

84-#20-11929

GEOLOGICAL AND GEOCHEMICAL INVESTIGATION
CUMMINS I AND II MINERAL CLAIMS
WHITESAIL LAKE AREA
OMINECA MINING DIVISION, B.C.
NTS 93 E/11 E
LATITUDE 53°31', LONGITUDE 127°05'

Prepared for

ICE STATION RESOURCES LTD.

**GEOLOGICAL BRANCH
ASSESSMENT REPORT**

11,929

ARCTEX ENGINEERING SERVICES

Paul Kallock
Geologist

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January 4, 1984

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MAPS: (Pocket inside back cover)

 Geology Map

 Soil Geochemical Map: Composite

 Cu-Mo-Pb-Zn-Ag

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SUMMARY

Initial geological mapping and soil geochemical surveys have been carried out on the Cummins mineral claims of Ice Station Resources Ltd. The group consists of 40 units (1000 hectares) and is located 1 km north of Whitesail Lake in west-central British Columbia, approximately 110 km south of Houston, B.C. A large portion of the claim block appears to be underlain by granodiorite which may belong to the Nanika type of intrusions considered to be lower Tertiary in age. In contact with the granitic rocks are intermediate volcanics of the Hazelton Group. Three areas of base metal soil anomalies, two of which contain anomalous silver, are indicated by initial sampling. The next Phase of exploration should include additional geological mapping, soil sampling, and ground geophysics at a cost of \$25,300. Total of the next three Phases, if warranted, is estimated at \$317,500.

INTRODUCTION

The Cummins I and II mineral claims, owned by Ice Station Resources Ltd., are located in west-central British Columbia between the Whitesail Range and Whitesail Lake, approximately 110 km south of Houston, B.C. Troitsa Creek passes through the northwest corner of the Cummins I claim. Elevation of the property ranges between 1006 and 1372 metres (3300 and 4500 feet). Each of the two claims is comprised of 20 units, totalling approximately 500 hectares. Statistics of the claims are as follows:

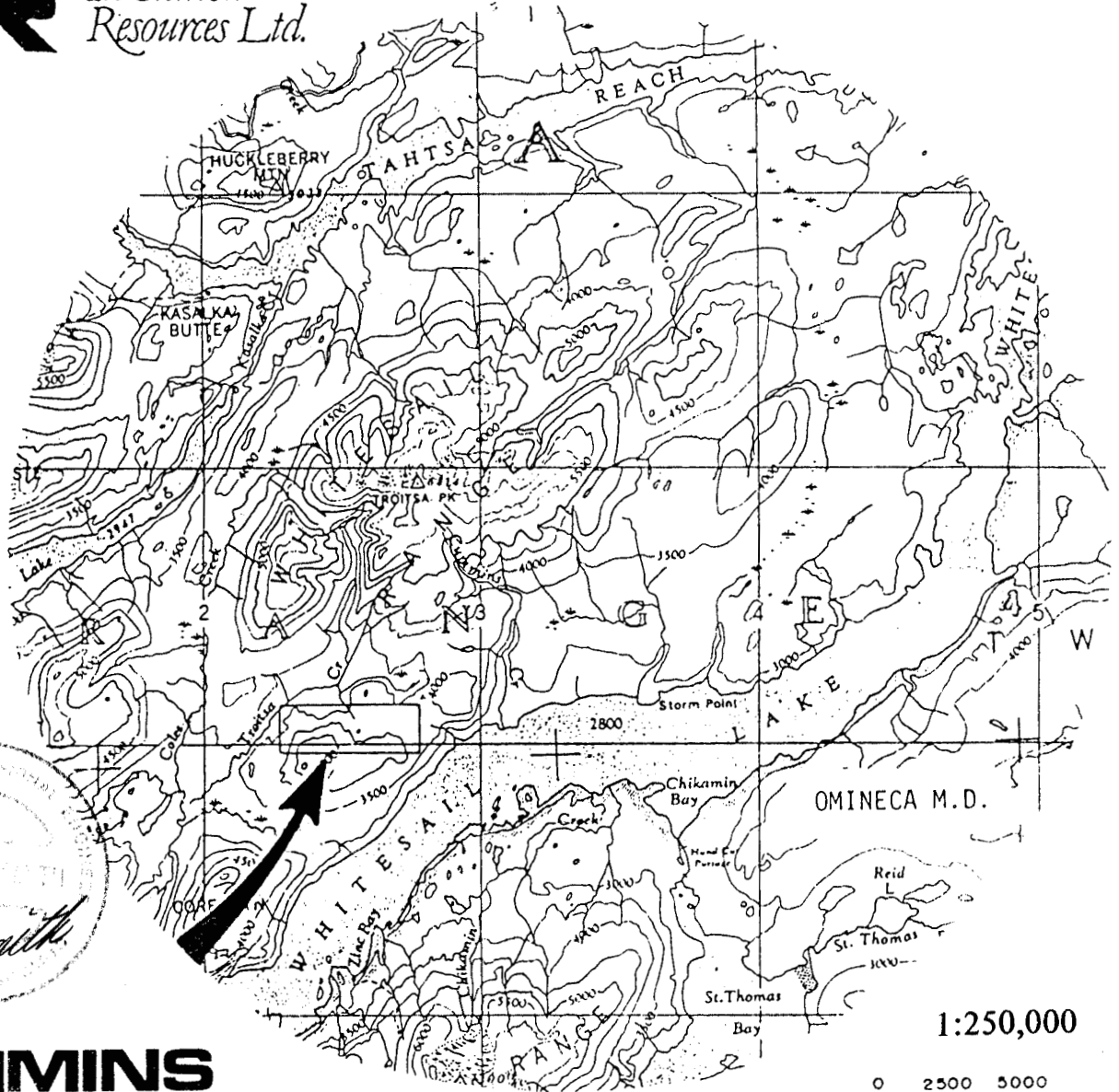
	<u>Units</u>	<u>Record No.</u>	<u>Record Date</u>	<u>Tag No.</u>
Cummins I	20	5090(4)	April 27, 1983	74848
Cummins II	20	5091(4)	April 27, 1983	74849

Access to the property is best accomplished from Houston or Burns Lake, 150 km to the north. Launch or barge transport is available on the Nechako Reservoir (Whitesail Lake) which is 1 km southeast of the southeast corner of the Cummins II claim.

There is no known record of mineral production from the Cummins claim group, nor are there records of mineral exploration activity or previous ownership. On July 9, 1983, and between September 27 and October 3, 1983, personnel of Arctex Engineering Services conducted geological mapping and soil, stream sediment, and rock sampling of the Cummins I and II. The data presented in this report were gathered during these periods, and are supplemented by previous government mapping by Woodsworth (1980) and by van der Heyden (1982).

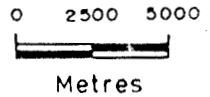
The legal corner post for the Cummins I and II was observed. Furthermore, extensive lengths of blazed and flagged claim lines and perimeter posts were also found to be in satisfactory order.

