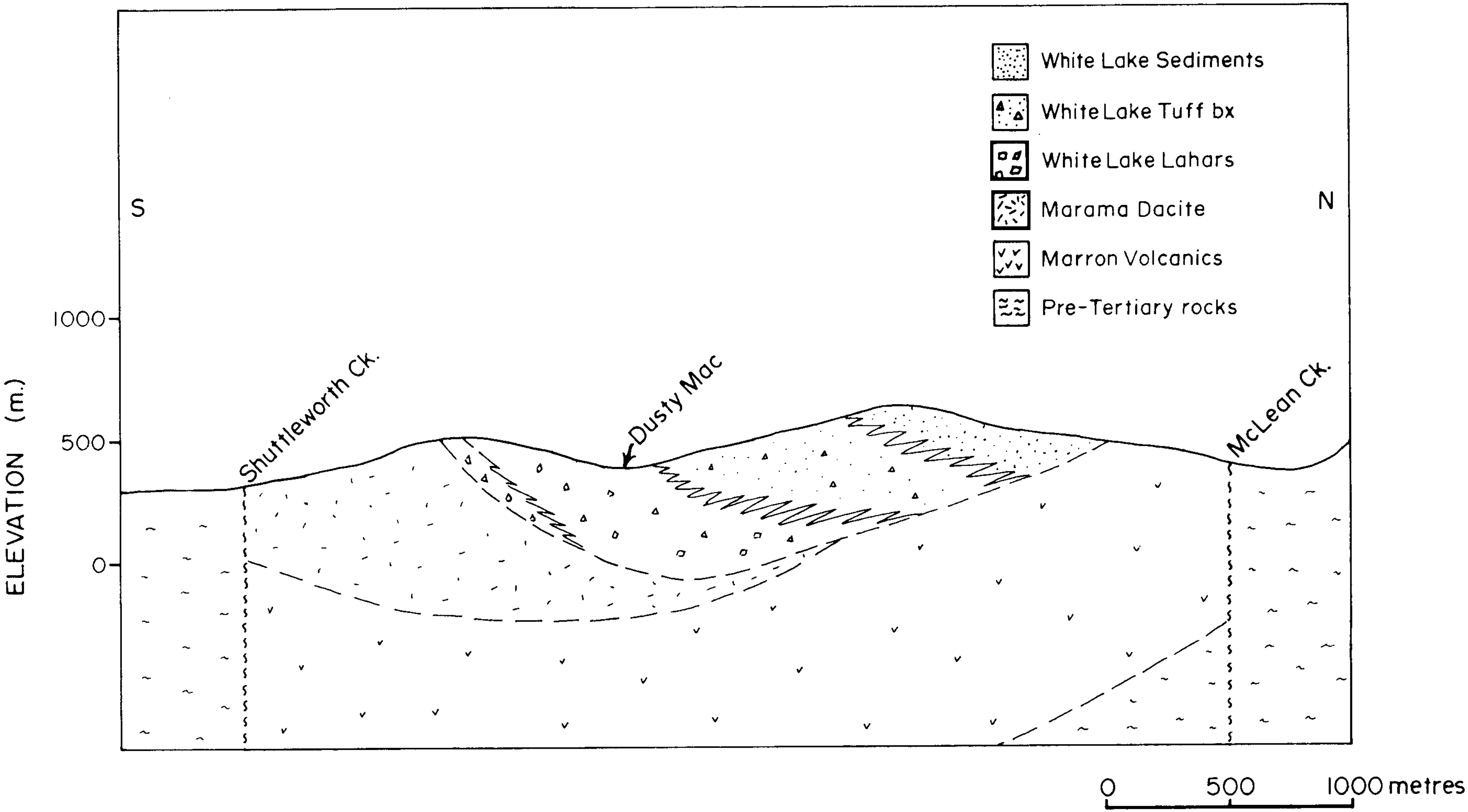
N.B. Church (1973) describes the tertiary stratigraphy of the Dusty Mac property as ..."units (occur) on the south limb of a southeasterly trending syncline. The beds have dips ranging from 30 to 55 degrees northeast. A strong cross-fracture system strikes about 010^{o} dipping 80^{o} westerly almost perpendicular to the synclinal axis.

"In addition these rocks are cut by an important system of reverse faults. The system trends generally with interwoven easterly and southerly striking segments and splays. The direction and magnitude of movement in these faults are indicated at a number of points where slices of Marama lava have been thrust outward and upward from the core of the syncline through several hundred feet of White Lake strata. As in the White Lake basin, reverse faulting is thought to be the result of concentric folding and accommodation of the stratigraphic pile to bedding plane slip.

"At Dusty Mac, mineralization appears to be largely controlled by the fault system. Quartz veins and gossans are present in or adjacent to most of the main faults".

Whereas Church has assumed a system of reverse faults thrusting Marama dacite upward through White Lake stratigraphy, no such direct evidence is present on the property. On the contrary, evidence would suggest that one large dacite block situated on L9+00N, 2+00W has a normal (sharp, vertical) non-faulted relationship with adjacent upper lahar rocks. The writer suggests that the dacite is a slump block. Contact relationship observed near L10+00N, 3+25W and 4+50W between Marama dacite and overlying lahars suggests an unroofing of the lower unit. The large exposure of dacite on L2, 3+00N, 4+50W may represent a palaeotopograghic high. Contacts are obscure but geophysical data does not show any evidence of faulting surrounding this large bluff.

Together with the blocks of dacite, a complex network of interwoven faults and splays has been interpreted by Church from the presence of gossans situated near prominent gulleys. Again no physical evidence exists to support the presence of major faulting. The gossans represent zones of permeability which provided a plumbing system for the passage of hydrothermal fluids. The accurate trend of the gossanous zones



SECTION THROUGH
DUSTY MAC
LOOKING WEST NORTHWEST

fig. 11

suggests the presence of shallow widespread porous zones such as would be expected along bedding planes. Good examples of shallow fluid-guiding structures are: the intense sericite alteration zone in the main adit area dipping 18° NE; the quartz breccia near the northeast adit dipping 34° NE; and the Dusty Mac orebody dipping 5 to 35° NE. The presence of shallow bedding plane faulting is not discounted. Evidence of bedding plane slip is clearly demonstrated in the calcareous shales which occur in the northeast pit wall.

Tabulation and manipulation of Dusty Mac drill hole assay data and field observations indicates that the orebody and surrounding area was subjected to considerable faulting. Quartz breccia remnants in the pit are clearly fault bounded with the most prominent fracture set trending 16o° to 175° dipping 90° + 10°. This set is cut by a later joint set trending 010 + 10°, again steeply dipping.

During pit mapping, 140 joint and fault directions were measured and a plot of the fault poles is shown on Figure #14. Six major fault orientations are identified and listed in order of diminishing frequency:

1. 164°/90°

2. 008°/70°W

3. 011°/76°E

4. 172°/69°W

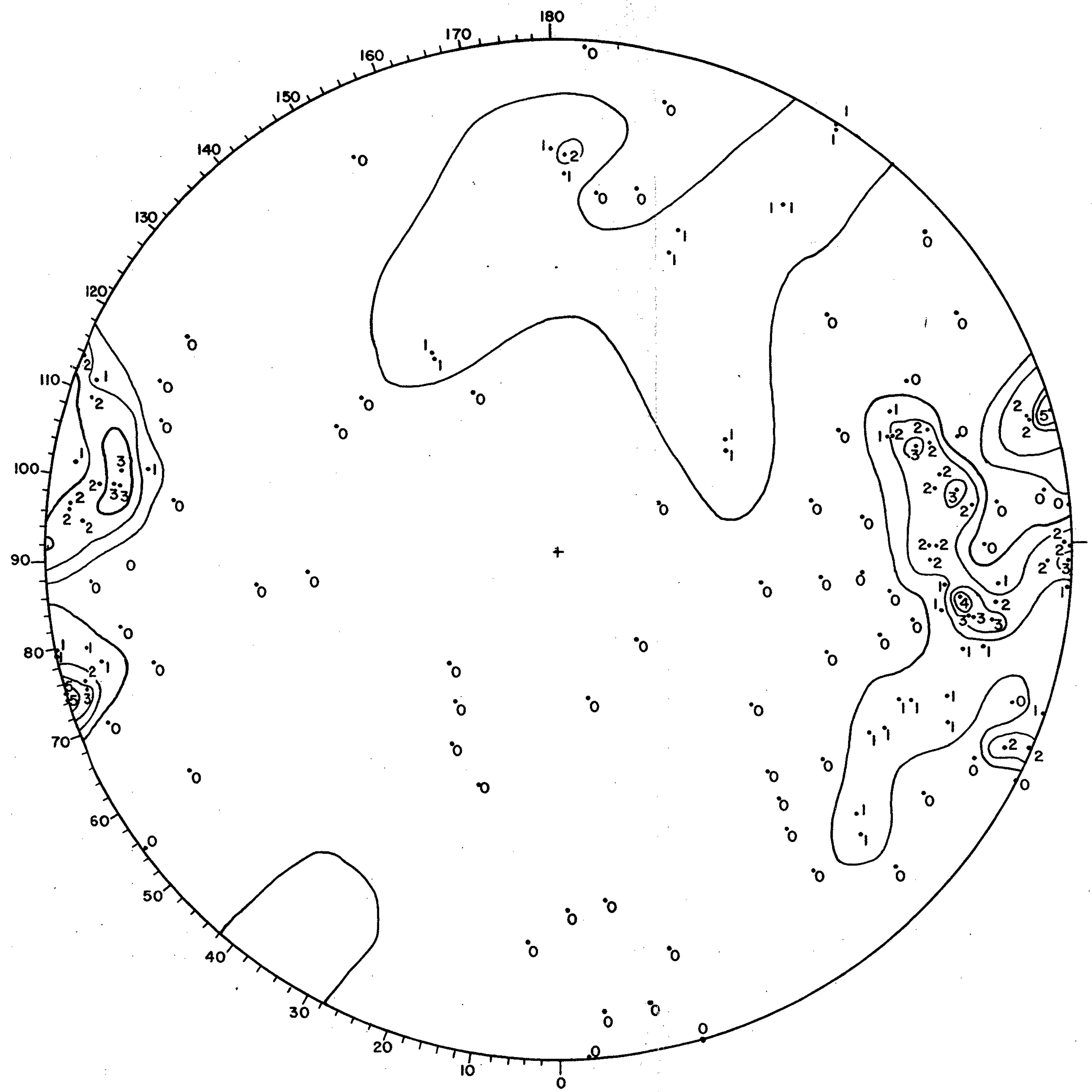
5. 164°/62°W

6. 002°/90°

Two major fracture trends are apparent; 168 ± 4° dipping vertically or steeply westerly, and 010° ± 1° dipping steeply easterly and westerly.

A percent frequency histogram, Figure #15 of the same data indicates that three major fault directions are present: 1) 165°, 2) 010°, 3) 025°.

A "foot-ounce" contour map, Map #2197-15, has been prepared for gold using Dusty Mac Mine assay data. A foot-ounce coefficient is determined by multiplying the gold assay in oz/T by the true thickness of the intersection in feet. Assay intersections indicate that the orebody "feathers-out" to the southwest and thickens considerably to the northeast where it abruptly vanishes. A line trending 305° separates significant high grade interesections from blank holes. This demarcation zone may represent a major fault truncating the Dusty Mac orebody.



Density Contours

- 4 1/2 — 5 1/2
- 3 1/2 — 4 1/2
- 2 1/2 — 3 1/2
- 1 1/2 — 2 1/2
- 1/2 — 1 1/2

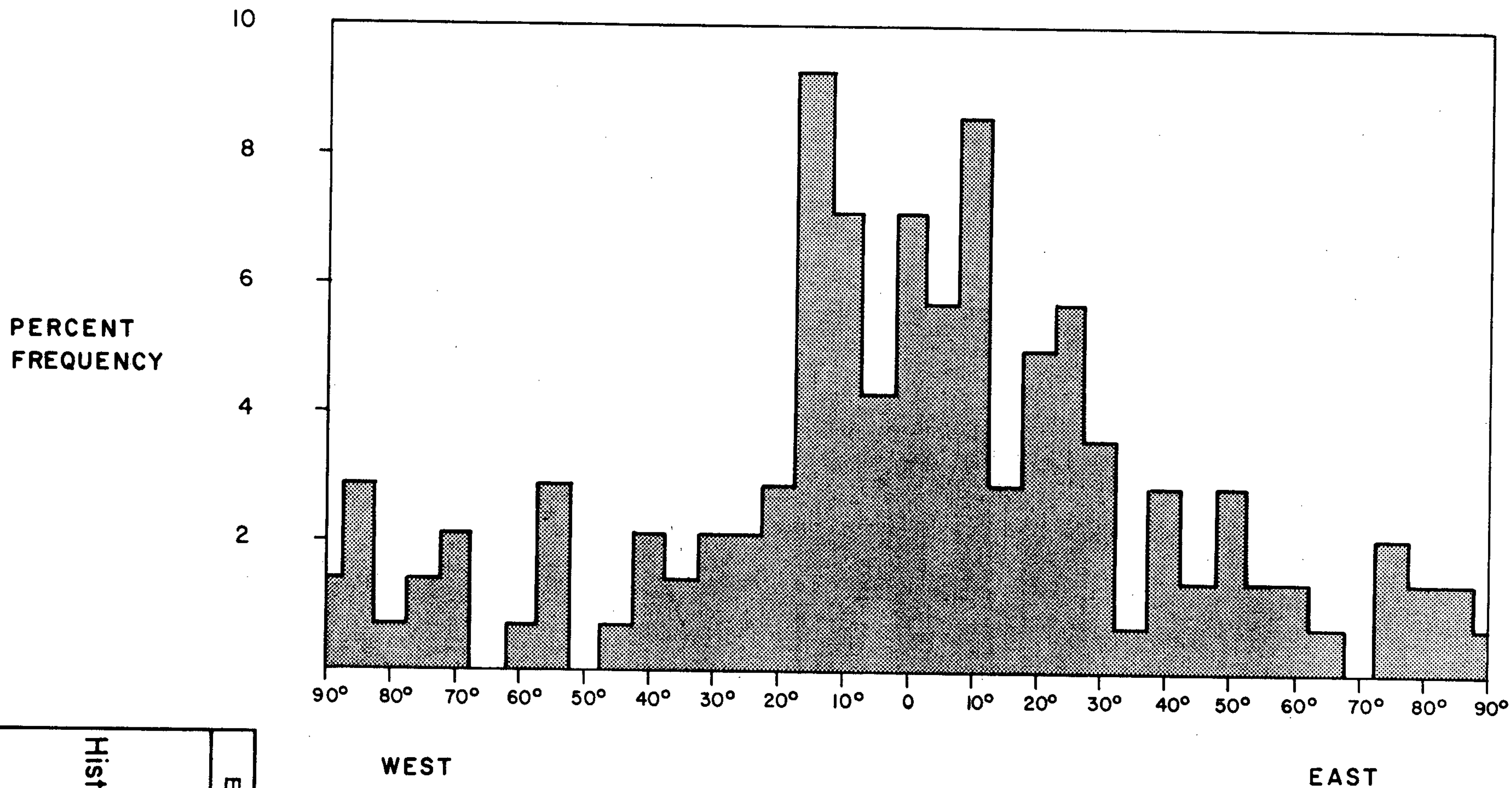
Major Fault Orientations

1) 164 / 90
2) 008 / 70 W
3) 011 / 76 E
4) 172 / 69 E
5) 164 / 62 W
6) 002 / 90

ESSO MINERALS CANADA

Plot of 140 Fault Poles
Dusty Mac Pit Area

Project No. 2197	Mining Div Osoyoos
NTS: 82E/5E	Drawn by: G.T.
Date: Jan. 1985	Fig. No. 12



ESSO MINERALS CANADA

Histogram of fractures in Dusty Mac Pit

Project No. 2197	Mining Div. Osoyoos
NTS. 82E / 5E	Drawn by: G.T.
Date: Jan. 1985	Fig. No. 13

The gold foot-ounce contours outline distinct "lobes" trending 010° suggesting that a late stage fracture set in that direction has also contributed to segmenting the orebody.

