REPORT ON GEOLOGY AND
SOIL GEOCHEMISTRY

ON

THE MIKA GROUP

FOR

CAMPBELL RESOURCES INC.

CLINTON MINING DISTRICT
LAT. 51° 07' LONG. 121° 28'

NTS 92P/3W

CAMPBELL RESOURCES INC.
VANCOUVER, B. C.

ROBERT G. WILSON
JANUARY 13, 1981

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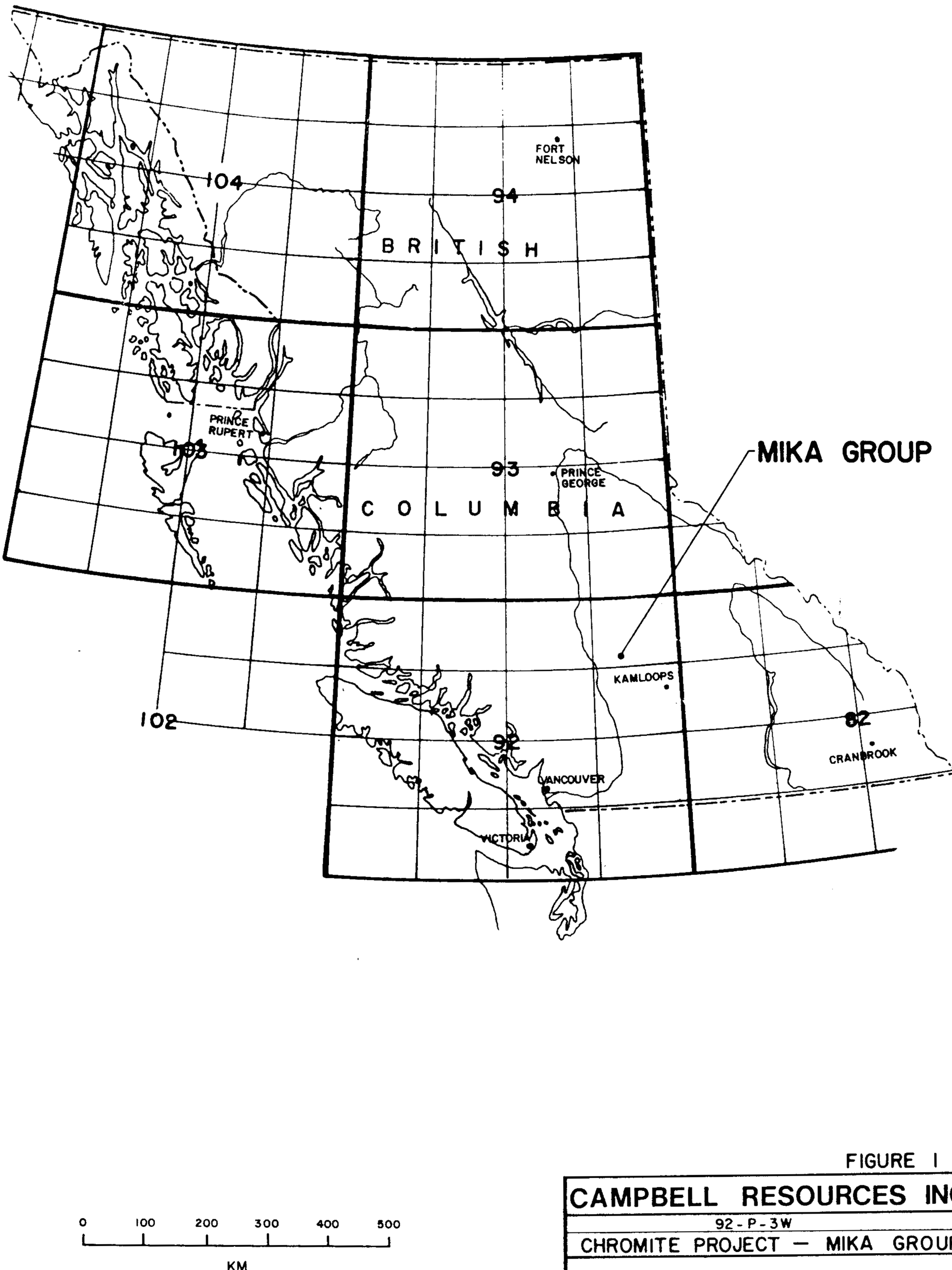


FIGURE I

CAMPBELL RESOURCES INC.			
92-P-3W			
CHROMITE PROJECT — MIKA GROUP			
PROPERTY LOCATION			
SCALE 1:8.94 X 10^6	DRAWN BY DFN	DATE JAN. 15, '81	PLAN N. 502-8
FIELD YEAR	REVISED BY	DATE	

