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REPORT

on the

CHEHALIS RIVER MINE

HARRISON MILLS, B.C.

by

Fred J. Hemsworth, P.Eng.

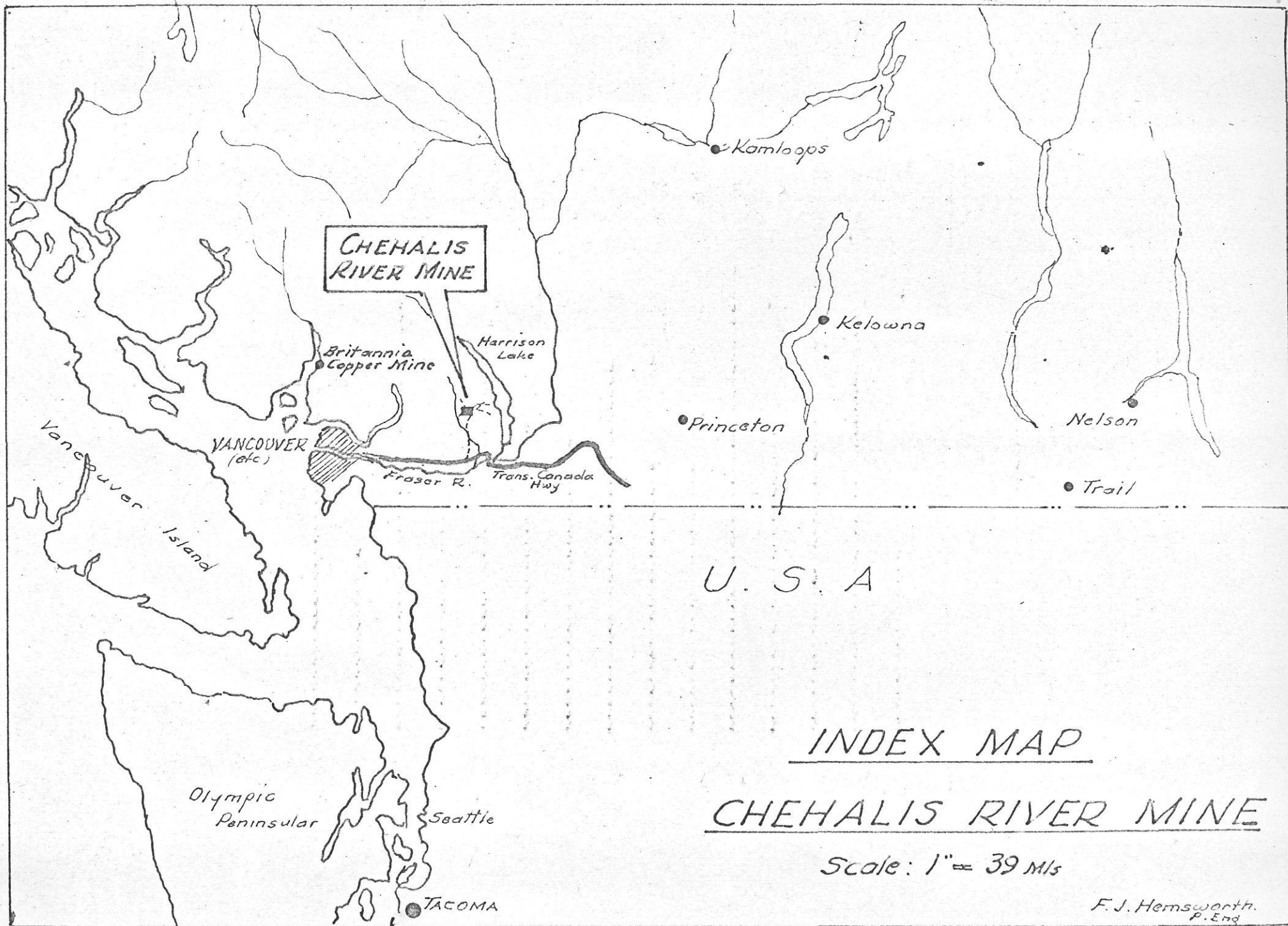
May 19, 1961.

