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OTTAWA, O. C.

CANADIAN NICKEL COMPANY LIMITED

REPORT ON
GEOLOGICAL, GEOCHEMICAL AND GEOPHYSICAL
SURVEYS CONDUCTED ON THE BEAR CLAIMS -
GROUPS A, B, AND C - 1973

OMINECA MINING DIVISION
LAT 126° 52'N; LONG. 56° 07'W

BY

M. J. Gidluck, BSc

September 1973

<p>Department of Mineral Resources and Technical Surveys</p>	
NO	4648

CONTENTS

	<u>Page</u>
 <u>REPORT</u>	
Summary	1
Location	2
Access	2
Topography and Water	2
Claims	3
Expenditures	4
Regional Geology	5
Detail Geology	6
Grid Survey	10
Magnetic Survey	10
Rock Geochemical Survey	11
Induced Polarization Survey	11
Conclusions and Recommendations	12
 <u>APPENDICES</u>	
	<u>No.</u>
Cost Analysis Tabulation	1
Statements of Qualification	
E. N. Hunter	2
M. J. Gidluck	3
B. R. Krause	4
McPhar Statements	
Costs	5
Survey Details	6
 <u>PLANS & SECTIONS</u>	
	<u>Scale</u>
#1 Location Map	1" = 4 miles
#2 Topography, Claim, Grid Map	1" = 1000 feet
#3-4 Geology Maps (2)	1" = 200 feet
#5-6 Magnetic maps (2)	1" = 200 feet
Rock Geochemical Maps	
#7-8 Copper (2)	1" = 200 feet
#9-10 Molybdenum (2)	1" = 200 feet
#11-12 Zinc (2)	1" = 200 feet
I.P. Survey	
#13-14 Frequency Effects (2)	1" = 200 feet
#15-16 Resistivities (2)	1" = 200 feet
#17-18 Metal Factors (2)	1" = 200 feet
#19-24 Sections (6)	1" = 300 & 100 feet

BEAR CLAIMS

SUMMARY

During the summer of 1972 the Canadian Nickel Company Limited located encouraging amounts of chalcopyrite and molybdenite mineralization associated with the Katsburg intrusive unit situated on the main ridge of Tsyatut Spur just west of Bear Lake. A block of 54 claims were staked and recorded over the area of interest in September of the same year.

In February 1973 Lockwood Survey Corporation Limited was contracted to prepare an orthophoto which would serve as a basis for the topographic control necessary to conduct detailed geochemical, geological and geophysical surveys over the main area of interest.

Late in June 1973 a fly-camp was set-up on the claim group and supported by helicopter for the remainder of the season from a base-camp on Thutade Lake 60 miles north. E.N. Hunter (geologist) and a crew for Canadian Nickel Company Limited, commenced work on the property with the establishment of 8.4 miles of surveyed grid.

Early in July a magnetic survey and rock geochemical sampling program were the first surveys to be conducted. Following additional staking of new claims along the northwest and southern boundaries of the original claim group a McPhar team of two men were brought in on August 1st to conduct an I.P. survey. They were assisted by three Canico personnel in completing 5 lines of reconnaissance spread I.P. surveys on 1,000 ft. spaced lines.

After a considerable reduction in snow cover by mid-August Hunter engaged in further rock-sampling and commenced detailed geological mapping over the gridded portion of the claims.

The fly-camp and base-camp were dismantled late in August and the crews remobilized to Thompson, Manitoba and Sudbury, Ontario in September.

LOCATION

The property is located in a remote mountainous region within the Omineca Mining Division. It is situated 90 miles north of Smithers in the NTS quadrant 94D-2W centered approximately at a latitude of 126° 52'N, longitude 56° 07'W. The claim block straddles the main ridge of the Tsyatut Spur at a maximum elevation of 6,000 ft. above sea level between Bear Lake and the headwaters of the Driftwood River.

ACCESS

Float equipped aircraft can land on Bear Lake and wheeled aircraft up to a DC-3 in size on an airstrip at the railway construction camp site some 7 miles northeast. The only access to the claims covered by this report is by helicopter.

Support for the 1973 work on the property was provided by a Jet Ranger 206-B helicopter on contract from Dominion-Pegasus Helicopters and based at the Canadian Nickel Company Limited base-camp at Thutade Lake 60 miles north of Bear Lake.

Future access to this region will be greatly facilitated with the completion of the new Ft. St. James to Dease Lake B.C. Railway line now under construction. It will pass the Bear claim block 3 miles to the east.

TOPOGRAPHY AND WATER

The claims considered in this report occur above the 5,500 ft. level on the crest of the main ridge of the Tsyatut Spur. The top of the spur consists of a relatively flat landscape vegetated mainly with alpine heather and isolated patches of stunted spruce thickets in the less exposed areas. The edge of the ridge breaks away into typical cliffs and talus slopes with the tree-line commencing around the 5,300 ft. level.

A permanent snow-fed pond occurs at 5,350 ft. in a small cirque-like basin on the west side. It would appear that

this will constitute the major water supply for any drilling program. Another pond occurs at a slightly lower elevation over the south east side as well. Several intermittent snow fed "puddles" higher on the main ridge might be considered for damming and serve as auxillary water supply systems.

Fairly extensive snow cover (70 to 80%) occurs on the claims up until mid or late July.

CLAIMS

The original block of 54 contiguous claims was staked by agents for the Canadian Nickel Company Limited, in September 1972 and recorded on September 18, 1972. On July 27th 1973, 12 of these claims (now Group C) were restaked and recorded on July 31st, 1973. Since that time additional claims have been pegged by the Canadian Nickel Company Limited, Copper Cliff, Ontario bounding the original block of 54 on the north, west and south.

The original block has recently been subdivided into the 3 assessment groups; Bear Group A (20 claims), Bear Group B (22 claims) and Bear Group C (12 claims).

This report concerns the work done mainly on 16 of the claims lying within the 3 groups. Details of these 16 claims are listed below:

Bear Group A

<u>Claim Name</u>	<u>Record No.</u>	<u>Anniversary Date</u>
Bear #26	117514	September 18, 1973
Bear #28	117516	" "
Bear #41	117529	" "
Bear #43	117531	" "
Bear #45	117533	" "

Bear Group B

Bear # 4	117492	September 18, 1973
Bear # 6	117494	" "
Bear # 8	117496	" "
Bear #10	117498	" "
Bear #25	117513	" "
Bear #27	117515	" "

Bear Group C

<u>Claim Name</u>	<u>Record No.</u>	<u>Anniversary Date</u>
Bear #63	126665	July 31, 1974
Bear #64	126666	"
Bear #65	126667	"
Bear #66	126668	"
Bear #67	126669	"

EXPENDITURES

The geological, geochemical and geophysical work applied for credit covers the contiguous block of 16 claims which overlaps portions of the 3 Bear Claim Groups A, B and C (Fig. 1). The work expenditures have been proportioned accordingly and the total expenditures incurred in each group are as follows:

Bear Group A - 20 claims

Work was done on the 5 claims

Bear 26, 28, 41, 43 and 45

(1) Expenditures prior to July 27, 1973

5/16 x \$6,441.82 = \$1,996.96

(2) Expenditures post July 27, 1973

5/16 x \$10,461.64 = 3,242.95

\$5,239.91

Bear Group B - 22 claims

Work was done on the 6 claims

Bear 4, 6, 8, 10, 25 and 27

(1) Expenditures prior to July 27, 1973

6/16 x \$6,441.82 = \$2,383.47

(2) Expenditures post July 27, 1973

6/16 x \$10,461.14 = 3,870.62

\$6,254.09

Bear Group C - 12 claims

Work was done on the 5 claims
Bear 63, 64, 65 and 66 and 67

(1) Expenditures post July 27, 1973

5/16 x \$10,461.14 = \$3,242.95

\$3,242.95

Individual Expenditure Calculations

Figure 2 in the Appendix is a Cost Analysis tabulation listing the individual expenditures comprising the total costs of each operation performed on the Bear claims in 1973.

The "support cost" figures used represent an average per-man-day figure calculated from the total 1973 program costs in the Omineca Mining Division. Included in these calculations are the following major expenditures involved in supporting the crews in the field: -

- (1) The purchase of consumable supplies from Super Value 67 in Smithers.
- (2) Expediting of supplies by Overland Expediting in Smithers.
- (3) Transportation of supplies by fixed-wing aircraft (Trans-provincial Airlines) from Smithers to the Canico base-camp (160 miles) on Thutade Lake.
- (4) Transportation of supplies by helicopter from Thutade Lake to Bear claims (60 miles).

REGIONAL GEOLOGY

On a broad regional basis this property lies within the western most of the two northerly extensions of Upper Triassic-Lower Jurassic Takla Group volcanics. In the vicinity of the Bear property the Takla is composed mainly of a steep easterly dipping sequence of basic to intermediate flows and interlayered pyroclastic rocks.

The claims cover a later Tertiary multiphase acid intrusive body shown by C. S. Lord (G.S.C. Map 962A-1949)

as belonging to the Katsberg Group of porphyritic intrusions.

DETAIL GEOLOGY

E. N. Hunter, geologist for the Canadian Nickel Company Limited commenced the geological mapping of the gridded area on the Bear claims in mid August. An earlier mapping attempt in July had to be postponed due to persistent snow cover. Mapping was done at a scale of 200 ft. to the inch using the grid stations for precise location in the field.

As an aid to rock type identification, etching and staining of hand specimens was standard procedure during this program. Hydrofluoric acid was used for the etching and sodium cobaltinitrite for the staining of potassium feldspars. Petrological examination confirmed the accuracy of the rock names applied in the field.