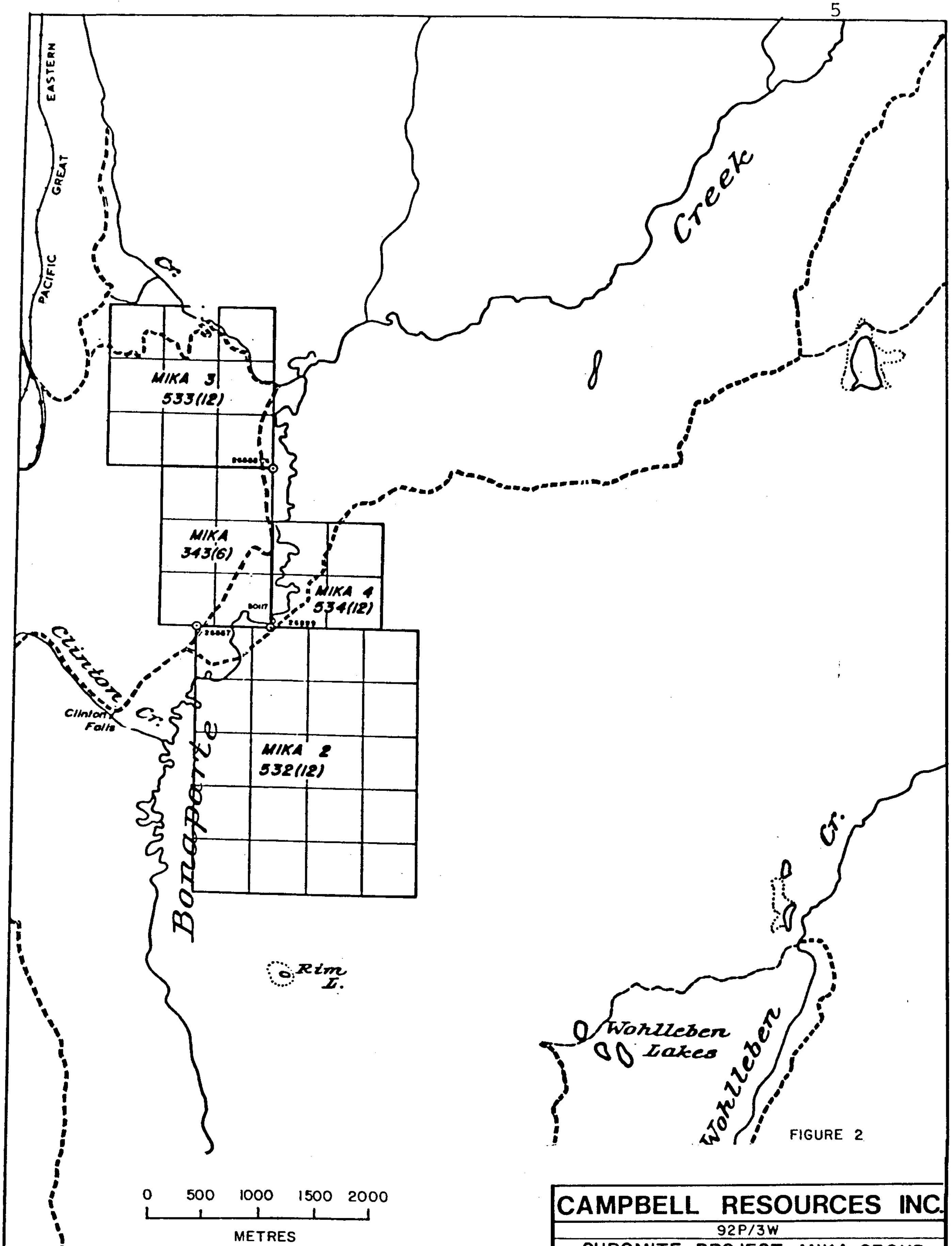


FIGURE 2

CAMPBELL RESOURCES INC.			
92P/3W			
CHROMITE PROJECT- MIKA GROUP			
CLAIMS LOCATION			
SCALE 1:50,000	DRAWN BY RGW	DATE JAN 1980	PLAN NO 502/G80/5
FIELD YEAR 1980	REVISED BY	DATE	

INTRODUCTION

LOCATION AND ACCESS

The Mika property is located 8.6 km E.N.E. of Clinton, B.C. on the west and east sides of the Bonaparte River valley.

