

2589

GEOCHEMICAL SURVEY REPORT

ON

PLACER MINERAL LEASE 813

LILLOOET RIVER
NEW WESTMINSTER MINING DIVISION

REFERENCE QUADRILATERAL

125° 15' WEST LONGITUDE
55° 00' NORTH LATITUDE

FOR

CHILCO DEVELOPMENTS LIMITED (N.P.L.)

WORK DONE BETWEEN JUNE 1969
AND 25 AUGUST 1970

BY G.L. KIRWAN, B.Sc., F.G.A.C.

J.M. ASHTON, P.Eng.

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<p>Department of Mines and Petroleum Resources ASSESSMENT REPORT</p> <p>NO. <u>2589</u> MAP</p>

GENERAL STATEMENT

The report herewith was prepared by J.M. Ashton, P.Eng. from a report by G.L. Kirwan, B.Sc., F.G.A.C. dated 15 June, 1970 for Chilco Developments Ltd. and submitted to the British Columbia Securities Commission. The writer was requested by Chilco Developments Ltd. to submit an addendum to the report showing the geochemical survey results on Placer Mineral Lease 813 and certify the statement of expenditure for the purpose of filing assessment work as required by the Department of Mines and Petroleum Resources. Note that the work described herein was done within the period of staking the Placer Mineral Lease and the receipt of the Placer Mining Lease Indenture and before the anniversary date August 25, 1970. More than two months had elapsed before the indenture was received.

J.M. Ashton

CHILCO DEVELOPMENTS LTD.

REPORT ON PROPERTY

LILLOOET RIVER AREA

BRITISH COLUMBIA

SUMMARY:

Chilco Developments Ltd. holdings comprise an undivided ninety percent interest in a single lease, some 80 acres in all, located in the Lillooet River Area at mile 23 north of Harrison Lake in the southwestern portion of the Province of British Columbia.

Based upon surface sampling and drilling programs supervised and reported on by competent professional mining personnel with many assays from several reliable assay houses clearly indicate that precious metals exist in economic proportions and values in the unconcentrated raw sands of the subject Lillooet River Valley, British Columbia. Considerable exploratory work is planned in the region of the property.

The following points form a broad analysis of the Lillooet sand and the subject property based on research to date:

1. THAT silver, gold, platinum and allied metals exist in submicron size particles along with the possibility of sponge iron in economic proportion and values in the raw sand of the Lillooet River area under discussion.
2. THAT metal values are reasonably consistent throughout the sand having been derived from a common source and deposited under similar conditions, and thus it is highly probable the subject property contains vast quantities of precious metals.

3. THAT considerable progress has been made over a short period of time from very low gold values indicated in most of the original samples to recent findings of an ounce of gold per ton from many assays, and experimentation with fluxes indicates half of this amount if recoverable in production quantities at a cost range of \$5.00 to \$8.00.
4. THAT metal values increase substantially with increase in depth.
5. THAT stable markets exist for detected metals and that markets should continue as such for some considerable time.
6. THAT sand is alluvial, not glacial, indicating full contributions of metals throughout.
7. THAT metals occur in submicron size in such a manner that certain metals such as platinum interfere with detection of other metals such as gold. Sands do not regularly respond to normal fire assay, spectrographic, or atomic absorption methods.
8. THAT sands are amenable to open cut operations in an area of easy access with abundant water supply and source of electric power with direct access to Pacific Ocean ports.
9. THAT a probable 25 million tons of sand to depth 100 feet from surface underlie the Chilco property. Inferred faulting adds further depth potential.
10. THAT many producing mines in the world today derive source from submicron size metals in sand material.

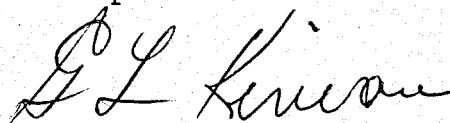
11. THAT substantial funds have been allocated for research at the field and laboratory levels, which programs have now commenced, in order to determine the best methods for extraction of precious metals as a major step prior to production.

In view of findings to date, expenditures are indeed warranted to determine the extent and degree to which the Chilco property carries precious metals.

As an initial exploratory step, it is recommended that representative surface sampling be performed on the lease and assayed for gold, silver, and the platinum group metals preferable at the Delta Smelting & Refining Laboratories, Vancouver, which firm is accustomed to processing the Lillooet alluvium.