A sequence of tectonic events effecting the Dusty Mac orebody may have occurred as follows. Following the emplacement of the Dusty Mac epithermal system into the upper lahar of the White Lake Formation, a major northwesterly trending, 305°, growth fault truncated the buried deposit. Movement along the growth fault was slow, vertical with subsidence occurring on the northeast side. The shallow basin was infilled with detrital material consisting of reworked lahar and mineralized quartz-carbonate pebbles from the eroding Dusty Mac epithermal system to the southwest. Occasionally quiescent periods saw the influx of material consisting of muds and sandstone.

A final stage of compressive tectonism resulted in the development of the extensive network of faults, joints, bedding plane slips and soft sediment deformation, which segmented the quartz breccia. Tilting probably also occurred during this time.

Pit observations suggest that faulting in the 165° and 025° directions may have been contemporaneous and preceeded movement in the 010° direction. Relative movement in the 010° direction appears to have been in the order of 8-12 meters, right lateral, as determined from the gold foot-ounce contour map. The vertical component during this late stage faulting was minimal as thin sandstone seams in the northeast wall display vertical displacement from zero to 0.4 metres.

In summary, evidence derived from mapping the pit suggests that a complex system of faulting and jointing trending 165°, 025° and 010° segmented the Dusty Mac orebody following its emplacement but has not drastically altered the overall configuration of the quartz breccia lense. An earlier more dramatic event is believed to have occurred displacing the quartz breccia lens from a similar body at depth.

MINERALIZATION

The overall lack of sulfide mineralization and vague hydrothermal alteration are the two most obvious features characterizing the Dusty Mac deposit. Production from the pit totalled 93,653 tonnes grading 6.89 gm/tonne Au, 146.59 gm/tonne Ag, 0.003% Cu, and 0.002% Pb.

Dusty Mac Pit

The pit minerology consists of gold, silver, sphalerite, chalcopyrite, galena, and pyrite. Pyrite is the most abundant sulphide but it amounts to less than 1% by volume. The remaining three sulphides and precious metals account for much less than 1%.

Mineralization, except for scattered grains of pyrite, is difficult to observe in hard specimen. Precious metals are particularly scarce but have been observed in matrices of black breccias. Silvery flecks of native silver are locally common and silvery-yellow flecks of electrum have also been noted.

A Bachelors thesis was written by Paul Chung in 1982 at the University of British Columbia entitled "Genesis of the Dusty Mac Gold Deposit, South-Central British Columbia". The following is an excerpt from that thesis discussing mineralization in the quartz breccias ...."Pyrite, galena, chalcopyrite, and sphalerite were observed in polish section. Sulphide mineralization is restricted to the quartz breccias and is abundant in the matrix of the black quartz breccia. Pyrite occurs both as anhedral single crystals and as anhedral disseminated aggregates in the matrix of the breccia. Chalcopyrite, galena, and sphalerite occur as fine disseminated grains exclusively in the matrix.

"The most abundant mineral is pyrite followed by chalcopyrite and galena respectively. Galena occurs as small anhedral grains attached to or in grains of chalcopyrite suggesting replacement of galena by chalcopyrite. Sphalerite replaces all the sulphides especially galena.

"Sulphide deposition started after brecciation, as all the sulphides are in the matrix. Chalcopyrite was deposited at the late stage of galena deposition and continued until after galena finished precipatating. The last sulphide to be deposited was sphalerite which replaces pyrite, chalcopyrite, and galena."

Western Zone

The Western Zone is an area wherein weak precious metal values were identified by Dusty Mac Mines during exploration drilling in 1973. This zone is located 200 meters southwest of the Dusty Mac pit and is loosely defined by five drill holes in an area of poor rock exposure.

Out of the five drill holes testing this zone, only one is a diamond hole, DDH 276, drilled by Noranda in 1970. The drill hole encountered a porphyritic andesite breccia in the initial 75 feet and an andesitic agglomerate over the remaining 26 feet. Two 20 foot zones grading 0.02 oz/T Au were intersected. Carbonate veining appears to be ubiquitous together with lesser amounts of quartz veining and traces of pyrite over the entire length of hole.

Percussion hole 466 located hear L0+00, 2+40W encountered a 5.2 meter section near surface which ran 0.356 oz/T Au, 0.34 oz/T Ag. Within this section, a 2.2m section from 2.4-4.6m ran 0.750 oz/T Au, and 0.60 oz/T Ag. It is not known whether the host for the precious metals was a quartz breccia.

'A' Zone

The 'A' Zone is located 700 meters west northwest of the pit at coordinates L7+00N, 3+00W. This zone consists of a narrow brecciated quartz vein trending 135°, measuring 4m in length to 1.0m in width and vertically dipping. This vein is hosted by the carbonate altered upper lahar unit. The vein is mineralized and contains chalcopyrite, pyrite, galena, tetrahedrite and sphalerite. The vein is distinctly stained with malachite.

At least seven drill holes including three diamond, and four percussion have tested the vein and immeditate surrounding area. A surface sample collected by Esso across the vein ran 0.277 oz/T Au and 62.07 oz/T Ag across 1.0m. Only two drill holes, 131 and 473 encountered precious metal values of significance near surface. DDH 131 ran 0.130 oz/T Au, and 16.70 oz/T Ag over 1.5m, and DDH 473 ran 0.460 oz/T Au and 0.62 oz/T Ag over 1.5m. A diamond drill hole, 273, did not intersect the high grade vein, but a descriptive log indicates that the lithology encountered was a brecciated porphyritic andesite veined with carbonate and minor quartz.

A second quartz breccia "vein" occurs 10 meters to the northeast and apparently trends 100°. A 1.0m sample collected across this structure ran 0.011 oz/T Au and 0.53 oz/T Ag. This mineralized showing does not appear to have any continuity but its presence indicates that a mineralizing plumbing system was present in the 'A' Zone area.

Adit Area

The adit area is located 900 meters northwesterly from the open pit. Four adits and five open cuts have been excavated by previous workers in an area measuring 150m x 70m. This zone straddles lines 8N and 9N at 4+25W, and forms a prominent knob overlooking Okanagan Falls.

An area of intense sericite alteration, pyritization, and moderate quartz veining extends 250m x 70m from L7+00N to L9+00N and beyond. Minor amounts of chalcopyrite, pyrite, and tetrahedrite (?) occur in quartz veins. Malachite is also locally present. The presence of the alteration, veining and scant vein mineralization enticed the old-timers to excavate the adits and open cuts.

Noranda drilled two diamond drill holes in 1970, DDH 274, 275, in the adit area and encountered only background values for gold and silver. The host lithology in DDH 274 is described as a brecciated andesite porphyry carrying moderate quartz-carbonate veining with fluorite and minor amounts of pyrite. DDH 275 is collared 35m northwest of L8+00N, 4+65W. The host lithology again is described as the brecciated andesite porphyry although sericitization is much more intense. Quartz-carbonate veining and pyritization is noted.

Esso conducted extensive assay sampling in the adit area, collecting 45 assays from altered surface exposures and adits. Intense sericitization in the main adit was accompanied by moderate pyritization, 10-15% by volume, and locally intense silicification. All assays reflected Noranda's drill results, they ran trace amounts in precious metals.

Norwest Zone

The norwest zone is located near L10+00N, 0+50W near the baseline and 900m northwest from the pit. The zone consists of an intensely altered breccia extending over an area of 70 x 20m with the long dimension trending northerly.

Alteration consists of intense sericitization, silicification and weak pyritization. Surface exposures are rubbly, gassanous and subdued. Esso personnel collected five assay samples all of which ran trace amounts gold and silver.

Dusty Mac Mines drilled three percussion holds, 476, 477 and 478 into the zone and only DDH 477 intersescted a 1.5m interval that ran 0.010 oz/T Au and 0.40 oz/T Ag.

ALTERATION

Hydrothermal alteration has been recognized on the Dusty Mac property and four obvious alteration suites have been identified which include carbonate, propylitic, phyllic and potassic.

Carbonate alteration consists of both pervasive carbonatization, and fracture healings to veinlets and veins. The propylitic assemblage consists of carbonate, chlorite, and abundant epidote. Phyllic alteration is represented by varying intensities of silicification, sericitization and pyritization. Potassic alteration consists of potash metasomatism determined from whole rock analyses.

Carbonate Alteration

Carbonate alteration is the most wide spread alteration feature on the property. The recognized distribution extends from the first exposures on L3+00S to a point near L10+00N in the vicinity of the adits. Carbonate alteration is restricted to the upper lahar unit occurring centrally, and trending northwesterly and southeasterly through the property. Three restricted areas of lower lahar occurring within the upper unit are also carbonatized. The extent of carbonate alteration is at best only vaguely understood due to the method of detection and extensive central glacial cover.

Widespread carbonatization occurs in the southeastern area of the grid encompassing the pit and western zone. A core area of 500 x 500 meters carries significant quantities of carbonate at depth confirming surface observations.

The total extent of carbonate alteration along strike from the Dusty Mac ore-body is unknown due to lack of rock exposure. A prominent carbonate alteration 'tail' trends 320^{o} from L4+00N to L10+00N. This 120m wide belt incorporates the 'A' zone and adit area. On a property scale, the zone of carbonitization encompasses all the mineralized zones except for the norwest zone.

Several areas of carbonate veining and/or coarse carbonate debris were observed throughout the property, but especially prominent is the area between L1+00S, L0+00 at 2+50W. In this area coarse carbonate debris is scattered over 75m between the two grid lines. A large quartz-carbonate vein that occurs here was drilled by Noranda in 1970, DDH 271. The drill hole encountered 1.5m of quartz breccia near surface and a variably brecciated porphyritic andesite to 31m. The rock contained much carbonate veining with lesser quartz over the entire interval. The cuttings did not assay except for the quartz breccia which ran 0.01 oz/T Au. Percussion hole 466 occurs near L0+00, 2+50W wherein an intersection of 5.2m near surface ran 0.356 oz/T Au and 0.34 oz/T Ag.

A second large banded, barren carbonate vein occurs at 0+600N, 4+00W.

Propylitic Alteration

A restricted area of propylitic alteration occurs in the southwestern area of the grid fringing the 'A' zone and trending toward the adit area.

This alteration assemblage is especially diagnostic due to the abundant presence of yellow-green epidote with chlorite and carbonate. The alteration zone extends from L5+00N to L10+00N outlining a vague sigmoidal belt from 20 to 110m wide. The alteration zone transects upper ahd lower lahar terrain.

The overall extent of propylitic alteration is not clearly understood nor is the relationship between this alteration assemblage and sparse sulphide mineralization in the adit area. Diamond drill hole 274, located near L7+00N, 4+00W intersected brecciated porphyritic andesite which contained significant quantities of epidote although on surface this mineral was not observed.

Phyllic Alteration

Numerous areas of quartz, sericite and pyrite alteration occur throughout the property. This alteration assemblage is referred to as phyllic alteration. The altered areas occur as small patches of gossanous material in road cuts, rusty patches of soil or isolated outcrops wholly or partially altered to quartz, sericite, and pyrite. This alteration style occasionally extends over large areas such as that adjacent to the pit or the intense sericite alteration associated with the adit area.

The intensity of silicification and sericitization is variable. The distinguishing characteristics of this type of alteration is the bleaching, yellowish, rusty-red gossanous colour on weathered rock surfaces and the silica content which is significantly elevated in terms of pervasiveness and veining as compared to unaltered rocks.

The distribution of quartz-sericite alteration patches is confined to an area from L2+00S to L10+00N over a width of about 400 meters. This zone of patchy alteration is confined to the lahar units, mainly within the upper lahar. This alteration is carbonate destructive consequently the two alteration assembleges occupy exclusive domains.

The significance of quartz-sericite-pyrite alteration intensities and spatial distributions remain unresolved. The high alumina and high alkaline chemistry of the lahars would readily permit the development of sericite in lower pressure - temperature environments and in conditions removed from favourable precious metal deposition. Therefore the sericite patches may represent distal extremities of plumbing conduits which deposited the precious metals at Dusty Mac.

The curious phenomenon whereby only portions of outcrops are altered, and the juxta positioning of altered lahars against unaltered Marama dacite suggests that hydrothermal fluids were lower temperature and may have migrated substantial distances. The preferred alteration may also be attributed to the superior permeability of the lahars as compared to the dacites.

Several key features differentiate the pit phyllic alteration assemblage from that of the various other patches. The pit alteration is considerably more intense as compared to other altered areas. Silicification is pervaisive and chalcedonic fragments or pebbles are common. The pit alteration is spatially very closely associated with previous metal mineralization as versus unknown or non-detected precious-metal values from other zones.

GEOCHEMISTRY

Introduction

The purpose of the geochemical sampling program was to establish a signature characteristic of the Dusty Mac precious-metal deposit and compare the known geochem response to values obtained from the remainder of the property. The object of the program was to identify near surface ore-zones comparable to the Dusty Mac ore-body.