The oldest rocks on the property, the Takla Group, occur as a northwest trending steeply dipping volcanic sequence of at least 5 distinct rock types. As the major portion of this group on the property is situated along the slopes of the ridge it tends to be obscured by talus and vegetation.

The volcanics are intruded by a semi-conformable syenodiorite plug which in turn has been cut by a younger quartz monzonite porphyry body which forms an approximate tear-drop shaped contact with the syenodiorite out to the south. Randomly oriented alaskite dykes and a stockwork of fractures and quartz veinlets commonly occupy the contact zone of the quartz monzonite porphyry with the syenodiorite.

It is this contact zone, especially on the eastern half of the structure, which carries the most encouraging amounts of chalcopyrite and minor molybdenite mineralization.

TERTIARY INTRUSIVES

Quartz Monzonite Porphyry

The quartz monzonite porphyry forms the core of the intrusive and intrudes the surrounding syenodiorite. It

consists of a very fine grained matrix of quartz and feldspar with medium grained phenocrysts of quartz, plagioclase and biotite and exceedingly large phenocrysts of orthoclase - up to 1 inch long. The quartz monzonite porphyry is generally grey to pale orange in colour but near contacts the feldspars become a honey-brown colour giving the whole rock a brownish colour. Typical composition is: orthoclase 45%, plagioclase 35%, quartz 15% and biotite 5%.

This intrusive facies has dyke components to the north and south of the main body. The dykes are of the same composition as the main body but at least one of them intrudes it, suggesting that there was more than one pulse from the same magma chamber.

Along the eastern margin of this facies there is a fairly intense stockwork of quartz veinlets carrying small amounts of pyrite and chalcopyrite. Pyrite and chalcopyrite are disseminated throughout the quartz monzonite porphyry in minor quantities and locally may occur in fractures with minor molybdenite.

In some areas along the contact with the syenodiorite the quartz monzonite porphyry is intruded by criss-crossing dykes of alaskite which form as much as 60 per cent of the rock.

No alteration has been recognized in this facies and generally the rock is very massive and is only locally moderately fractured.

At the south end of the intrusive the quartz monzonite appears to be dipping between 70° and 90° to the west.

Syenodiorite

The syenodiorite is a medium grained, grey, equigranular rock with a modal composition of: plagioclase 55%, orthoclase 5%, mafics (amphibole and sometimes minor biotite) 30%, quartz 5%, accessory minerals including magnetite 5%. Generally the syenodiorite is moderately to highly fractured throughout with a stockwork of quartz veinlets and aplite dykes. Pyrite, chalcopyrite and molybdenite occur in quartz veinlets and fractures, disseminated in the syenodiorite in a zone 300 to 600 feet wide following the quartz monzonite porphyry-syenodiorite contact. Locally along this contact alaskite

dykes make up to 60% of the volume.

Alteration is limited to weak sericitization of the plagioclase.

The southwest corner of the syenodiorite contains more quartz (up to 10%) and is locally porphyritic. Porphyritic syenodiorite dykes extend to the south west beyond the main area of interest.

The syenodiorite appears to be dipping 70° to 90° west as observed at the northwest and south end of the intrusive.

Alaskite

The alaskite is a fine to medium grained quartz-feldspar rock with no mafics. It is found almost exclusively along the syenodiorite-quartz monzonite porphyry contact as a swarm of criss-crossing 6" to 1' dykes or occasionally as massive bodies up to 50 feet wide. The alaskite on one occasion was found to parallel a quartz monzonite porphyry dyke that intrudes volcanics. Molybdenite appears to be associated with the alaskite, however more work is needed to determine if such a relationship persists.

Syenite Porphyry Dykes

The syenite porphyry dykes are medium grained and generally carry disseminated pyrite and epidote(?). They occur off the southeast and northwest corner of the main intrusive area striking in a northwesterly direction. Their age relative to the intrusive is not known.

Quartz-Feldspar Porphyry Dyke

A 15 foot wide quartz-feldspar porphyry dyke trends 040° -050° across the syenodiorite near the north end of the intrusives. The dyke has about 60 fractures per meter parallelling its strike and the feldspars are highly weathered giving the rock a brownish colour.

TRIASSIC-JURASSIC TAKLA VOLCANICS

Rhyolite

The rhyolite is a white fine grained rock with a seriate textured fine grained intergrowth of orthoclase (?) and quartz with irregular patches of green biotite concentration. It contains disseminated pyrite and magnetite.

A prominent orange brown gossan on the south end of the claims is the result of weathering of the disseminated pyrite in the highly fractured rhyolite.

Tuff

Tuff occurs on both the east and the west sides of the intrusive. It generally has a very fine grained sericite matrix which includes various sized patches of quartz grains and small irregular fragments outlined by abundant fine grained opaque material.

On the western side of the intrusive there are patches of more basic andesite tuff within the sericite variety. These patches have ragged, generally prismatic crystals of plagioclase and scattered quartz-feldspathic lithic fragments in a fine grained seriate textured matrix, probably of quartz-feldspathic composition. The plagioclase crystals of the andesite tuff show only very minor sericitization.

Whether the abundant sericite, in the sericite tuff, is a result of secondary hydrothermal alteration or syn-depositional alteration, cannot be determined.

The tuffs are finely laminated and generally dip vertically. Disseminated pyrite up to 5 per cent is common on the western side of the intrusive with much less pyrite occurring on the eastern side.

Andesite

The andesite is a very fine grained, green, biotite rich, quartz feldspar rock with fine grained sodic plagioclase phenocrysts. Only very weak sericitization of the plagioclase phenocrysts occurs.

The andesite occurs on both the east and west sides of the intrusive and generally parallels the tuffs. There is generally about one per cent disseminated pyrite but locally it may approach 30%.

Basic Volcanic Porphyry

The basic volcanic porphyry has a very fine grained grey matrix with medium grained plagioclase phenocrysts. This rock type is only seen in one location, at 16N/19E on the grid.

Agglomerate

The agglomerate occurs near the southeast corner of the intrusive. It is green (locally purple), massive and has fragments from $\frac{1}{4}$ inch to 6 inches in diameter.

To the south of the map area the agglomerates are entirely purple.

GRID SURVEY

The first field work to be done was the construction of a surveyed grid over the main area of interest (intrusive units and marginal volcanic rocks). A 4,500 ft. north-south base line at an azimuth of 354° was established along the crest of the main ridge, the starting point being located from the contoured orthophotograph produced by Lockwood Survey Corp. Ltd. Cross lines at 500 ft. intervals were turned off the base line with a transit and chained (corrected for slope) 2,500 ft. to the east and 1,500 ft. to the west. Stations were established with pickets every 100 ft.

MAGNETIC SURVEY

The magnetic survey was conducted by student A. Luk and supervised in the field by E. Hunter. Readings were taken at every 100 ft. station along each of the 500 ft. spaced grid lines using a Sharp (Scintrex) MF-1 magnetometer.

The magnetic relief is relatively low with a maximum variation of 570 gammas being attained. While there is no obvious pattern to the rather irregular picture, it does

appear that the volcanic rocks produced higher readings than the intrusives. There is also a suggestion of a subtle increase in the magnetic response of the syenodiorite, especially to the west, as compared to the quartz monzonite. This is consistent with field observations of the magnetite content in the two rock types.

ROCK GEOCHEMICAL SURVEY

The lithochemical sampling program was conducted in two stages by E. Hunter and student geologist D. Toderian. The first half was done in July and the second half in August after a considerable reduction in the snow cover. Most of the stations were confined to testing the intrusive units on the gridded portion of the claims although a number of representative samples were also taken from the surrounding volcanic rocks as well.

Sampling consisted of compositing a number of rock chips at each station taken from either outcrop or frost heaves known to be in situ. These were then submitted for copper, molybdenum and zinc analysis with a contract laboratory in Vancouver (Bondar-Clegg and Co. Ltd.)

After pulverizing the chips to minus 100 mesh treatment consisted of attacking the sample first with concentrated nitric acid, followed by the addition of concentrated hydrochloric acid and digestion for 3 hours. The solutions were then bulked to 20% acid concentration, homogenized, settled and analyzed by atomic absorption.

INDUCED POLARIZATION SURVEY

A limited Induced Polarization (I.P.) survey, using frequency domain equipment, was carried out over part of the intrusive and surrounding volcanics for two main reasons. One was the need to test the feasibility of the technique under the severe topographical and geomorphological conditions present on the claims and elsewhere in the area. The other purpose was, of course, to determine whether any anomalies or patterns could be found which would aid the mapping or selection of drill targets.

The field work was done by a contract crew from McPhar geophysics with Canico helpers. The McPhar I.P. unit, model 660, was operated at frequencies of 0.3 and 5.0 hz and the dipole-dipole array was used throughout the survey. Copies of the data as presented by McPhar in a pseudo-section format are enclosed herein. Although progress was slow, the field conditions presented no technical problems that could not be overcome and the results obtained were quite valid.

Interpretation of the data is restricted by the limited coverage as determined by the time available during the 1973 season. However, the first separation, 300 ft. spread frequency effects, metal factors and resistivities were plotted in plan view and contoured (see enclosed). This presentation emphasizes one striking feature of the survey, namely, the frequency effect and metal factor low plus resistivity high roughly centred over the quartz monzonite porphyry. Bordering the feature we have high frequency effects over the syenodiorite and volcanics. Sulphide mineralization is thus expected to be very low in the monzonite and higher in the syenodiorite and volcanics. This is in agreement with the known geology which has shown chalcopyrite and pyrite to be present in the syenodiorite and pyrite in, at least, some of the volcanics.

