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THE CONSOLIDATED MINING AND SMELTING COMPANY OF CANADA LIMITED
TRAIL, B.C.

GEOCHEMICAL SURVEY REPORT
ON THE WILL GROUP NO. 1 CLAIMS - OMINECA M.D.

(NE QUADRANT 54°, 124°)

The claims belonging to the Will Group No. 1 are located six miles north of Fort St. James, B.C. (Lat. 54°, long. 124°, NE). The following is a list of the names of the claims on which the work was done and shows the amount of assessment work to be credited to each claim:

Claim	Record No.	Requested Assessment Credits	Total
Will Group No. 1:			
Will 1-12	28015-28026	1 year each claim	12 yrs.
Will 13-24	28027-28038	-	-
			12 yrs.

Work was carried out on the above claims during the period from August 10 - August 19, 1965.

REPORT BY

D.W. HEDDLE

PROFESSIONAL ENGINEER

DWH:gmc
January 21, 1966

THE CONSOLIDATED MINING AND SMELTING COMPANY OF CANADA LIMITED
TRAIL, B.C.

GEOCHEMICAL SURVEY REPORT
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SUMMARY

A total of $1,283 was expended on the geochemical survey of the Will Group No. 1 claims. It is requested that $1,200 of the amount spent be applied as assessment work credit to the Will claims as indicated below:

Claim	Record No.	Requested Assessment Credit	Total
Will Group No. 1:			
Will 1-12	28015-28026	1 year each claim	12 yrs.
Will 13-24	28027-28038	-	
			12 yrs.

INTRODUCTION

General

During July and August 1965, a geochemical (mercury detector) survey was carried out in the general Pinchi Lake area. Emphasis was placed on the coverage of claims overlying the Pinchi fault zone. Part of the survey included the Will No. 1 claim group from which samples were collected and analyzed for mercury content. The immedaite area along the Pinchi fault zone is known to be favorable for the occurrence of mercury mineralization. At least 15 cinnabar deposits have been found along the Pinchi fault and of these two have been economically mined in the past. A large detriment to prospecting for additional deposits in this area is the thick mantle of overburden which covers a large part of the area. Therefore in order to assess the area in terms of its mercury potential methods other than standard prospecting methods must be employed. This geochemical survey was made on the basis that the mercury content of soils would suggest areas in which to localize further geochemical or geophysical work or even targets which would warrant drilling or trenching.

Our work with the Lemaire mercury detector was to some extent experimental. Little or no information was available with respect to depth or soil horizon from which samples should be taken to obtain consistent and valuable results. We had no idea of what contamination might have resulted from the former reduction plant operation at the Pinchi Lake Mine or how widespread such contamination might be. The Lemaire detector in its present form does not distinguish between metallic mercury in the soil (halo effect) or possible cinnabar particles in the soil which may have been transported over considerable distances. We are currently conducting laboratory studies in an attempt to clarify some of the unknown factors which might aid in interpreting survey results. These studies will include experiments pertaining to the mode of occurrence of metallic mercury in soils and the nature of soil fractions which might provide the best and consistent conditions for concentration. Post doctorate research work along the general lines described above is now being done under Cominco sponsorship by Dr. L.M. Azzaria at McGill University.

The survey was done during the period from August 10, 1965 to August 19, 1965, under the supervision of D.W. Heddle (U.B.C. 1949), Cominco Senior Exploration Geologist and registered B.C. Professional

Engineer. Field supervision and analyses were carried out by Dr. L.M. Azzaria (Ph.D. Geological Sciences, Toronto). Dr. L.M. Azzaria did post doctorate work at the University of California, Berkley, California under the direction of H.E. Hawkes, one of the foremost authorities in the development of mercury detector work. E.W. Batchelor and G.E. Paulus, third year Geology students assisted in the field work.

Location and Access

The Will claims are located seven airmiles north of Fort St. James, B.C. They overlie the inferred Pinchi fault zone and are located approximately half way between Pinchi Lake and Fort St. James, B.C. Access is gained by road, although part of the road is a logging road and may be open only in the summer season.

GENERAL GEOLOGY

The claim group lies along the position of the Pinchi fault zone extending southeasterly from Pinchi Lake. The claims are completely drift covered and the exact position of the fault zone and the geology of the claim area can only be inferred.