The estimated all-inclusive cost of this work is \$5,000.00.

Becker drilling, at an approximate cost of \$10.00 per foot drilled, would be the next recommended step towards production to confirm metal values at depth.



G. L. Kirwan, B. Sc.
Consulting Geologist

Vancouver, B.C.
June 15, 1970.

Chilco Developments Ltd.,
Ste. 214 - 475 Howe Street,
Vancouver 1, B.C.

Gentlemen:

Chilco Developments Ltd. hold an undivided ninety percent interest in one lease, indicated as containing precious metals in alluvial sand material located in the Lillooet River Valley, British Columbia, Canada.

This report is an appraisal of the economic mineral potential of the subject property and carries recommendations for preliminary work programs to test this potential from a mine making point of view.

PROPERTY, LOCATION, ACCESS:

The holdings of Chilco Developments Ltd. consist of one sand lease totalling some 80 acres in all bearing the following number followed by tag number: 813 (37961M). The property is located in the New Westminster Mining Division.

The lease is located at mile 23 north of the northern tip of Harrison Lake.

Location of the property is some 60 miles due north-east from Vancouver, British Columbia, along the Lillooet River.

Access by road from Vancouver is via Pemberton thence directly onto the property by secondary road, a distance of some 100 miles. Float-equipped aircraft are accommodated by both Harrison and Lillooet Lakes, while wheel-equipped aircraft can land on strips at mile 6 and 38. Secondary roads flank each side of the Lillooet River in the subject area.

GEOLOGY:

A prominent valley running south southeasterly is occupied by Lillooet River within the rugged peaks of the Coast Range Mountain System, Western British Columbia. It is economically significant that this valley in the area under consideration is a probable fault adding depth potential to alluvial gravel material.

According to G.S.C. Map No. 1151A, Pitt Lake, rock assemblages in the region are represented by complex intrusives (granite to granodiorite to diorite), sediments, and volcanics chiefly of Mesozoic Age. Ultrabasic and basic rock formations occur some 110 miles north of the subject property.

The Lillooet River between Harrison and Lillooet Lakes, a distance of some 34 miles, generally occupies a broad mountain flanked valley. The sands containing the precious metals occur along the 34 mile ancient river bed, are laterally one-quarter to one-half mile wide, and are occasionally characterized by paired benches flanking the narrow, fast-flowing, shallow river. In most instances the Lillooet River is entrenched within the sands occupying a bed some 100 feet deep. These sands have been classified and re-distributed in post-Pleistocene time over a period of some 10,000 years.

The raw material deposited is the product of erosion of some 2,000 square miles of rock which forms the drainage system of the Lillooet Valley. The tributaries and feeder creeks drain an area containing basic and ultrabasic intrusives and these rocks are considered as source for the precious metals contained in the sands. As the sands have a common source and deposited under similar conditions the average values contained therein should be reasonably consistent throughout the entire Lillooet River Valley under discussion. Work to date indicates this to be so.

The platinoid metals, gold, and silver occur in sub-micron size in the sands and thus cannot be detected by the naked eye which probably accounts for non-discovery of the metals to current time.

Dimensions of a lease to depth 100 ft. allow it to contain 25 million tons of sand material.

HISTORY AND ECONOMIC CONSIDERATIONS:

The Lilloet River alluvial sands were tested at the turn of the century for coarse gold with crude methods by prospectors en route to the Cariboo Gold Area, and as fine gold could not be detected by these procedures, the area fell dormant.

Preliminary work in the Lilloet region consisted of ten random surface samples of raw sand from the Zyrox Mining Company's holdings at Harrison Lake assayed by the Whirry Laboratory, Los Angeles, California, and reported on by Consultant B.D. Weaver, P. Eng. Assays returned economic values in silver, gold, and the platinum group metals according to report dated April 23rd, 1968. Substantiation of these values was subsequently obtained through representative sampling from 18 vertical Becker drill holes to depth 100 feet assayed by the Robert E. Craig Laboratory, Sun Valley, California. This work showed average value in gold alone to be \$10.73 per ton at \$35.00 per ounce for the first 50 feet, while from 50 feet to 100 feet gold averaged \$16.90 per ton, values increasing substantially with depth. Competency of the Craig Laboratory was established by Mining Consultants Ford, Bacon & Davis, Inc., New York City.