The area is reached by taking the Mound Road, which leaves Highway #97 two kilometers north of Clinton, and travelling it along a distance of approximately 7 km. Below the road are cultivated fields and above the road on the hillsides are the claims.

The Mika area is part of the Thompson Plateau just south of the Fraser Plateau-Thompson Plateau boundary, as defined by Holland (1964). The Fraser Plateau is mainly underlain by flat lying lava beds, while the Thompson Plateau is mainly underlain by folded and block faulted late Paleozoic, Mesozoic and early Tertiary volcanic, sedimentary and granitic rocks.

The Bonaparte River valley at the Mika is characterized by rolling hills, between 670 and 1097 meters ASL. Situated within a semi-arid climatic belt the area's vegetation consists mainly of Ponderosa pines, bunch grasses and prickly pear cactus. Where water is transported to the land, alfalfa crops can be grown.

The B.C. Railway line(formerly Pacific Great Eastern) is located 2½ km west and 335 meters above the property. A main line of the B.C. Hydro power system is 8 km west of the property, while oil and gas pipelines belonging to West Coast Petroleum - West Coast Transmission cross the Bonaparte River valley 20 km to the north east.

A branch from this gas line owned by Inland Natural Gas, crosses the property between the Mika "1" and Mika 2 claims and supplies natural gas to the town of Clinton.

EXPLORATION HISTORY

The earliest known work on the Mika area was minor trenching and underground testing of chromite occurrences, completed in 1932 by W.N.D. McKay of Clinton, on claims called Winnifred. The only recorded results of this work is an unpublished property examination report by J.S. Stevenson (1941), a B.C. Department of Mines geologist who examined the area in 1938.

The earliest reported staking of the Mika area for its asbestos potential was in 1952 by G. Baney, A. Derry (prospectors), and Vic Bjorkman (P. Eng.). The claims were optioned to Western Asbestos, but no work was completed and the option was dropped.

New claims named Venus and Mac were staked over this area in 1957 and optioned to New Jersey Zinc Exploration Co. Ltd. Magnetometer survey and geologic mapping programs were conducted over the property during the winter of 1957 and spring of 1958, reportedly to test the asbestos potential of the serpentines. Some bulldozer trenching was reportedly completed in 1958 as a follow-up to the 1957 survey.

No ground controls are marked on the maps accompanying the resultant assessment report (#197), which renders the work virtually useless.

More bulldozer trenching is reported to have been done in 1959 and also prior to the 1957 survey. However, it is not clear who completed this work. It is also reported that Kaiser drilled one hole, apparently to test the area's magnesite potential, but did not file assessment work. No dates or locations are known for this drilling.

The area was dormant from 1959 until 1967 when the Jo claims were staked as an asbestos prospect for Riviera Mines Ltd. by A. Derry. W.G. Stevenson, a consultant geologist, completed a mapping program and minor magnetic survey, using a "Sharp D-2 dip needle".

No mapping controls are mentioned in the resultant assessment report (#1146) and the geologic map is therefore assumed to be a pace and compass sketch map only.

The Jo claims were allowed to expire with no further work being recorded. The ground lay dormant again until the Mika claim was staked for CCH Resources Ltd. by R. Wilson in June, 1979. Three more claims, Mika 2-4 were added in December of 1979.

A preliminary exploration program, consisting of soil sampling, ore sample assaying and geologic mapping was carried out by CCH Resources Ltd. in August-September of 1979. The results of that work are reported in Assessment Report #8111.

In 1980 the Mika claims were sold to CCH Resources Ltd.'s parent company, Campbell Chibougamau Mines Ltd. Campbell Chibougamau Mines Ltd. underwent a name change in September, 1980 to Campbell Resources Inc. Campbell Resources Incorporated is the current owner and operator.

ORE POTENTIAL

From geological-geochemical evidence, three parallel zones of chromite mineralization are suspected to occur on the Mika "1" claim, with widths in excess of 1 m occurring in at least two of the zones. Distances between known showings on these two zones are 250 and 240 m respectively, giving a total potential mineralization strike length in excess of 490 m. No strike length is known for the mineralization in the third zone.

Minor disseminated chromite was noted in three dunitic zones on the Mika 2 claim south of the Bonaparte River. More detailed prospecting is required to fully determine the chromite content of these dunites.

SUMMARY OF WORK DONE

Geological Survey

Geological mapping, at a scale of 1:2500, was completed along 13.125 line kilometers, in an area 1750 X 2100 m, Figure 3.