In general the northeastern margin of the Pinchi fault zone represents the contact between closely folded stratified Permian rocks on the southwest and Mesozoic formations and Jura-Cretaceous Omineca granitic intrusions on the northeast. It seems probable that the fault zone marks the site of major thrust-faulting from the southwest and that Permian rocks have moved up with respect to the Mesozoic formations. Intense faulting occurs in the Permian rocks within the fault zone. There the more important faults trend north and northwest and dip steeply west and southwest. The orebodies along the Pinchi fault zone, including the Pinchi Mine deposit, occur in sheared and brecciated Permian limestones or in carbonatized serpentine.

The Will No. 1 claim group is entirely covered with overburden. It is assumed that it overlies the position of the Pinchi fault zone. To the southwest of the claim group the nearest outcrop occurs approximately one mile distant from the southwest boundary of the group. This outcrop consists of Permian limestones belonging to the Cache Creek group of rocks and in all probability these rocks underlie part of the claim group. To the northeast approximately one mile from the northeastern boundary of the claim group, a small peridotite stock belonging to the Trembleur intrusions is present. It is thought that this stock may underlie the claim group on the footwall side of the Pinchi fault. It is possible that volcanics of the Takla group underlie the Will claims on the footwall side immediately adjacent to the fault itself.

EQUIPMENT AND PRINCIPLE OF OPERATION

The high volatility of mercury and the association of small amounts of mercury with many sulphide deposits has suggested that extensive mercury halos may exist around sulphide deposits. The halo developed from mercury deposits should be particularly amenable to detection by soil analyses. Our Lemaire mercury detector technique, with a sensitivity (5 parts per billion), well below the average abundance of mercury in rocks and soils, can be used to detect the small amounts of mercury that may indicate hidden ore deposits.

The Lemaire detector works on a basically simple principle. The mercury contained in the sample is vaporized in a closed chamber by a heat source which may consist of a torch or small furnace. The mercury vapor is drawn into a light chamber which houses an ultra-violet light. The reading obtained from a microammeter is a measurement of the amount of light absorbed by the mercury vapor which is proportional to the amount of mercury in the sample.

A modification was made to the standard Lemaire detector by L.M. Azzaria, J.M. Bryan, A.R. Allen and R. Wilson of the Cominco Technical Research Center and the Instrument Shop at Trail, B.C. Commercially available detectors are sensitive to several specific sub-

stances as well as to smoke and dust in general. The Cominco modification consisted essentially of the addition of a gold wire filter in the vapor circuit by means of which the mercury was trapped on the gold and contaminating vapors were expelled.

The operation of the modified Lemaire detector essentially consists of two steps. In the first step the sample is heated by a small electric furnace at 800° - 900° and the mercury is vaporized and collected on the gold filter while interfering vapors are exhausted. In the second step the gold is heated by a second electric furnace to revaporize the mercury which is than pulled into the ultraviolet light chamber.

PROCEDURE IN SAMPLING AND ANALYSIS

Location of samples was controlled by chain and compass survey. The majority of samples were collected at 500-foot intervals along location lines and along roads that traversed the claim group. Part of the claim group was covered on a 500-foot by 500-foot grid pattern.

The soil development varies considerably from one locality to another within the general Pinchi Lake area. The A and B soil horizons are usually confined to within a foot of the surface and are underlain by unmodified glacial material. The initial samples were taken below the A1 horizon generally at a depth of 6" to 12" below the surface. In some cases deeper resampling was done to check high readings. The analyses of these samples was done in Trail after completion of the field work.

The majority of analyses was done in a field laboratory in Fort St. James, B.C. Samples were allowed to dry at room temperature, as drying at higher temperatures would cause the loss of some mercury. The dry samples were sieved to -100 mesh size. A one gram sample of the -100 mesh fraction was then processed in the modified Lemaire mercury detector as described in the preceding section of this report. The detector reading was then referred to a standard curve to obtain the mercury content of the samples expressed in parts per billion (ppb).