Under report dated February 24, 1970, the arithmetical average of 61 random, unscreened, raw samples taken at regular intervals over a 26 mile section in the subject Lillooet Area under direction of the writer returned the following values in troy ounces per dry ton of sand: platinum 0.046, gold 0.036, palladium 0.020, silver 0.067 and iridium 0.002 for an average gross metal value of \$8.39 per ton, Engineering and Mining Journal figures. Assays indicate metal values are generally consistent throughout the sands, one area being as favourable as another. Samples assayed from the subject property returned average gross metal values of \$14.78 in precious metals at current market prices.

About mid-point between Harrison and Lillooet Lakes, Atlas Rainbow Mines Ltd. recently completed surface sampling and eleven vertical Becker drill holes to depth 108 feet. Positive results were obtained from samples assayed for precious metals and results again showed values increase substantially with depth. Hemrich Mines Ltd. drilled a short distance north of Atlas with comparable results. Assays on the latter samples were reported on by Delta Smelting & Refining Co. Ltd., Vancouver, Canada, from determinations performed by Crest Laboratories (B.C.) Ltd.

Based upon results of research to date but with many variables yet to consider, the indicated all-inclusive cost to process the Lillooet sands would be in the range \$5.00 to \$8.00 per ton.

Modern assaying techniques and recovery methods have recently been developed and perfected to a degree to recover economically submicron size gold and precious metals from sand material. The second and third largest gold producers in U.S.A. located at Carlin and Cortez, Nevada, are recent examples of submicron size gold recovery from siltstone processed to sand. Dana's Textbook of Mineralogy, 4th Edition, pp. 406-7, states that many alluvial sand deposits throughout the world are yielding platinum and allied metals.

From the Lillooet River Region, direct shipping access to Vancouver and the Pacific Coast is via Harrison Lake and the Fraser River. It is noted that a heavy duty power line traverses the entire property area, and that timber is available for mining operations.

SUMMARY OF LABORATORY RESEARCH TO DATE:

Field exploration demonstrates vividly that extremely large tonnages of sand material containing economic values and amounts of precious metals occur in the Lillooet River Valley, British Columbia. As in the case of ores of many successfully operating mines throughout the world today, the sands are complex and require fundamental research at the Laboratory level in order to determine the best procedure for maximum metal recovery. The material does not regularly respond positively to standard fire assay, spectrographic, or atomic absorption

methods. Considerable encouragement has been obtained from initial research study, and Chemalloy Minerals Ltd., which firm recently optioned the large Zyrox holdings, are currently financing research towards production.

Under report dated November 23rd, 1969, a bulk smelting research program consisting of 1.5 tons of representative Lillooet River sands was performed by Delta Smelting and Refining Company Ltd., Vancouver. Experimenting with normal fluxes, results of this study strongly indicate that gold and silver can be recovered in production quantities. Further research shows that recoveries should well exceed gold assay values from Robert E. Craig Laboratory. In fact, an ounce of gold alone is shown as being present in many sand samples assayed, and indications are half of this amount at present is recoverable. Because of this breakthrough and other indications in the laboratory, Delta researchers firmly believe that all the platinate metals in the sands are recoverable on a commercial scale, and research is geared towards concentrating these metals.

Intensive study of the Lillooet sands has commenced by the Canadian Federal Government in order to perform complete analysis with a view to the most economical method of extraction. Further, cyclasizer, infrasizer, and electromagnetic separation

studies are being performed by Cyclone Engineering Ltd., Edmonton, and Rapid Magnetic Ltd., Birmingham, England, in order to separate sand into fractions, and this work is meeting with marked encouragement in eliminating the bulk of the interfering elements. Other tests are continuing in a number of laboratories across Canada.

Sands underlying the subject Chilco property are characteristic of the Lillooet River belt under discussion and field research indicates similarity to those sands on the Chemalloy-Zyrox and Atlas Rainbow holdings.

Economic trends show that a stable market exists for precious metals noted herein and will continue for some considerable time.

CONCLUSIONS AND RECOMMENDATIONS:

Chilco Developments Ltd. holdings comprise an undivided ninety percent interest in a lease, some 80 acres in all, located in the Lillooet River Area at mile 23 north of Harrison Lake in the southwestern portion of the Province of British Columbia.