ISR Ice Station Resources Ltd.



**CUMMINS
1 & 2**

1:250,000



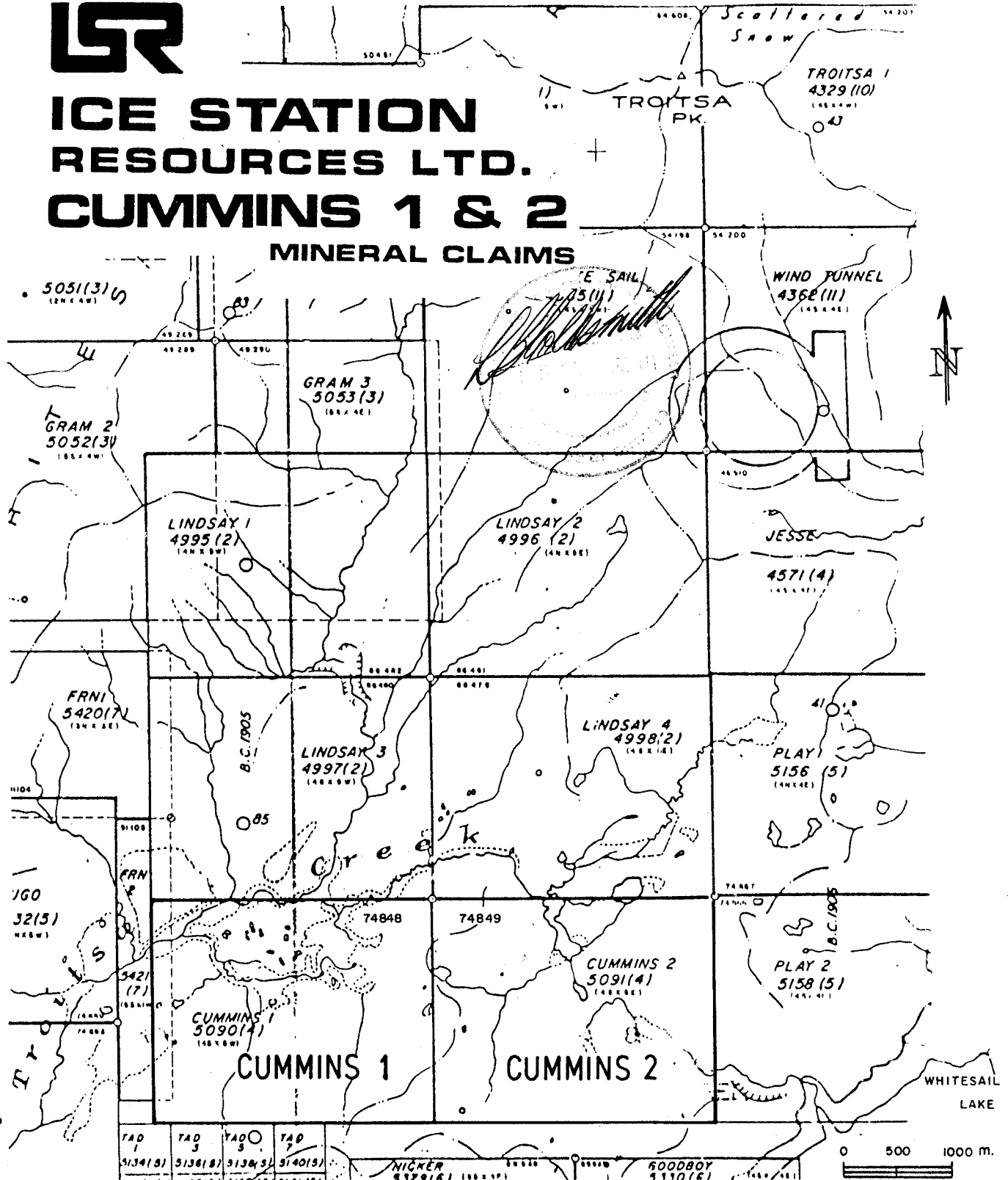
Whitesail Lake area, B.C. 93E/11E

Location Map

OMINECA MINING DIVISION



ICE STATION RESOURCES LTD. CUMMINS 1 & 2 MINERAL CLAIMS



Claim Map Whitesail Lake area, B.C. 93E/11E 1:50,000

To accompany JANUARY 1984 REPORT by KALLOCK, DAVIDSON & GOLDSMITH. ARCTEX Engineering Services.

REGIONAL GEOLOGY

The Cummins claim group lies within the Intermontane tectonic belt, approximately 20 km east of the Coast Plutonic Complex. The most significant geologic formation of west-central British Columbia is the Jurassic Hazelton Group which is basement for most of the Intermontane Belt. The Hazelton Group consists mainly of folded andesitic volcanic and sedimentary rocks, typical of volcanic island arc assemblages. These rocks are unconformably overlain by a sequence of less-deformed Lower Cretaceous marine sedimentary rocks informally called the Skeena Group. They occur to the west of the Cummins claim in the Coles Creek-Troitsa Lake area. Relatively flat-lying to gently dipping continental volcanic rocks of Upper Cretaceous to Tertiary age outcrop in the vicinity of Ootsa Lake and in the Whitesail Range, and constitute the Ootsa Lake Group. A younger sequence of intermediate to mafic volcanics occurs in the Whitesail Range.

Numerous intrusions of dykes, plugs and stocks, mostly of Upper Cretaceous to Tertiary age, are scattered throughout the Whitesail Range and Tahtsa Lake area. Porphyry copper and molybdenum occurrences are associated with the porphyritic phase of some of these intrusions.

Caldera development near Tahtsa Lake, 12 km northwest of the Cummins claims, has been documented by Hodder and MacIntyre (1979). Intrusion, vulcanism and associated caldera collapses are evidenced by subsidence faults which cut Cretaceous Kasalka volcanics. Ring and radial faults extend away from the central downfaulted blocks and are believed to have localized mineralized intrusives at Ox Lake and Coles Creek.

LOCAL GEOLOGY

As can be seen from the geology map included in the pocket of this report, outcrops on the Cummins claim group are sparse but sufficient to delineate the presence of a large granodiorite body which intrudes intermediate volcanics. Relative ages and names have been assigned to these two rock units by van der Heyden (1982).

The oldest rocks in the claim group belong to the Telkwa Formation of the Hazelton Group. They are considered to be lower Jurassic (Sinemurian?) in age. Regionally, the Telkwa Formation is composed of variegated red, maroon, grey, and green tuff, breccia and flows of basaltic to rhyolitic composition. The formation may also include lesser amounts of conglomerate, red mudstone, siltstone and argillite.

Most of the intermediate volcanics including andesite and dacite that were observed on the property are tentatively assigned to the Telkwa Formation. However, at least two areas may be exceptions. Near grid station 6S 3E amygdaloidal andesite and andesite breccia is dissimilar to green and purple volcanics farther south. The amygdaloidal nature of the andesite is more characteristic of younger flows such as the Endako Group. In the southeast corner of the claim group, bleached and silicified felsic (?) volcanics are fractured and locally sheared. It is unknown if this compositional change from andesites is confined to flows within the Telkwa Formation or if other, younger volcanics are involved.