Geochemical Survey

465 soil samples were taken on the Mika 2 claim. 419 samples were analyzed for chromite, and the results are displayed on Figure 4. A total of 46 samples from the eastern ends of lines 12 + 00S, 15 + 00S, 18 + 00S and 21 + 00S were not analyzed, as they were deemed well out of the ultramafite.

Grid Establishment

A reconnaissance grid was established for control in soil sampling and geological mapping. The baseline was established using a visually controlled picket line and tight slope chaining. Grid control was accomplished by a visually controlled, tight slope chained crossline which established the position of a second baseline. All other lines are flag lines and were established by compass, clinometer and hipchain methods. No other previous grids were recognized in the survey area.

The grid has been plotted on Figures 3 and 4. All plotted lines have been corrected for true horizontal distance.

CLAIMS WORKED

All work (sampling, mapping and grid establishment) was performed upon the Mika 2 and 4 claims. The Mika 2 claim was located on the 28th of November, 1979, recorded on December 3, 1979 and has record number 532(12). The Mika 4 claim was located on the 30th of November, 1979, recorded on December 3, 1979 and has record number 534(12).

DETAILED TECHNICAL DATA & INTERPRETATION

GEOLOGICAL SURVEY

Purpose

Following an initial phase of exploration on the Mika "1" claim and the discovery of chromite mineralization, further exploration was recommended south of the Bonaparte River on the Mika 2 and 4 claims. The major purpose of the 1980 survey was to establish the aerial extent of the ultramafite and to locate any massive chromite showings.

Geologic mapping of the gridded area on the Mika 2 claim was completed at a scale of 1:2500, Figure 3.

Results

The Mika 2 claim is underlain by 3 main rock types; Permian Cache Creek Group metavolcanics and metasediments; Permian? or Triassic? Mika Ultramafite; and Miocene and/or Pliocene Plateau lavas.

Cache Creek Group rocks present on the Mika 2 include cherts, ribbon cherts, cherty argillites, limestones and basaltic tuffs. These rocks are relatively minor in abundance, occupy the south west corner of the map area and are similar to the Cache Creek rocks found on the Mika "1" claim.

The Mika Ultramafite consists of moderately to highly serpentinized peridotites, dunites, serpentines and pyroxenites. The wide spacing of the grid lines prevented any detailed mapping of zones of rock types.

The peridotites are medium-grained, dark-green weathering, with dark-green fresh surfaces. Pyroxene bastites form a significant percentage of the rock and are often seen as honey-colored, raised knobs.

The dunites are light to pale-green, recessive weathering and in part, steatized. Magnetite and chromite grains are always present, but were not seen in high concentrations. No mapping and/or prospecting between the grid lines has been carried out along these dunitic horizons, of which three have been recognized.

The serpentines and pyroxenites are of minor abundance within the ultramafite. The serpentines are dark-green, highly sheared and lack any recognizable internal structure. The pyroxenites are dark-green to black and consist almost entirely of pyroxene crystals.

The ultramafic rocks found on the Mika 2 claim are similar to those found on the Mika "1" claim, except for the presence of serpentines which are not steatized, as they are on the Mika "1".

A fairly distinct break in slope defines the contact between the Mika ultramafite and flat-lying plateau basalts. These olivine basalts are medium-grey, fine-grained and vesicular, with the vesicules often filled by zeolites?. Although this area is virtually uneroded, the basalts appear to be recessive and are seldom seen in outcrops. Outliers of basalt found within the ultramafite may be float boulders which have eroded down slope.

A very large outcrop of medium-green, fine-grained, slightly foliated mudstone/siltstone occurs in the central part of the map area.

This outcrop may be correlated with the Deadman River Formation as an outlier, or may possibly be part of the Cache Creek Group.

The youngest rocks on the property are cobble conglomerates. These rocks consist of a peridotite, serpentine, basalt framework in a calcareous matrix composed of fine-grained framework rock fragments. The conglomerate may be correlative with one that occurs on the Mika "1". Due to the size of the framework rocks, it is unclear if other rounded rock occurrences are outcrops, or large float cobbles derived from the conglomerate.

No high grade concentrations of chromite were found during the mapping project, although an unpublished report by a B.C.D.M. geologist in 1941 describes a 7.5 cm wide vein of chromite occurring in the vicinity of the Mika 2 and 4 claims.

Further mapping and prospecting on a more detailed grid is required to fully determine the structure of the ultramafite.

GEOCHEMICAL SURVEY

Purpose and Procedure

The soil samples taken in 1979 on the Mika "1" claim were successful in identifying three zones of higher chromite soil content, which were correlative with chromite mineralization. The results also distinguished between ultramafic and country rocks.