It thus appears that the I.P. technique will be a useful aid both by assisting the geological mapping and indicating the outline of the monzonite, and, showing areas of increased mineralization and thus helping plan a drill program to test the prospect. The local frequency effect high along the eastern monzonite syenodiorite contact (i.e. 00/10E) warrants further investigation by drilling due to its proximity to the contact and local geochemical highs. Further coverage is recommended both to cover the northern and southern areas of the intrusion and to extend the coverage east and west further into the volcanics to determine the extent of the high frequency effects and/or to reach a background level.

CONCLUSIONS AND RECOMMENDATIONS

- (1) No definite conclusions can be drawn from the ground magnetic data. While one can suggest that the intrusive

may be marked as a low, compared to the volcanics and that the syenodiorite portion is slightly higher than the monzonite, the differences are too vague and irregular to interpret any geological boundaries. Furthermore, there appears to be no reflection of the known areas of interesting mineralization.

- (2) The two main objectives of the short I.P. test survey were accomplished. Valid readings can be obtained even under the severe conditions present and the values obtained do relate to known geology and mineralization. The technique, therefore, is expected to aid mapping and drill hole selection so that it should be extended over all of the intrusive plus more of the volcanics to better determine the regional background values.
- (3) The rock geochemical sampling program has defined two zones of interesting copper and molybdenum mineralization:
 - (a) along the eastern quartz monzonite porphyry/syenodiorite contact extending from approximately 17N to 10S.
 - (b) along the flexure in the western contact from 10N to 3N between the same two intrusive rock types.
- (4) The property contains a number of features which make it an encouraging porphyry copper-molybdenum prospect:
 - (a) a multiphase acid intrusive body with a porphyritic facies, occurs in a Jurassic-Triassic sequence of volcanics.
 - (b) significant copper and molybdenum values are associated with an internal acid intrusive contact.
 - (c) copper-molybdenum mineralization is associated with a system of abundant randomly oriented fractures and a quartz stockwork.
 - (d) an I.P. anomaly is coincident with a zone of mineralization within the syenodiorite facies.
 - (e) there is some evidence of a pyrite "halo" occurring peripheral to the main anomalies of interest.

- (5) This property is at the stage where sub-surface testing is required in order to evaluate its potential. A program of 12 diamond drill holes (BQ size) to depths of approximately 800 ft. is recommended.

The drill pattern should be designed to provide a reasonable statistical sampling of the intrusive plug. The program should include at least three holes to test the eastern zone of mineralization and one hole to test the smaller mineralized zone on the western intrusive contact.

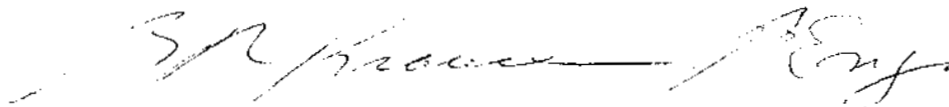
- (6) It is recommended that the I.P. coverage be extended to cover all the 500 ft. grid lines not yet surveyed. This additional geophysical information would provide a more complete picture of the I.P. responses which could greatly facilitate further interpretation of the extent of mineralization.

Respectfully submitted

MJG:vs



I certify that this is an accurate statement of the work performed and a reasonable interpretation of the results.



B. R. Krause, P. Eng. (Ontario)

COST ANALYSIS

Appendix 1

INDIVIDUAL COMPONENT COSTS

<u>OPERATION</u>	<u>PERIOD</u>	<u>EXPENDITURE</u>	<u>PERFORMED BY</u>	<u>RATE</u>	<u>PERIOD</u>	<u>SUB-TOTAL</u>	<u>TOTAL</u>	
Contoured Topo Map	Feb. 1973	Orthophoto	Lockwood Survey Corp. Ltd.	Contract		980.37	980.37	
Surveyed Grid	June 28- July 6	1) Wages	E.N. Hunter, geologist	\$ 55.22	9 days			
			D. Toderian, student geologist	29.54	9 "			
			A. Luk, student	25.45	9 "	991.89		
		2) Support Costs	1973 program average; 3 men	36.96	9 "	997.92		
		3) Helicopter	Dominion-Pegasus Helicopters	225.00	3 hrs.	675.00	2,664.81	
Magnetic Survey	July 7- July 13	1) Wages	A. Luk, student	\$ 25.45	7 days	178.15		
		2) Support Costs	1973 program average	36.96	7 days	258.72	436.87	
Rock Geochemical Sampling	July 7- July 13	1) Wages	E.N. Hunter, geologist	\$ 55.22	7 days			
			D. Toderian, student geologist	29.54	7 "	593.32		
		2) Support Costs	1973 program average; 2 men	36.96	7 "	517.44		
		3) Assays	Bondar-Clegg and Co. Ltd.	2.45	261	639.45	1,750.21	
Supervision	June 28- July 13	1) Wages	M. J. Gidluck, Area Geologist	\$ 74.00	4 days	296.00		
		2) Support Costs	1973 program average(base-camp)	22.14	4 "	88.56		
		3) Helicopter	Dominion-Pegasus Helicopters	225.00	1 hr.	225.00	609.56	
		TOTAL - Prior to July 27, 1973						\$6,441.82
I.P. Survey	Aug. 1- Aug. 9	1) Transportation	Transprovincial Airlines	\$ 1.25	371 mi.	463.75		
			Dominion-Pegasus Helicopters	225.00	3.5 hrs.	787.50		
		2) Support Costs	2 McPhar men and 3 Canico men	36.96	8 days	1,478.40		
		3) Wages	E.N. Hunter, geologist	55.22	8 "			
			D. Toderian, student geologist	29.54	8 "			
			A. Luk	25.45	8 "	881.68		
		4) I.P. Operation	McPhar	265.00	6 "	1,590.00		
		5) Misc. charges	McPhar-travel, standby	100.00	3 "	300.00		
		6) Penalty charge	McPhar-less than 10 days	200.00		200.00		
		7) Mobilization	McPhar crew and equipment	435.00		435.00	6,136.33	
Geological Mapping and Rock Geochemical Sampling	Aug. 12- Aug. 24	1) Wages	E.N. Hunter, geologist	\$ 55.22	13 days			
			D. Toderian, student geologist	29.54	13 days	1,101.88		
		2) Support Costs	1973 program average; 2 men	36.96	13 days	960.96		
		3) Assays	Bondar-Clegg and Co. Ltd.	2.45	136	333.20		
		4) Helicopter	Dominion-Pegasus Helicopters	225.00	2 hrs.	450.00	2,846.04	
Supervision	Aug. 1- Aug. 24	1) Wages	M.J. Gidluck, Area Geologist	\$ 74.00	5.5 days	407.00		
		2) Support Costs	1973 program average (base-camp)	22.14	5.5 "	121.77		
		3) Helicopter	Dominion-Pegasus Helicopters	225.00	2 hrs.	450.00	978.77	
Report	Sept. 1973	1) Wages	Gidluck and Hunter, geologists	125.00	2 days	250		
			B.R. Krause, geophysicist	75.00	2 days	150		
			Draftsman	50.00	2 days	100	500.00	
October 10, 1973		TOTAL - Post July 27, 1973						\$10,461.64

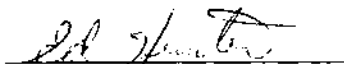
QUALIFICATIONS

I, Edward N. Hunter, received a B.Sc. (Geology) from the University of British Columbia in April 1970. I have been actively engaged in mineral exploration with The International Nickel Company since graduating.

May 1970 to May 1971 was spent on geological mapping and diamond drilling projects in the Precambrian Shield of Northern Manitoba.

Two years, 1971 and 1972, were spent prospecting, geological mapping and rock geochemical sampling in Northwestern British Columbia.

The 1973 field season was spent doing detailed geological mapping and rock geochemical sampling on the Bear Claims in Northwestern British Columbia.



Edward N. Hunter,
Box 890,
THOMPSON, Manitoba.

QUALIFICATIONS

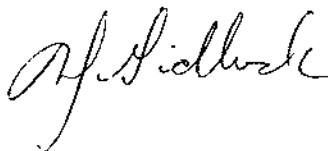
I, Marcus J. Gidluck graduated from the University of British Columbia with a Bachelors Degree in Science (Geology) in 1965. Since that time I have been actively engaged in mining exploration for base-metal deposits with the International Nickel Company of Canada, Limited in Canada and Australia.

Until April 1967 I was involved with geophysical programmes and follow-up diamond drilling operations in Northern Ontario.

The subsequent $5\frac{1}{2}$ years were spent with International Nickel Australia Ltd. in West Australia where I was primarily concerned with:

- (a) geological mapping and drilling of claim groups for one year
- (b) on site supervision of geological mapping, geophysical and geochemical surveys as well as drilling (rotary, percussion and diamond) operations at the pre-development stage of a nickel-copper property for $2\frac{1}{2}$ years.
- (c) conducting regional exploration and property evaluations of various base-metal prospects in the eastern half of West Australia for $1\frac{1}{2}$ years.

The last year, 1972 - 1973, was spent on the preparation and supervision of the Canadian Nickel Company Limited (INCo) exploration programme in North Central British Columbia which includes the Bear claims.



M. J. Gidluck,
45 Notigi Bay,
THOMPSON, Manitoba

CERTIFICATE

I, Barry Russell Krause, of Sudbury, Ontario hereby certify that:

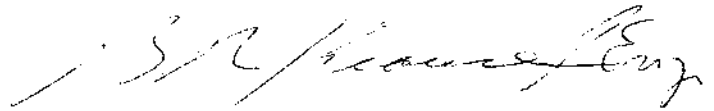
I am a geophysicist employed by International Nickel Company Limited as Exploration Geophysics Manager.