Most of the western half of the claim group appears to be underlain by a monzonite or granodiorite intrusion. The rock is generally fine- to medium-grained and usually has a pink to orange-brown colour due to orthoclase feldspar and variable amounts of limonite oxidizing from disseminated magnetite. Occasionally the granodiorite is green due to moderate to strong chlorite alteration. The intrusive is more extensive than is indicated on van der Heyden's 1982 geology map. Outcrops extend up the hill south of the Cummins I claim and to the north and northwest into adjoining claims.

From outcrops in Troitsa Creek, van der Heyden has assigned the granitics to the Nanika group of intrusions which are designated as Paleocene and Eocene in age.

Recent alluvium covers much of the claim group. Terraced gravel benches flank the north and south sides of Troitsa Creek. Extensive meadows with deep organic soils are also present in the poorly drained area of the northern half of the claim group.

Limited rock exposures inhibit study of any structural features which may be present in the claims. In the southeast corner of the Cummins II, strong

bleaching along fractures and introduction of pyrite into the volcanics indicate major structural breaks in the area, however attitude of such features was undeterminable.

Alteration or zones of quartz-carbonate veining are occasionally present in the granodiorite intrusive. Northwest of the claim group such an easterly-trending iron-stained zone was seen in creek bed outcrops. In the south part of the claim a narrow clay-altered zone trending N70°W60°S bisects otherwise unaltered granodiorite.

GEOCHEMISTRY OF SOILS, STREAM SEDIMENTS AND ROCKS

A north-south base line was measured and flagged along the claim line which bisects the Cummins I and Cummins II claims. From 200 metres south of the legal corner post, lines were established at 400-metre intervals to 1800 metres south. Two hundred and twelve soil samples were collected at 100-metre stations along these lines.

For the purpose of statistical treatment of soil geochemical data, the 212 soil samples collected from the Cummins claims have been combined with 172 samples collected from the Lindsay claim group adjoining the property to the north. Furthermore, during treatment of the soil data, values have been segregated according to projected underlying rock type, i.e. granitics or volcanics. Histograms and cumulative frequency plots were constructed. Threshold and anomalous values for each element have been determined by graphic representation on logarithmic probability graphs following the methods of Sinclair (1976).

The following table represents data interpreted from the graphs:

<u>Element</u>	<u>High Value (ppm)</u>	<u>Low Value (ppm)</u>	<u>Threshold (ppm)</u>	<u>Anomalous (2x threshold) (ppm)</u>	<u>Strongly Anomalous (4x threshold) (ppm)</u>
Copper	120	2	100	200	400
Lead	65	1	18	36	72
Zinc	367	29	158	316	632
Silver	1.6	0.1	0.8	1.6	3.2
Molybdenum	31	1	6.6	13.2	26.4
Gold			all less than 10 ppb		

The soil geochemical values have been plotted on maps in the back of this report. Contour lines have been drawn using values of threshold, 2 times threshold, and 4 times threshold.

Probability plots of each element grouped by underlying rock type did not reveal significant differences between volcanics or granitic in geochemical signature. In each case, 70 to 80 percent of the populations displayed identical logarithmic curves. Slight divergence occurs in the remaining upper 20 percent of the population. Only in the case of molybdenum does a significant split in granite and volcanic geochemistry occur at the upper 2.0 to 2.5 percent of the population. This split is caused by several high molybdenum values (up to 31 ppm) which occur in volcanic areas on the Lindsay claims.

Copper provenance is representative of a single population, with a suggestion of a second population above 100 ppm. Statistically the high values (greater than 100 ppm) form too small a proportion of the population to be significant. However, locations of these samples may be important due to their coincidence with other anomalous base or precious metals.

Detectable quantities of gold greater than 10 ppb were not found on the property. The following areas are worthy of note.

Three areas in the Cummins I claim contain multi-sample clusters of anomalous base metals or silver in soil samples. The most interesting zone occurs on the west end of lines 14S and 18S near the southwest corner of the claim. Silver to 1.0 ppm, copper to 105 ppm, and zinc to 367 ppm occur in a zone which appears to be at least 300 m wide and 400 m long. Outcrops of granodiorite are present 200 m east of these samples. It is not known if the granodiorite-volcanic contact underlies this zone.

A second soil geochemical anomaly on lines 14 and 18 south occurs near 11W. Five contiguous samples with values up to 9 ppm molybdenum indicate an enriched zone approximately 300 m wide and possibly greater than 400 m long. Furthermore, a stream sediment sample of 8 ppm molybdenum confirms the continuity of the zone. The north to south-trending anomaly is undoubtedly underlain by granodiorite and possibly dacite or andesite because the contact is projected to pass through the eastern edge of the area.

The third (subanomalous) area of base metal enrichment in soils of the Cummins I claim occurs between 18 and 21 west on line 2 south. Four samples contain copper up to 57 ppm, lead of 19 ppm, and zinc up to 188 ppm. Bench gravels along Troitsa Creek are thought to be present in this area, although outcrops of locally altered granodiorite occur within 100 metres of the eastern end of the zone.

Besides the three metal-enriched soil zones previously described, four single sample anomalies in the Cummins II claim have been found. At 1E 6S, on the small hill known to have outcrops of amygdaloidal andesite, 50 ppm copper and 0.8 ppm silver were obtained. There is a remote possibility that enrichment in this area could extend to sample 2S 2E, 400 m to the north, which contained 0.7 ppm silver.

Copper of 120 ppm and 0.7 ppm silver are also present at 14S 4E. At 18S 0W, 24 ppm lead is present, and molybdenum of 10 ppm occurs at 18S 15E. These are spot high values in areas known to be underlain by intermediate volcanics.

Seventeen stream sediment samples were collected from the Cummins claim group. Only the previously mentioned anomalous molybdenum sample at 14S 12+32W is significant because it is coincident with several soil samples enriched in molybdenum.

Four rock samples, described in the Appendix, were collected from various outcrops on the claims. None returned significant base or precious metal values.

CONCLUSIONS

Most of the Cummins I mineral claim is underlain by granitic rock which may belong to the early Tertiary Nanika group of intrusives. Outcrops east of the granodiorite are predominantly dacite and andesite, probably of the Telkwa Formation of the Hazelton Group of lower Jurassic age. In addition to single location anomalous soil samples in the volcanics, three multi-sample clusters of soils enriched in base and/or precious metals have been detected

within the area underlain by the small granodiorite stock, or near its contact zone. Size of the stock exceeds 3.5 by 5 km.

Two of the three anomalous zones exceed 400 m in length and 300 m in width. Although sample locations are contiguous in these areas, this initial exploration and sampling phase is wide-spaced (400 m line separation, 100 m spaced sample stations). Therefore, follow-up sampling may change the size, shape and value of these areas appreciably.