The 1979 geochemistry was successful mainly because the area does not have the thick glacial alluvium which is present only slightly north of the Mika property.

Soil profiles taken in 1979 revealed that soil taken from an average depth of 20 to 25 cms. with analysis of the -20 +40 size fraction, was the most responsive to chromite mineralization. A similar geochemical procedure was followed in 1980.

The main purpose of the 1980 geochemical sampling was to delineate the aerial extent of the ultramafite in areas of no outcrop and to identify any zones of possible chromite mineralization.

1980 soil sampling was conducted simultaneously with grid emplacement. Samples were taken at 25 m intervals along lines spaced 300 m apart. Samples were also taken every 50 m along the baseline. A total of 465 soil samples were collected from B-C horizons in mattock dug holes of approximately 20 cm depth. The samples were numbered by their grid locations and the results of 419 samples are displayed on Figure 4.

All samples were sent to Bondar-Clegg Laboratories in Vancouver for geochemical analysis. Appendix I is an information sheet prepared by Bondar-Clegg on their analytical techniques of analyses.

The plotted results (Figure 4 in back pocket) were contoured, using the following arbitrary cut-off points:

1) Less than .20% Cr.
2) Greater than, or equal to, .20% Cr and less than .40% Cr.
3) Greater than, or equal to, .40% Cr and less than .60% Cr.
4) Greater than, or equal to, .60% Cr.

Results

The geochemical results above the break in slope are low, with values generally less than .18% Cr. The eastern most .20% Cr contour approximately outlines the break in slope. Areas defined by the .20% Cr contour occur as bands, striking approximately 190^{o}.

Generally these areas have cores with higher geochemical responses, which follow the overall strike direction. The highest values obtained are .63 to .78% Cr, but these values are in an area of no outcrop.

The .20% Cr zones appear to pinch to the south of the grid.

INTERPRETATION

The lowest geochemical contour approximately follows the break in slope. At the break in slope the first ultramafic float is seen and the last volcanic float is noted. This is thus considered to be the approximate contact between ultramafite and volcanic rocks.

Areas with geochemical responses greater than .20% Cr are thought to be underlain by ultramafic rock. Using this criteria, the Mika ultramafite on the Mika 2 claim appears to be much more broken up and in bands, than is apparent from geologic mapping of the same area. Thus, several "outcrops" mapped in areas of low geochemical response may in fact be float boulders from the conglomerate.

The eastern most "geochemical band" of ultramafite is seen wrapping around an area where a large outcrop of sediments exists, suggesting that the sediments are older than the ultramafite. This argues against the sediments being part of the Miocene aged Deadman River Formation, as the ultramafite is thought to be older than Miocene.

The .20% Cr zones pinch to the south of the grid, indicating that the ultramafite also pinches at this point. This feature is common for ultramafic rocks and it is not unreasonable to expect more ultramafics further south along strike.

CONCLUSIONS

The Mika Group is comprised of 4 claims totalling 41 units, covering the "Mika" Ultramafite. The Mika 2 and 4 claims, where the present grid is located, are 4 x 5 or 20-unit, and 2 x 2 or 4-unit claims.

The Mika Ultramafite underlies approximately half of the 1100 X 2100 metre gridded area, and is thought to occur in bands which span the entire length of the grid.

Higher soil geochemical values occur centrally in the bands, but the highest geochemical values are in areas where no outcrops have been found.

No high grade concentrations of chromite were found during the mapping project, which only covered the widely spaced reconnaissance grid lines. Further mapping and prospecting between grid lines is required.

ITEMIZED COST STATEMENT

WAGES

1 Geological Supervisor 1 day @ $200.00 man/day - November 12, 1980	$200.00
1 Geologist 6 days @ $150.00 man/day November 3 - November 8, 1980	900.00
1 Geological Assistant 6 days @ $100.00 man/day, November 3 - November 8, 1980	600.00
1 Field Supervisor 6 days @ $175.00 man/day November 3 - November 8, 1980	1,050.00
1 Field Assistant 6.5 days @ $130.00 man/day November 2 - November 8, 1980	845.00
1 Field Assistant 6.0 days @ $130.00 man/day November 3 - November 8, 1980	780.00

FOOD AND ACCOMMODATION

5 Persons 6 days @ $28.489 man/day November 3 - November 8, 1980	854.68

TRANSPORTATION

Truck I Rental November 3 - November 8, 1980 @ $20.00/day	120.00
Truck I Mileage 974.1 Km @ $.08/km	77.93
Tax on above @ 4%	7.92
Truck I Fuel 251.2 l @ 28.7¢/l avg.	72.10
Truck I Parking (Loading & Unloading:Vancouver)	10.00
Page 18 Total	5,517.63