Soil and lithogeochemical sampling was conducted over the property using a cut grid for control. The area sampled encompasses the pit area and measures 1.9 km by 1.2 km. A sampling interval of 50m was used for soil sampling along lines spaced 100m apart. A total of 485 soil samples were collected. Lithogeochem samples were collected along grid lines and a determined effort was made to collect samples at regular 50m intervals regardless of lithological type. A total of 212 lithogeochem samples were collected on the grid plus an additional 40 samples were collected from the pit.

In addition to the geochemical sampling, eighty-two assay samples were collected from areas which exhibited interesting alteration and/or mineralization features.

Soil Geochemistry

Soil samples were collected consistently from the "B" horizon at a depth of 20 to 30 cm. The samples were appropriately documented recording location, type, texture, origin, horizon, colour and depth. The samples were numbered, packed and shipped to Bondar-Clegg Laboratories in North Vancouver. All soils were routinely analyzed for Cu, Mo, Pb, Zn, F, As, Au, Ag. A select twenty-five samples were analyzed for Tl, Te, Ba, Sr, Se. The extraction and analytical method are as follows:

Element	Lower Dection Limit	Extraction	Method	Size Fraction
Cu	1 ppm	HNO_3-Hcl Hot Extr.	Atomic Absorp	-80
Pb	2 ppm	HNO_3-Hcl Hot Extr.	Atomic Absorp	-80
Zn	1 ppm	HNO_3-Hcl Hot Extr.	Atomic Absorp	-80
Mo	1 ppm	HNO_3-Hcl Hot Extr.	Atomic Absorp	-80
Ag	.2 ppm	HNO_3-Hcl Hot Extr.	Atomic Absorp	-80
F	20 ppm	POT Hydroxide Fusion	Sp Ion	-80
As	2 ppm	Nitric Perchlor Dig	Colourimetric	-80
Au	5 ppm	Aqua Regia	Fire Assay/A.A.	-80
Tl	.5 ppm	Multi Acid - MIBK	Atomic Absorp	-80
Te	.2 ppm	$HBr-Br_2$ - MIBK	Atomic Absorp	-80
Ba	20 ppm		X-Ray Fluorescence	-80
Sr	5 ppm		X-Ray Fluorescence	-80
Se	1 ppm		X-Ray Fluorescence	-80

In the ensuing discussion, values quoted for background and threshold are visual estimates only.

Soil samples were collected near the open pit according to the established grid. As a result, eleven samples were collected from the reclaimed area surrounding the pit. These eleven samples form the basis of comparison of geochem values from the Dusty Mac Pit area and values obtained from the remaining grid.

Gold Cheochemistry

Gold soil geochem values are plotted on Map #2197-5. In the vicinity of the pit, eleven soil samples were collected from the disturbed or reclaimed area. Values for gold range from 5 to 2660 ppb. Seven samples have values greater than 50 ppb and three samples ran greater than 1000 ppb. The sample that ran 2660 ppb was collected in the pit on L1+00N.

Dusty Mac gold mineralization is represnted by soil gold geochemistry with a magnitude of 45 to 2660 ppb. The visual estimated background for gold is 5-10 ppb and values $\geq$50 ppb are considered anomalous.

Gold soil geochemistry is erratic. Aside from the pit area, fifteen spot occurrences of high gold geochemistry, greater than 50 ppb, occur scattered throughout the grid area. In terms of lithologies, twelve values occur within the upper lahar unit of the White Lake Formation. Only one value of 50 ppb occurs in the dacite domain and two values occur in the tuff-breccia unit.

A crude belt of anomalous gold values extends from L2+00S, 3+75W to L7+00N, 4+00W. This zone is 900m long and about 100 meters wide. With the exception of one value, all occur within the carbonate alteration zone. Five values, ranging from 90 to 480 ppb, occur immediately south and southwest of the open pit reflecting precious-metal mineralization identified from previous drilling in the Western Zone.

An area bounded by L2+00N, L2+00S, 4+00W, and 1+50E represents an area wherein anomalous gold values ranging from 75 to 2660 ppb occur.

Two anomalous values on L5+00N, 60, 120 ppb, and a single value on L7+00N, 75 ppb, do not appear to correlate with any feature which could account for the response, although the "A" Zone does occur nearby. A single value of 65 ppb occurs at L9+00N, 2+50N near an area of intense quartz, sericite alteration. A single value of 125 ppb on L6+00N, 0+50NE occurs in an area mantled by glacial drift and is of unknown origin.

A core sample anomaly of 60 ppb at L1+00S, 3+00E correlates well with an anomalous lithogeochem sample which suggests an insitu response.

In summary, gold values in the pit area demonstrate that Dusty Mac gold mineralization is characterized by soil gold geochem values ranging from 45 to 2660 ppb. A vague belt, 100m wide, of anomalous gold values occurs south and southwest of the pit trending northwesterly for 900m. Gold soil geochemistry indicates a substantial area of anomalous values situated in the area of L2+00N, L2+00S, 4+00W, and 1+50E.

Silver Geochemistry

Silver soil geochem values are plotted on Map # 2197-5. In the vicinity of the open pit silver values range from 0.2 to 27 ppm. Nine samples have values greater than 1 ppm. The remaining two samples run 0.2 and 0.4 ppm.

Dusty Mac silver mineralization is represented by soil silver geochemistry with values of 2.8 to 27 ppm. The silver soil geochemistry mirrors anomalous gold geochemistry very closely.

Silver soil geochemistry is erratic in nature similar to that of gold, although the dispersion is not as extensive. Grid background for silver is 0.2 ppm and values ≥ 1 ppm are considered significant. Ten anomalous samples outline a discontinuous zone 150m wide extending from L2+00S to L8+00N along the southwestern flank of the valley trending northwesterly. The ten anomalous samples ranging from 1.2 to 3.9 ppm Ag occur within the carbonate alteration zone. This zone of anomalous values extends from the vicinity of the Western Zone to the area of the adits. Sixty percent of the anomalous silver values are associated with anomalous gold geochemistry. Similarly 60% of the anomalous silver values occur in the vicinity of the Western Zone. Combined with the pit area, the anomalous values represent a circular area bounded by 2+00S, 2+00N, 4+00W and 1+50E.

In summary, silver values in the pit area characterize Dusty Mac silver mineralization with values ranging from 2.8 to 27 ppm. Silver soil geochemistry is erratic although a general pattern does emerge. A circular anomalous silver zone encompasses the pit and Western Zone. A 'tail' traces off to the northwest toward the adit area.

A direct relationship of soil silver geochemistry and intense areas of alteration does not appear to exist, rather, high values are spatially related to areas where quartz and carbonate veins (veinlets) occur.

Fluorine Geochemistry

Fluorine soil geochem values are plotted on Map #2197-6. Within the reclamation area, fluorine values range from 200 to 1800 ppm. A visual estimate of the background is 350 ppm fluorine. Values greater than 800 ppm define a distinctly anomalous population. Only four fluorine values within the reclamation area are anomalous varying from 960 to 1800 ppm. Fluorine appears to be very closely spatially related to the precious-metal mineralization in the Dusty Mac pit.

A zone, measuring 1300 by 100m, of anomalous fluorine values trends northwesterly starting at L3+00S and continuing to the vicinity of the adits. Seventeen values greater than 800 ppm fluorine occur in this zone which lies within the upper-lahar unit. This zone parallels the upper-lahar-dacite contact in the southern portion of the grid and parallels the upper-lower lahar contact to the north.

The overall configuration of the anomalous fluorine zone indicates a general widening to the southeast and a narrowing, trailing-off, to the northwest. A distinct widening of the fluorine anomaly to the southeast is indicated possibly coalescing with the pit fluorine anomaly. There is a strong correlation between the fluorine anomaly and the zone of carbonate alteration.

A small fluorine soil anomaly occurs on L10+00N, 3+00E to 6+00E. Five fluorine values greater than 800 ppm occur on a steep mountain side underlain by tuff breccia. The area exhibits no alteration features. This area is also weakly anomalous in copper. The source of anomalous copper and fluorine geochemistry is unknown.

Several other small spot, one sample, fluorine anomalies occur but are of no significance.

Fluorine soil geochemistry correlates very well with gold-silver data. These data suggest that the direction of increase in intensity and absolute anomaly size is southeasterly. Drilling of the Western Zone has substantiated the presence of widespread precious-metal mineralization.

Arsenic Geochemistry

Arsenic soil geochemistry values are plotted on Map #2197-6. Grid background for arsenic is 4 ppm. Values greater than 10 ppm are considered significant. Arsenic values within the pit area range from 2 to 18 ppm and only one value is greater than 10 ppm. Only 13 values out of 485 are greater than 10 ppm within the sampled area.

Anomalous arsenic values range from 10 to 300 ppm and show an erratic distribution. All values except one are less than or equal to 30 ppm. A single high value of 300 was obtained from a sample at L0+00, 4+00W, an area of phyllic alteration.

A crude arsenic anomaly occurs in part coincident with the fluorine anomaly starting at L3+00S and extending intermittently northwesterly to L7+00N. This anomaly is represented by 12 anomalous samples, 10-30 ppm As, over a width of 150m.

The inconclusive, weak arsenic response in the contaminated pit area suggests that hydrothermal events responsible for precious-metal deposition and alteration were deficient in arsenic.

Molybdenum Geochemistry

Molybdenum soil geochemistry values are plotted on Map #2197-7. Pit values for molybdenum range from 1 to 213 ppm. Eight samples have values greater than 4 ppm.

Grid molybdenum geochem background is 2 ppm and values of $\geq$ 4 ppm are considered significant. Twenty-three elevated molybdenum geochem values occur within the confines of the grid. These values are erratically scattered from the pit area to the south and southwest. Grid molybdenum geochemistry appears to subtly mimic the precious metal geochem dispersion. Molybdenum values range from 4 to 17 ppm although most values are less than 10 ppm.

Anomalous molybdenum values in the vicinity of the pit and Western Zone outline a large circular area bounded by 3+00N, 2+00S, 4+00W, and 1+50E. A zone of elevated values 100m wide trends northwesterly from this central area and terminates in the vicinity of the adits.

All anomalous values greater than 4 ppm, except four, occur within the upper lahar unit and 72% of these values occur within the carbonate alteration zone.

Molybdenum geochemistry may reflect Dusty Mac style precious-metal mineralization and suggests a genetic history similar to the Dusty ore-body.

Copper Geochemistry

Copper soil geochem values are plotted on Map #2197-7. Values for copper in the pit area range from 10 to 118 ppm. Five samples have values greater than 40 ppm.

Dusty Mac copper mineralization is vaguely represented by soil copper values of 40 to 118 ppm.

Grid background for copper is in the order of 20 ppm. Values of 40 ppm occur in a broad arcuate fashion peripheral tot he pit and transecting lithological boundaries. In the southern portion of the grid copper values range from 44 to 96 ppm and are restricted to the dacite. To the west, copper values in the order of 40-51 ppm occur within the two lahar units and the marama dacite. A large area in the northern portion of the grid underlain by tuff-breccia has seventeen anomalous copper values ranging from 40 to 72 ppm. This area is also moderately anomalous in fluorine. Abundant outcrop is lacking in alteration features and void of mineralization.

The overall trend of anomalous copper geochemistry suggests a crude halo not unlike porphyry zonation. There is a vague suggestion that copper geochemistry may be flanking the carbonate alteration zone.

The copper recovered from the Dusty Mac mining operation amounted to 2880 kg which averaged 0.003%. The direct association of copper and precious-metals in the pit does not hold true for grid soil geochemistry.

Lead Geochemistry

Lead soil geochem values are plotted on Map #2197-8. Eleven samples collected from the pit area resulted in values ranging from 4 to 600 ppm. Five samples have values greater than 40 ppm. A visual estimate for lead background is 20 ppm and values of 40 ppm and greater are considered significant.

Only nine samples in the grid area ran greater than 40 ppm Pb. The White Lake Formation lahars are not anomalous in lead and only two samples resulted in anomalous values south and southeast of the pit.

A total of 1527 kg Pb was recovered from the Dusty Mac Mining operation. Therefore a spatial, if not genetic relationship is present in the Dusty style mineralization. Soil geochemistry does not reflect a lead precious-metal association. Lead geochemistry is not of any assistance in targeting other areas of potential precious-mnetal mineralization.

Zinc Geochemistry

Zinc soil geochem values are plotted on Map #2197-8. Zinc values in the reclaimed pit area vary from 30 to 143 ppm. All values except one are less than 100 ppm. A visual estimate of background for zinc is 60 ppm. Within the confines of the grid, only nine randomly scattered values are slightly over 100 ppm.

The minute quantities of zinc encountered in the pit area reflects a system deficient in zinc. Grid soil geochemistry supports this point.

Zinc is of no value as a guide to discovering Dusty Mac style ore.

Lithogeochemistry

Introduction

A rock chip sampling program was undertaken on the Dusty Mac property during the 1984 field program. A total of 252 lithogeochem samples were collected including 212 samples from the grid and 40 samples from the pit. The samples were run for whole rock analysis, gold, silver, rubidium, and strontium.

Grid sampling involved systematic, regular sample collection at 50m intervals - outcrop permitting. A composite chip sample and hand specimen were collected at each site independent of lithological consideration.

The purpose of the lithogeochem program was to determine a pit (ore) geochem signature and relate it to other areas on the property with similar characteristics. The discussion will outline the results obtained from the pit in terms of precious metal distribution, K_2O/TiO_2, and Rb/Sr ratios. The results from the grid survey will then be discussed and compared with those of the pit.

Pit Lithogeochemistry

A total of forty samples were collected at predetermined locations to give a homogeneous distribution and representative nature to the data. A composite sample was collected at every site. For purposes of this exercise, only samples of lahar and flow material were collected.

Gold Lithogeochemistry

Gold lithogeochemistry demonstrates a relatively high incidence of elevated values in the pit area. Gold values vary from 10 to 5680 ppb in 39 rockchip samples. Sixty-six percent of the samples ran greater than 50 ppb and forty-four percent ran greater than 100 ppb.

In general terms the elevated gold lilthogeochemistry outlines a broad zone approximately 50m wide trending across the pit at 284^{o}, and open in both directions. This belt coincides with the zone of quartz-breccia remnants which remain in place. Lithogeochemistry demonstrates that the host lithology has been contaminated during the mineralizing event and a gold halo is present surrounding the quartz-breccia ore-body.