The most encouraging anomalous zone occurs near the west end of lines 14 and 18 south. The zone is probably underlain by granodiorite, possibly at its western contact with older volcanics. Outcrops were not seen within the zone but overburden is expected to be of quite shallow depth. The presence of copper, silver and zinc occurring in or near a small granitic plug or stock suggests a similarity to the Lansdowne Oil and Minerals property 15 km north of the anomaly, on the north side of the Whitesail Range. Here, drilling is beginning to outline a breccia zone with abundant sulphides containing appreciable copper and silver (with lesser zinc) associated with more than one phase of intrusion and mineralization. Pyrite and argillic alteration are ubiquitous. Initial exploration in the Lansdowne area revealed soil geochemistry of similar or slightly higher values as compared to the Cummins claim.

Magnetite is disseminated in the granodiorite of the Cummins claim. Future exploration could be aided by a magnetic survey which may delineate contacts and/or hydrothermally altered areas within or adjacent to the plug.

RECOMMENDATIONS

Soil geochemistry and geological mapping should continue, particularly on the Cummins I claim. Coverage of this claim should be completed at 200 m line separations and stations spaced at 50 m. Ground magnetometer and VLF-electromagnetic surveys should be initiated coincident with mapping and sampling. The single-sample anomalous areas in the Cummins II claim should be investigated and samples gathered in their immediate vicinity. Airborne geophysical surveys which were recommended in the report of May 26, 1983 are now deleted, because a cost-sharing programme between the individual claim owners was not developed.

Additional geophysics, geochemistry or core drilling would be dependent upon results from Phase 1(b) exploration.

COST ESTIMATE

Phase I(b)

Geologic mapping	\$ 4,000	
Soil and/or rock geochemistry with additional grid layout	4,000	
Geochemical analyses	3,000	
Ground VLF-EM and magnetic surveys	7,000	
Transportation including helicopter	3,000	
Camp and supplies	1,500	
Supervision and engineering	1,500	
Reporting	<u>2,000</u>	
	23,000	
Contingencies @ 10%	<u>2,300</u>	
Total Phase I(b)	25,300	\$ 25,300

Phase II

Detailed geologic mapping of selected areas	\$ 5,000	
Rock and/or soil geochemistry	5,000	
Trenching	2,500	
Limited diamond drilling, including helicopter, allow	50,000	
Site preparation	5,000	
Travel, board, camp facilities, supplies	10,000	
Supervision and engineering	7,000	
Reporting	<u>4,000</u>	
	88,500	
Contingencies @ 20%	<u>17,700</u>	
Total Phase II	106,200	106,200

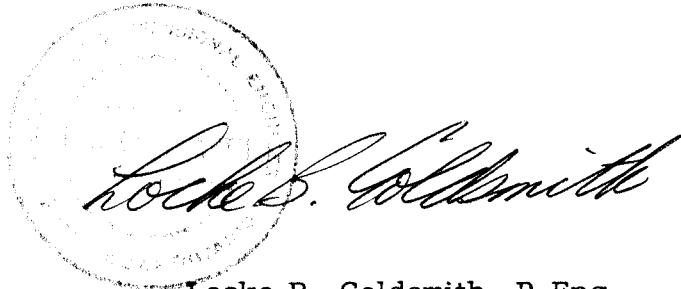
Phase III

Diamond drilling, allow 1000 m @ \$100/m @ \$100/m	\$100,000	
Drill site preparation	10,000	
Assays	3,000	
Vehicle, travel, board, camp facilities	7,000	
Road construction	10,000	
Supervision and engineering	<u>25,000</u>	
	155,000	
Contingencies @ 20%	<u>31,000</u>	
Total Phase III	186,000	<u>\$186,000</u>

Total - Phases I(b), II and III \$317,500

At the end of each Phase, results should be documented in an engineering report; continuation to the following Phase should be contingent upon favourable conclusions and recommendations from an Engineer.

Respectfully submitted,



Paul Kallock
Geologist

Locke B. Goldsmith, P.Eng.
Consulting Geologist

Norman C. Davidson, P.Eng.
Consulting Engineer

Vancouver, B. C.

January 4, 1984

GEOLOGIST'S CERTIFICATE
PAUL KALLOCK

I, Paul Kallock, do state: that I am a geologist with Arctex Engineering Services, 301 - 1855 Balsam Street, Vancouver, B. C.

I Further State That:

1. I have a B.Sc. degree in Geology from Washington State University, 1970. I am a Fellow of the Geological Association of Canada.
2. I have engaged in mineral exploration since 1970, both for major mining and exploration companies and as an independent geologist.
3. I have co-authored the report entitled, "Geological and Geochemical Investigation, Cummins I and II Mineral Claims, Whitesail Lake Area, Omineca Mining Division, B.C." The report is based on my fieldwork carried out on the property and from previously accumulated geologic data.
4. I have no direct or indirect interest in any manner in either the property or securities of Ice Station Resources Ltd., or its affiliates, nor do I anticipate to receive any such interest.
5. I consent to the use of this report in a prospectus or in a statement of material facts related to the raising of funds.

Paul Kallock
Geologist

Vancouver, B. C.

January 4, 1984

ENGINEER'S CERTIFICATE

LOCKE B. GOLDSMITH

1. I, Locke B. Goldsmith, am a Registered Professional Engineer in the Province of Ontario and a Registered Professional Geologist in the State of Oregon. My address is 301, 1855 Balsam Street, Vancouver, B. C.
2. I have a B.Sc. (Honours) degree from Michigan Technological University and have done postgraduate study in Geology at Michigan Tech, University of Nevada and the University of British Columbia. I am a graduate of the Haileybury School of Mines and am a Certified Mining Technician. I am a member of the Society of Economic Geologists, the AIME, and the Australasian Institute of Mining and Metallurgy, and a Fellow of the Geological Association of Canada.
3. I have been engaged in mining exploration for the past 25 years.
4. I have co-authored the report entitled, "Geological and Geochemical Investigation, Cummins I and II Mineral Claims, Whitesail Lake Area, Omineca Mining Division, B.C." dated January 4, 1984. The report is based upon fieldwork and research supervised by the author.
5. I have no ownership in the property, nor in the stocks of Ice Station Resources Ltd.
6. I consent to the use of this report in a prospectus or in a statement of material facts related to the raising of funds.

Respectfully submitted,



Locke B. Goldsmith, P.Eng.
Consulting Geologist

Vancouver, B. C.
January 4, 1984

ENGINEER'S CERTIFICATE

NORMAN C. DAVIDSON

1. I, Norman C. Davidson, am a Registered Professional Engineer in the Provinces of British Columbia, Nova Scotia and Ontario. My address is P.O. Box 39, St. Andrews, Antigonish County, Nova Scotia BOH 1X0.
2. I am a graduate of Michigan Technological University, Houghton, Michigan, U.S.A., with a B.Sc. in Mining Engineering. I am a graduate of the Haileybury School of Mines as a Certified Mining Technician. I am registered as a Mine Manager under the Coal Mines Regulation Act of Nova Scotia. I am a member of C.I.M., A.I.M.E., and the Mining Society of Nova Scotia.
3. I have been engaged in mining exploration, development and mine production for 21 years.
4. A personal examination of the property was not undertaken. The completed report was reviewed and discussed with Arctex Engineering Services personnel, the competence of whom is known to the undersigned.
5. I have no interest either directly or indirectly in the claims named herein or Ice Station Resources Ltd., nor do I expect to receive any.
6. I consent to the use of this report in a prospectus or in a statement of material facts related to the raising of funds.