Based upon surface sampling and drilling programs supervised and reported on by competent professional mining personnel with many assays from several reliable assay houses clearly indicate that precious metals exist in economic pro-

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8. THAT sands are amenable to open cut operations in an area of easy access with abundant water supply and source of electric power with direct access to Pacific Ocean ports.
9. THAT a probable 50 million tons of sand to depth 100 feet from surface underlie the Chilco property. Inferred faulting adds further depth potential.
10. THAT many producing mines in the world today derive source from submicron size metals in sand material.
11. THAT substantial funds have been allocated for research at the field and laboratory levels, which programs have now commenced, in order to determine the best methods for extraction of precious metals as a major step prior to production.

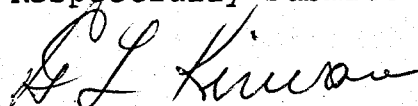
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duction to confirm metal values at depth.

Respectfully Submitted,



G. L. Kirwan, B. Sc.
Consulting Geologist

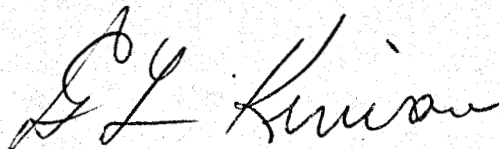
Vancouver, B.C.
June 15, 1970.

CERTIFICATE

I. GERALD L. KIRWAN of the cities of Toronto and Vancouver, certify as follows:

1. THAT I am a Geologist with offices at Ste. 205 - 160 Bay Street, Toronto, and Ste. 214 - 475 Howe Street, Vancouver, B.C.
2. THAT I have been graduated from Carleton University, B. Sc., 1957, and that I have practised my profession continuously.
3. THAT I am a Fellow of the Geological Association of Canada and a member of the Canadian Institute of Mining and Metallurgy.
4. THAT I have no interest direct or indirect in the property of Chilco Developments Ltd., and that I own 114,000 shares of Chilco Developments Ltd. acquired from treasury offering some 12 months ago.
5. THAT the accompanying report has been prepared by myself and is based upon numerous visits to the area of the property, a personal study of the alluvial sand material contained in the Lillooet River Valley, and close contact with personnel and laboratories involved in research of these sands over the past two years.
6. THIS report herein may be used in the prospectus of the Company and amendments thereto.

DATED at the City of Vancouver, in the Province of British Columbia, this 15th day of June, 1970.



G. L. Kirwan

ADDENDUM

Geochemical Survey of Aluvium Discussion of Results

Four representative samples of aluvium material were taken from Placer Mineral Lease 813 and submitted to the Robert E. Craig and Company Assayers, 11844 Art Street, Sun Valley, California, U.S.A. for assay.

Samples were collected in situ at locations as marked approximately on the location map appended herewith. Three pound samples were collected at 3 feet or more below surface under the direction of Mr. G.L. Kirwan.

Samples were placed in plastic containers, tagged and tied, and shipped to the Craig Laboratories for determinations of the following metals:

Gold
Silver

Platinum
Palladium
Iridium
Rhodium
Osmium
Ruthenium

and:
Rare Earth Metals

(a) Method of Analysis

(1) A low temperature fusion was conducted using a small amount of Silver as a collector in addition to the conventional PbO. It was found that the older method that states that high fusion temperatures are required will not apply to the form that the nobles are present in the subject material.

(2) The recovered metal was placed in solution in a conventional manner and the solution was subjected to Spectrochemical analysis and compared against standards made in the Craig laboratory. Results were checked by another firm, and values then reported.

This method will recover any Osmium or Ruthenium present in view of the fact that the primary fusion is conducted below the point that they are subject to volatilization.

The Rare-Earth analysis was conducted by the conventional Spectrographic method.

Assay Results

Assay results are shown below in troy ounces per ton of aluvium material dug. Samples were averaged and, their uncorrected gross worth was obtained using prices for the specific metals as quoted in the June 1970 issue of the Engineering and Mining Journal.