Silver Lithogeochemistry

Silver lithogeochemistry indicates a broad widespread enrichment in the pit, similar to that of gold. Silver values vary from 0.4 to 44.0 ppm. Seventy-four percent of the values are greater than 2 ppm and thirty-eight percent are greater than 5 ppm. Silver values of 5 ppm and greater outline a zone 50 meters wide, very similar to the gold values, however this zone terminates at the escarpment of the northeast pit wall. This zone is open to the west northwest. The $\geq$5 ppm zone coincides with the remaining remanants of quartz-breccia in the pit and broken pieces of quartz vein material.

K_2O/TiO_2

A ratio of K_2O/TiO_2 was used in an attempt to determine whether potash metasomatism had occurred in the vicinity of the ore body and whether the intensity and dispersion could guide future exploration activities. The assumption is made that only normal background levels of titanium would be present, consequently a ratio of K_2O/TiO_2 would result in a true expression of potash levels.

The plot of ratios on Map #2197-13 indicates that there is a wide variance in ratios from 4.3 to 25.3 throughout the pit. An apparent trend is established with low ratios $<$ 10 restricted to the northeast wall of the pit, to high ratios, $\geq$15, in the vicinity of the pit which contained the Dusty Mac ore body and which now contains remnants of quartz breccia.

There are two possible reasons accounting for the lower K_2O/TiO_2 ratios occurring along the northeast wall as versus the pit. Firstly, the northeast wall may represent detrital material eroded from the southwest and deposited into a shallow subsiding basin. This feature would account for the mineralized quartz pebbles imbedded in that wall. This being the case, this unit would temporarily post date the main Dusty Mac mineralizing event and escape potash metasomatism. Secondly, assuming that the Dusty Mac ore-body is not faulted but pinched to the northeast and represents a strata controlled ore system, the intensity of potash metasomatism may not have been significantly intense and could not permeate the overlying stratigraphic pile.

The highest ratios, greater than 20, occur in a crude linear zone trending N30^{o}W, coincident with the trend of quartz breccia remnants in the pit. The remaining values in the pit range from 12 to 20 and may be demonstrative of the alteration halo surrounding a mineralized quartz breccia.

Rubidium/Strontium

The Rubidium/Strontium ratios are plotted on Map #2197-14.

Rubidium strontium ratios vary considerably within the confines of the pit. Ratios vary from 0.14 near the northeast pit wall to 0.67 near a large mass of quartz breccia centrally located within the pit.

An obvious trend similar to the K_2O/TiO_2 ratio is apparent. Ratios along the northeast wall of the pit are generally quite low ranging from 0.14 to 0.27. Ratios throughout the remainder of the pit range from 0.30 to 0.67. The highest Rb/Sr ratios occur clustered in near proximity to a large ridge of quartz breccia centrally within the pit.

The Rb/Sr ratio of 0.45 and greater, identifies zones of mineralized quartz breccia in the pit. Areas such as the northeast escarpment, which may not have been subjected to hydrothermal alteration, have ratios of less than 0.30. This general rule could be useful in identifying additional zones of Dusty Mac type precious metal mineralization.

Grid Gold Lithoeochemistry

Lithogeochemistry sampling in the pit indicates that values for gold 50 ppb envelope the quartz breccia orebody. Using that parameter on a grid basis, 16 values fall within that category. Most elevated values are restricted to the upper lahar unit except in the area of L0+00S and L1+00S where anomalous gold values occur in the volcanic sandstone, agglomerate unit. Eight values ranging from 55 to 1370 ppb occur within the area of the pit and western zones reflecting a similar general pattern demonstrated by the soils. At least 10 values are directly attributed to areas of quartz veining or alteration while the remaining values are curiosities which can not be readily explained.

Sustained extensive gold anomalies do not exist, only general trends which minic previously determined trends from soil geochemistry for gold, silver, molybdenum and fluorine.

A single sample collected near the 'A' zone on L7+00N, 3+00W ran 65ppb reflecting gold mineralization known to exist there. One sample on L8+00N, 2+00W ran 55ppb. This sample was collected from an outcrop intensely altered with quartz, sericite and pyrite. One sample on L9+00N ran 500 ppb. This sample was collected from an exposure of upper lahar which appears unaltered although 75 meters to the northwest brecciated quartz veins occur and a small sericite altered patch occurs within meters to the southwest.

Two samples on L10+00N are anomalous in gold. At 3+00W the sample ran 295 ppb. This sample was collected from an outcrop of lahar (?) which carried broken quartz veins and probably reflects precious metal mineralization in that host. A second sample was collected at 0+50W from an altered exposure in the northwest zone. This sample ran 50 ppb. Assay sampling failed to detect any gold or silver values.

Three anomalous gold values occur within the volcanic sandstone, agglomerate unit. The samples on L1+00S and L0+00 run 90,365 and 709 ppb. The source of the anomalous gold geochemistry is unknown and further investigation is warranted.

Gold lithogeochemistry indicates that widesprad gold mineralization occurs in the vicinity of the pit and western zones. Structural complexities may be responsible for the weak responses in the area of the 'A' Zone and norwest zone. Large portions of the property remain untested southeast and northwest from the Dusty Mac pit due to extensive glacial drift. Geochemical trends suggest that favourable mineralized zones may exist beneath the glacial debris and should be tested for.

Grid Silver Geochemistry

The analysis of silver lithogeochem data from the pit indicated that silver values 2ppm reflect Dusty Mac style mineralization. Background is at or near the detection limit of 0.2 ppm.

The distribution of silver values on a grid scale is restricted. Only eight silver values are greater than 2ppm and of these, six values occur in the pit and western zone area. A distinct silver lithogeochem halo surrounds the pit and extends beyond to the northwest and southeast. This zone extends from L2+00N to L1+00S and appears to widen southeasterly toward the meadow.

The 'A' zone precious metal mineralization is identified by a single silver value of 13 ppm at L7+00N, 3+00W. Another single value of 4.6 ppm occurs at L9+00N, 2+50W near a patch of serictic altered rock and 75 meters southeast from an area of brecciated quartz veins. The two anomalous silver values correlate with high gold values, although the reverse is not true.

All anomalous silver values are restricted to the upper lahar unit. Most high values are related to intense alteration or quartz-carbonate veining. The three high gold geochem values in the volcanic sandstone, agglomerate area east of the pit do not carry high silver values.

Silver lithogeochemistry reflects a more direct correlation with Dusty Mac mineralization and could be used as a pathfinder element in further exploration.

Grid K_2O/TiO_2

The analysis of pit K_2O levels have determined that potash metasomatism is present in the pit area and apparently shrouds the quartz breccia orebody. Ratios of less than 10 are indicative of background potash levels while ratios greater than 15 are closely associated with precious metal mineralization.

On a grid scale, twenty-seven ratios are greater than 10 and ten ratios are greater than 15. All elevated ratios occur within the confines of the upper lahar unit and Marama dacite. Ratios 15 do not correspond to mapped areas of intense alteration except in the vicinity of the pit where three ratios of 15.8, 19.1 and 25.1 occur.

Five anomalous ratios occur in the general vicinity south and southwest of the northwest zone. The ratios range from 15.3 to 31.1 and conform to a linear zone trending 293°. Two values, 31.1 and 19.5, occur on L8+ooN, 2+00W and 1+50W respectively. These two samples represent seemingly unaltered Marama dacite. A single sample collected in dacite domain on L9+00N, 2+00W ran 20.5 . A one sample anomaly on L10+00N, 2+5-W ran 15.3 in an area underlain by lahar and/or lava carrying brecciated quartz veins. A one sample anomaly onL11+00N, 3+00W ran 21.3 in an area underlain by Marama dacite.

Two remaining high ratios occur in the southwestern portion of the grid, an area underlain by the upper lahar unit. One sample on L4+00S, 3+75W ran 17.3 and the second sample on L1+00S, 3+00W ran 16.9.

The significance of the spatial distribution of high K_2O ratios is unknown. In the vicinity of the pit, the ratios clearly demonstrate a close spatial relation with precious metal mineralization. Elsewhere on the grid this relationship remains to be determined.

Rubidium Strontium Ratios

From lithogeochem data gathered in the pit area, Rb/Sr ratios 0.45 define zones of precious metal mineralization. In the grid sampling program, four samples collected from an intensely altered area immediately adjoining the pit to the southwest ran 0.53 to 0.63 Rb/Sr.

Grid Rb/Sr ratios vary from 0.05 to 1.44. Twenty-one samples have ratios greather than 0.45, and all anomalous samples occur in areas underlain by the two lahar units independent of alteration boundaries.

Ten anomalous samples, 0.45 to 1.44, occur in an accurate area from L1+00S to L2+00N overlapping the western zone and facing the pit.

The northwest zone is defined by two anomalous Rb/Sr ratios 0.89 and 0.99. The brecciated quartz veins on L10+00N and L9+00N also have two elevated ratios of 0.98 and 1.15. An altered area on L8+00N, 2+00W ran 1.93. The above five anomalous ratios ascribe a circular zone surrounding an area underlain by Marama dacite.

The 'A' zone is defined by only one anomalous sample which ran 0.85.

A single sample on L4+00N, 3+00W near the road cut ran 0.90. One sample located at L8+00N, 4+50W in the adit area ran 0.68.

Two samples in the southwestern corner of the grid, one on L3+00S and L4+00S ran 0.68 and 1.54 respectively. Mapping indicates that the area is underlain by unaltered lahars, however, the elevated Rb/Sr ratios suggest that this area may have exploration potential.

Forty-six samples collected from terrain underlain by tuff breccia, and volcanic sandstone and agglomerate, resulted in background Rb/Sr ratios of 0.10 to 0.23. The elevated gold lithogeochem response on L1+00S and L0+00 is not reflected by higher Rb/Sr ratios.

A positive correlation between intensely altered areas and high (0.45) Rb/Sr ratios is apparent and a reasonably good correlation exists between the gold-silver lithogeochem and Rb/Sr ratios.

Walter W Melnyk

April 15, 1985

STATEMENT OF QUALIFICATION

I received my Bachelor of Science degree in Geological Engineering from the University of Saskatchewan, Saskatoon, in 1972. I have been permanently employed as an exploration geologist since 1974. I am a member of the Association of Professional Engineers of Ontario and British Columbia.

Walter D. Melnyk

Walter D. Melnyk

STATEMENT OF QUALIFICATION

I am a graduate of McGill University, with a Bachelor of Engineering Degree in Mining Engineering and Applied Geophysics and a Master of Science Degree in Applied Geophysics. I have been employed as an exploration geophysicist with Esso Minerals Canada for the last eight years.

Z.B. Doborzynski, APRIL 10, 1985

Zbigniew B. Doborzynski.

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APPENDIX A

APPENDIX A

GEOPHYSICAL SURVEYS

Introduction

Magnetometer and VLF-EM surveys were carried out. A total of 23 line-kilometers were surveyed by each method. Readings were taken at 25 meter intervals along lines spaced 100 meters apart.

The purpose of the magnetometer survey was to differentiate the geologic units found on the property. VLF-EM survey data was used to outline faults, shears or breaks to aid structural interpretation and provide exploration targets.

Equipment and Survey Procedures

1. Magnetometer Survey

A geometrics G816 portable proton precession magnetometer was used. This instrument measures the total magnetic field strength, by measuring the frequency at which protons (hydrogen atoms) precess about the axis of the earth's magnetic field. The magnetic field strength, which is directly proportional to the frequency, is digitally displayed.

Readings were taken at 25 meter intervals along the survey lines. To correct time variations of the magnetic field (diurnal), base stations were first established within the survey area. Readings were taken at these base stations at the beginning and end of each traverse. The difference in the readings at these base stations were linearly distributed over the other readings along the traverse.

The results of the survey have been contoured on Map 2197-21.

VLF-EM Survey

A GEONICS EM16 VLF receiver was used. The VLF (Very Low Frequency) EM method uses high powered radio transmitters set up in different parts of the world for military communications. These stations operate in the frequency range from 15 to 25 kilo-hertz (k Hz).

These VLF transmitters induce electric currents in conductive features which inturn produce secondary magnetic fields. These fields are detected by the VLF receiver as a distortion in the normal VLF field.

(Cont'd.....2)

The GEONICS EM16 measures the orientation or tilt angle of the VLF field at each point of measurement. The data can either be recorded in degrees of tilt or as the tangent of the angle in percent. The system also measures the "quadrature" component which is roughly equal to the ratio of the out of phase component of the vertical magnetic field to the horizontal primary VLF-EM field.

Ideally, the transmitter station should be located in line with the strike direction of the conductive features sought. Readings would be taken at right angles to the strike direction.

In the present survey, signals broadcast by stations located near Annapolis, Maryland and Seattle, Washington were measured. These stations operate at frequencies of 21.4 and 18.6 k Hz respectively.

The resulting data has been plotted as profiles on Maps 2197-22 and 2197-23. The tilt angle data has been Fraser filtered and the results contoured on Maps 2197-24 and 2197-25.

Discussion of Results

1. Magnetic Survey

In general, the residual magnetic field amplitudes vary in the range between -50 and 150 's. The strongest responses correlate with outcropping areas. This indicates that the magnetic susceptibility of the geologic units mapped on the property are low and therefore any trends are more likely to reflect the presence or absence of overburden cover rather a change in lithology.

In the vicinity of the pit, magnetic field strengths are near background. This deposit does not have any magnetic signature.

To the east, the series of magnetic highs extending from 200N to 1200N are due to the outcropping portions of the tuff-breccia unit along the top of the ridge. Downslope and to the west, the values are lower and erratic reflecting the talus cover on the slopes. At the base of the ridge the contact between the tuff-breccia and quartz porphyry lahar is not obvious; effectively both units are not magnetic.

West of the baseline between lines 500S and 700N, responses are again background. Very localised highs on line 100S and 100N at 500W and 450W respectively correlate with extensive outcrops of dacitic lavas.

The anomaly on line 400N at 450N indicates a localised magnetic feature having very short strike length and dip extent. This anomaly is caused by a small wedge of "blocky lahar" nested within dacitic lavas.

(Cont'd.....3)

A more extensive magnetic feature is found on lines 800N and 900N between 500W and 600W. This anomaly occurs within the blocky lahar unit but reflects local magnetic mineral enrichment, as most of the unit extending from 100N to 1200N is virtually non-magnetic.

The magnetically active area west of the baseline between lines 900N and 1300N has extensive outcrop of blocky feldspar lahar. The data suggests a series of narrow, parallel magnetic bands which correlate with small outcropping ridges of lahar separated by shallow infilled gullies.