Norman C. Davidson, P.Eng.
Consulting Mining Engineer

Vancouver, B. C.

January 4, 1984

REFERENCES

- Goldsmith, L.B. May 26, 1983. Preliminary Report, Cummins I and II Mineral Claims, Whitesail Lake Area, B.C. Prepared for Ice Station Resources Ltd. by Arctex Engineering Services.
- Hodder, R.W. and MacIntyre, D.G. 1979. Place and Time of Porphyry-Type Copper-Molybdenum Mineralization in Upper Cretaceous Caldera Development, Tahtsa Lake, B.C. *In: Papers on Mineral Deposits of Western North America*. Nevada Bureau of Mines and Geology. Report 33, pp. 175-184.
- Sinclair, A.J. 1976. Applications of Probability Graphs in Mineral Exploration. Special Volume No. 4, The Association of Exploration Geochemists. Richmond Printers Ltd., 583 Minoru Blvd., Richmond, B.C.
- van der Heyden, P. 1982. Geology of the West-Central Whitesail Lake Area, B.C. M.Sc. Thesis, Univ. of British Columbia.
- Woodsworth, G.J. 1980. Geology of the Whitesail Lake Map-Area 93E, B.C. G.S.C. Open File 708.

ITEMIZED COST STATEMENT, 1983 PROGRAMME

A. Wages

L.B. Goldsmith, $\frac{1}{2}$ Dec. 8, Jan 3, $\frac{1}{2}$ 4, total 2 days @ \$360/day	\$ 720.00	
P. Kallock, July 9, $\frac{1}{2}$ Sept. 27, 28-Oct. 2, $\frac{1}{2}$ Oct. 12, Dec. 3, total 8 days @ \$300/day	2,400.00	
W. Flanagan, $\frac{1}{2}$ Sept. 27, 28-Oct. 2, $\frac{1}{2}$ Oct. 12, total 6 days @ \$200/day	1,200.00	
N. Davidson, Jan. 3, 1 day @ \$400/day	<u>400.00</u>	
	4,720.00	\$ 4,720.00

B. Food & Accommodation

\$488.33 \div 13 field days = \$37.56/man/day 488.33

C. Transportation

Vehicle, pro-rated	206.75	
Helicopter, pro-rated	<u>1,270.00</u>	
	1,476.75	1,476.75

D. Analyses

223 samples cost \$2,606.50 = \$11.69/sample 2,606.50

E. Report

Drafting, prints, typing, photocopying,
materials 1,265.00

TOTAL \$10,556.58

APPENDIX

ROCK SAMPLE DESCRIPTIONS

- 6S 3E Outcrop - grey to green amygdaloidal andesite, locally fragmented flow breccia (?), amygdules of calcite and zeolites (?) up to 0.5 cm
- 16S 22E - grab sample of silicified felsic (?) volcanics from bluff beside creek, local moderate limonite on surface with 2-3% disseminated pyrite on fresh broken surface, strongest bleaching restricted to major fractures
- 18S 13W - chip of 0.25 m of fine-grained granodiorite, relatively weak alteration of mafics to chlorite
- 18S 15+90W - chip of 20 cm wide limonite-stained zone trending N70°W 60°S, hosted in fine- to medium-grained granodiorite; zone is only area of alteration containing 2% pyrite; majority of host is unaltered



CHEMEX LABS LTD.

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• ANALYTICAL CHEMISTS

• GEOCHEMISTS

• REGISTERED ASSAYERS

CERTIFICATE OF ANALYSIS

TO : ARCTEX ENGINEERING

#301-1855 BALSAM STREET
VANCOUVER, B.C.
V6K 3M3

CERT. # : A8315665-0C1-A
INVOICE # : I8315665
DATE : 21-CCT-83
P.C. # : NONE

CC: PAUL KALLOCK

Sample description	Prep code	Cu ppm	Mo ppm	Pb ppm	Zn ppm	Ag ppm	AU-AA ppb
2S 01E	201	23	2	7	87	0.1	<10
2S 02E	201	40	3	6	103	0.7	<10
2S 03E	201	21	2	6	85	0.2	<10
2S 04E	201	44	3	19	166	0.2	<10
2S 05E	201	20	1	7	72	0.2	<10
2S 06E	201	20	1	5	85	0.1	<10
2S 07E	201	21	2	7	76	0.2	<10
2S 08E	201	12	1	6	57	0.1	<10
2S 09E	201	15	3	7	86	0.1	<10
2S 10E	201	16	2	10	77	0.2	<10
2S 0+00W	201	22	2	8	89	0.2	<10
2S 1+00W	201	16	2	9	61	0.2	<10
2S 1+81W SILT	201	20	2	9	100	0.1	<10
2S 2+00W	201	33	2	7	90	0.1	<10
2S 3+00W	201	23	2	5	79	0.1	<10
2S 4+00W	201	29	2	9	80	0.2	<10
2S 5+00W	201	26	3	8	89	0.2	<10
2S 6+00W	201	23	5	7	83	0.2	<10
2S 7+00W	201	24	2	8	95	0.3	<10
2S 8+00W	201	26	2	12	161	0.1	<10
2S 9+00W	201	23	3	6	89	0.1	<10
2S 10+00W	201	10	2	7	81	0.1	<10
2S 11+00W	201	13	2	7	80	0.1	<10
2S 12+00W	201	10	2	8	60	0.3	<10
2S 13+00W	201	14	3	9	79	0.2	<10
2S 14+00W	201	10	3	9	55	0.1	<10
2S 15+00W	201	17	2	8	70	0.2	<10
2S 16+00W	201	13	1	8	57	0.1	<10
2S 16+85W SILT	201	11	7	8	84	0.2	<10
2S 17+00W	201	35	6	10	104	0.4	<10
2S 18+00W	201	37	2	16	123	0.2	<10
2S 19+00W	201	52	3	19	198	0.2	<10
2S 20+00W	201	57	2	18	176	0.1	<10
2S 21+00W	201	35	3	15	142	0.2	<10
2S 22+00W	201	23	2	10	112	0.2	<10
2S 23+00W	201	19	3	11	120	0.2	<10
2S 24+00W	201	22	3	9	89	0.1	<10
6S 01E	201	50	3	11	85	0.3	<10
6S 02E	201	20	2	8	85	0.2	<10
6S 03E	201	25	2	7	92	0.1	<10



Certified by *Hart Bichler*



CHEMEX LABS LTD.