I am a graduate of the University of Toronto having received a BSc in 1958 in Engineering Physics (Geophysics Option) and a MA in Physics in 1960.

I am a certified member of the Association of Professional Engineers of the Province of Ontario.

The Induced Polarization survey reported herein was done under my personal supervision and I prepared that part of the text of the report relating to it and the magnetic survey.

The other geophysical, geological and geochemical work was carried out under my general supervision.



October 12, 1973

B. R. Krause, P. Eng.

Appendix 4

McPHAR GEOPHYSICS LIMITED

PHONE 449-5551
TORONTO AREA CODE 416

139 BOND AVENUE, DON MILLS, ONTARIO, CANADA

CABLE-McPHAR
TORONTO

DUPLICATE

September 7, 1973
Invoice No. G 17071

SEP 24 1973
GEOLOGICAL DEPT.

Mr. B.R. Krause,
Senior Staff Geophysicist,
Field Exploration,
Canadian Nickel Company Ltd.,
Copper Cliff, Ontario

REFERENCE: IP Survey - Bear Lake Area
Contract # G 6447

Period: August 1 - August 9, 1973

Geophysicist: D. J. Misener

Technician: P. Makulowich

Charges as per contract:

6 days Operating @ \$265.00/day \$1,590.00

2 days Travel)

$\frac{1}{2}$ day Preparation) 3 days @ \$100.00/day 300.00

$\frac{1}{2}$ day Standby)

Charge re less than 10 operating days 200.00

Mobilization charge - Vancouver to Smithers 435.00

\$2,525.00

J.F.C.
B.R.K.
J.E.M.
D.P.
A.J.S.
H.F.S.
A.A.W.
FILES

D. J. Misener
McPHAR GEOPHYSICS LIMITED

E. M. Woods

LMB/ds

for L. M. Braid (Mrs.)

ASSESSMENT DETAILS

PROPERTY: Bear Lake

MINING DIVISION: Omineca

SPONSOR: Canadian Nickel Co. Ltd.

PROVINCE: British Columbia

LOCATION: Bear Lake

TYPE OF SURVEY: Induced Polarization

OPERATING MAN DAYS: 30.0

DATE STARTED: August 1, 1973

EQUIVALENT 8 HR. MAN DAYS: 45.0

DATE FINISHED: August 9, 1973

CONSULTING MAN DAYS: -0-

NUMBER OF STATIONS: 88

DRAUGHTING MAN DAYS: -0-

NUMBER OF READINGS: 328

TOTAL MAN DAYS: 45.0

MILES OF LINE SURVEYED: 4.5

GEOPHYSICIST:

Dr. D.J. Misener, 208 Lord Seaton Drive, Toronto, Ontario.

FIELD TECHNICIANS:

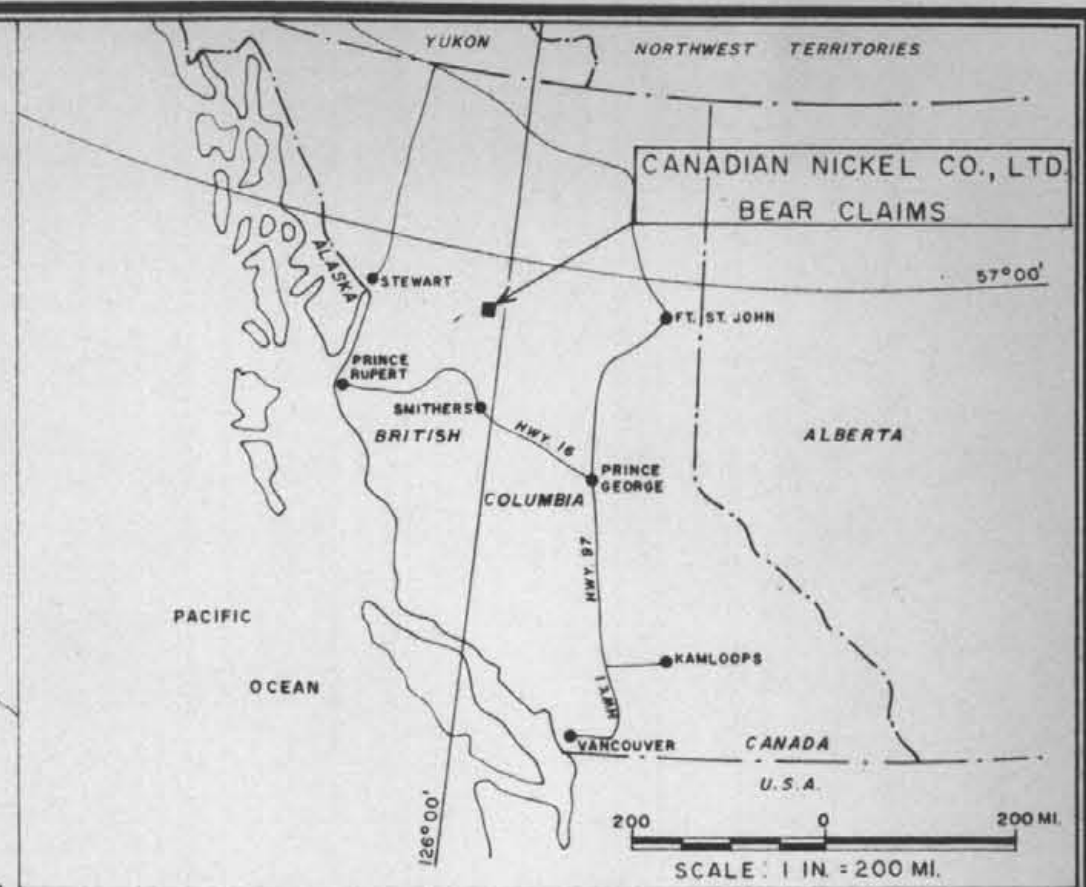
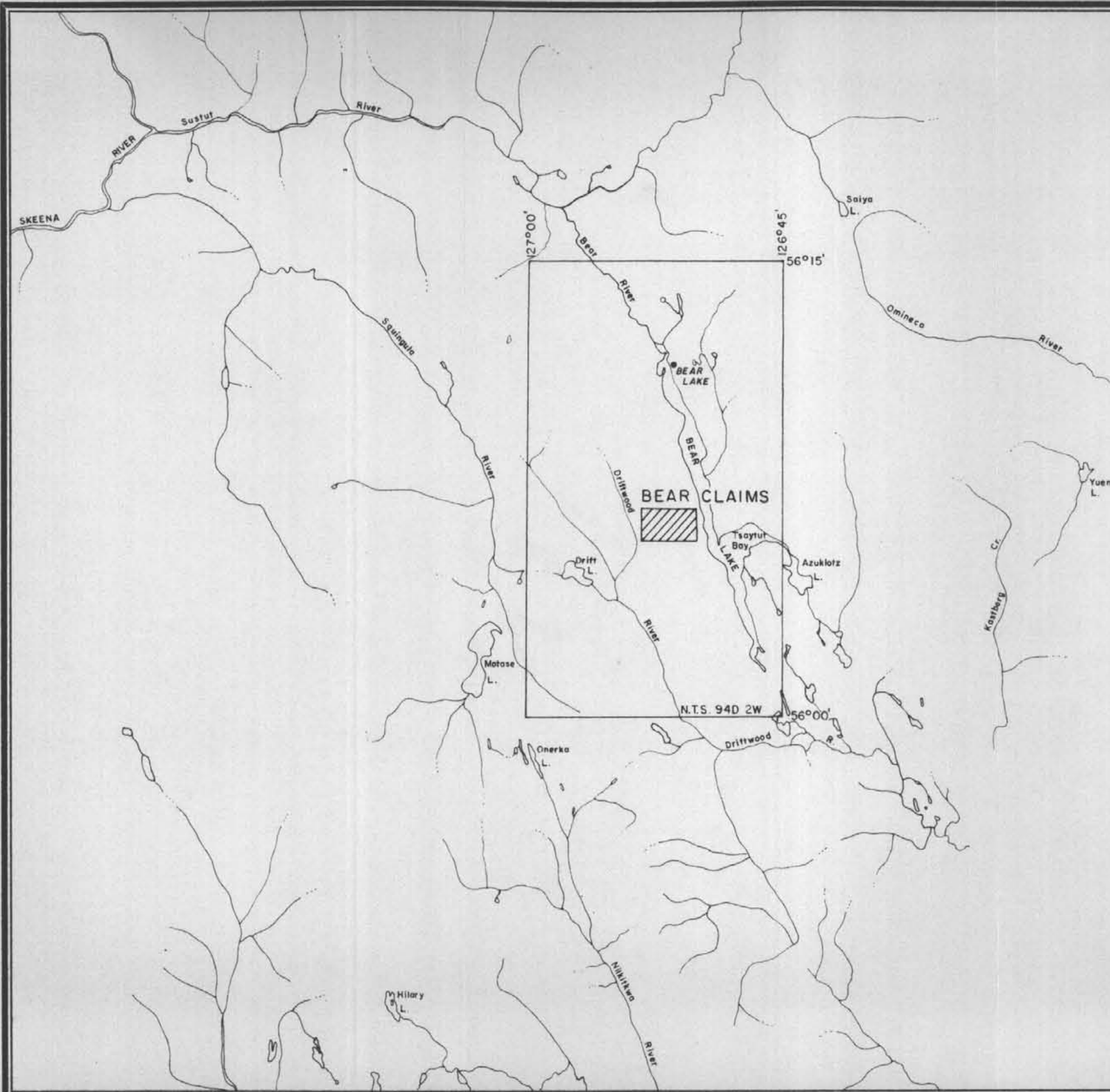
P.T. Makulowich, 669 Valdes Drive, Kamloops, B.C.