In this survey all samples yielding 70 ppb or less were considered to be normal for the area or within the background range. Samplesyielding more than 70 ppb mercury are considered to be anomalous. Readings expressed in parts per billion are plotted on a 1" = 1/4 mile plan and have been contoured where applicable. In contouring the mercury content of the soils, only the results from the initial sampling (at a depth of one foot or less) were considered. In areas where information is sparse, contouring is open to various interpretations.

RESULTS

The results of the geochemical survey on the Will No. 1 claim group are shown on plate PL-9A. Samples representing a major part of the claim area were found to have a mercury content of 70 ppb or less. Several local but strong anomalies exist within the claim area. The anomalies on plate PL-9A are the result of contouring only the values from shallow samples. It is of interest to note that in cases where deeper sampling (1-2½') was done at the locations of high readings in the shallower sampling, values obtained fall within the background range (70 ppb or less) or only slightly higher. This fact, at first glance, casts some doubt as to the validity of the anomalies as shown, but probing deeper into the matter one can see possible explanations.

The apparent conflicting results between the shallow and the deeper sampling may be brought about by some mechanism concentrating mercury, from an underlying deposit, only in the upper soil horizon leaving the deeper soils somewhat deficient in mercury. If this is so, the anomalies are significant. On the other hand the results may indicate surface contamination from the former reduction plant operation at the Pinchi Mine, although if this is the case, a more uniform pattern of contamination would generally be expected. A pattern as indicated by our survey might be caused by erratic distribution of contaminating

vapors or dusts from the reduction plant. The erratic pattern may have even resulted from the selective absorption of contaminating vapors in the atmosphere by certain types of vegetation.

It is recommended that the anomalous areas be resampled at both depth and near surface on a 100' grid system. If anomalous results are repeated in detailed shallow sampling, or if anomalous results are obtained by the deeper sampling, stripping or drilling should be carried out as the ultimate test.

ATTACHMENTS:

(1) Plan - Pinchi Lake Area - General Geology and Claim Location, Scale 1" = 6 mi. Plate PL-13.

(2) Plan of the Geochemical Survey on the Will Group No. 1 Claims, Scale 1" = 1/4 mile. Plate PL-9A.

(3) Statement of Expenditures.

(4) Statutory Declaration relating to Expenditures.

Report by: D. W. Heddle
D.W. Heddle
Professional Engineer

DWH:gmc
Trail Expl'n Office, Western District
January 21, 1966
Distribution: Mining Recorder (Smithers) (2)
Western Exploration (Trail) (2)

THE CONSOLIDATED MINING AND SMELTING COMPANY OF CANADA LIMITED
TRAIL, B.C.

1965 GEOCHEMICAL SURVEY EXPENDITURES
WILL NO. 1 CLAIM GROUP, OMINECA M.D.

SALARIES

1 Exploration Geologist (L.M. Azzaria) soil analysis and supervision for 10 days at $45/day - (Aug. 10-Aug. 19, 1965).	$ 450
2 Field Assistants (E.W. Batchelor and G.E. Paulus) for 10 days at $30/man-day - (August 10 - 19, 1965).	600

EQUIPMENT

Rental of Lemaire mercury detector for 10 days at $10/day	$ 100

TRANSPORTATION

Truck Rental for 10 days at $400/month	$ 133
TOTAL:	$1,283

D.W. Heddle
D.W. Heddle
Professional Engineer

Endorsed by:

G. Hamson
G. Hamson
Branch Accountant

This is Exhibit "A" to the Statutory Declaration of D.W. Heddle, declared before me the 31st day of January A.D. 1966.

A Commissioner for taking Affidavits for the Province of British Columbia.

CANADA)
) STATUTORY DECLARATION RELATING TO EXPENDITURES ON A GEOCHEMICAL SURVEY OF CERTAIN MINERAL CLAIMS THE PROPERTY OF THE CONSOLIDATED MINING AND SMELTING COMPANY OF CANADA LIMITED
PROVINCE OF BRITISH COLUMBIA)
)
TO WIT:)

I, DUNCAN W. HEDDLE, Professional Engineer, of the City of Trail, in the Province of British Columbia, DO SOLEMNLY DECLARE:

1. That I am the person who prepared a geochemical report as the result of surveys carried out of certain mineral claims, the property of The Consolidated Mining and Smelting Company Limited, situated in Omineca Mining Division.