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*express +
7/21/67*

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CHEHALIS RIVER MINE

Britannia Copper Mine

Harrison Lake

Kamloops

Kelowna

Princeton

Nelson

Trail

VANCOUVER (etc)

Fraser R. Trans-Canada Hwy

Vancouver Island

Olympic Peninsular

Seattle

TACOMA

U. S. A

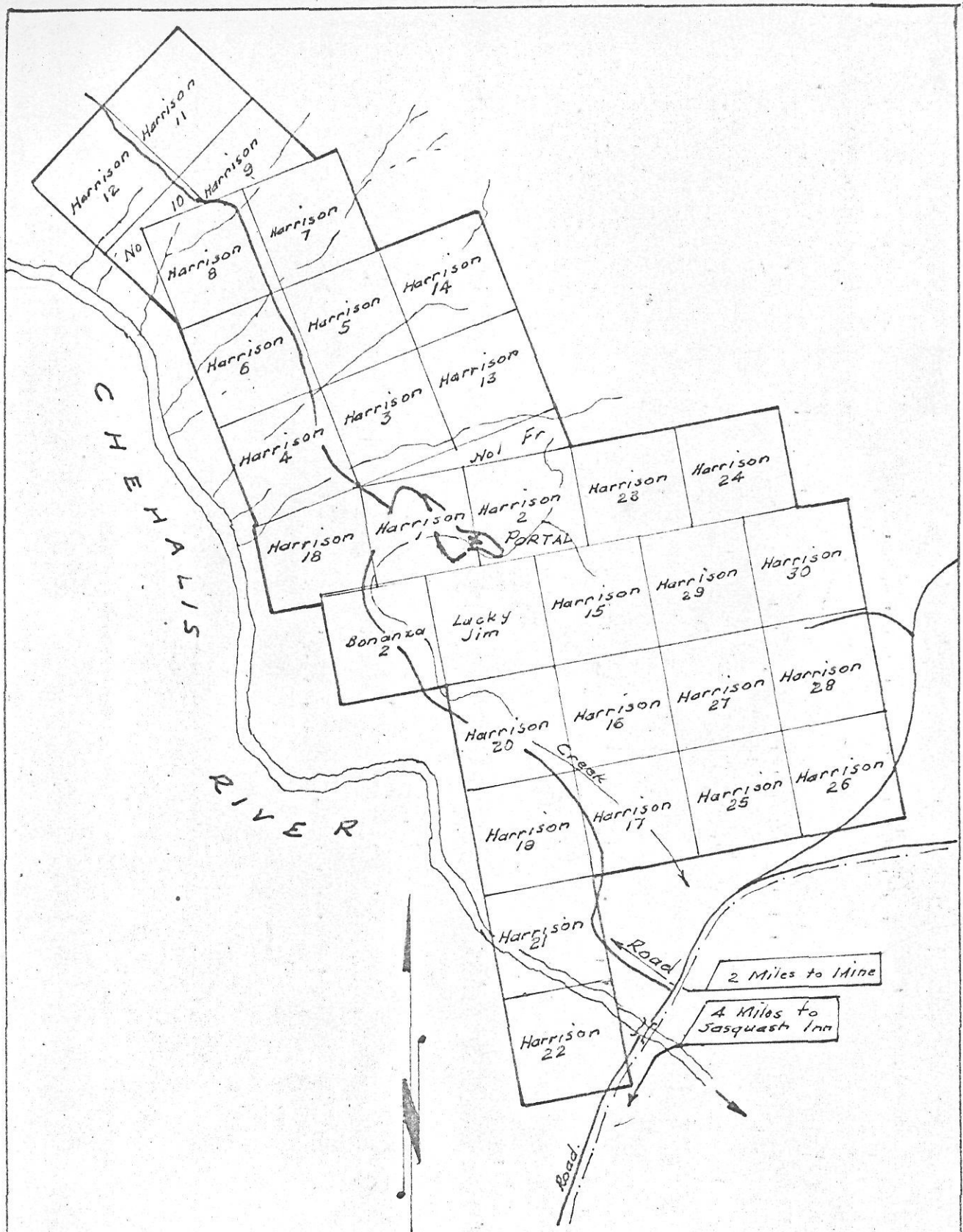
INDEX MAP

CHEHALIS RIVER MINE

Scale: 1" = 39 Mls

F. J. Hemsworth.
P. Eng

Frontispiece



CHEHALIS RIVER MINE

— SKETCH OF LOCATED CLAIMS —

Scale: 1" = 2000'

To Accompany Report by
F. J. Hensworth, P. Eng.

REPORT
on the
CHEHALIS RIVER MINE
HARRISON MILLS, B.C.

INTRODUCTION

The Chehalis River Mine, which was formerly known as the Motherlode property, is now being developed by a private company, the M^c M & H Mining Co. Ltd. The property was examined by the writer, Fred J. Hemsworth, P.Eng., on May 6th, 1961. Information from reports by Alfred R. Allen, P.Eng., dated 1953 and 1955, has been incorporated in this report, and some geologic features shown on the attached plan, have been borrowed from a recent sketch made up by Ralph McDonald, P.Eng.

This report is prepared at the request of Mr. Sheldon Haggman, 1557 West Broadway, Vancouver, B.C. It purports to describe the complex gold, silver, zinc, copper mineralization; the work that has been accomplished; and to make recommendations for extensive additional development.

SUMMARY

The mine consists of 41 mineral claims, lying east of the Chehalis river, 170 miles by road northeast of Vancouver.

A strong zone of fracturing and brecciation occurs in Jurassic volcanics about two miles from the main granitic contact. Two types of mineralization were noted:- quartz veins carrying coarse-grained pyrite, sphalerite, and occasional blobs of chalcopyrite; and replacement bodies in tuff carrying massive fine-grained marmatite and chalcopyrite, with appreciable values in