Truck 2 Rental November 3 - November 8, 1980 @ $30.00/day including tax	180.00
Truck 2 Mileage 1025 km @ $.15/km	153.75
Truck 2 Fuel approximately 236 l @ 27.9¢/km	65.83

INSTRUMENTAL RENTAL

Field Survey Equipment (compasses, chains, topofils, clinometers, axes)	
Bema supplied: 4 days @ $30.00/day	120.00
Campbell supplied: $10.00 man/day x 6 days	120.00

SAMPLE ANALYSIS

Soil Samples

418 samples, analyzed for Cr @ (+40 - 20) @ $5.60/sample	2,340.80
REPORT PREPARATION	1,250.00

OTHER COSTS

Bema Supplied Materials

Flagging - 40 rolls @ $1.15 per roll	46.00
Hip Chain Thread - 14 rolls @ $2.75 per roll	38.50
2 Bundles Cedar Lath	14.87
2 Cans Paint	6.95
Gloves, Batteries and Unspecified	21.36
Page 19 Total	$4,358.06

Bema 15% Disbursement Charge on $165.51	24.83

Campbell Supplied Materials

1 Bundle Cedar Lath		16.42
Spray Paint, Replacement Geopick		15.53
418 Soil Sample Bags $52.50/1000		21.95
4 Folding Cartons @ $1.25 each		5.00
20 Plastic Bags @ $99.90/1000		2.00
1 Geopick (new)		22.00
1 Replacement Axe Handle		8.00
	Page 18 Total	115.73
	Page 19 Total	4,358.06
	Page 20 Total	5,517.63
		$9,991.42

AUTHOR'S QUALIFICATIONS

I, Robert G. Wilson, do hereby certify that:

1. I graduated in 1976 with a BSc Degree in Geology from the University of British Columbia.

2. I practiced my trade as a Geologist on a project basis until March, 1979.

3. I have been practicing my trade as a Geologist on a full-time basis since March, 1979.

January 13, 1981
Vancouver, B. C.

Rob Wilson
Geologist

APPENDIX I

BONDAR-CLEGG & COMPANY LTD.

1500 PEMBERTON AVE., NORTH VANCOUVER, B.C. PHONE: 985-0681 TELEX: 04-54554

Response to your inquiry concerning what and why, at our lab.

1. Flow Sheet

1 SORT

sorting by project and box no.
inspection by supervisor
organization of priorities
samples put in order in drying trays
samples present vs sample list
entry in log book.

2 DRY

drying in low temp driers
coin envelopes for sifted samples made
lab sheets made up

3 SIFT

sifting and retention of rejects

4 WEIGH

37 samples
2 checks
1 pulp standard in every rack of 40

5 DIGEST (CuPbZnMoAgMnCdFe)

HNO_3 attack of organics & sulfides/carbonates
HCl attack of resistant material
95^oC 2 1/2 - 3 1/2 hr.

6 HOMOGENIZE

diluted to 20% acid concentration and homogenize
1 hour settling time

7 ANALYZE

atomic absorption
background correction simultaneous for Pb Ag Cd
results permanently on chart

8 TELEX - TYPING

all results call checked

2. Sample Prep Procedures - Everything done in numerical order

SOIL/SEDS

a) bang dry sample in the bag with rubber mallet to break loose fines from clods/mosses/etc.
b) pour into 80 mesh stainless steel sieve.
c) sift out all -80; if samples are for Au, sift out -20 if -80 fraction less than 20 gm.
d) re-bag sample and re-file if retention of rejects requested. Otherwise - out goes the oversize

ROCKS

a) put in numerical order; insert made-up pulp bags into proper rock bag.
b) primary crush

c) secondary crush (70% -10 mesh)
d) split out 200 - 400 gm with a Jones riffle
e) pulverize via an impact (ring and puck) grinder. Final product is about 50% -150 mesh and 99% -80 mesh, and is free from pulverizer contamination.

PAN CONS

a) bagged, dry sample is wholly pulverized as above, mixing of sample is thorough and complete in pulverizer.

Please no coarse metallic nuggets without prior warning.

3. Digestion Methods

HNO_3-HCl - a vicious attack that satisfactorily leaches Cu Pb Zn Mo Ag Mn Cd Ni Co etc. in "all" rocks and soils/seds. Problems would be low level values (<40 ppm) in high iron oxide soils, or in tight refractory lattices.

HNO_3 - satisfactory for almost all present day ore minerals of U, Bi some Ag minerals, and most sulfides.