3 Helpers : supplied by client

McPHAR GEOPHYSICS LIMITED


Dr. D.J. Misener

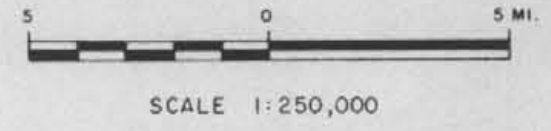
Dated: August 14, 1973



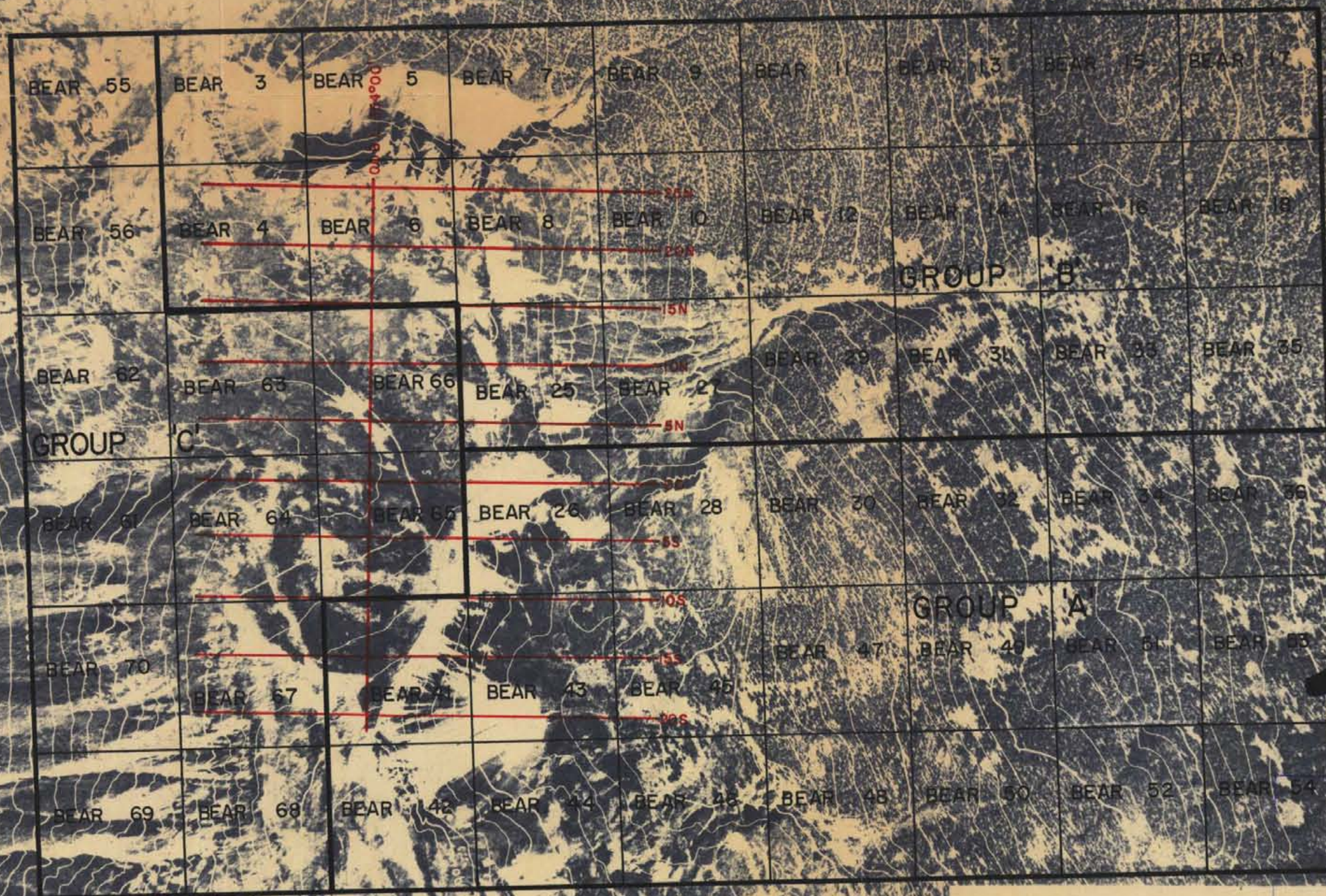
4648

Dep. of
M1
 Mines and Petroleum Resources
 ASSESSMENT REPORT
 NO. **4648** MAP #1

Canadian Nickel Co. Ltd.
LOCATION MAP
 BEAR CLAIMS - GROUPS A, B, and C
 OMINECA MINING DIVISION
 BRITISH COLUMBIA



To accompany report by M.J. Gidluck Sept. 1973



ASSESSMENT REPORT
NO. 4648 MAP #2

Canadian Nickel Co. Ltd.
TOPOGRAPHICAL, CLAIM AND GRID PLAN
BEAR CLAIMS - GROUPS A, B, and C
OMINECA MINING DIVISION
BRITISH COLUMBIA



SCALE: 1" = 1000'

To accompany report by M.J. Gidluck Sept. 1973

LEGEND

TERTIARY INTRUSIVES

- 1 Quartz Monzonite Porphyry: very fine grained quartz-feldspar matrix, medium grained plagioclase, biotite phenocrysts; large orthoclase phenocrysts (maximum 1 inch); very fresh and massive; local chalcopyrite pyrite; local quartz stockwork.
- 1 a Quartz Monzonite Porphyry: 20 to 60 percent alkali dykes, generally near syenodiorite contact, chalcopyrite in quartz veinlets.
- 1 b Quartz Monzonite Porphyry Dykes: 10 to 100 feet wide; generally striking 040°; disseminated pyrite 1 to 5 percent.
- 2 Syenodiorite: medium grained, 30 percent amphibole, minor biotite, 1 to 5 percent disseminated magnetite; generally highly fractured, quartz-aplite stockwork; chalcopyrite, molybdenite, pyrite - fractures, veinlets, disseminated - concentrated near quartz monzonite porphyry contact, weak sericitization of plagioclase.
- 2 a Syenodiorite: 20 to 60 percent alkali dykes, generally near quartz monzonite porphyry contact, chalcopyrite, molybdenite on fractures.
- 2 b Syenodiorite: quartz rich (10 percent); locally porphyritic; 5 percent magnetite, no alteration, moderate fracturing, disseminated pyrite.
- 2 c Syenodiorite Porphyry Dykes: 20 feet wide, striking 040°, disseminated pyrite, no alteration.
- 3 Alaskite: fine grained to medium grained, no mafics, almost exclusively on contact between syenodiorite and quartz monzonite porphyry, up to 50 feet wide.
- 4 Syenite Porphyry Dykes: medium grained, disseminated pyrite, disseminated epidote (?).
- 5 Quartz-Feldspar Porphyry Dyke: 15 feet wide; highly fractured, highly weathered; no sulphides.

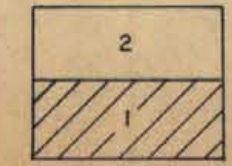
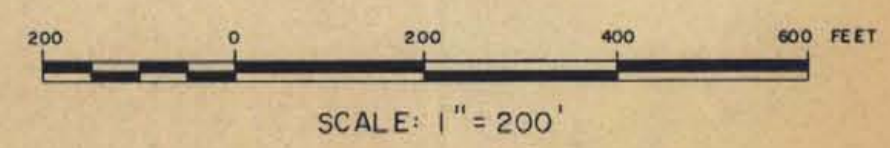
JURASSIC VOLCANICS TAKLA GROUP

- 6 Rhyolite: fine grained white, patches green biotite; disseminated pyrite, magnetite; locally very rusty; locally highly fractured.
- 7 Sericite Tuff: very fine grained finely laminated, white to grey; 2 to 5 percent disseminated pyrite; moderately fractured.
- 7 a Andesite Tuff: prismatic plagioclase, fine grained sericite matrix, very minor sericitization; finely disseminated pyrite and apatite.
- 8 Andesite: green very fine grain biotite rich quartz-feldspathic matrix, fine grained plagioclase phenocrysts; very weak sericitization.
- 9 Basic Volcanic Porphyry Dykes: grey, 10 feet wide, barren medium grained plagioclase phenocrysts in fine grained matrix.
- 10 Agglomerate: green - locally purple; maximum 6 inch fragments massive.