2. That copies of the said report are being filed with the Mining Recorder in Smithers.

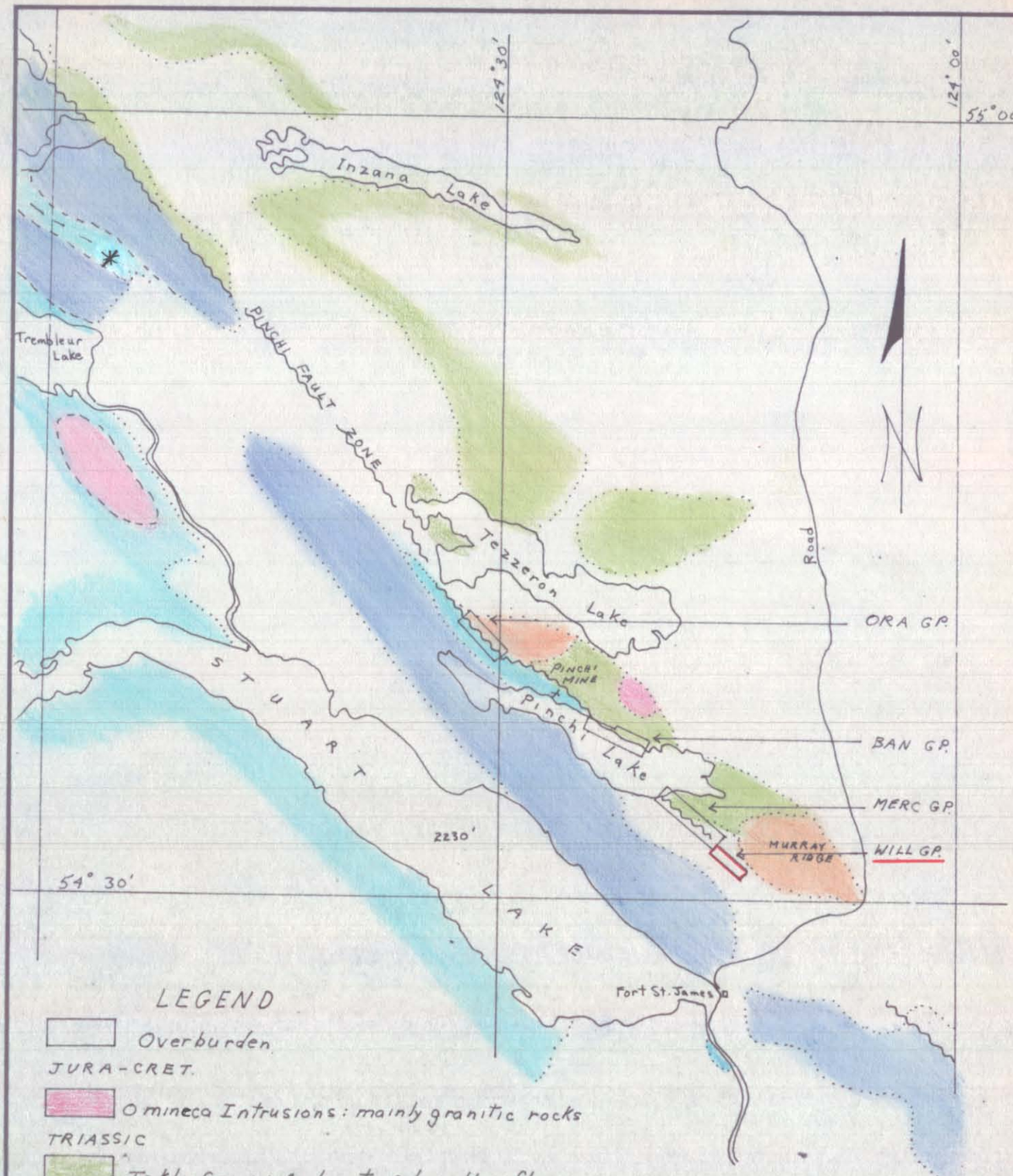
3. That attached hereto and marked with the letter "A", upon which I have signed my name at the time of declaring hereof, is a statement of expenditures incurred in connection with the geochemical survey of the said claims showing in addition the dates during which those making the said survey performed their work.