		OZ/TON ALUVIUM						
SAMPLE		<u>H-23</u>	<u>H-24</u>	<u>H-59</u>	<u>H-60</u>	<u>AVG</u>	<u>\$(U.S.)/OZ</u>	<u>\$(U.S.)/TON</u>
<u>ELEMENT</u>								
Au	TR	0.025	0.072	0.072	0.030	0.031	36.44	1.13
Ag	Nil	0.060	0.140	0.140	0.090	0.072	1.67	0.12
Pt	TR	0.037	0.081	0.081	0.051	0.042	130.00	5.46
Pa	Nil	0.008	0.079	0.079	0.040	0.031	37.00	1.15
Ir	Nil	TR	0.007	0.007	0.002	0.002	155.00	0.31
Rh	Nil	Nil	0.002	0.002	Nil	-	215.00	0.00
Os	Nil	Nil	TR	TR	Nil	-	200.00	0.00
Ru	Nil	Nil	TR	TR	Nil	-	50.00	0.00
TOTAL								\$8.17

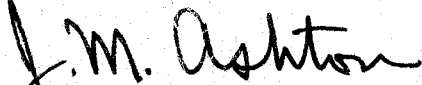
CONCLUSIONS

Geochemical sampling of aluvium located on Placer Mineral Lease 813 from three feet or greater from surface yielded an average, uncorrected gross value of \$8.17 (U.S.) per aluvium ton. Values were obtained in Gold, Silver, Platinum, Palladium and Iridium with Platinum being the largest contributor at \$5.46 (U.S.) per aluvium ton.

Depth of aluvium on Lease 813 is unknown at this time however as the Lillooet River occupies a probable fault zone potential for a deep aluvium deposit exists. Samples have been taken as deep as 130 feet elsewhere along the River without encountering bedrock.

As concentrations of metals in alluvial deposits normally increase with depth reaching a maximum on or close to underlying bedrock it becomes significant that values were obtained near surface. Deeper sampling would probably yield higher metal value.

Respectfully submitted,



J.M. Ashton, P.Eng.

Vancouver, B.C.
29 September 1970.

Statement of Expenditure

Geochemical aluvium sampling was supervised by Chilco Developments Ltd. (N.P.L.). The names of other personnel who worked on the sampling program and dates of employment are shown below with the program expenditures.

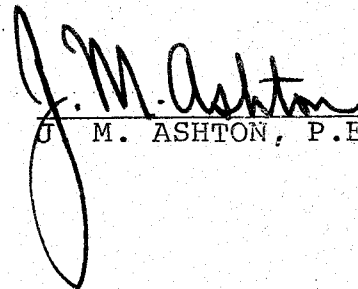
<u>Name</u>	<u>Date Employed</u>	<u>Expenditure</u>
G.L. KIRWAN, B.Sc., F.G.A.C.	15 June, 1970	150.00
P. DARNELL, B.A.	24 June, 1969	28.50
Assay 4 samples for Au, Ag, Platinates and Rare Earths @ \$120.00		480.00
Report & Maps		150.00
Vehicle employed on property 1/2 day @ 20		<u>10.00</u>
	TOTAL	\$818.50