Partial Extractions - specific for specific type occurrences or for loosely bonded (e.g. hydromorphically deposited) ions.

HNO_3-$HClO_4$-HF - a higher temperature, vicious attack that specifically attacks some refractory silicates and oxides. More difficult to control precision, but useful for things like V, Be, Se, and certain low level metallics in rock geochem programs.

HBr-Br - a slow, but powerful oxidative attack designed for Te minerals etc.

HCl-$SnCl_2$ - a powerful reducing attack for dissolving magnetites, etc.

Various fusions - for difficult to handle elements in refractory lattices. (e.g. W Cr Au Pt). Cr- Fused with Na_2O_2 and leached with H_2O, then run by A.A.

4. Best Analytical Techniques as far as we are concerned (and as far as the state of the art)

Element	Method
Au	- Fire assay and atomic absorption. Technique and systems critical.
Pt Group	- Fire assay and atomic absorption. Technique and systems critical. - Fire assay and spec okay. Technique and systems critical.
U	- Fluorimetric preferred on routine. Technique critical. - XRF very good in 10 ppm - 2% range - Neutron activation very good, but also subject to corrections - technique control. Cannot handle very high volumes or handle them cheaply - Laser Spectrometers - good for clean, low-level solutions. - Colourimetric - satisfactory; good for high grade ores.
Cu Pb Zn Mo Ag Mn Fe Cd Ni Co	- Atomic absorption preferred
Mo	- Colourimetric after fusion acceptable
Ag	- Cyanide acceptable

Element		Method
Sn	-	XRF preferred
	-	Colourimetric after fusion or distillation not satisfactory for routine work
	-	Spec okay at intermediate levels, but small sample size taken precludes its use
W	-	Colourimetric quite acceptable. Technique critical.
Cr	-	A.A. or Titration

5. Background correction

In our lab, principally dirty carbonate matrices may enhance low-level Ag Cd values up to a false value of 3 - 6 ppm, Pb up to 45 - 65 ppm, Sb Bi values up to 100 ppm.

Background correction measures the majority of this false impulse simultaneously with the Ag Pb etc signal and automatically gives a more accurate answer. Exact reproduceability is more difficult, but still very acceptable.

Background correction for Ag Cd Pb is strongly recommended except in areas where Ag Cd Pb thresholds are over 10-10-100 ppm. To a lesser extent low level Ni Co could be added to this list. Sb Bi cannot be determined in low levels without background correction; this is included in the price of analysis.

6. Discussion of Special Techniques we use.

We are happy to thoroughly discuss things verbally. The range is too broad, and some of the techniques too confidential to put in print.

7. Detection limits - printed on fee schedules

Results usually ± detection limit at detection limit.

We are happy to clarify and discuss any of the above at your request. Do not hesitate to ask questions - either simple ones or complex ones.