2. VLF-EM Survey

Both the Seattle and Annapolis stations are located at acute angles to the general strike in the area, hence, responses are much weaker than would normally be the case. This is evident in the Annapolis tilt angle data (Map 2197-23) which did not detect the powerline but is seen in the Seattle data (Map 2197-22). This is because the Annapolis station is practically at right angles to the direction of the powerline.

The Fraser filtered data (Maps 2197-24 and 25) shows weak responses, reflecting the poor location of the two transmitter stations, and the absence of any strongly conductive features. The bulk of the anomalies can be explained as caused either by man-made or cultural sources. Only three zones are possibly due to bedrock conductors. These are identified as Zones 1 to 3 on both maps.

Zone 1 is located between lines 800N and 1100N from 300E to 450E. This anomaly is within the tuff-breccia unit and is located along the steepest portion of the ridge. The anomalous pattern is broad, suggesting a cultural source. However, anomalous Cu, Zn and Pb geochemical values along line 1000N are directly coincident with the strongest VLF responses indicating this area should be further investigated.

Zone 2 is roughly bounded by lines 700N and 1100N and the baseline and 300W. The VLF data has outlined a series of E-W and N-S conductive trends which appear to bracket a block of dacitic lava centered on line 900N at about 150W. A number of gold showings are identified in the vicinity of but not directly associated with the VLF-EM trends.

Zone 3 extends from line 500S to 0 at about 400W. This anomalous zone is immediately west of the contact between the blocky feldspar porphyry lahar and dacitic lavas and reflects the contact.

(Cont'd.....4)

Conclusions

The magnetic survey shows that there is little magnetic contrast between the various units. Where anomalous responses do occur, they are caused by outcropping bedrock. The few localised "highs" encountered in the survey correlate with the blocky lahar unit which appears to have been locally enriched in magnetic minerals.

The VLF-EM survey has outlined two areas that may deserve further investigation. Zone 1 is along a steep slope of tuff-breccia where Cu, Pb, and Zn geochemical anomalies were outlined. Zone 2 represents a series of N-S and E-W conductive trends possibly reflecting faults. Gold occurrences have been found in the vicinity of these trends.

The VLF-EM survey detected weak anomalies in the vicinity of the pit, however these appear to be man-made. No bedrock conductors have been outlined in the vicinity of the pit.

APRIL 10, 1985

Z.B. Doborzynski
Geophysicist

Doc. #0024C

APPENDIX B

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REPORT: 124-1538

FROM: ESSO MINERALS CANADA SUBMITTED BY: W. MELYNK
DATE: 23-JUL-84 PROJECT: 2197

ORDER	ELEMENT	LOWER DETECTION LIMIT	EXTRACTION	METHOD	SIZE FRACTION	SAMPLE TYPE	SAMPLE PREPARATIC
01	Ag	.2 PPM	HNO3-HCL HOT EXTR	Atomic Absorption	-100	ROCK OR BED ROCK	CRUSH,PULVERIZE -10C
02	Au	5 PPB	AQUA REGIA	Fire Assay AA	-100		
03	Rb	5 PPM		X-RAY Fluorescence	-100		
04	Sr	5 PPM		X-RAY Fluorescence	-100		

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MR. WALTER MELNYK

REMARKS: WHOLE ROCK ANALYSES ON 224-1538.

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REPORT: 124-1538

PROJECT: 2197 PAGE 1

SAMPLE NUMBER	Ag PPM	Au PPB	Rb PPM	Sr PPM	NOTE	SAMPLE NUMBER	Ag PPM	Au PPB	Rb PPM	Sr PPM	NOT
R 4DMR001	<0.2	<5	70	540		R 4DMR041	0.2	<5	260	380	
R 4DMR002	<0.2	<5	46	885		R 4DMR042	<0.2	<5	125	885	
R 4DMR003	<0.2	<5	165	1295		R 4DMR043	<0.2	<5	130	720	
R 4DMR004	<0.2	<5	190	505		R 4DMR044	<0.2	<5	120	680	
R 4DMR005	<0.2	<5	200	630		R 4DMR045	<0.2	<5	170	1215	
R 4DMR006	<0.2	<5	87	360		R 4DMR046	<0.2	<5	84	1560	
R 4DMR007	<0.2	15	150	840		R 4DMR047	<0.2	<5	175	1080	
R 4DMR008	<0.2	<5	110	425		R 4DMR048	13.0	65	315	370	
R 4DMR009	<0.2	<5	120	585		R 4DMR049	0.2	<5	64	1440	
R 4DMR010	<0.2	<5	100	570		R 4DMR050	0.5	<5	145	815	
R 4DMR011	<0.2	<5	93	470		R 4DMR051	<0.2	5	170	670	
R 4DMR012	0.5	55	280	315		R 4DMR052	<0.2	<5	160	520	
R 4DMR013	<0.2	15	330	355		R 4DMR053	<0.2	<5	135	390	
R 4DMR014	<0.2	<5	105	1600		R 4DMR054	<0.2	10	130	1625	
R 4DMR015	<0.2	<5	155	1300		R 4DMR055	<0.2	<5	145	1425	
R 4DMR016	0.6	75	250	215		R 4DMR056	<0.2	<5	105	735	
R 4DMR017	0.6	295	225	635		R 4DMR057	<0.2	<5	155	380	
R 4DMR018	<0.2	<5	140	755		R 4DMR058	<0.2	<5	87	935	
R 4DMR019	<0.2	<5	185	1400		R 4DMR059	<0.2	<5	115	670	
R 4DMR020	<0.2	<5	110	1110		R 4DMR060	<0.2	<5	93	1250	
R 4DMR021	<0.2	<5	125	485		R 4DMR061	<0.2	<5	160	580	
R 4DMR022	0.9	25	175	610		R 4DMR062	<0.2	<5	125	785	
R 4DMR023	<0.2	<5	180	980		R 4DMR063	0.6	15	215	770	
R 4DMR024	<0.2	<5	100	745		R 4DMR064	<0.2	<5	180	345	
R 4DMR025	<0.2	<5	120	425		R 4DMR065	<0.2	<5	120	770	
R 4DMR026	4.6	500	324	330		R 4DMR066	<0.2	5	145	845	
R 4DMR027	<0.2	<5	200	1440		R 4DMR067	<0.2	<5	140	565	
R 4DMR028	<0.2	<5	215	1315		R 4DMR068	<0.2	5	67	1220	
R 4DMR029	0.2	<5	185	820		R 4DMR069	<0.2	30	170	665	
R 4DMR030	<0.2	<5	140	1000		R 4DMR070	<0.2	<5	160	590	
R 4DMR031	<0.2	<5	46	780		R 4DMR071	<0.2	<5	88	380	
R 4DMR032	<0.2	<5	88	660		R 4DMR072	<0.2	<5	100	1115	
R 4DMR033	<0.2	<5	45	1220		R 4DMR073	<0.2	<5	150	780	
R 4DMR034	<0.2	<5	190	1545		R 4DMR074	<0.2	<5	135	345	
R 4DMR035	<0.2	<5	75	720		R 4DMR075	0.4	10	250	275	
R 4DMR036	<0.2	55	415	215		R 4DMR076	<0.2	<5	130	845	
R 4DMR037	<0.2	<5	190	900		R 4DMR077	<0.2	<5	185	655	
R 4DMR038	<0.2	5	130	1410		R 4DMR078	<0.2	<5	79	985	
R 4DMR039	<0.2	<5	165	1625		R 4DMR079	<0.2	5	120	675	
R 4DMR040	<0.2	<5	110	975		R 4DMR080	<0.2	<5	97	700	

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REPORT: 124-1538

PROJECT: 2197 PAGE 2

SAMPLE NUMBER	ELEMENT UNITS	Ag PPM	Au PPB	Rb PPM	Sr PPM	NOTE	SAMPLE NUMBER	ELEMENT UNITS	Ag PPM	Au PPB	Rb PPM	Sr PPM	NOT
R 4DMR081		<0.2	<5	155	930		R 4DMR121		3.2	<5	230	620	
R 4DMR082		<0.2	<5	155	670		R 4DMR122		<0.2	<5	180	600	
R 4DMR083		<0.2	<5	100	825		R 4DMR123		<0.2	<5	140	595	
R 4DMR084		<0.2	<5	85	390		R 4DMR124		<0.2	<5	165	985	
R 4DMR085		<0.2	<5	71	335		R 4DMR125		0.6	40	250	385	
R 4DMR086		<0.2	<5	100	1095		R 4DMR126		<0.2	<5	225	500	
R 4DMR087		<0.2	<5	125	625		R 4DMR127		<0.2	<5	<5	1310	
R 4DMR088		<0.2	<5	115	795		R 4DMR128		<0.2	<5	145	380	
R 4DMR089		<0.2	<5	140	430		R 4DMR129		<0.2	<5	88	430	
R 4DMR090		2.2	25	155	245		R 4DMR130		<0.2	<5	76	270	
R 4DMR091		0.8	445	300	355		R 4DMR131		<0.2	<5	80	220	
R 4DMR092		<0.2	<5	160	490		R 4DMR132		0.2	15	225	525	
R 4DMR093		<0.2	<5	120	1055		R 4DMR133		<0.2	<5	245	940	
R 4DMR094		0.7	45	310	215		R 4DMR134		<0.2	<5	100	1100	
R 4DMR095		<0.2	<5	53	535		R 4DMR135		<0.2	<5	110	785	
R 4DMR096		<0.2	<5	74	380		R 4DMR136		<0.2	<5	125	865	
R 4DMR097		<0.2	<5	67	380		R 4DMR137		<0.2	<5	150	480	
R 4DMR098		<0.2	<5	180	435		R 4DMR138		<0.2	<5	70	420	
R 4DMR099		<0.2	<5	125	390		R 4DMR139		<0.2	<5	81	475	
R 4DMR100		0.7	35	310	565		R 4DMR140		<0.2	<5	100	465	
R 4DMR101		<0.2	<5	55	1095								
R 4DMR102		<0.2	70	245	360								
R 4DMR103		<0.2	<5	82	850								
R 4DMR104		<0.2	<5	135	875								
R 4DMR105		<0.2	<5	57	540								
R 4DMR106		<0.2	10	140	570								
R 4DMR107		<0.2	<5	62	475								
R 4DMR108		<0.2	<5	110	580								
R 4DMR109		<0.2	<5	155	525								
R 4DMR110		1.2	20	360	630								
R 4DMR111		<0.2	10	130	1000								
R 4DMR112		0.2	20	175	655								
R 4DMR113		<0.2	<5	300	475								
R 4DMR114		<0.2	<5	<5	1625								
R 4DMR115		<0.2	<5	61	1045								
R 4DMR116		0.8	70	190	260								
R 4DMR117		5.6	190	255	220								
R 4DMR118		<0.2	<5	160	495								
R 4DMR119		<0.2	<5	65	310								
R 4DMR120		<0.2	<5	71	335								

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REPORT: 124-1966

PROJECT: 2197 PAGE 1

SAMPLE NUMBER	ELEMENT UNITS	Ag PPM	Au PPB	Rb PPM	Sr PPM	NOTE
R 4DMR-141		0.2	5	130	1165	
R 4DMR-142		<0.2	<5	130	495	
R 4DMR-143		2.6	110	130	595	
R 4DMR-144		0.2	5	155	480	
R 4DMR-145		<0.2	<5	260	380	
R 4DMR-146		<0.2	<5	155	485	
R 4DMR-147		<0.2	<5	83	535	
R 4DMR-148		<0.2	<5	87	380	
R 4DMR-149		<0.2	<5	61	335	
R 4DMR-150		<0.2	10	370	240	
R 4DMR-151		0.2	10	155	925	
R 4DMR-152		<0.2	<5	130	920	
R 4DMR-153		0.4	<5	140	1260	
R 4DMR-154		<0.2	<5	165	1075	
R 4DMR-155		<0.2	<5	125	1300	
R 4DMR-156		<0.2	<5	140	775	
R 4DMR-157		<0.2	<5	115	890	
R 4DMR-158		<0.2	<5	110	730	
R 4DMR-159		<0.2	<5	105	1090	
R 4DMR-160		<0.2	<5	120	890	
R 4DMR-161		<0.2	10	125	920	
R 4DMR-162		<0.2	<5	105	970	
R 4DMR-163		<0.2	15	135	805	
R 4DMR-164		2.8	155	130	1160	
R 4DMR-165		1.1	55	125	1055	
R 4DMR-166		0.7	30	130	1090	
R 4DMR-167		1.3	90	105	1020	
R 4DMR-168		0.8	20	130	745	
R 4DMR-169		0.9	365	120	685	
R 4DMR-170		0.3	25	145	570	
R 4DMR-171		<0.2	5	110	710	
R 4DMR-172		<0.2	5	130	1010	
R 4DMR-173		<0.2	<5	120	765	
R 4DMR-174		<0.2	<5	135	655	
R 4DMR-175		<0.2	10	135	960	
R 4DMR-176		2.1	20	265	715	
R 4DMR-177		<0.2	10	115	835	
R 4DMR-178		<0.2	10	140	890	
R 4DMR-179		<0.2	10	110	940	
R 4DMR-180		0.2	<5	120	850	
R 4DMR-181		0.2	<5	130	900	
R 4DMR-182		<0.2	<5	125	1105	
R 4DMR-183		<0.2	<5	145	660	
R 4DMR-184		<0.2	<5	125	705	
R 4DMR-185		<0.2	790	145	780	
R 4DMR-186		0.4	<5	260	495	
R 4DMR-187		3.8	80	295	550	
R 4DMR-188		1.3	15	175	945	
R 4DMR-189		<0.2	<5	110	1100	
R 4DMR-190		<0.2	15	145	945	
R 4DMR-191		<0.2	<5	135	970	
R 4DMR-192		<0.2	<5	135	850	
R 4DMR-193		<0.2	<5	105	860	
R 4DMR-194		<0.2	<5	120	1100	
R 4DMR-195		<0.2	<5	110	950	
R 4DMR-196		<0.2	25	130	965	
R 4DMR-197		<0.2	5	135	790	
R 4DMR-198		<0.2	<5	145	820	
R 4DMR-199		<0.2	<5	130	740	
R 4DMR-200		<0.2	<5	150	625	
R 4DMR-201		<0.2	15	170	910	
R 4DMR-202		<0.2	<5	125	675	
R 4DMR-203		<0.2	15	130	565	
R 4DMR-204		<0.2	5	120	655	
R 4DMR-205		<0.2	<5	120	730	
R 4DMR-206		<0.2	<5	110	1095	
R 4DMR-207		<0.2	<5	140	970	
R 4DMR-208		<0.2	<5	115	925	
R 4DMR-209		<0.2	<5	125	685	
R 4DMR-210		<0.2	<5	125	770	
R 4DMR-211		0.4	10	165	975	
R 4DMR-212		1.0	195	155	945	
R 4DMR-213		0.9	255	160	960	
R 4DMR-214		1.6	150	165	1195	
R 4DMR-215		44.0	2070	190	710	
R 4DMR-216		3.5	140	190	350	
R 4DMR-217		1.9	15	190	665	
R 4DMR-218		4.2	80	250	480	
R 4DMR-219		4.6	125	320	795	
R 4DMR-220		1.8	45	155	1110	