212 BROOKSBANK AVE.
NORTH VANCOUVER, B.C.
CANADA V7J 2C1

TELEPHONE: (604) 984-0221
TELEX: 043-52597

• ANALYTICAL CHEMISTS

• GEOCHEMISTS

• REGISTERED ASSAYERS

CERTIFICATE OF ANALYSIS

TO : ARCTEX ENGINEERING

#301-1855 BALSAM STREET
VANCOUVER, B.C.
V6K 3M3

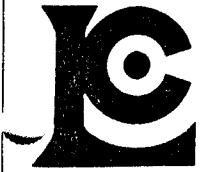
CERT. # : A8315665-002-A
INVOICE # : I8315665
DATE : 21-OCT-83
P.C. # : NONE

CC: PAUL KALLOCK

Sample description	Prep code	Cu ppm	Mo ppm	Pb ppm	Zn ppm	Ag ppm	AU-AA ppb
6S 04E	201	16	2	9	83	0.2	<10
6S 05E	201	30	2	2	100	0.2	<10
6S 06E	201	21	3	4	78	0.3	<10
6S 07E	201	12	3	5	55	0.2	<10
6S 08E	201	13	4	6	63	0.2	<10
6S 09E	201	14	3	8	73	0.2	<10
6S 10E	201	13	3	4	86	0.1	<10
6S 11E	201	22	3	10	94	0.1	<10
6S 13E	201	22	2	9	89	0.2	<10
6S 14E	201	22	4	9	93	0.4	<10
6S 15E	201	13	1	7	64	0.2	<10
6S 16E	201	12	2	6	73	0.2	<10
6S 17E	201	10	3	9	83	0.1	<10
6S 18E	201	19	1	5	67	0.2	<10
6S 19E	201	14	3	7	66	0.1	<10
6S 20E	201	17	1	4	68	0.2	<10
6S 21E	201	23	2	5	78	0.5	<10
6S 22E	201	41	2	7	80	0.5	<10
6S 23E	201	70	3	10	82	0.7	<10
6S 24E	201	27	3	8	74	0.3	<10
6S 25E	201	20	2	6	82	0.3	<10
6S 00W	201	20	2	8	62	0.2	<10
6S 01W	201	19	3	5	75	0.2	<10
6S 02W	201	29	5	7	94	0.4	<10
6S 03W	201	20	3	4	82	0.1	<10
6S 04W	201	19	2	4	79	0.2	<10
6S 05W	201	14	2	5	71	0.2	<10
6S 06W	201	21	3	5	82	0.2	<10
10S 01E	201	12	1	6	87	0.1	<10
10S 02E	201	15	4	10	75	0.1	<10
10S 03E	201	14	3	6	73	0.2	<10
10S 04E	201	21	2	7	78	0.1	<10
10S 05E	201	9	2	10	58	0.1	<10
10S 06E	201	10	2	9	64	0.1	<10
10S 07E	201	15	2	6	121	0.1	<10
10S 08E	201	13	1	7	51	0.1	<10
10S 09E	201	17	3	4	79	0.1	<10
10S 10E	201	15	1	9	79	0.1	<10
10S 11E	201	14	2	6	72	0.1	<10
10S 12E	201	12	3	5	80	0.1	<10



Certified by *Hart Buchler*



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 #301-1855 BALSAM STREET
 VANCOUVER, B.C.
 V6K 3M3

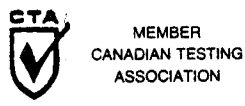
CERT. # : A8315665-003-A
 INVOICE # : I8315665
 DATE : 21-CCT-83
 P.C. # : NONE

CC: PAUL KALLOCK

Sample description	Prep code	Cu ppm	Mo ppm	Pb ppm	Zn ppm	Ag ppm	AU-AA ppb
10S 13E	201	21	4	11	103	0.1	<10
10S 14E	201	9	3	9	47	0.1	<10
10S 15E	201	9	2	6	47	0.2	<10
10S 16E	201	7	4	9	68	0.1	<10
10S 17E	201	22	3	8	97	0.1	<10
10S 18E	201	14	4	12	80	0.1	<10
10S 19E	201	23	4	7	110	0.1	<10
10S 20E	201	15	1	9	61	0.2	<10
10S 21E	201	20	1	9	77	0.3	<10
10S 22E	201	23	1	9	85	0.2	<10
10S 23E	201	21	1	8	85	0.1	<10
10S 24E	201	16	1	8	86	0.3	<10
10+00S OW	201	10	1	8	37	0.1	<10
10S 1+30W	201	13	1	7	80	0.3	<10
10S 1+80W	201	14	2	6	68	0.1	<10
10S 2+10W	201	12	3	5	61	0.1	<10
10S 03W	201	10	2	7	70	0.1	<10
10S 04W	201	19	2	9	52	0.3	<10
10S 05W	201	19	2	8	51	0.2	<10
10S 07W	201	9	3	8	45	0.1	<10
10S 08W	201	15	2	7	53	0.1	<10
10S 09W	201	14	1	9	64	0.1	<10
10S 10W	201	13	1	3	61	0.1	<10
10S 11W	201	15	2	8	64	0.2	<10
10S 12W	201	11	2	8	52	0.3	<10
10S 13W	201	14	1	6	53	0.1	<10
10S 14W	201	16	2	8	65	0.1	<10
10S 15W	201	11	1	8	50	0.5	<10
10S 17W	201	18	3	6	76	0.2	<10
10S 17+40W	201	22	2	6	90	0.3	<10
10S 13W	201	19	3	7	100	0.2	<10
10S 19W	201	17	2	5	62	0.4	<10
10S 20W	201	6	2	2	50	0.2	<10
10S 21W	201	19	1	7	70	0.2	<10
10S 22W	201	17	2	5	92	0.3	<10
10S 23W	201	16	1	12	93	0.3	<10
10S 24W	201	9	1	7	85	0.2	<10
10S 25W	201	15	1	17	72	0.2	<10
14S 01E	201	13	2	7	64	0.1	<10
14S 02E	201	19	3	8	65	0.1	<10