AND I MAKE this solemn declaration conscientiously believing it to be true and knowing that it is of the same force and effect as if made under oath and by virtue of the Canada Evidence Act.

DECLARED before me at the Municipality of Tadanac, in the Province of British Columbia, this 31 day of January, A.D. 1966.

D. W. Heddle

A Commissioner for taking Affidavits for British Columbia



LEGEND

Overburden

JURA-CRET.

Omineca Intrusions: mainly granitic rocks

TRIASSIC

Takla Group: Andesitic & basaltic flows agglomerates, tuffs & sediments

Trembleur Intrusions: Mainly pyroxenite

PERMIAN - Cache Creek Gp.

Varied sediments and greenstone

Mainly massive limestone.

The Consolidated Mining and Smelting Company of Canada Limited

DRAWN BY:		TRACED BY:	
REVISED BY	DATE	REVISED BY	DATE

PLAN - PINCHI LAKE AREA - GENERAL GEOLOGY AND CLAIM LOCATION - TO ACCOMPANY GEOCHEMICAL REPORT BY D.W. HEDDLE P. ENG., ON THE WILL NO. 1 CLAIM GROUP, PINCHI LAKE AREA, OMINECA M.D. DATED JAN. 21, 1966.

D. W. Heddle

SCALE: 1" = 6 mi | DATE: Jan 25/66 | PLATE: P.L. 13

HUGHES OWENS - 190M - 2500 - 6-65

COMINCO 210-0610

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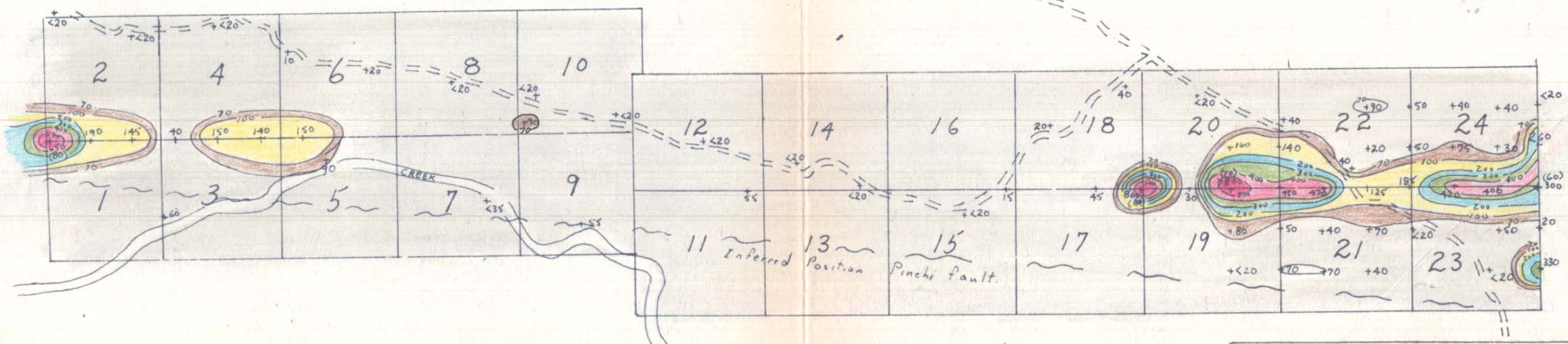

LEGEND

MERCURY CONTENT OF SOILS (p.p.b.)

0 - 70	
70 - 100	
100 - 200	
200 - 300	
300 - 400	
400 - 500	
500 +	

+ Sample location

70 etc. - Mercury content of soils (p.p.b). samples taken near surface

30 etc - Mercury content of soils (p.p.b). - samples taken from depth below 1 foot.

Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 719 MAP #2

M1

The Consolidated Mining and Smelting Company of Canada Limited

DRAWN BY:		TRACED BY:	
REVISED BY	DATE	REVISED BY	DATE

GEOCHEMICAL SURVEY - WILL NO 1 CLAIM GROUP

To accompany geochemical report by D. W. Heddle, P. Eng. on the Will No 1. claim group, Omineca M.D. dated JAN 21, 1966.

D. W. Heddle

SCALE: 1" = ¼ mi. | DATE: Jan 29/66 | PLATE: P.L 9A

COMINCO 210-0620