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SAMPLE NUMBER	ELEMENT UNITS	Ag PPM	Au PPB	Rb PPM	Sr PPM	NOTES
R 4DMR-221		1.2	45	140	955	
R 4DMR-222		2.8	15	315	665	
R 4DMR-223		5.8	215	255	725	
R 4DMR-224		2.4	115	280	855	
R 4DMR-225		4.2	20	285	705	
R 4DMR-226		10.0	110	350	610	
R 4DMR-227		6.6	1050	210	720	
R 4DMR-228		2.0	55	220	850	
R 4DMR-229		17.0	<200	225	550	
R 4DMR-230		8.6	50	285	935	
R 4DMR-231		0.6	15	280	870	
R 4DMR-232		2.3	25	305	990	
R 4DMR-233		7.0	55	265	570	
R 4DMR-234		3.3	55	240	565	
R 4DMR-235		2.6	30	235	715	
R 4DMR-236		8.0	155	300	645	
R 4DMR-237		2.0	25	245	625	
R 4DMR-238		0.7	10	175	990	
R 4DMR-239		5.0	85	305	545	
R 4DMR-240		1.2	40	270	555	
R 4DMR-241		37.0	2990	58	135	
R 4DMR-242		2.6	40	305	530	
R 4DMR-243		32.0	5630	220	320	
R 4DMR-244		4.7	225	260	795	
R 4DMR-245		8.6	30	270	665	
R 4DMR-246		11.0	55	280	655	
R 4DMR-247		> 50.0	> 10000	80	175	
R 4DMR-248		9.6	345	310	515	
R 4DMR-249		2.8	50	310	675	
R 4DMR-250		5.8	700	190	445	

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REPORT: 124-2290

PROJECT: 2197

PAGE 1

SAMPLE NUMBER	ELEMENT UNITS	Ag PPM	Au PPB	Rb PPM	Sr PPM
R 4DRR 251		1.3	1370	260	300
R 4DRR 252		0.4	10	200	350

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REPORT: 224-1538

FROM: ESSO MINERALS CANADA SUBMITTED BY: W. MELNYK
DATE: 23-JUL-84 PROJECT: 2197

ORDER	ELEMENT	LOWER DETECTION LIMIT	EXTRACTION	METHOD	SIZE FRACTION	SAMPLE TYPE	SAMPLE PREPARATIO
01	Al2O3	.01 PCT	MULT ACID TOT DIG	D.C. Plasma	-100	ROCK OR BED ROCK	AS RECEIVED, NO SP
02	CaO	.01 PCT	MULT ACID TOT DIG	D.C. Plasma	-100		
03	Fe2O3*	.01 PCT	MULT ACID TOT DIG	D.C. Plasma	-100		
04	K2O	.01 PCT	MULT ACID TOT DIG	D.C. Plasma	-100		
05	LOI	.01 PCT		Gravimetric	-100		
06	MGO	.01 PCT	MULT ACID TOT DIG	D.C. Plasma	-100		
07	MNO	.01 PCT	MULT ACID TOT DIG	D.C. Plasma	-100		
08	Na2O	.01 PCT	MULT ACID TOT DIG	D.C. Plasma	-100		
09	P2O5	.01 PCT	MULT ACID TOT DIG	D.C. Plasma	-100		
10	SiO2	.01 PCT	MULT ACID TOT DIG	D.C. Plasma	-100		
11	TiO2	.01 PCT	MULT ACID TOT DIG	D.C. Plasma	-100		

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MR. WALTER MELNYK

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PROJECT: 2197 PAGE 1

SAMPLE NUMBER	ELEMENT UNITS	Al2O3 PCT	CaO PCT	Fe2O3* PCT	K2O PCT	LOI PCT	MGO PCT	MNO PCT	Na2O PCT	P2O5 PCT	SiO2 PCT	TiO2 PCT	NOTES
R 4DMR001		14.80	1.90	2.90	3.80	3.56	0.60	0.03	4.10	0.20	67.50	0.40	
R 4DMR002		14.80	0.70	2.06	1.90	1.99	0.55	0.04	5.70	0.15	71.50	0.30	
R 4DMR003		18.40	4.00	6.30	9.50	4.32	2.20	0.14	4.40	0.60	55.00	0.85	
R 4DMR004		16.10	1.50	4.40	5.60	3.44	1.80	0.14	3.70	0.35	62.50	0.55	
R 4DMR005		16.50	2.70	7.25	5.60	4.04	2.35	0.13	3.40	0.75	56.80	0.90	
R 4DMR006		13.50	0.40	2.10	3.20	2.34	0.25	0.03	3.90	0.15	72.50	0.15	
R 4DMR007		16.50	3.50	6.60	5.30	4.78	3.05	0.17	3.00	0.60	56.35	0.90	
R 4DMR008		12.80	0.85	2.15	2.90	2.66	0.80	0.05	3.80	0.15	73.00	0.35	
R 4DMR009		14.90	0.90	2.80	3.10	2.87	1.05	0.05	4.80	0.15	68.70	0.40	
R 4DMR010		14.80	1.75	3.95	3.50	4.05	1.60	0.06	4.40	0.30	65.40	0.45	
R 4DMR011		15.30	2.00	3.65	3.70	3.56	1.45	0.06	4.70	0.25	64.95	0.50	
R 4DMR012		11.80	0.50	3.95	8.20	2.32	2.10	0.06	0.40	0.40	68.40	0.60	
R 4DMR013		14.10	1.00	5.80	8.90	3.34	1.60	0.06	0.30	0.80	64.00	0.70	
R 4DMR014		19.10	3.25	4.80	4.90	2.38	2.10	0.15	4.60	0.45	58.00	0.70	
R 4DMR015		18.80	2.35	4.40	5.00	2.86	2.05	0.12	5.30	0.35	58.00	0.65	
R 4DMR016		9.30	0.30	3.15	6.90	2.41	0.22	0.03	0.20	0.35	75.50	0.45	
R 4DMR017		14.50	1.40	8.10	7.80	3.57	3.25	0.20	0.30	0.80	61.20	0.85	
R 4DMR018		15.40	2.40	4.10	3.60	3.23	1.40	0.16	4.50	0.26	65.00	0.50	
R 4DMR019		18.30	2.50	4.90	6.40	3.54	1.90	0.13	4.40	0.42	56.50	0.75	
R 4DMR020		14.70	3.50	6.40	3.30	4.03	2.50	0.09	4.50	0.57	60.00	0.85	
R 4DMR021		16.80	1.50	4.50	2.60	3.03	2.20	0.06	5.20	0.23	63.00	0.55	
R 4DMR022		15.00	1.60	4.20	6.60	3.28	2.10	0.06	3.30	0.37	65.50	0.65	
R 4DMR023		18.10	2.40	5.40	5.70	3.52	2.30	0.08	4.80	0.56	57.00	0.75	
R 4DMR024		15.50	2.35	4.10	3.80	3.80	2.80	0.07	4.30	0.38	61.00	0.50	
R 4DMR025		14.90	0.70	2.40	4.10	1.63	0.70	0.05	4.80	0.12	71.00	0.20	
R 4DMR026		12.80	0.60	4.90	9.00	2.06	0.60	0.03	0.30	0.48	69.00	0.75	
R 4DMR027		18.00	2.30	4.20	6.20	2.86	1.10	0.07	4.00	0.37	61.00	0.65	
R 4DMR028		18.00	2.90	4.70	7.10	2.63	2.20	0.14	3.70	0.47	56.50	0.71	
R 4DMR029		16.60	2.00	5.20	5.30	3.84	2.60	0.11	4.30	0.45	61.00	0.80	
R 4DMR030		17.00	2.70	4.70	6.10	3.00	2.90	0.11	4.60	0.47	57.00	0.80	
R 4DMR031		14.80	1.20	3.50	1.80	1.93	1.10	0.05	5.90	0.23	70.00	0.50	
R 4DMR032		15.40	1.10	3.00	3.90	2.24	0.90	0.06	5.10	0.23	70.50	0.45	
R 4DMR033		15.00	1.60	3.40	2.60	1.79	1.20	0.04	5.70	0.26	68.00	0.50	
R 4DMR034		18.10	2.30	4.30	5.90	3.57	1.70	0.09	4.80	0.54	58.00	0.80	
R 4DMR035		13.80	0.40	2.10	3.90	1.50	0.80	0.04	4.80	0.11	73.00	0.20	
R 4DMR036		12.60	0.30	1.50	10.90	1.51	0.40	0.02	0.40	0.13	71.50	0.35	
R 4DMR037		17.60	2.00	5.50	5.80	3.70	2.10	0.10	3.90	0.41	58.50	0.70	
R 4DMR038		18.10	2.70	4.70	5.50	1.70	1.10	0.08	5.00	0.35	60.50	0.65	
R 4DMR039		19.20	3.10	4.50	6.60	2.33	2.10	0.13	4.40	0.47	55.50	0.70	
R 4DMR040		15.20	1.60	5.10	4.30	3.25	2.30	0.06	4.30	0.40	63.00	0.75	

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SAMPLE NUMBER	ELEMENT UNITS	Al2O3 PCT	CaO PCT	Fe2O3* PCT	K2O PCT	LOI PCT	MGO PCT	MNO PCT	Na2O PCT	P2O5 PCT	SiO2 PCT	TiO2 PCT	NOTES
R 4DMR041		13.10	1.80	5.50	5.60	2.67	2.00	0.08	0.30	0.56	65.50	0.80	
R 4DMR042		14.70	2.00	6.00	4.00	3.74	3.80	0.09	3.20	0.61	65.00	0.90	
R 4DMR043		14.60	1.10	4.30	3.90	2.34	1.60	0.07	4.10	0.44	67.00	0.55	
R 4DMR044		16.00	1.90	3.90	3.80	2.62	1.40	0.07	4.30	0.37	65.00	0.60	
R 4DMR045		17.70	2.00	5.60	6.00	3.30	2.20	0.08	3.50	0.54	58.50	0.80	
R 4DMR046		16.10	2.90	6.90	3.80	4.34	3.10	0.10	3.50	0.54	57.50	0.90	
R 4DMR047		17.50	3.50	6.20	5.70	2.96	2.60	0.12	3.10	0.70	57.00	0.80	
R 4DMR048		13.30	1.10	4.70	8.20	2.01	2.00	0.07	0.30	0.40	67.50	0.65	
R 4DMR049		16.70	4.50	8.50	3.40	2.67	3.50	0.15	3.90	0.94	54.50	1.00	
R 4DMR050		15.10	2.00	6.80	4.90	3.06	2.80	0.07	3.10	0.66	60.50	1.00	
R 4DMR051		14.00	2.50	7.40	5.70	3.84	3.40	0.11	1.80	0.64	60.00	0.95	
R 4DMR052		13.80	1.10	4.60	4.60	2.82	1.60	0.06	3.00	0.35	67.50	0.60	
R 4DMR053		15.50	1.70	6.60	3.60	3.65	2.10	0.09	3.20	0.82	62.50	0.75	
R 4DMR054		17.70	3.00	6.20	5.50	2.99	2.00	0.10	3.70	0.68	57.50	0.85	
R 4DMR055		17.80	2.20	5.40	5.70	2.69	1.60	0.07	3.60	0.56	60.00	0.75	
R 4DMR056		15.10	1.20	5.00	3.30	6.32	2.40	0.08	4.30	0.41	62.00	0.60	
R 4DMR057		13.50	4.20	6.40	3.60	7.39	3.30	0.11	1.90	0.54	58.50	0.80	
R 4DMR058		16.30	4.60	7.20	4.00	3.99	3.90	0.12	3.00	0.69	55.50	1.00	
R 4DMR059		13.80	5.70	6.80	3.80	6.42	4.20	0.13	2.70	0.60	55.50	0.35	
R 4DMR060		15.20	1.50	3.70	3.50	2.50	1.40	0.06	4.60	0.28	66.50	0.50	
R 4DMR061		14.00	1.40	5.80	4.20	3.63	2.20	0.07	3.00	0.52	67.00	0.75	
R 4DMR062		14.90	1.30	4.10	3.80	3.42	1.80	0.07	3.20	0.45	66.00	0.65	
R 4DMR063		10.80	2.40	4.80	5.70	4.44	3.00	0.08	0.20	0.52	67.50	0.65	
R 4DMR064		12.20	1.30	5.20	4.20	3.99	2.20	0.07	1.10	0.41	69.00	0.65	
R 4DMR065		15.00	2.40	5.60	4.60	4.50	2.70	0.09	3.30	0.48	60.50	0.65	
R 4DMR066		14.20	3.50	6.40	3.30	3.56	3.20	0.09	3.40	0.67	61.00	0.85	
R 4DMR067		15.00	3.60	6.70	4.80	5.60	4.25	0.12	2.00	0.59	56.50	0.95	
R 4DMR068		14.00	1.90	4.70	2.10	2.95	2.15	0.07	4.70	0.30	66.00	0.60	
R 4DMR069		13.90	1.30	4.90	4.00	2.89	1.70	0.06	3.00	0.33	67.50	0.65	
R 4DMR070		13.90	1.60	2.90	3.40	2.99	0.90	0.05	3.70	0.26	69.50	0.40	
R 4DMR071		15.20	0.50	3.10	3.30	2.04	0.50	0.04	4.70	0.20	70.00	0.35	
R 4DMR072		15.90	2.20	6.40	4.00	3.59	2.70	0.16	3.80	0.68	59.50	0.90	
R 4DMR073		15.30	4.50	6.70	4.50	5.90	3.30	0.11	3.50	0.62	55.50	0.85	
R 4DMR074		12.50	1.60	6.90	3.50	4.89	2.90	0.11	1.70	0.49	65.00	0.70	
R 4DMR075		10.00	1.80	6.60	5.20	5.87	1.80	0.03	0.20	0.22	68.00	0.60	
R 4DMR076		14.10	4.30	5.60	4.20	4.74	3.80	0.09	2.80	0.46	59.50	0.85	
R 4DMR077		14.60	4.00	5.70	6.10	4.69	2.80	0.09	1.70	0.47	60.00	0.80	
R 4DMR078		13.50	1.20	4.30	2.70	2.42	1.40	0.05	4.10	0.32	69.50	0.60	
R 4DMR079		14.20	2.80	5.20	3.40	4.46	2.80	0.08	3.80	0.52	62.00	0.80	
R 4DMR080		13.90	0.90	5.30	3.30	2.35	1.40	0.04	4.00	0.32	68.00	0.55	