- Outcrop Area
- Observed Contact
- Inferred Contact
- ↗ Top Edge of Scarp
- ↘ Strike and Dip of Bedding or Banding
- Lineation
- * Major Fracture Directions
- ▭ Claim Boundary
- Claim Post
- BEAR 7 Claim Number

Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 4648 MAP #3

Canadian Nickel Co. Ltd.
GEOLOGY PLAN
BEAR CLAIMS - GROUPS A, B, and C
OMINECA MINING DIVISION
BRITISH COLUMBIA

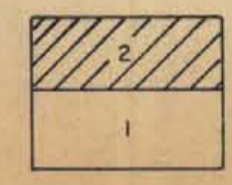
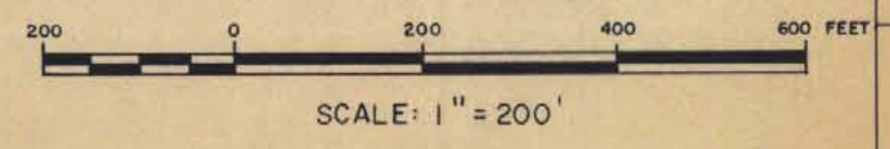


To accompany report by M.J. Gidluck Sept. 1973

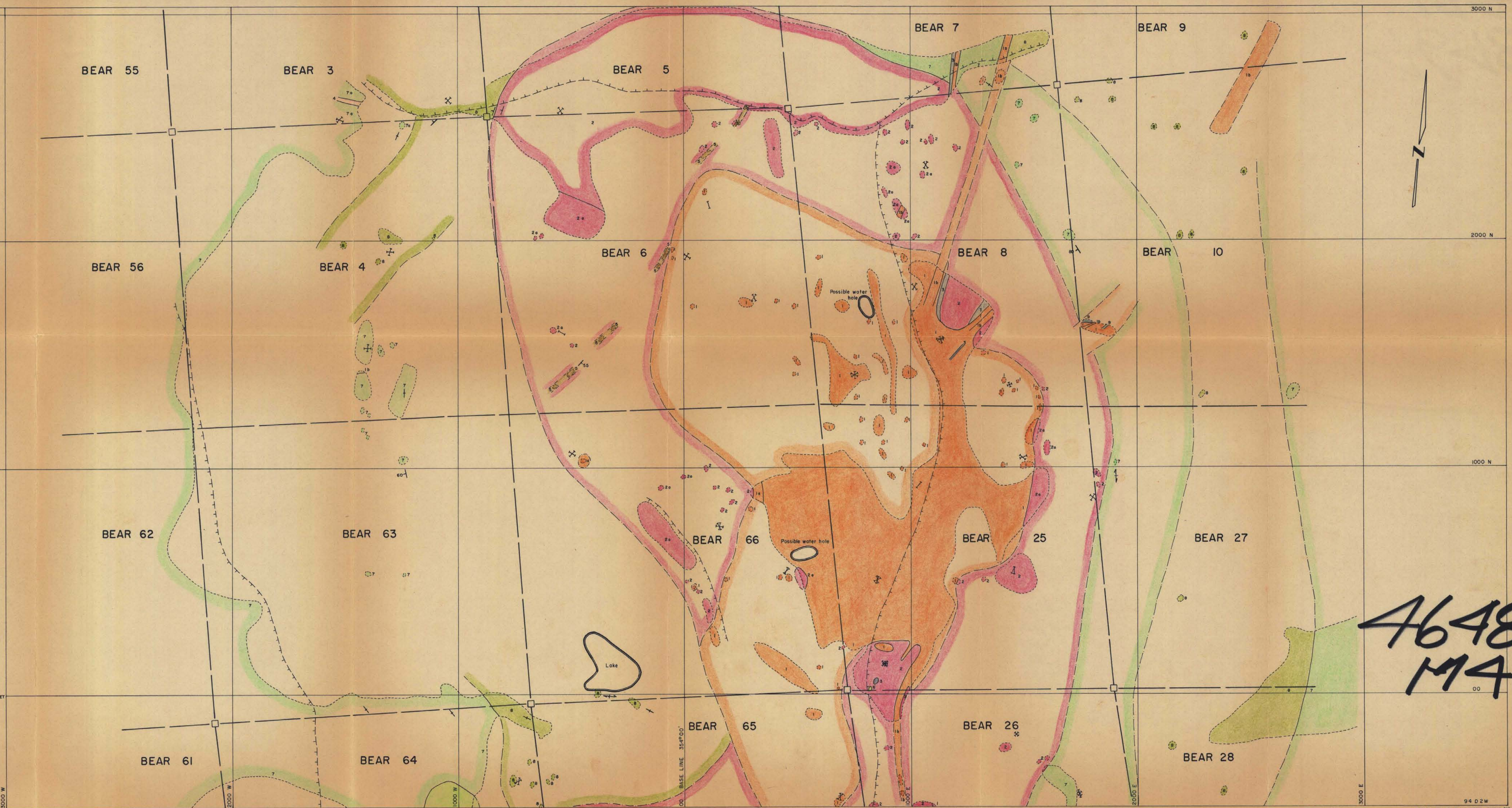


Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 4648 MAP #4

Canadian Nickel Co. Ltd.
GEOLOGY PLAN
BEAR CLAIMS - GROUPS A, B, and C
OMINECA MINING DIVISION
BRITISH COLUMBIA



To accompany report by M. J. Gidluck Sept. 1973



4648
M4

LEGEND

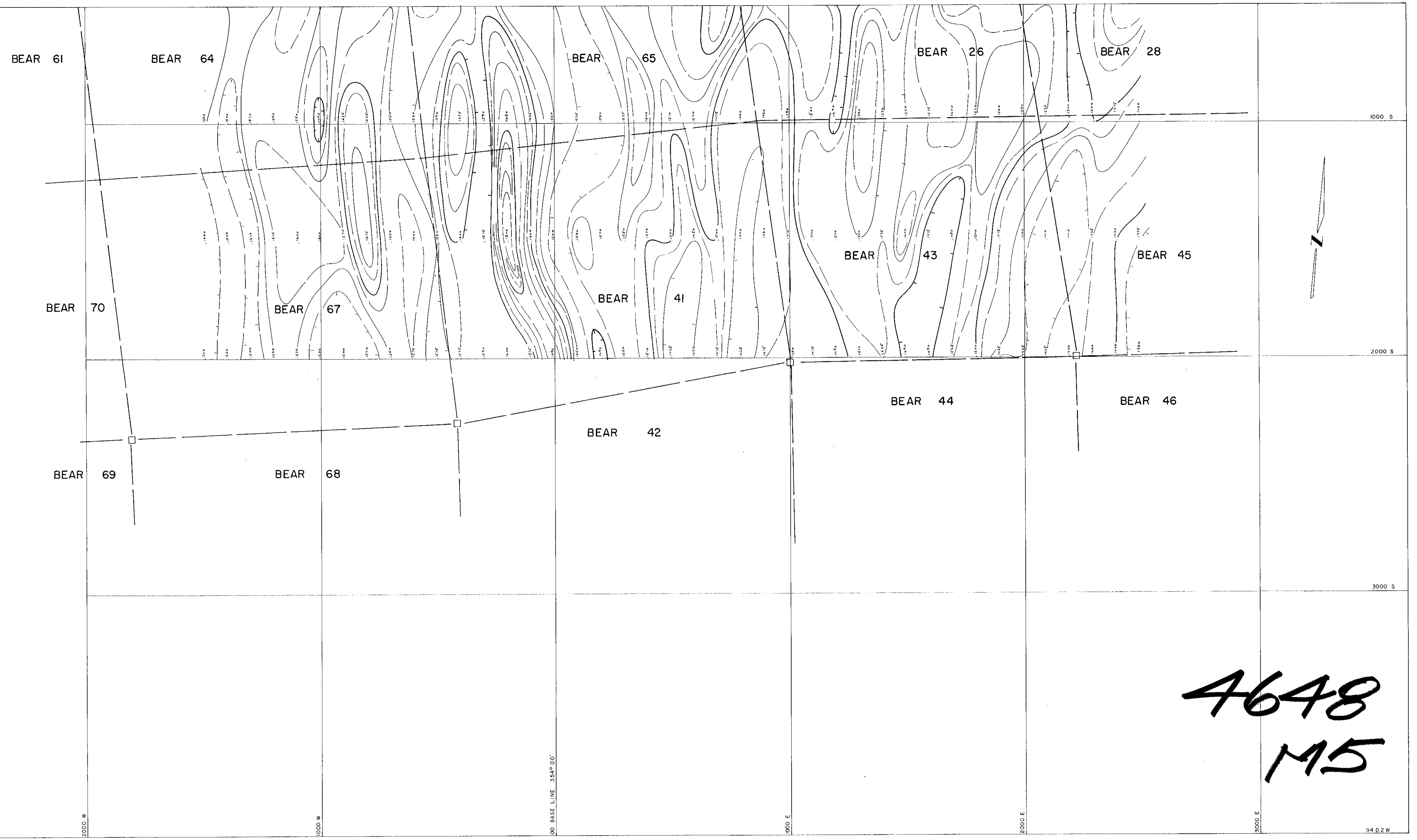
1450 MAGNETIC READING IN GAMMAS
 CONTOUR INTERVAL: 25 GAMMAS

— 100 GAMMA CONTOUR
 - - - 50 GAMMA CONTOUR
 ···· 25 GAMMA CONTOUR

— RELATIVE LOW

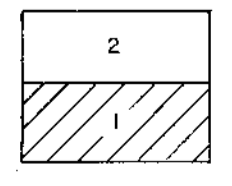
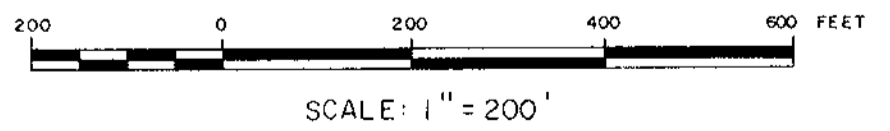
□ CLAIM POST
 - - - CLAIM BOUNDARY

BEAR 7: CLAIM NUMBER



Department of
 Mines and Petroleum Resources
 ASSESSMENT REPORT
 NO. 4648 MAP #5

Canadian Nickel Co. Ltd.
 MAGNETIC SURVEY
 BEAR CLAIMS - GROUPS A, B, and C
 OMINECA MINING DIVISION
 BRITISH COLUMBIA

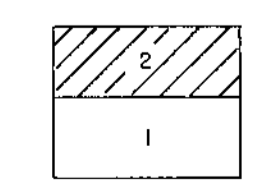
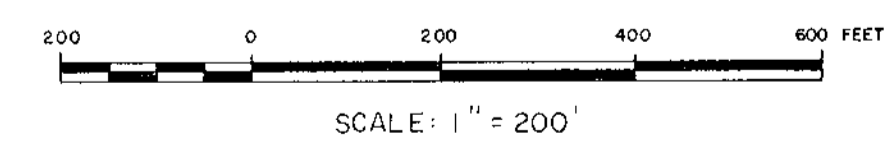