gold and silver. The quartz veins and silicified zones are found over a large area. The higher-grade replacement mineralization is, so far, confined to one opencut and the dump from an old adit, about 300 feet distant. Large float boulders of massive sulphides are found scattered along the zone.

Old work on the property consisted of a 30-foot adit, an 18-foot shaft and numerous trenches. In addition 12 short diamond drill holes were drilled by Noranda Exploration. The present owners have built a good road, bulldozed out one large opencut, and driven a crosscut adit 423 feet. Numerous quartz veins, carrying generally low values, have been transected underground. The adit is being extended to come under the richer replacement mineralization and will give a depth of about 100 feet below the surface.

The writer strongly recommends the completion of the new adit, followed by extensive diamond drilling from underground stations.

LOCATION & FACILITIES

The claims are situated on the east side of the Chehalis river, near Harrison Mills. Access from Vancouver is by Provincial Highway No. 7 for 165 miles up the north side of the Fraser river to the Susquatch Inn, and thence by gravel road north for five miles to the mine camp.

The area has been recently logged and burnt, so that only a small quantity of timber suitable for mine stulls and lagging remains. However, squared timber is available from several sawmills near the mine.

The workings are about 500 feet in elevation above the Harrison river valley floor. The portal of the new adit is at an elevation of 860 feet above sea level. At this elevation the winters are mild, typical of southwestern British Columbia, and mining could be carried on during the entire year.

Sufficient water is available for preliminary development from a small creek which flows past the portal. When required a larger volume could be obtained from the Chehalis river.