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SAMPLE NUMBER	ELEMENT UNITS	Al2O3 PCT	CaO PCT	Fe2O3* PCT	K2O PCT	LOI PCT	MGO PCT	MNO PCT	Na2O PCT	P2O5 PCT	SiO2 PCT	TiO2 PCT	NOTES
R 4DMR081		16.40	3.30	5.60	4.70	3.86	2.00	0.11	4.60	0.55	58.50	0.80	
R 4DMR082		13.50	1.60	5.00	4.80	2.78	2.90	0.11	2.90	0.52	65.00	0.75	
R 4DMR083		16.00	2.60	6.00	3.50	4.83	3.30	0.08	4.00	0.39	58.50	0.70	
R 4DMR084		13.90	0.70	3.20	3.60	2.64	1.10	0.12	3.80	0.22	70.50	0.45	
R 4DMR085		14.20	1.60	3.10	3.50	6.04	1.10	0.06	4.00	0.24	66.00	0.45	
R 4DMR086		15.00	2.60	6.10	4.10	4.52	4.60	0.14	3.00	0.57	58.50	0.85	
R 4DMR087		15.20	2.00	5.70	3.70	3.83	3.00	0.08	3.30	0.55	61.50	0.85	
R 4DMR088		14.60	4.50	3.90	3.70	5.38	2.40	0.10	4.10	0.47	61.00	0.70	
R 4DMR089		14.70	1.00	3.90	4.40	3.90	1.70	0.04	3.20	0.39	65.50	0.65	
R 4DMR090		7.50	0.10	3.00	5.00	1.72	0.30	0.02	0.30	0.08	81.00	0.35	
R 4DMR091		11.30	0.70	4.30	6.60	2.74	2.80	0.06	0.20	0.48	71.00	0.60	
R 4DMR092		13.50	1.50	5.30	3.80	4.57	2.20	0.07	2.90	0.51	65.00	0.70	
R 4DMR093		13.60	0.70	4.00	4.10	2.79	1.70	0.07	3.90	0.29	69.00	0.50	
R 4DMR094		12.20	0.50	1.80	8.20	2.17	0.65	0.03	0.20	0.27	73.00	0.60	
R 4DMR095		15.70	2.80	3.70	2.10	2.92	1.30	0.05	5.70	0.23	64.50	0.50	
R 4DMR096		14.60	1.30	3.20	4.00	1.59	0.90	0.06	4.50	0.26	69.50	0.45	
R 4DMR097		13.90	1.70	3.30	3.80	2.08	1.00	0.07	4.20	0.25	69.50	0.45	
R 4DMR098		14.40	1.50	4.60	4.40	3.28	1.80	0.05	2.70	0.44	66.00	0.65	
R 4DMR099		15.70	2.30	3.30	3.10	4.22	0.90	0.05	4.10	0.18	66.00	0.40	
R 4DMR100		16.40	0.10	2.80	10.50	3.75	0.40	0.03	2.70	0.30	62.50	0.55	
R 4DMR101		13.80	0.60	2.80	2.40	1.38	0.90	0.04	5.20	0.15	72.50	0.35	
R 4DMR102		11.70	1.00	4.40	6.40	2.79	1.80	0.06	0.60	0.46	69.50	0.60	
R 4DMR103		15.00	2.30	5.50	3.80	3.69	2.60	0.08	3.70	0.41	62.50	0.75	
R 4DMR104		15.60	1.40	5.20	4.60	3.00	2.70	0.09	4.10	0.49	62.00	0.70	
R 4DMR105		14.00	2.30	3.60	3.30	2.55	1.00	0.05	4.30	0.40	68.50	0.45	
R 4DMR106		13.10	2.90	4.10	4.20	3.49	1.80	0.09	3.20	0.36	63.00	0.60	
R 4DMR107		13.70	3.00	3.30	3.30	2.96	1.00	0.04	4.70	0.21	67.50	0.45	
R 4DMR108		13.10	1.00	4.70	3.60	3.08	2.30	0.07	3.30	0.44	67.50	0.65	
R 4DMR109		14.20	1.30	3.90	4.50	2.94	1.50	0.05	3.40	0.37	67.50	0.60	
R 4DMR110		16.10	0.20	2.90	11.30	1.72	0.50	0.03	2.20	0.30	64.00	0.45	
R 4DMR111		17.20	1.70	5.40	5.60	2.97	2.30	0.10	3.60	0.56	60.00	0.85	
R 4DMR112		14.70	0.90	4.60	5.00	2.90	2.10	0.09	2.80	0.49	66.00	0.80	
R 4DMR113		16.30	1.70	5.60	9.30	3.25	2.40	0.14	0.90	0.59	59.00	0.75	
R 4DMR114		16.00	3.80	5.00	0.30	3.79	2.00	0.15	6.10	0.49	62.00	0.65	
R 4DMR115		14.10	1.20	3.60	2.40	2.60	1.50	0.05	4.90	0.20	69.00	0.45	
R 4DMR116		10.20	0.30	3.80	7.00	2.80	1.10	0.02	0.30	0.45	73.00	0.55	
R 4DMR117		11.60	0.30	5.10	7.80	3.60	1.50	0.02	0.20	0.55	68.50	0.60	
R 4DMR118		14.10	0.70	3.80	4.50	2.58	1.60	0.05	3.30	0.29	68.50	0.65	
R 4DMR119		14.10	1.80	2.70	4.00	2.90	0.40	0.08	4.00	0.16	70.00	0.45	
R 4DMR120		13.70	0.60	2.70	4.10	3.34	0.30	0.04	3.50	0.26	70.50	0.45	

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R 4DMR121		13.60	4.30	4.60	6.70	4.97	2.80	0.09	1.90	0.49	60.00	0.80	
R 4DMR122		14.10	1.50	5.10	5.00	2.86	2.30	0.09	3.10	0.45	65.00	0.75	
R 4DMR123		14.40	1.60	6.80	4.70	3.74	4.00	0.10	3.10	0.63	60.00	0.85	
R 4DMR124		14.40	2.80	4.90	5.00	3.75	2.50	0.09	3.50	0.53	61.00	0.75	
R 4DMR125		8.70	1.90	4.60	5.90	2.97	0.90	0.05	0.20	0.33	74.00	0.35	
R 4DMR126		14.70	2.40	6.20	6.50	4.04	4.30	0.10	1.70	0.66	59.00	1.00	
R 4DMR127		15.20	1.60	5.30	<0.10	2.13	2.50	0.08	6.00	0.56	66.00	0.75	
R 4DMR128		14.10	0.60	3.70	4.50	2.36	1.60	0.04	3.50	0.32	59.00	0.60	
R 4DMR129		13.70	0.90	2.70	3.80	2.11	0.80	0.04	3.90	0.16	71.50	0.40	
R 4DMR130		13.00	1.80	2.60	3.30	3.48	0.50	0.04	3.10	0.21	72.50	0.40	
R 4DMR131		13.80	0.30	2.90	4.20	2.79	0.30	0.03	3.20	0.21	72.50	0.40	
R 4DMR132		13.90	0.60	4.50	5.60	3.20	1.90	0.06	2.10	0.44	67.00	0.75	
R 4DMR133		14.40	2.70	5.70	5.60	4.50	3.20	0.15	1.70	0.63	61.00	0.80	
R 4DMR134		16.30	1.60	5.70	3.30	2.77	1.60	0.07	5.00	0.47	63.00	0.60	
R 4DMR135		15.20	2.60	6.50	4.50	4.49	4.50	0.10	3.50	0.62	58.00	1.00	
R 4DMR136		14.60	2.40	6.60	4.40	3.97	4.60	0.10	3.60	0.53	58.50	0.90	
R 4DMR137		13.50	5.50	6.70	4.60	7.17	3.60	0.19	2.20	0.53	55.00	0.95	
R 4DMR138		13.80	0.60	3.20	3.40	2.97	0.40	0.04	3.60	0.25	71.50	0.45	
R 4DMR139		13.70	0.30	2.60	4.00	2.09	0.30	0.03	3.70	0.23	72.50	0.40	
R 4DMR140		9.40	0.90	2.20	2.80	2.95	0.50	0.03	1.50	0.16	79.00	0.30	

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SAMPLE NUMBER	ELEMENT UNITS	Al2O3 PCT	CaO PCT	Fe2O3A PCT	K2O PCT	LOI PCT	MGO PCT	MNO PCT	Na2O PCT	P2O5 PCT	SiO2 PCT	TiO2 PCT	NOTES
R 4DMR-141		16.40	2.00	5.00	5.20	3.75	2.10	0.09	4.20	0.55	59.50	0.75	
R 4DMR-142		13.70	3.00	8.90	4.10	4.70	2.50	0.11	2.00	0.80	59.50	0.75	
R 4DMR-143		13.70	1.60	6.20	4.20	3.80	2.20	0.08	2.80	0.55	62.50	0.75	
R 4DMR-144		12.40	1.50	5.10	4.40	4.55	1.80	0.05	1.90	0.40	65.00	0.70	
R 4DMR-145		13.30	2.65	4.40	7.40	4.25	1.85	0.07	0.40	0.45	64.00	0.60	
R 4DMR-146		13.80	2.95	5.90	5.40	5.30	4.10	0.11	1.65	0.50	59.50	0.95	
R 4DMR-147		12.90	0.20	2.60	3.30	2.70	0.20	0.02	3.10	0.20	72.50	0.40	
R 4DMR-148		13.00	0.60	2.10	3.80	3.25	0.35	0.02	3.90	0.20	72.00	0.45	
R 4DMR-149		13.00	1.95	3.10	2.90	3.70	0.35	0.05	4.30	0.20	69.00	0.40	
R 4DMR-150		14.10	0.55	4.10	9.50	2.35	1.20	0.04	0.20	0.35	66.50	0.55	
R 4DMR-151		17.80	1.10	5.10	6.20	3.30	1.70	0.08	4.10	0.50	60.00	0.80	
R 4DMR-152		16.00	1.90	5.00	5.20	4.70	0.80	0.05	4.20	0.55	60.50	0.70	
R 4DMR-153		17.60	2.20	5.00	5.70	3.60	2.20	0.10	3.80	0.60	57.00	0.80	
R 4DMR-154		17.30	1.90	4.30	7.30	2.95	1.40	0.09	4.00	0.40	59.50	0.60	
R 4DMR-155		17.50	2.80	5.00	5.30	3.95	2.10	0.10	4.50	0.50	57.00	0.65	
R 4DMR-156		15.60	1.60	5.30	5.20	3.70	2.00	0.06	4.30	0.60	60.50	0.85	
R 4DMR-157		16.50	1.50	5.60	5.10	3.35	2.60	0.06	4.30	0.65	59.50	0.85	
R 4DMR-158		15.90	1.10	5.70	4.60	3.35	2.40	0.06	4.00	0.50	61.00	0.80	
R 4DMR-159		14.50	3.40	5.60	4.40	5.50	1.30	0.08	2.80	0.50	58.50	0.75	
R 4DMR-160		14.70	3.40	5.10	4.70	5.65	0.95	0.06	3.30	0.50	60.00	0.80	
R 4DMR-161		14.00	3.80	4.80	5.10	6.10	0.75	0.06	3.30	0.50	59.00	0.65	
R 4DMR-162		14.50	4.00	5.30	4.70	7.05	1.00	0.08	3.50	0.50	58.00	0.70	
R 4DMR-163		15.20	2.80	5.40	5.20	4.65	2.20	0.07	3.40	0.55	60.00	0.80	
R 4DMR-164		16.00	2.70	5.50	5.70	3.25	2.00	0.10	4.40	0.50	59.00	0.75	
R 4DMR-165		15.90	2.50	4.30	5.70	4.05	1.65	0.09	4.30	0.40	[illegible]	0.65	
R 4DMR-166		17.90	1.90	5.70	5.90	2.40	2.10	0.10	4.20	0.55	57.50	0.75	
R 4DMR-167		15.40	2.50	4.30	4.70	3.85	2.00	0.07	4.70	0.50	61.00	0.75	
R 4DMR-168		15.70	1.20	5.20	5.20	2.80	1.70	[illegible]	4.80	0.50	62.00	0.70	
R 4DMR-169		15.30	2.70	5.10	5.10	4.55	2.50	0.08	3.60	0.50	59.00	0.70	
R 4DMR-170		14.70	2.10	4.40	5.00	3.75	1.80	0.05	2.75	0.50	60.50	0.55	
R 4DMR-171		14.80	1.30	4.30	4.60	3.50	1.70	0.06	3.70	0.40	64.50	0.60	
R 4DMR-172		15.90	2.20	5.50	5.50	3.90	2.40	0.07	4.10	0.60	57.50	0.85	
R 4DMR-173		15.30	1.60	5.40	4.90	2.65	2.30	0.05	3.90	0.50	60.00	0.75	
R 4DMR-174		16.00	1.90	4.50	4.80	2.25	2.00	0.20	4.10	0.50	59.50	0.75	
R 4DMR-175		16.00	4.00	5.00	4.90	5.20	2.00	0.13	4.20	0.60	55.00	0.80	
R 4DMR-176		14.20	1.50	2.20	8.10	2.65	0.75	0.04	1.80	0.12	67.00	0.55	
R 4DMR-177		15.30	3.00	5.40	4.40	4.15	2.20	0.06	4.30	0.50	59.00	0.75	
R 4DMR-178		16.20	3.70	5.50	5.00	4.80	2.30	0.08	2.90	0.60	56.00	0.80	
R 4DMR-179		15.00	2.60	4.50	4.00	4.10	2.70	0.06	4.30	0.55	58.00	0.75	
R 4DMR-180		15.40	3.40	5.30	4.60	5.00	2.60	0.07	3.80	0.55	55.50	0.75	