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TO : ARCTEX ENGINEERING

#301-1855 BALSAM STREET
VANCOUVER, B.C.
V6K 3M3

CERT. # : A8315665-004-A
INVOICE # : I8315665
DATE : 21-CCT-83
P.O. # : NONE

CC: PAUL KALLOCK

Sample description	Prep code	Cu ppm	Mo ppm	Pb ppm	Zn ppm	Ag ppm	AU-AA ppb
14S 03E	201	17	1	7	84	0.2	<10
14S 04E	201	16	3	5	90	0.1	<10
14S 05E	201	120	4	14	69	0.7	<10
14S 06E	201	12	2	9	61	0.1	<10
14S 07E	201	19	4	5	90	0.1	<10
14S 08E	201	18	1	3	72	0.2	<10
14S 09E	201	12	2	6	70	0.2	<10
14S 10E	201	14	2	4	63	0.2	<10
14S 11E	201	20	3	3	67	0.1	<10
14S 12E	201	12	3	18	95	0.1	<10
14S 13E	201	14	2	6	60	0.2	<10
14S 14E	201	11	1	6	52	0.3	<10
14S 15E	201	11	1	7	59	0.1	<10
14S 16E	201	15	2	6	65	0.3	<10
14S 17E	201	11	1	5	60	0.1	<10
14S 18E	201	15	1	7	80	0.1	<10
14S 19E	201	18	1	9	67	0.1	<10
14S 20E	201	16	2	4	70	0.2	<10
14S 22E	201	15	1	6	110	0.1	<10
14S 23E	201	16	2	5	103	0.1	<10
14S 24E	201	18	3	6	109	0.1	<10
14S 25E	201	17	2	4	76	0.1	<10
14S 00W	201	7	4	11	39	0.1	<10
14S 01W	201	11	3	8	46	0.1	<10
14S 1+62W	203	14	2	1	90	0.1	<10
14S 1+82W	203	9	2	1	84	0.1	<10
14S 02W	201	15	3	5	62	0.1	<10
14S 03W	201	17	2	5	80	0.1	<10
14S 04W	201	55	2	7	54	0.4	<10
14S 05W	201	8	3	6	61	0.2	<10
14S 5+82W	203	14	4	3	120	0.1	<10
14S 06W	201	11	2	4	70	0.1	<10
14S 6+70W	203	11	1	2	86	0.1	<10
14S 07W	201	10	7	3	64	0.1	<10
14S 08W	201	71	4	3	61	0.1	<10
14S 08W SILT	203	6	4	3	95	0.1	<10
14S 09W	201	9	3	2	50	0.1	<10
14S 9+50W	203	13	5	4	77	0.1	<10
14S 10W	201	9	9	4	52	0.1	<10
14S 11W	201	17	8	6	75	0.1	<10



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TC : ARCTEX ENGINEERING

#301-1855 BALSAM STREET
 VANCOUVER, B.C.
 V6K 3M3

CERT. # : A8315665-005-A
 INVOICE # : 18315665
 DATE : 21-CCT-83
 P.C. # : NONE

CC: PAUL KALLOCK

Sample description	Prep code	Cu ppr	Mo ppm	Pb ppm	Zn ppm	Ag ppm	AU-AA ppb
14S 12W	201	10	7	5	46	0.1	<10
14S 12+32W	201	16	8	5	67	0.2	<10
14S 13W	201	15	4	3	56	0.1	<10
14S 14W	201	9	2	3	54	0.1	<10
14S 15W	201	9	3	4	60	0.1	<10
14S 15+35W	203	13	4	3	82	0.1	<10
14S 16W	201	11	3	6	56	0.4	<10
14S 16+43W	203	18	2	4	81	0.1	<10
14S 16+80W	201	24	3	7	94	0.1	<10
14S 17W	201	12	4	5	77	0.1	<10
14S 18W	201	12	3	6	54	0.1	<10
14S 19W	201	6	2	4	63	0.3	<10
14S 20W	201	29	3	8	87	0.3	<10
14S 21W	201	12	3	2	83	0.1	<10
14S 22W	201	13	2	4	70	0.1	<10
14S 23W	201	18	1	5	78	0.3	<10
14S 24W	201	105	2	9	142	0.4	<10
14S 25W	201	40	2	8	101	1.0	<10
18S 01E	201	10	3	9	58	0.1	<10
18S 02E	201	23	3	6	83	0.1	<10
18S 03E	201	13	3	8	108	0.1	<10
18S 04E	201	12	4	6	92	0.1	<10
18S 05E	201	6	2	9	56	0.1	<10
18S 06E	201	10	1	6	55	0.1	<10
18S 07E	201	7	1	7	70	0.2	<10
18S 08E	201	13	3	6	94	0.1	<10
18S 09E	203	30	4	1	50	0.1	<10
18S 10E	201	10	2	7	64	0.1	<10
18S 11E	201	88	2	5	74	0.1	<10
18S 12E	201	11	1	8	45	0.1	<10
18S 13E	201	12	1	6	67	0.1	<10
18S 15E	201	23	10	5	47	0.1	<10
18S 16E	201	10	2	4	50	0.2	<10
18S 17E	201	10	3	7	52	0.1	<10
18S 18E	201	13	1	6	64	0.1	<10
18S 19E	201	16	1	4	63	0.1	<10
18S 20E	201	14	1	5	61	0.1	<10
18S 21E	201	6	1	5	42	0.1	<10
18S 22E	201	2	1	7	29	0.1	<10
18S 23E	201	7	1	7	62	0.1	<10



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#301-1855 BALSAM STREET
VANCOUVER, B.C.
V6K 3M3

CERT. # : A8315665-006-A

INVOICE # : I8315665

DATE : 21-CCT-83

P.C. # : NONE

CC: PAUL KALLOCK

Sample description	Prep code	Cu ppr	Mo ppm	Pb ppr	Zn ppm	Ag ppm	AU-AA ppb
18+00S 0+00W	201	13	2	24	63	0.1	<10
18S 01W	201	4	1	16	56	0.1	<10
18S 02W	201	10	3	12	53	0.2	<10
18S 03W	201	10	2	8	52	0.1	<10
18S 04W	201	12	2	7	54	0.1	<10
18S 05W	201	13	3	4	50	0.2	<10
18S 06W	201	7	1	8	50	0.1	<10
18S 6+75W	201	14	2	5	86	0.1	<10
18S 07W	201	12	6	8	51	0.1	<10
18S 08W	201	6	1	5	51	0.1	<10
18S 09W	201	14	4	7	64	0.1	<10
18S 10W	201	9	6	12	66	0.1	<10
18S 11W	201	18	8	9	71	0.1	<10
18S 12W	201	9	2	9	38	0.1	<10
18S 13W	201	10	1	6	61	0.1	<10
18S 14W	201	8	1	13	46	0.1	<10
18S 15W	201	14	1	65	52	0.2	<10
18S 15+87W	201	30	3	11	95	0.3	<10
18S 16W	201	18	1	6	46	0.3	<10
18S 17W	201	12	1	9	46	0.1	<10
18S 18W	201	13	1	6	73	0.1	<10
18S 18+35W	201	32	1	12	98	0.2	<10
18S 19W	201	16	1	5	70	0.1	<10
18S 20W	201	16	2	4	70	0.2	<10
18S 21W	201	22	1	9	82	0.7	<10
18S 22W	201	36	2	5	220	0.7	<10
18S 23W	201	57	4	7	367	0.7	<10
18S 24W	201	19	2	5	91	0.1	<10
18S 25W	201	11	1	5	72	0.1	<10