PROPERTY

Particulars of the 41 mineral claims are as follows:-

<u>NAME</u>	<u>RECORD NO.</u>	<u>TAG NO.</u>	<u>EXPIRY DATE</u>
Bonanza No. 2	10574	278198	Oct. 21/61
Lucky Jim	3296	49788	Nov. 14/61
Harrison No. 1 Fr.	10938	377393	Nov. 14/61
Harrison Nos. One & Two	6592-93	453652-53	Nov. 14/61
Harrison Nos. 3,4,5, & 6	10939-42	279255-58	Nov. 14/61
Harrison No. 7	10943	377389	Nov. 14/61
Harrison No. 8	10944	377340	Nov. 14/61
Harrison No. 9 Fr.	10945	398129	Nov. 14/61
Harrison No. 10 Fr.	10946	377400	Nov. 14/61
Harrison Nos. 11 & 12	10947-48	377391-92	Nov. 14/61
Harrison Nos. 13,14 & 15	10949-51	377394-96	Nov. 14/61
Harrison Nos. 16 & 17	10952-53	377397-98	Nov. 15/61
Harrison No. 18 Fr.	10954	377399	Nov. 14/61
Harrison Nos. 19,20,21&22	10955-58	377572-75	Nov. 15/61
Harrison Nos. 23 & 24	10976-77	377586-87	Nov. 29/61
Harrison Nos. 25,26 & 27	10978-80	377580-82	Nov. 29/61
Harrison Nos. 28,29 & 30	10981-83	377583-85	Nov. 29/61
Mary M Nos. One & Two	10825-26	377385-86	July 14/61
Mary M Nos. Three & Four	10827-28	377387-88	July 14/61
Mary M Nos. Five & Six	10883-84	408201-02	Sept. 1/61
Mary M Nos. Seven & Eight	10885-86	408203-04	Sept. 1/61

GEOLOGY & MINERALIZATION

The Chehalis river claims are underlain mainly by andesitic lavas, largely altered to greenstones, greenish-grey tuff and agglomerate. Near the numerous quartz veins and fracture zones, the volcanics are altered to a cherty silicified rock. The Geological Survey Map No. 737A shows a granitic batholith on the west side of the Chehalis river, the contact following the course of the river about two miles west of the workings.

A strong shear zone strikes northwest and dips at varying angles to the southwest. The main mineralized zone appears to be about 60 feet wide and 400 feet long, although isolated silicified zones, containing pyrite and sphalerite, have been uncovered at numerous other places on the property. The main shear consists of a number of quartz veins and minor veinlets, occurring sporadically, and mineralized with coarsely-crystalline pyrite, sphalerite, and chalcopyrite. Small amounts of galena have also been noted. Assays to date on these veins and silicified zones have been generally low in both base and precious metal content. The interesting part of the property is the replacement bodies. Here fine-grained zinc and copper sulphides occur in massive form, in beds from two feet to ten feet thick. This ore carries commercial values in zinc, copper, gold and silver. The replacement appears to be in favorable beds of volcanic tuff, but the generic relationship with the quartz veins is obscure. Large boulders of massive replacement ore have been found scattered along the zone. Bulldozing of the "A" zone has revealed the favorable formation lying under a bed of softer fractured greenstone. In the vicinity of the favorable mineralization a soft blue rock (unclassified) was noted, and a gelatinous blue clay eroded from it appears to be an indicator of the presence of replacement ore. The presence of barite has been determined and the clay may be a mixture of the soft blue rock with calcium and iron sulphates.

SAMPLES & ASSAYS

Only four samples were taken by the writer. Considerable additional sampling would be required before average values could be estimated. The first two samples were chipped from rock exposures in the "A" zone pit, where sloughing tended to dilute the mineralization.

The third sample (No. 11705) was broken from a large piece of high-grade ore which had been bulldozed from the pit. This is a specimen sample and the assay represents what can be expected from the better grade ore. The gold and silver values are particularly encouraging.

The fourth sample was a grab from the better-mineralized material on a small dump 300 feet south of the "A" zone. This area is being trenched to find the source of this ore.

<u>Sample No.</u>	<u>Location</u>	<u>Width Feet</u>	<u>Au Ozs/T</u>	<u>Ag Ozs/T</u>	<u>Zn %</u>	<u>Cu %</u>
11703	"A" Zone	10	0.04	3.4	4.5	0.8
11704	"A" Zone	20	0.01	0.3	0.6	0.3
11705	"A" Zone	Grab	0.24	29.3	33.7	0.9
11706	Old Dump	Grab	0.14	5.4	12.9	1.4

Assay Certificate by G.S. Eldridge & Co. is attached to this report.