J. M. Ashton

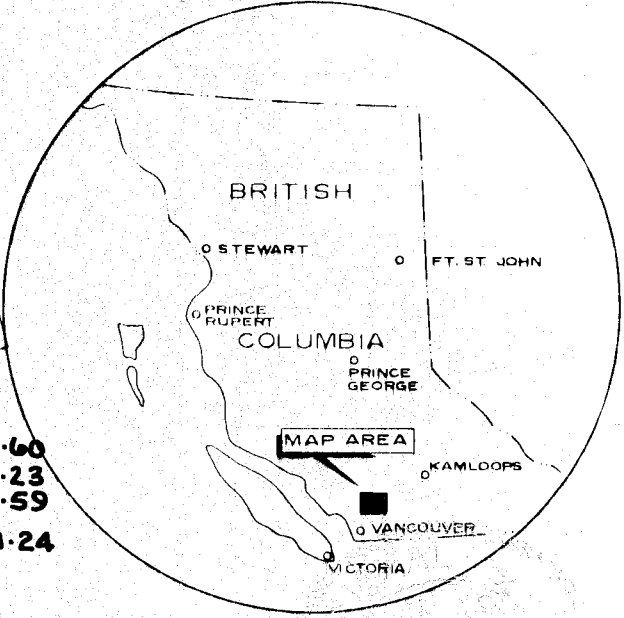
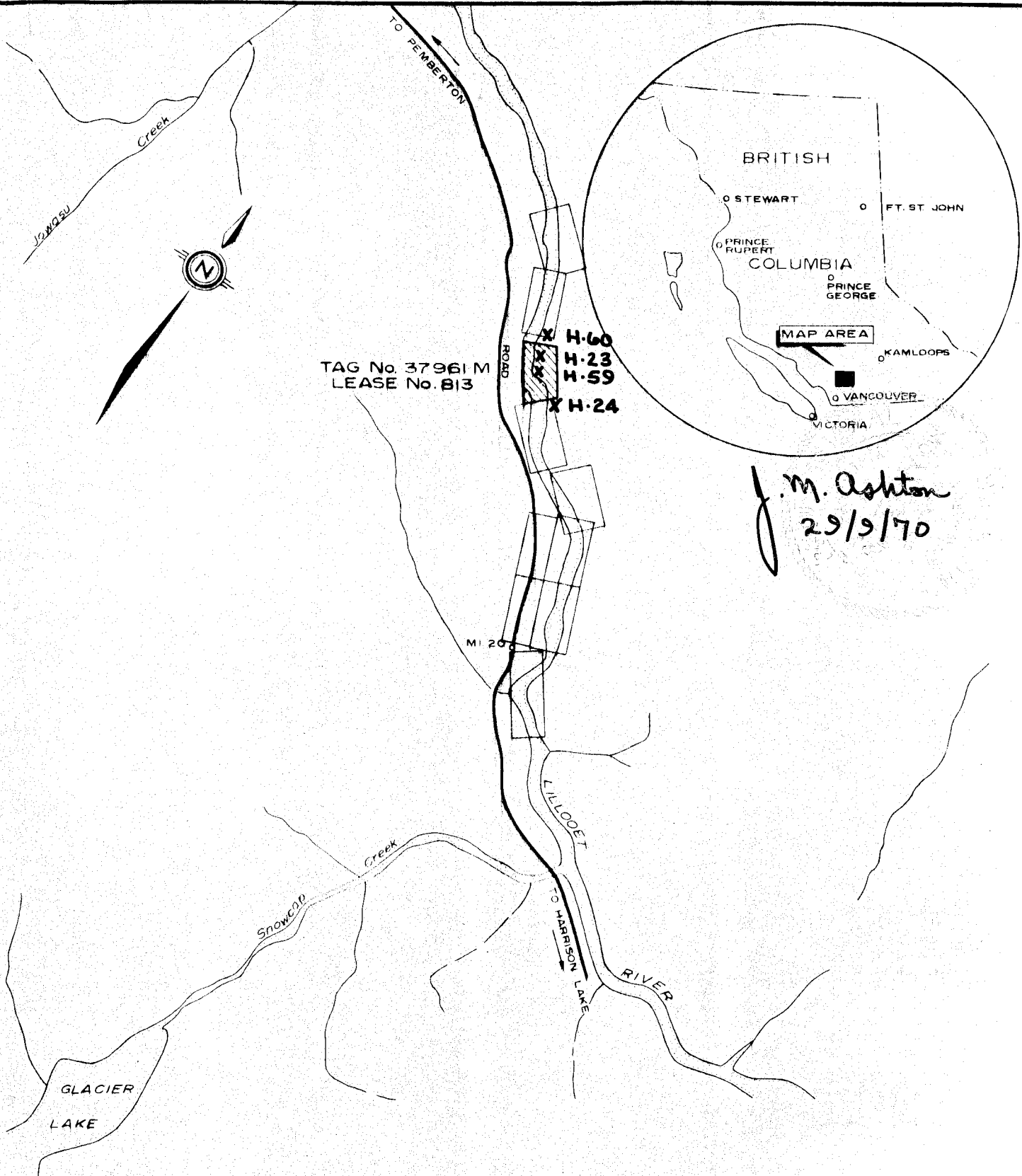
STATEMENT OF QUALIFICATIONS, J. M. ASHTON

I, JOHN MICHAEL ASHTON, of Suite 204 - 2930 Spruce Street, Vancouver 9, British Columbia, do hereby certify that:

1. I am a graduate of the University of British Columbia, and hold the Degree of Bachelor of Applied Science in Electrical Engineering.
2. I am a registered Professional Engineer of the Province of British Columbia.
3. This report is based upon a Geochemical Survey made in June, 1969 on Placer Mineral Lease 813.
4. I have no interest directly or indirectly in the properties or securities of Chilco Developments Limited (N.P.L.) nor do I intend to hold any such interest.


J. M. ASHTON, P.Eng.

23rd September, 1970



J. M. Ashton
29/9/70

Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 2589 MAP #1

CHILCO DEVELOPMENTS LTD.
LOCATION MAP
LEASE 813 TAG 37961 M



G. L. KIRWAN, B. Sc.