To accompany report by M.J. Gidluck Sept. 1973

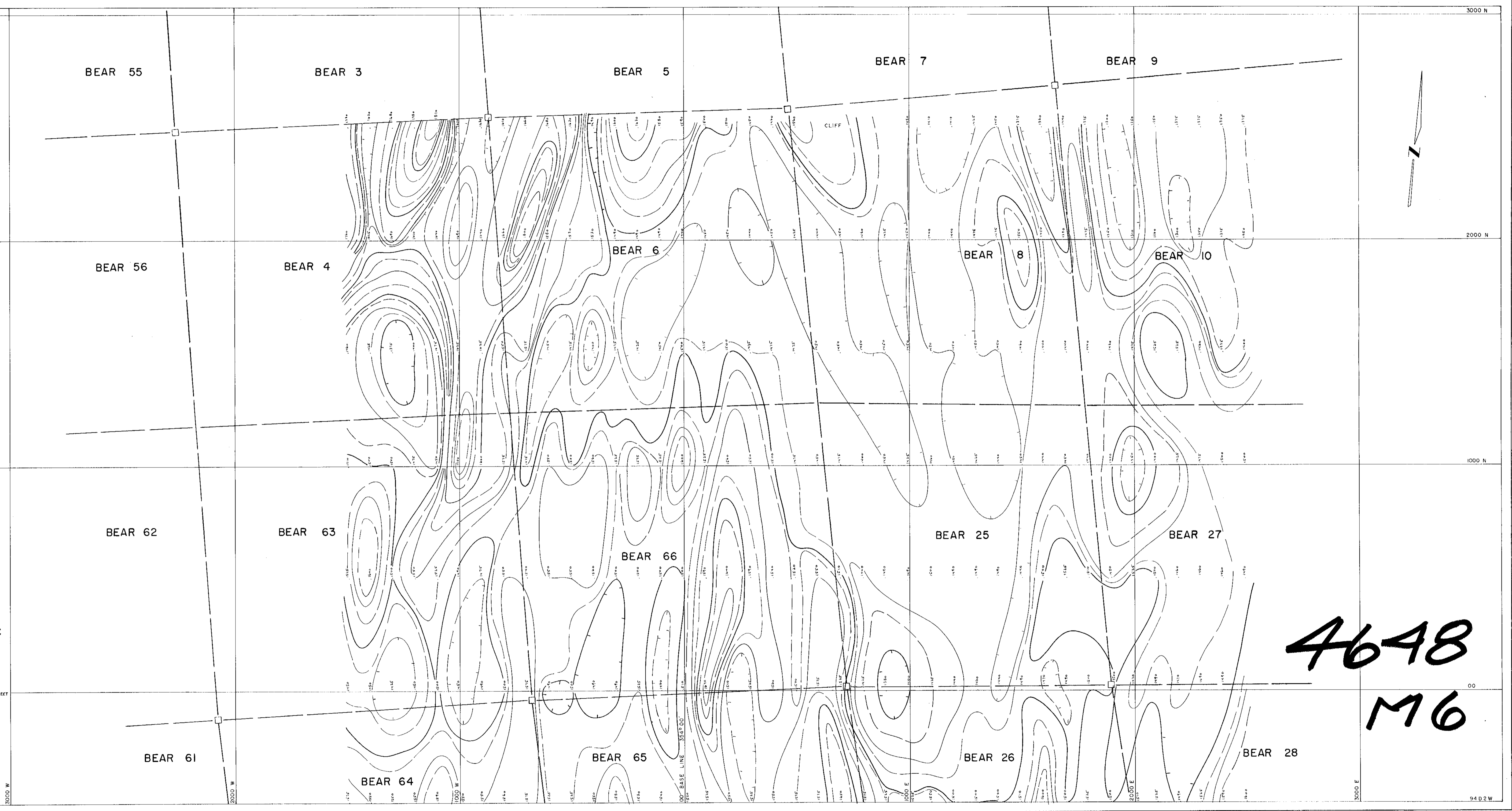
**4648
 M5**

Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 4648 MAP #6

Canadian Nickel Co. Ltd.
MAGNETIC SURVEY
BEAR CLAIMS - GROUPS A, B, and C
OMINECA MINING DIVISION
BRITISH COLUMBIA



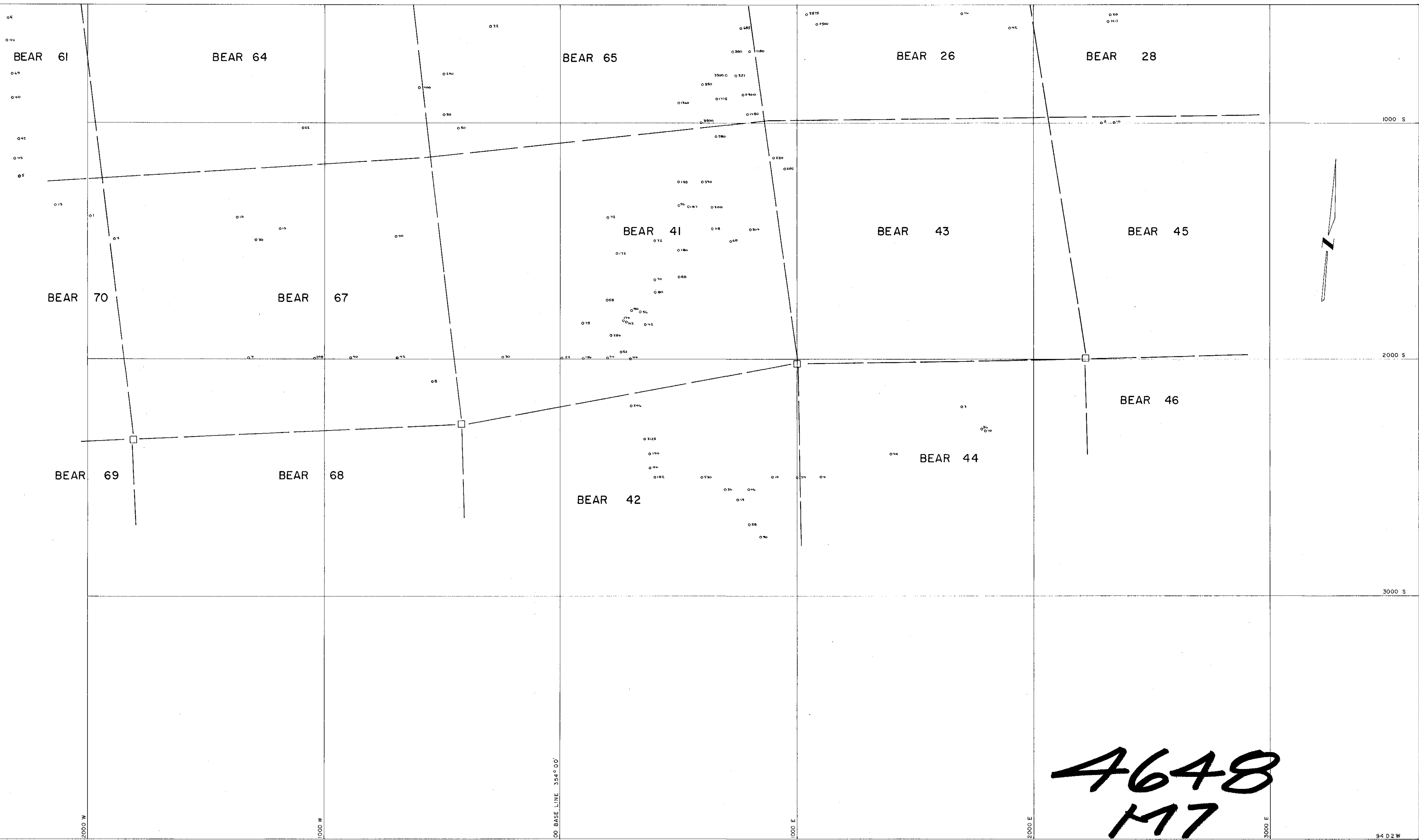
To accompany report by M. J. Gidluck Sept. 1973



4648
M6

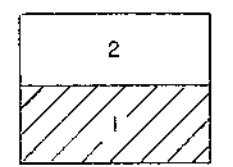
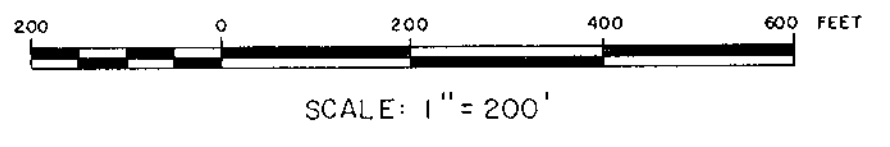
LEGEND