Samples taken by Alfred R. Allen, P.Eng., in 1953 gave the following results:

<u>Sample No.</u>	<u>Location</u>	<u>Width Feet</u>	<u>Au Ozs/T</u>	<u>Ag Ozs/T</u>	<u>Cu %</u>	<u>Zn %</u>
431	Large outcrop by road	2	0.015	1.40	0.95	0.80
432	Small cross quartz vein	2	0.020	2.45	4.95	8.60
433	Across pyritized zone in creek	33	0.010	0.90	0.70	0.90
Selected Dump Sample	Dump by shaft	--	0.005	0.70	0.50	11.20

Samples taken by B.O. Brynlesen, P.Eng., in 1951 assayed as follows:

<u>Width Feet</u>	<u>Au.Ozs/T</u>	<u>Ag.Ozs/T</u>	<u>Cu.%</u>	<u>Pb.%</u>	<u>Zn.%</u>
7.0	Tr.	0.50			0.20
4.0	0.08	3.80	3.4	Tr.	4.5
5.0	0.30	11.70	0.9	0.2	8.4
3.0	0.32	5.8	2.4	0.4	17.4
6.0	0.14	9.7	0.6	Tr.	2.6
4.0	0.24	9.5	2.9	0.4	8.4
Grab-dump	0.01	1.6	2.07		3.6
Grab-dump	0.01	1.4	2.3		3.1

The above assays are quoted to illustrate the variation in values. It is interesting to note the relationship between high zinc content and high gold and silver assays.

DIAMOND DRILL RESULTS

The property was diamond drilled to shallow depths by Noranda Exploration Ltd. in 1951. Twelve X-Ray holes were drilled and core recovery was poor. Results of the drilling as taken from Mr. Allen's report are summarized in the Appendix. It is noted that some holes, particularly Nos. 4 & 6 produced interesting ore values.

RECOMMENDATIONS

A survey is required to determine the exact position of the face of the crosscut in relation to the surface showing. This is of primary importance.

It is recommended that the crosscut adit be advanced to come under the replacement ore that has been exposed on the surface in the "A" showing. Until a proper transit survey has been made it is difficult to estimate the required advance, but it will not be more than 300 feet. When the ore is encountered in the crosscut, it should be drifted on in both directions and diamond drilled at depth. In addition a raise in ore to the surface would provide valuable information and facilitate ventilation.

As the tunnel is driven beside the shear zone in a southeast direction, it is possible that it may parallel the ore zone and not intersect it. In this case short drill holes to the northeast would cut the zone.

The cost of this first-stage of preliminary development including the tunneling, diamond drilling, and engineering is estimated at \$35,000.00.

Provided that the results of the preliminary development are favorable, a second-stage is recommended. This would involve the driving of a second crosscut adit some 500 feet lower in elevation. This would be a main haulage level some 1,500 feet long and would cost a minimum of \$65,000.00. If both stages of development are successful in proving up a sufficient tonnage of ore, a much larger amount of capital will be required for preproduction expenses.

ECONOMIC CONSIDERATIONS

From a visual inspection, the ore appears to be very marmatitic, that is, the zinc is ferriferous. The proportion of FeS to ZnS varies from 1:5 to 1:2 in marmatitic zinc ore. The presence of inherent iron in the zinc sulphide will make it difficult to make a high-grade zinc concentrate, and a 50% zinc concentrate would be the maximum that could be expected. This concentrate is not as readily marketable and commands a lower price on this continent. However, Japanese buyers are interested in zinc, iron, and copper concentrates so that a market is assured when required.

The present price of copper is 30 cents per pound and appears to be rising. This is compensated by the recent decline in the price of zinc to the present value of 11 cents per pound.

The Canadian Pacific Railway has loading facilities at Harrison Mills a distance of only five miles from the Chehalis River Mine.