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Geochemical Lab Report

REPORT: 224-1966 | PROJECT: 2197 | PAGE 2

SAMPLE NUMBER	ELEMENT UNITS	Al2O3 PCT	CaO PCT	Fe2O3A PCT	K2O PCT	LOI PCT	MGO PCT	MNO PCT	Na2O PCT	P2O5 PCT	SiO2 PCT	TiO2 PCT	NOTES
R 4DMR-181		15.70	2.60	5.20	4.50	4.20	2.40	0.07	4.40	0.55	59.00	0.75	
R 4DMR-182		15.90	2.40	5.50	5.10	4.05	2.90	0.08	3.90	0.85	57.00	0.95	
R 4DMR-183		15.80	1.80	5.80	4.90	4.30	2.40	0.07	3.90	0.60	58.50	0.80	
R 4DMR-184		16.40	2.50	5.50	4.30	4.45	2.50	0.07	4.00	0.60	59.00	0.80	
R 4DMR-185		14.90	6.00	5.80	5.20	6.75	1.90	0.12	3.70	0.60	55.00	0.85	
R 4DMR-186		14.70	0.20	3.30	8.70	1.80	0.45	0.02	3.60	0.30	65.00	0.55	
R 4DMR-187		14.70	0.60	3.40	9.80	2.30	0.65	0.02	2.30	0.30	65.50	0.50	
R 4DMR-188		16.00	1.50	5.50	6.30	3.25	2.50	0.09	3.40	0.60	59.50	0.80	
R 4DMR-189		16.20	3.00	5.40	5.00	4.10	2.30	0.08	4.60	0.55	56.00	0.80	
R 4DMR-190		15.30	3.80	4.00	5.10	4.90	1.70	0.09	3.80	0.50	59.00	0.70	
R 4DMR-191		15.10	2.20	5.40	5.00	3.90	2.30	0.08	4.20	0.55	59.00	0.75	
R 4DMR-192		16.50	2.50	6.00	4.80	4.15	2.30	0.08	4.00	0.65	57.00	0.85	
R 4DMR-193		15.50	2.70	5.30	4.70	4.00	2.00	0.10	4.30	0.55	60.00	0.75	
R 4DMR-194		15.90	2.90	4.90	4.40	4.30	2.00	0.09	4.70	0.65	58.00	0.80	
R 4DMR-195		15.50	3.60	5.60	4.70	5.25	2.10	0.11	3.60	0.65	58.50	0.80	
R 4DMR-196		14.50	3.60	5.40	4.40	4.85	2.30	0.10	4.00	0.55	57.00	0.80	
R 4DMR-197		15.10	3.70	5.40	5.10	5.15	2.10	0.09	3.50	0.65	58.00	0.80	
R 4DMR-198		15.20	2.60	5.20	5.10	4.20	1.90	0.10	4.20	0.60	58.50	0.80	
R 4DMR-199		15.50	2.20	5.60	5.30	3.90	2.20	0.06	3.90	0.65	56.50	0.85	
R 4DMR-200		14.40	2.80	5.50	5.30	4.15	1.90	0.09	3.60	0.70	57.00	0.85	
R 4DMR-201		15.40	2.40	5.00	5.90	3.45	2.30	0.10	3.70	0.60	58.00	0.75	
R 4DMR-202		13.80	3.20	5.20	4.50	4.40	2.20	0.07	4.00	0.50	57.50	0.75	
R 4DMR-203		14.50	1.20	5.40	4.50	5.30	2.30	0.07	4.10	0.55	60.00	0.70	
R 4DMR-204		15.00	2.60	4.60	4.40	4.80	1.90	0.08	4.10	0.45	60.00	0.65	
R 4DMR-205		14.50	2.20	4.10	4.50	4.35	1.60	0.06	4.40	0.40	61.50	0.65	
R 4DMR-206		14.30	2.20	4.90	4.70	[illegible]	2.20	0.07	4.50	0.45	[illegible]	0.70	
R 4DMR-207		15.10	4.40	5.00	5.30	5.10	2.20	0.09	4.10	0.75	[illegible]	0.80	
R 4DMR-208		14.00	4.90	5.00	4.50	7.35	1.70	0.09	3.90	0.75	[illegible]	0.85	
R 4DMR-209		14.80	2.60	5.30	4.60	4.85	2.30	0.09	4.00	0.55	59.00	0.70	
R 4DMR-210		14.60	2.70	5.20	[illegible]	4.90	2.20	0.09	4.20	0.50	58.00	0.75	
R 4DMR-211		15.20	2.90	5.00	5.60	4.05	2.00	0.10	3.30	0.60	59.50	0.75	
R 4DMR-212		15.40	2.20	4.70	5.80	3.15	1.90	0.11	2.90	0.55	60.00	0.65	
R 4DMR-213		16.00	2.50	4.80	5.90	3.25	2.00	0.10	3.90	0.55	59.50	0.70	
R 4DMR-214		17.50	1.20	4.50	6.10	2.70	1.70	0.07	4.00	0.50	60.50	0.75	
R 4DMR-215		13.00	1.60	4.90	6.20	2.65	1.70	0.03	2.30	0.50	66.50	0.70	
R 4DMR-216		6.40	0.50	2.00	4.50	1.50	0.50	0.04	0.25	0.45	81.50	0.20	
R 4DMR-217		13.30	3.30	6.10	4.70	5.20	3.00	0.11	1.40	0.65	60.50	0.75	
R 4DMR-218		13.50	0.65	2.80	7.10	2.65	0.55	0.02	0.35	0.12	70.00	0.45	
R 4DMR-219		17.10	0.55	4.50	10.50	2.65	1.30	0.03	1.60	0.30	60.50	0.65	
R 4DMR-220		15.50	5.00	4.70	5.50	5.05	2.00	0.09	3.40	0.50	57.00	0.75	

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Geochemi Lab Rep

REPORT: 224-1966

PROJECT: 219[illegible] PAGE [illegible]

SAMPLE NUMBER	ELEMENT UNITS	Al2O3 PCT	CaO PCT	Fe2O3A PCT	K2O PCT	LOI PCT	MGO PCT	MNO PCT	Na2O PCT	P2O5 PCT	SiO2 PCT	TiO2 PCT	NOTES
R 4DMR-221		14.50	5.20	5.20	4.30	6.00	2.50	0.10	3.00	0.65	58.00	0.75	
R 4DMR-222		16.70	0.20	2.80	9.80	2.35	0.35	0.01	2.80	0.20	64.00	0.55	
R 4DMR-223		16.50	1.00	3.50	8.60	2.00	0.30	0.04	3.80	0.30	63.00	0.55	
R 4DMR-224		17.60	1.20	3.50	9.90	2.25	1.00	0.03	2.90	0.30	60.00	0.60	
R 4DMR-225		15.60	0.95	3.40	10.00	2.35	0.60	0.02	2.60	0.35	62.50	0.60	
R 4DMR-226		14.00	0.20	3.00	11.40	2.55	0.30	<0.01	0.45	0.15	66.50	0.45	
R 4DMR-227		14.90	0.90	3.40	9.10	2.40	0.30	0.03	0.35	0.60	65.00	0.50	
R 4DMR-228		13.70	2.70	5.70	6.30	4.00	2.00	0.03	2.20	0.45	61.00	0.70	
R 4DMR-229		11.30	1.00	4.20	5.50	2.25	1.10	0.04	0.85	0.45	71.00	0.50	
R 4DMR-230		16.50	1.50	3.90	8.70	2.50	1.20	0.05	2.90	0.30	60.50	0.65	
R 4DMR-231		15.50	1.70	4.90	8.50	2.90	1.40	0.06	2.40	0.40	61.50	0.60	
R 4DMR-232		15.50	1.90	4.00	9.50	2.90	1.20	0.06	2.00	0.45	60.00	0.60	
R 4DMR-233		12.60	0.90	3.20	9.80	2.55	0.50	0.05	1.85	0.12	69.00	0.45	
R 4DMR-234		14.00	0.80	2.40	8.60	1.15	0.25	0.08	3.40	0.25	67.50	0.50	
R 4DMR-235		16.20	0.90	3.40	9.30	2.00	0.50	0.04	4.30	0.15	60.00	0.50	
R 4DMR-236		14.90	0.80	3.60	10.30	2.50	0.45	0.04	2.40	0.60	63.00	0.50	
R 4DMR-237		16.70	0.80	4.00	9.20	2.15	0.55	0.04	4.30	0.35	62.50	0.65	
R 4DMR-238		16.20	2.20	4.60	6.30	3.35	1.90	0.08	3.20	0.55	60.00	0.75	
R 4DMR-239		15.50	0.40	3.80	11.10	2.20	0.45	0.04	2.90	0.35	63.50	0.60	
R 4DMR-240		12.50	0.30	3.30	9.30	1.35	0.45	0.04	2.20	0.12	69.50	0.45	
R 4DMR-241		2.90	0.52	1.60	1.50	1.10	0.15	0.04	0.10	0.18	90.00	0.10	
R 4DMR-242		15.60	0.90	3.30	10.00	2.40	0.80	0.05	0.85	0.35	64.50	0.55	
R 4DMR-243		8.70	0.35	2.30	5.30	1.55	1.20	0.05	2.30	0.25	78.00	0.25	
R 4DMR-244		12.50	[illegible]	3.50	8.90	2.80	0.25	0.05	2.30	0.05	66.50	0.40	
R 4DMR-245		14.80	0.90	3.50	[illegible]	1.55	[illegible]	0.03	2.70	0.40	61.50	0.50	
R 4DMR-246		12.30	1.50	[illegible]	[illegible]	2.60	0.90	0.09	1.50	0.35	64.00	0.40	
R 4DMR-247		3.40	0.15	[illegible]	1.00	0.85	[illegible]	0.02	0.10	0.12	90.00	0.07	
R 4DMR-248		12.80	1.50	[illegible]	[illegible]	1.80	0.35	0.02	0.50	0.25	72.00	0.45	
R 4DMR-249		15.50	0.37	[illegible]	[illegible]	1.50	0.40	0.03	2.90	0.70	62.00	0.55	
R 4DMR-250		9.60	0.50	1.40	[illegible]	2.35	1.10	0.04	1.20	0.20	73.50	0.30	

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SAMPLE NUMBER	ELEMENT UNITS	Al2O3 PCT	CaO PCT	Fe2O3* PCT	K2O PCT	LOI PCT	MGO PCT	MnO PCT	Na2O PCT	P2O5 PCT	SiO2 PCT	TiO2 PCT	NOTES
R 40MR 251		10.80	0.40	3.50	2.40	3.45	0.85	0.01	0.30	0.27	72.50	0.55	
R 40MR 252		15.20	2.05	6.60	3.70	4.30	3.05	0.11	1.20	0.55	60.00	0.85	

APPENDIX C

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Certific of Analy

REPORT: 424-1539

FROM: ESSO MINERALS CANADA
DATE: 13-JUL-84 PROJECT: 2197

SUBMITTED BY: W. MELNYK

ORDER	ELEMENT	LOWER DETECTION LIMIT	EXTRACTION	METHOD	SIZE FRACTION	SAMPLE TYPE	SAMPLE PREPARATIO
01	Au	.002 OPT			-150	ROCK OR BED ROCK	ASSAY PREP
02	Ag	.02 OPT			-150		

REPORT COPIES TO: ESSO MINERALS CANADA
MR. WALTER MELNYK

INVOICE TO: ESSO MINERALS CANADA

NOTE
multiply all values by 34.28 to get g / tonne

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REPORT: 424-1539

PROJECT: 2197 PAGE 1

SAMPLE NUMBER	ELEMENT UNITS	Au OPT	Ag OPT	NOTE	SAMPLE NUMBER	ELEMENT UNITS	Au OPT	Ag OPT	NOT
R 14776		<0.002	<0.02		R 14816		0.002	0.08	
R 14777		0.004	0.20		R 14817		<0.002	0.02	
R 14778		0.004	0.31		R 14818		<0.002	<0.02	
R 14779		0.004	0.25		R 14819		<0.002	0.02	
R 14780		0.002	0.50		R 14820		<0.002	<0.02	
R 14781		<0.002	0.04		R 14821		<0.002	0.02	
R 14782		0.006	0.59		R 14822		<0.002	0.03	
R 14783		0.002	0.26		R 14823		<0.002	0.04	
R 14784		<0.002	0.12		R 14824		0.003	0.24	
R 14785		0.002	0.12		R 14825		0.002	0.02	
R 14786		<0.002	0.16		R 14826		0.002	0.05	
R 14787		0.005	0.67		R 14827		0.002	0.05	
R 14788		<0.002	0.06		R 14828		<0.002	0.02	
R 14789		<0.002	0.02		R 14829		0.628	4.17	
R 14790		<0.002	0.04		R 14830		0.003	0.02	
R 14791		<0.002	0.03		R 14831		<0.002	<0.02	
R 14792		<0.002	0.02		R 14832		0.003	0.06	
R 14793		<0.002	0.02		R 14833		0.443	3.25	
R 14794		<0.002	<0.02		R 14834		0.112	3.47	
R 14795		0.002	0.08		R 14835		<0.002	0.02	
R 14796		0.008	0.11						
R 14797		0.277	62.07						
R 14798		0.011	0.53						
R 14799		<0.002	0.06						
R 14800		<0.002	0.03						
R 14801		<0.002	0.05						
R 14802		0.002	0.04						
R 14803		<0.002	0.06						
R 14804		<0.002	0.04						
R 14805		0.002	0.12						
R 14806		0.003	0.13						
R 14807		<0.002	0.02						
R 14808		0.002	0.05						
R 14809		<0.002	0.09						
R 14810		0.003	0.02						
R 14811		0.003	0.02						
R 14812		<0.002	0.03						
R 14813		<0.002	0.05						
R 14814		<0.002	0.04						
R 14815		<0.002	0.02						

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REPORT: 424-1974

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SAMPLE NUMBER	ELEMENT UNITS	Au OPT	Ag OPT	NOTES
R 14836		0.002	0.03	
R 14837		0.003	0.05	
R 14838		0.002	0.06	
R 14839		<0.002	0.05	
R 14840		<0.002	0.06	
R 14841		0.068	1.73	
R 14842		0.064	1.44	
R 14843		0.305	8.44	
R 14844		0.060	2.61	
R 14845		0.524	4.87	
R 14846		0.290	15.74	
R 14847		0.860	9.17	
R 14848		0.130	3.39	
R 14849		0.143	1.71	
R 14850		0.049	1.08	
R 14851		<0.002	0.17	
R 14852		0.173	5.64	
R 14853		0.119	2.49	
R 14854		0.029	1.14	
R 14855		0.115	1.35	

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