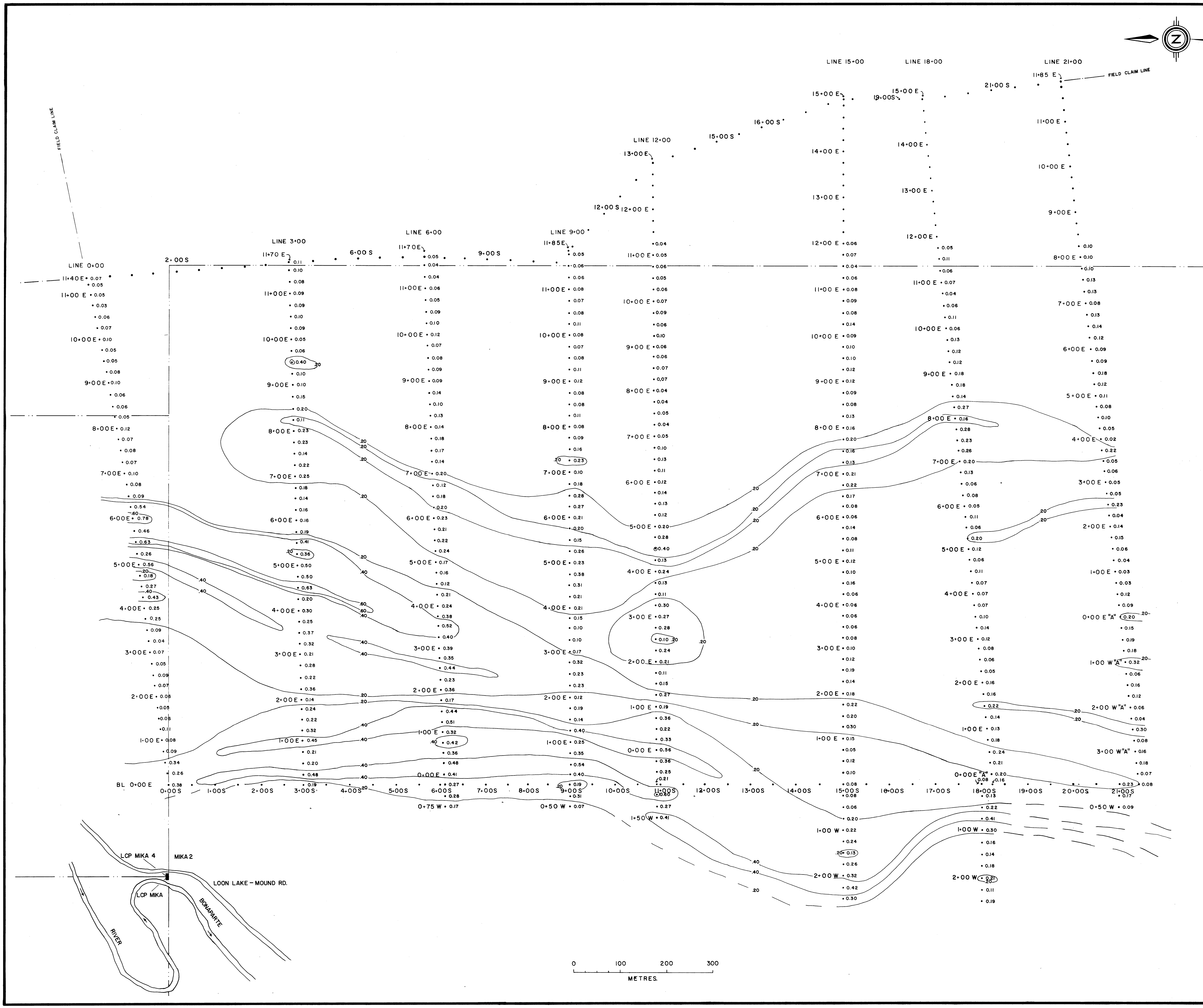
Cordially yours,

BONDAR-CLEGG & COMPANY LTD.

Ken Bright
Geol. E.

KB/sja

FIELD CLAIM LINE
LINE 0+00
LINE 3+00
LINE 6+00
LINE 9+00
LINE 12+00
LINE 15+00
LINE 18+00
LINE 21+00
BL 0+00 E
MIKA 2
LCP MIKA 4
LCP MIKA
LOON LAKE - MOUND RD
RIVER
BONAPARTE
0
100
200
300
METRES
8677
LEGEND
1 CONGLOMERATE
PERIDOTITE, SERPENTINE, BASSALT FRAMEWORK
2 RECENT VOLCANICS
FLAT-LYING, VESCULAR, OLIVINE PLATEAU BASSALTS.
3 MIKA ULTRAMAFITE
a DUNITE
b PERIDOTITE
c PYROXENE RICH PERIDOTITE
d SERPENTINE
4 CACHE CREEK GROUP
a LIMESTONE
b CHERT
c METAVOLCANICS & SILTSTONES
Cr(d) CROMITE DISSEMINATED
(f) FLOAT OR INDEFINATE OUTCROP
26° BEDDING
OUTCROP
GEOLOGIC CONTACT (APPROX.)
BREAK IN SLOPE
RIVER
CLAIM LINE
ROAD
FENCE (APPROX.)
EDGE OF CULTIVATION (APPROX.)
LCP & BOUNDARY LOCATIONS ESTABLISHED BY TOPOGRAHIC MAP
FIGURE 3
CAMPBELL RESOURCES INC.
92P/3W
CHROMITE PROJECT-MIKA GROUP
GEOLOGY
SCALE 1:2500
DRAWN BY DNH
DATE DEC. 1980
PLAN NO 502/G80/L12
FIELD YEAR 1980
REVISED BY
DATE



LEGEND

• 0.15 Cr IN %
.20 .20% Cr
.40 .40% Cr
.60 .60% Cr

RIVER
CLAIM LINE
ROAD

LCP & BOUNDARY LOCATIONS ESTABLISHED BY TOPOGRAHIC MAP

FIGURE 4

CAMPBELL RESOURCES INC.

92P/3W

CHROMITE PROJECT-MIKA GROUP

SOIL GEOCHEMISTRY CHROMIUM

SCALE 1:2500 | DRAWN BY DNH | DATE DEC. 1980 | PLAN NO. 502/G80/L13
FIELD YEAR 1980