Arrangements have been made to conduct a series of concentration tests at the Britannia Copper mill, and to mill some customs ore if desired.

CONCLUSIONS

The assays of samples of the replacement ore are very encouraging, and geological possibilities are excellent. Considerable more work will be required to clarify the structural control along the shear zone. There is no doubt that the first stage of development, involving the completion of the crosscut and extensive diamond drilling, is merited. The results of this program will be evaluated as a basis for further development.

Respectfully submitted,


Fred J. Hemsworth, P.Eng.

APPENDIX 1

Particulars of diamond drilling by
Noranda Exploration in 1951.

<u>Hole #</u>	<u>Bearing</u>	<u>Dip</u>	<u>Length</u>	<u>Remarks</u>
DDH #1	N.57°W.	-45°	48'	Greenstone throughout.
DDH #2	N.10°E.	-45°	87'	0 to 32' altered, brecciated. Av. Values 1 oz. Ag.; 3% Zn. 32' to 87' Greenstone.
DDH #3	S.45°W.	-65°	58'	Brecciated altered zone from 11' to 43.5'. Balance hole in greenstone. Av. value less than 1% Zn. From 31' to 36' value 4.7% Zn.
DDH #4	S.46°W.	-40°	26'	0-13.7' Greenstone. 13.7'- 18' Massive sulphides. Sample #8814. 18'-26' Greenstone, broken and faulted at 26'. #8814 -Au. .12; Ag. 4.4; Cu. 1.6; Zn. 22.5.
DDH #5	Vertical		16'	Greenstone. Gravel and broken ground at 16'.
DDH #6	S.46°W.	-60°	32'	0-13.8' Greenstone massive. 13.8'-16.6' Massive sulphides, Sample #8816. 16.6'-32' Greenstone massive. Sample #8816 - Au. .12; Ag. 2.1; Cu. 3.0; Zn. 22.3.
DDH #7	N.38°E.	-40°	32'	0-8' Altered brecciated - slight sulphides 8' - 32' Greenstone.
DDH #8	Vertical		15'	0-6' Altered brecciated - slight sulphides 6'-14' Massive greenstone.
DDH #9	Vertical		39'	Greenstone.
DDH #10	S.30°W.	-40°	36'	0-11' Altered pyritized - slight Zn. 118-36' Greenstone.
DDH #11	N.30°E.	-60°	19'	Cased through overburden to get under creek. No B.R. so discontinued hole

<u>Hole #</u>	<u>Bearing</u>	<u>Dip</u>	<u>Length</u>	<u>Remarks</u>
DDH #12	N.18°E.	-23°	35'	0 - 28' Altered brecciated pyritized - Sample #8820 28' - 35' Greenstone. Fault at 35'. Sample #8820 - 20 feet - Au. Trace; Ag. 1.0; Zn. Trace.

Referring to the assay on DDH No. 12 the following paragraph is quoted from a report by H. O'R. Dyer, P.Eng., dated May 21st, 1956.

"I would mention here that Mr. Miller showed me an assay certificate by a provincial assayer addressed to Mr. B.O. Brynelsen giving the results of 2 samples as follows:

		<u>Au.Ozs.</u>	<u>Ag.Ozs.</u>	<u>Cu.%</u>	<u>Pb.%</u>	<u>Zn.%</u>
#1	4'	0.24	33.5	2.11	4.68	21.56
#2	12'	0.46	12.4	0.68	0.41	5.72

Mr. Miller states that this certificate was given to him by Mr. Brynelsen on the property during the course of the drilling program and that Mr. Brynelsen informed him that the results were from core samples from the hole designated on the plan as No. 12. These results were apparently not included in the data made available to Allen. I offer no explanation concerning this but if Mr. Miller's impression is correct a very much more optimistic view of the possibilities of that occurrence obviously follows for a potential vein length of nearly 200 ft. with high values would then be indicated. And of course, the west end at least is open."



To:

Mr. Fred Hemsworth,
850 West Hastings St.,
Vancouver, B.C.