MEMBER
CANADIAN TESTING
ASSOCIATION

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TO : ARCTEX ENGINEERING

#301-1855 BALSAM STREET
VANCOUVER, B.C.
V6K 3M3

CERT. # : A8315666-001-A
INVOICE # : I8315666
DATE : 20-OCT-83
P.C. # : NONE

CC: PAUL KALLOCK

Sample description	Prep code	Cu ppm	Mo ppm.	Pb ppm	Zn ppm	Ag ppm	AU-AA ppb
CUTCRCP -3E -6S	205	49	2	1	97	0.1	<10
CUMMINS -16S-22E	205	12	7	6	45	0.1	<10
CUMMINS -18S-13W	205	62	1	1	102	0.1	<10
18S-15+9CW	205	9	4	5	81	0.1	<10



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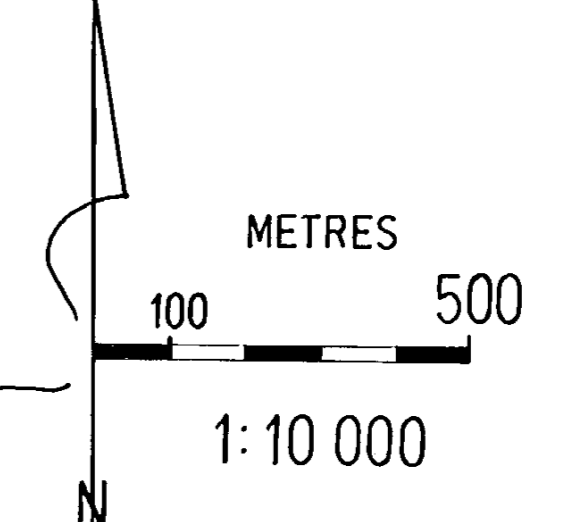
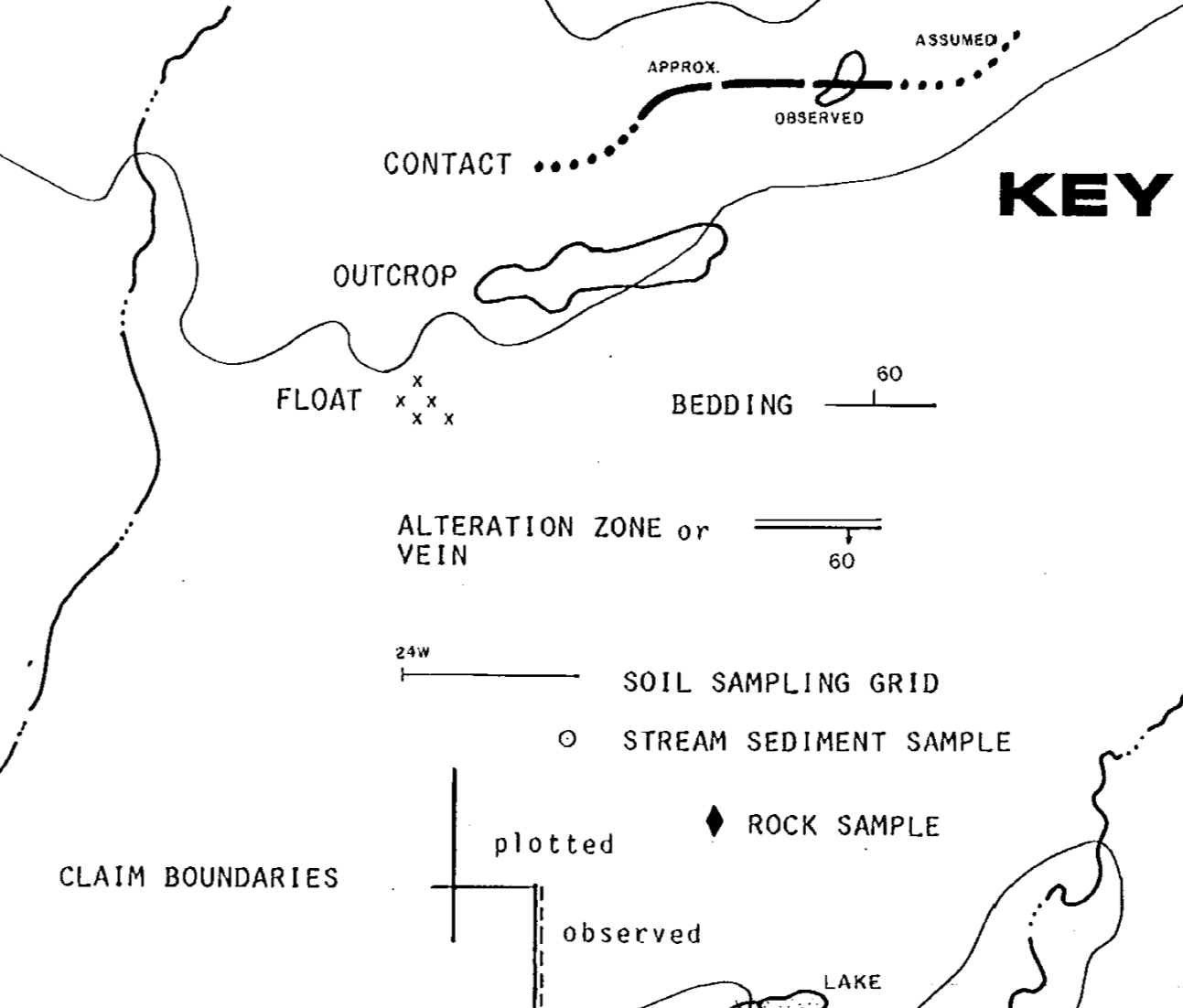
WHITESAIL LAKE
AREA, B.C.

GEOLOGICAL BRANCH
ASSESSMENT REPORT
11,929
GEOLOGY OF THE
CUMMINS 1 & 2 MINERAL CLAIMS

TO ACCOMPANY REPORT BY
L.B. GOLDSMITH P.ENG., CONSULTING GEOLOGIST
N.C. DAVIDSON P.ENG., CONSULTING ENGINEER
P. KALLOCK, GEOLOGIST

ARCTEX
ENGINEERING SERVICES

JANUARY 1984



OMINECA MINING DIVISION
NTS 93E/11E

STRATIGRAPHY
AFTER VAN DER HEYDEN (1982)

PLEISTOCENE AND RECENT		Glacial, alluvial, and fluvial deposits.
		ENDAKO GROUP
ECCENE TO LOWER MIOCENE	EMv	Massive, vesicular, and amygdaloidal basalt and andesite.
		OOTSA LAKE GROUP
UPPER CRETACEOUS TO EOCENE	uKEv	Rhyolite and dacite flows, breccia and tuff; minor andesite, basalt and conglomerate.
		NANIKA INTRUSIONS
PALEOCENE AND EOCENE	ETg	Granodiorite, monzonite, and quartz monzonite.
		HAZELTON GROUP
LOWER JURASSIC	IJr	Niikikwa Formation: red, maroon, purple and green fine-grained breccia and tuff.
		Telkwa Formation: red, maroon, and grey-green tuff, breccia, and flows of basaltic to rhyolitic composition; lesser conglomerate, siltstone, and argillite.
		IJt