Certificate of Assay

G. S. ELDRIDGE & CO. LTD.

ASSAYERS METALLURGISTS CHEMISTS

INSPECTION AND TESTING ENGINEERS

633 HORNBY ST.

VANCOUVER, CANADA

CABLE ADDRESS "ELDRICO"

FILE NO.

5102

DATE

May 10/61

MEMBERS OF

CANADIAN INSTITUTE OF CHEMISTRY
CANADIAN INSTITUTE MINING AND METALLURGY
AMERICAN SOCIETY FOR TESTING MATERIALS
AMERICAN SOCIETY FOR METALS
AMERICAN CHEMICAL SOCIETY
ASSOCIATION OF OFFICIAL RACING CHEMISTS
NATIONAL ASSOCIATION OF CORROSION ENGINEERS

We Hereby Certify that the following are the results of assays made by us upon submitted ORE samples.

MARKED	GOLD		SILVER		ZINC (Zn)		COPPER (Cu)		TOTAL VALUE	
	OUNCES PER TON	VALUE PER TON	OUNCES PER TON	VALUE PER TON	PER CENT.	VALUE PER TON	PER CENT.	VALUE PER TON	VALUE PER TON	PER TON (2000 LBS.)
11703	0.04	\$ 1.40	3.4	\$	4.45	\$	0.82	\$	\$	\$
11704	0.01	0.35	0.3		0.58		0.26			
11705	0.24	8.40	29.3		33.65		0.91			
11706	0.14	4.90	5.4		12.90		1.44			

Gold calculated at \$ per ounce.

Calculated at cents per lb.

Silver calculated at per ounce.

Calculated at cents per lb.

NOTE: Rejects retained one week.
Pulps retained three months.
Pulps and rejects may be stored for a maximum of one year by special arrangement.

H. Sharpe

Provincial Assayer

H. THOMSON LESLIE, B.Sc., E.M.

CONSULTING GEOLOGIST • MINING ENGINEER

SUITE 928, 67 YONGE ST., TORONTO, CANADA • TEL. EMPIRE 8-6533

MILLER MINING CLAIMS

CHEHALIS RIVER, B.C.

The writer examined the exposures on the Miller Mining Claims in August 1957, accompanied by the owner Mr. Isaac Miller. In this examination, a report by Mr. H. O'R. Dyer was of considerable assistance and shall be further referred to hereunder.

Accessibility

Access to the property is ideal as the main exposures are located approximately one and three quarter miles from the main highway and can be reached by a good gravel logging road. As such is the case, no accommodation on the property would be required for mine crew or staff.

Development

The claim area is mainly covered by overburden. A number of exposures have been made along or in proximity thereto of a creek bed which strikes more or less East and West through the exposure area. The exposures examined are those known as the "A" and "B" showing, and the exposures along the creek bed to an Adit Portal now covered by road construction located about 280 feet West of the "A" showing. Another exposure examined was an apparent branch from the main zone located about a quarter of a mile southwest of the Adit Portal. Most of the exposures show some sulphide mineralization. In places, the mineralization consists of disseminated pyrite and sphalerite and in other places it consists of a fairly good concentration of pyrite, sphalerite, chalcopyrite and a little galena, also the odd pod of assenopyrite. Sections of the "A" showing appear to have a visual content of better than 2% copper and 10% zinc. Similar mineralization was noted in float rocks West along the creek. Samples of the latter taken by Mr. Dyer and Dr. H. Gunning are reported to have assayed respectively as follows:

(A) 0.14 oz. Gold, 6.8 oz. Silver, 2.7% Copper and 14.4% Zinc

(B) 0.18 oz. Gold, 6.5 oz. Silver, 4% Copper and 13.4% Zinc

An Assay Certificate by the Provincial Assayer shown the writer by Mr. Miller and stated to be from No. 12 X-ray drill hole, gave the following results for two samples:

.....

	<u>Feet</u>	<u>Au.Oz.</u>	<u>Ag.Oz.</u>	<u>Cu.%</u>	<u>Pb.%</u>	<u>Zn.%</u>
#1	4	0.24	33.5	2.11	4.68	21.56
#2	12	0.46	12.4	0.68	0.41	5.72

Hole No. 12 location is shown to be under part of the exposure located 80 feet West of the "A" showing.

Geology

The main sulphide exposures occur along a shear or fault zone in altered volcanic rocks striking east and west along the creek. The area is mainly covered by overburden and the exposures so far made appear to be along the hanging wall side of the sulphide zones. The dip appears to be steeply to the South.

The actual width of the sulphide zone could not be ascertained as no indication of the footwall was noted in any exposure. The mineralization exposed in the "A" showing has a width of about 20 feet from the hanging wall to where it disappears under the overburden.

The formations north and south of the shear zone area are mainly amygaloidal andesites other than an outcrop of breccia material located about 150 feet north of the creek. The continuation of the breccia zone on its strike would enter the shear zone area at or slightly east of the "A" showing and if such is the case, it would provide a most suitable structure for a concentration of sulphide deposition.

History

The following is a brief history of the claims as given to the writer by the owner, Mr. Isaac Miller, and further outlined in Mr. Dyer's report of May 21st, 1956.

The claims were examined by Mr. Dyer in the early part of World War II for the Consolidated Mining & Smelting Co., at which time, showings "A" and "B" had not been uncovered. Mr. Dyer felt that the situation justified further exploration and in the Fall of 1944, a geological engineer of the Company's staff carried out a geological reconnaissance, covering the property, and as a result, arrived at the same general impression as Mr. Dyer. However, during this time, the Consolidated's exploration was cut down and the matter was not followed up.

Later, the property was examined by Dr. H. Gunning for the ^{new} Jersey Zinc Exploration Company. Subsequently, in construction of a road by the logging company, the mineralized zones "A" and "B" were uncovered. At this time, the property was brought to the attention of Noranda Explorations who put down 12 shallow X-ray diamond drill holes. Considering the results of these holes were not favourable, the Noranda Explorations dropped their option on the property.

In Mr. Dyer's opinion, the Noranda drilling results were definitely indecisive. In this the writer concurs for the following reasons:

- (A) An X-ray drill is not suitable for an area covered by overburden. It can only drill to shallow depths and cannot be used to get a proper cross-section of the mineralized zone area.
- (B) Drill holes should be put down to sufficient depth to get well under the weathered and oxidized surface and such drill holes should be extended to sufficient length to ascertain not only the hanging wall and footwall of the indicated zone, but far enough to intersect any parallel zone that may exist in the shear zone.
- (C) Other than a few holes drilled along the apparent hanging wall side of the zone, and in which values were obtained, the majority of the holes were drilled off the strike of the shear zone.

Summary

The claims are located at a low elevation. They are of easy access and operations may be carried out throughout the year.

The claims are not in a known mining area, the nearest mine operation being the Britannia Mine, 40 miles distant. If other mines were situated in the area, the claims would undoubtedly have had some extensive development ere now.

The development work to date has been limited and insufficient to ascertain widths, continuity or average values. The exposures so far made indicate interesting possibilities to develop sizeable ore bodies and a reasonable program of exploration is amply justified.

The mineralization may be found to be more or less continuous or found to occur as lenticular bodies along the strike.

Recommendations

The initial work should be in the form of diamond drilling and all further work based on the results obtained. Drill holes should be laid out to cross-section the shear zone and cut the present exposed mineralized zones at a vertical depth of about 100 feet. Such holes would ascertain actual widths, average values and the possibility of parallel zones.

One hole should be put down under the showing that was partially intersected by X-ray hole No. 12. A second hole under the "A" showing and a third hole 100 ft. along strike to the east. A fourth hole drilled at a steeper angle may then be considered to establish dips.

This drilling would total between 1,500 and 2,000 feet, and the total cost should not exceed \$10,000.00.

Respectfully submitted,



H. Thomson Leslie, B.Sc., E.M.

September 12, 1957