- 45 COPPER VALUES (P.P.M.)
- o ROCK CHIP SAMPLE SITE
- CLAIM BOUNDARY
- CLAIM POST
- BEAR 7 CLAIM NUMBER



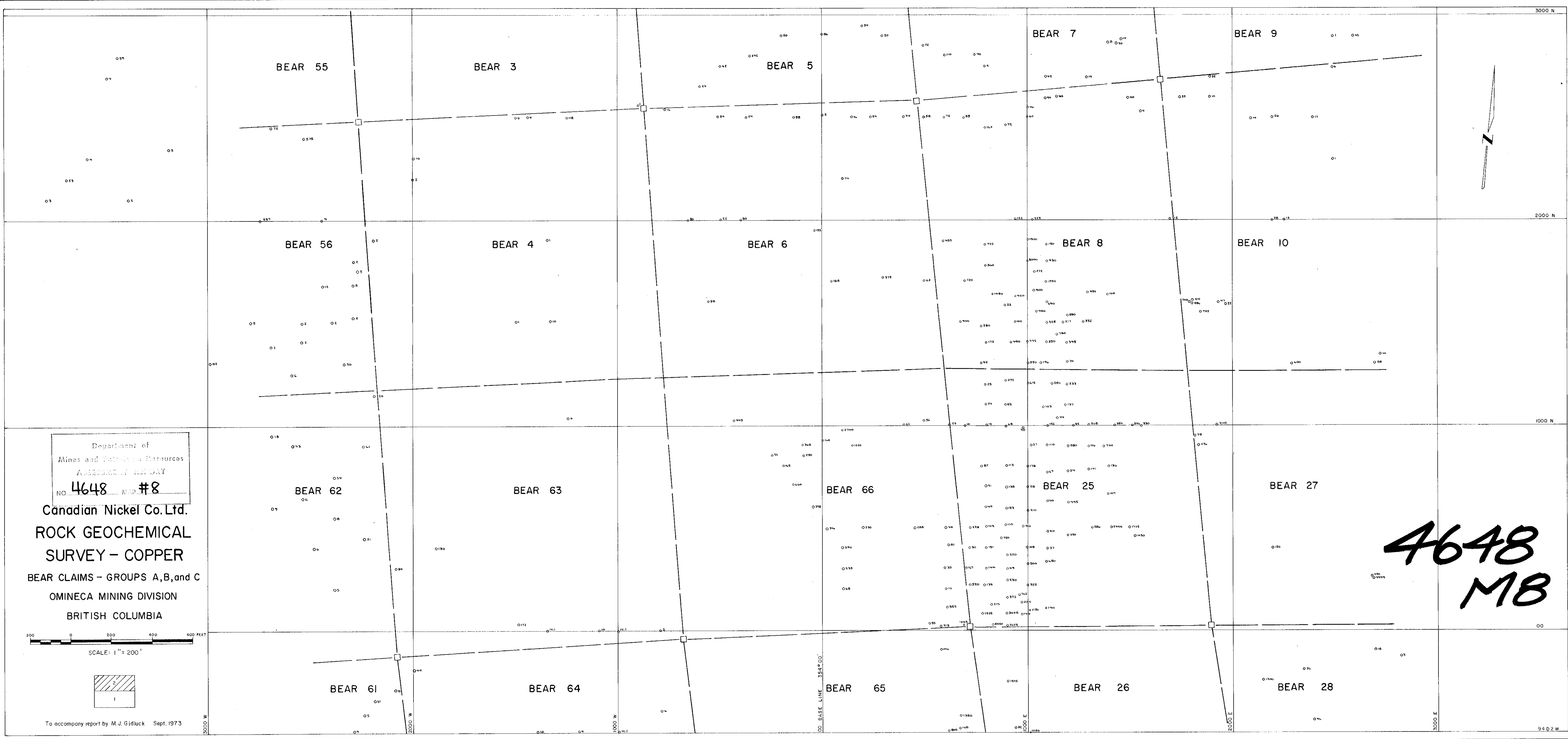
Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 4648 MAP #7

Canadian Nickel Co. Ltd.
ROCK GEOCHEMICAL
SURVEY - COPPER
BEAR CLAIMS - GROUPS A, B, and C
OMINECA MINING DIVISION
BRITISH COLUMBIA



To accompany report by M.J. Gidluck Sept. 1973

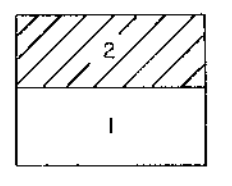
4648
M7



Department of
Mines and Technical Resources
ASSESSMENT REPORT
NO. **4648** MAP #8

Canadian Nickel Co. Ltd.
ROCK GEOCHEMICAL
SURVEY - COPPER
BEAR CLAIMS - GROUPS A, B, and C
OMINECA MINING DIVISION
BRITISH COLUMBIA

SCALE: 1" = 200'

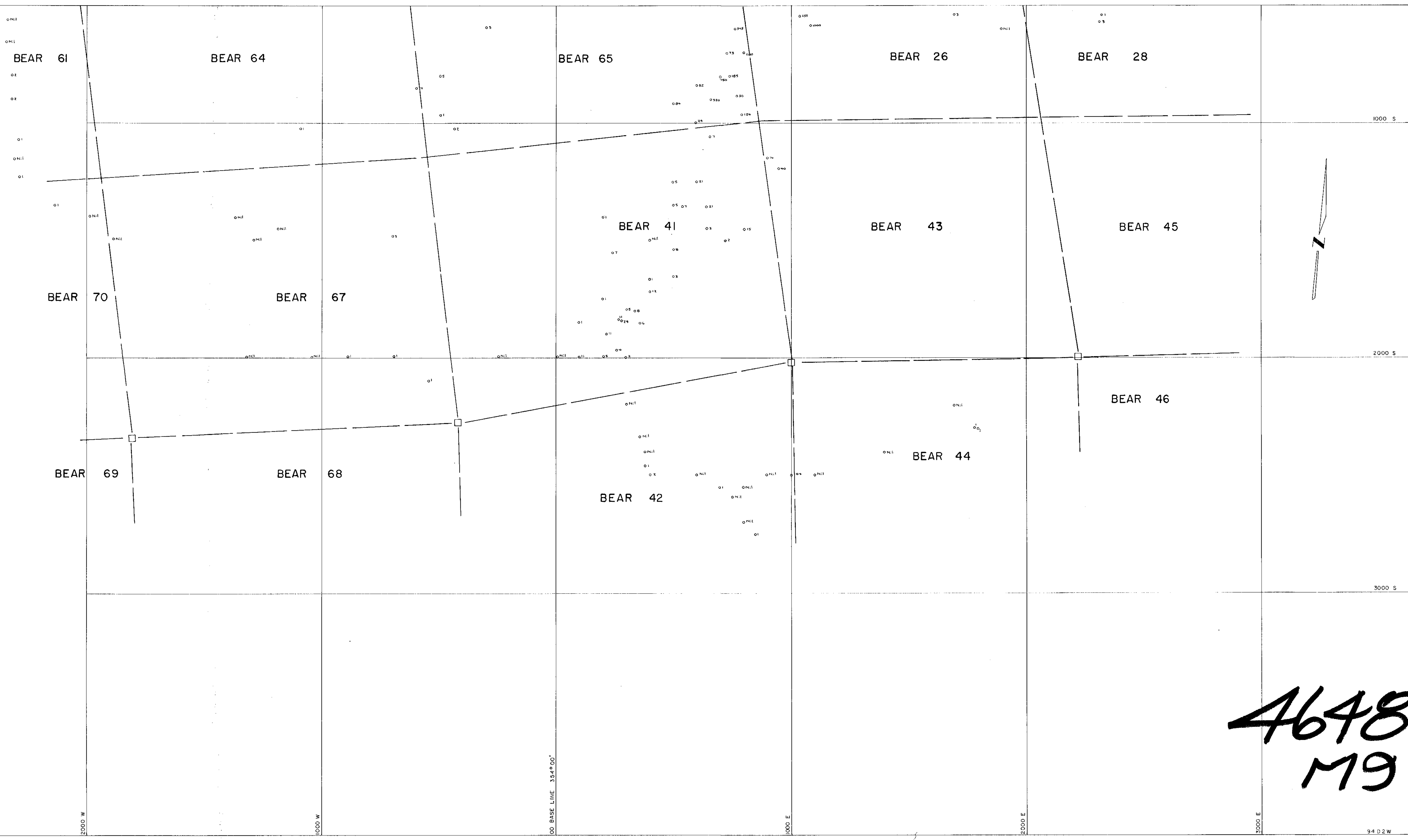


To accompany report by M. J. Gidluck Sept. 1973

**4648
M18**

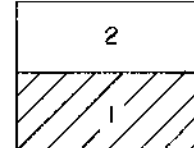
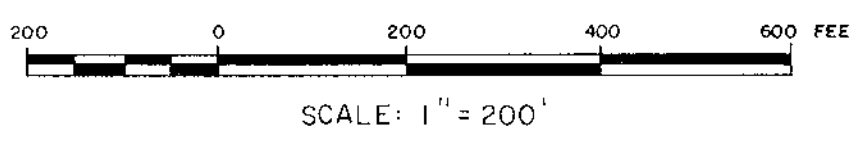
LEGEND

- 45 MOLYBDENUM VALUES (P.P.M.)
- ROCK CHIP SAMPLE SITE
- CLAIM BOUNDARY
- CLAIM POST
- BEAR 7 CLAIM NUMBER



Mines and Minerals
 Act
 NO. 4648 #9

Canadian Nickel Co. Ltd.
 ROCK GEOCHEMICAL
 SURVEY - MOLYBDENUM
 BEAR CLAIMS - GROUPS A, B, and C
 OMINECA MINING DIVISION
 BRITISH COLUMBIA

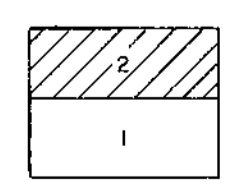
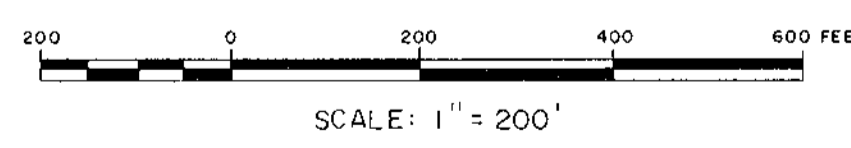


To accompany report by M.J. Gidluck Sept. 1973

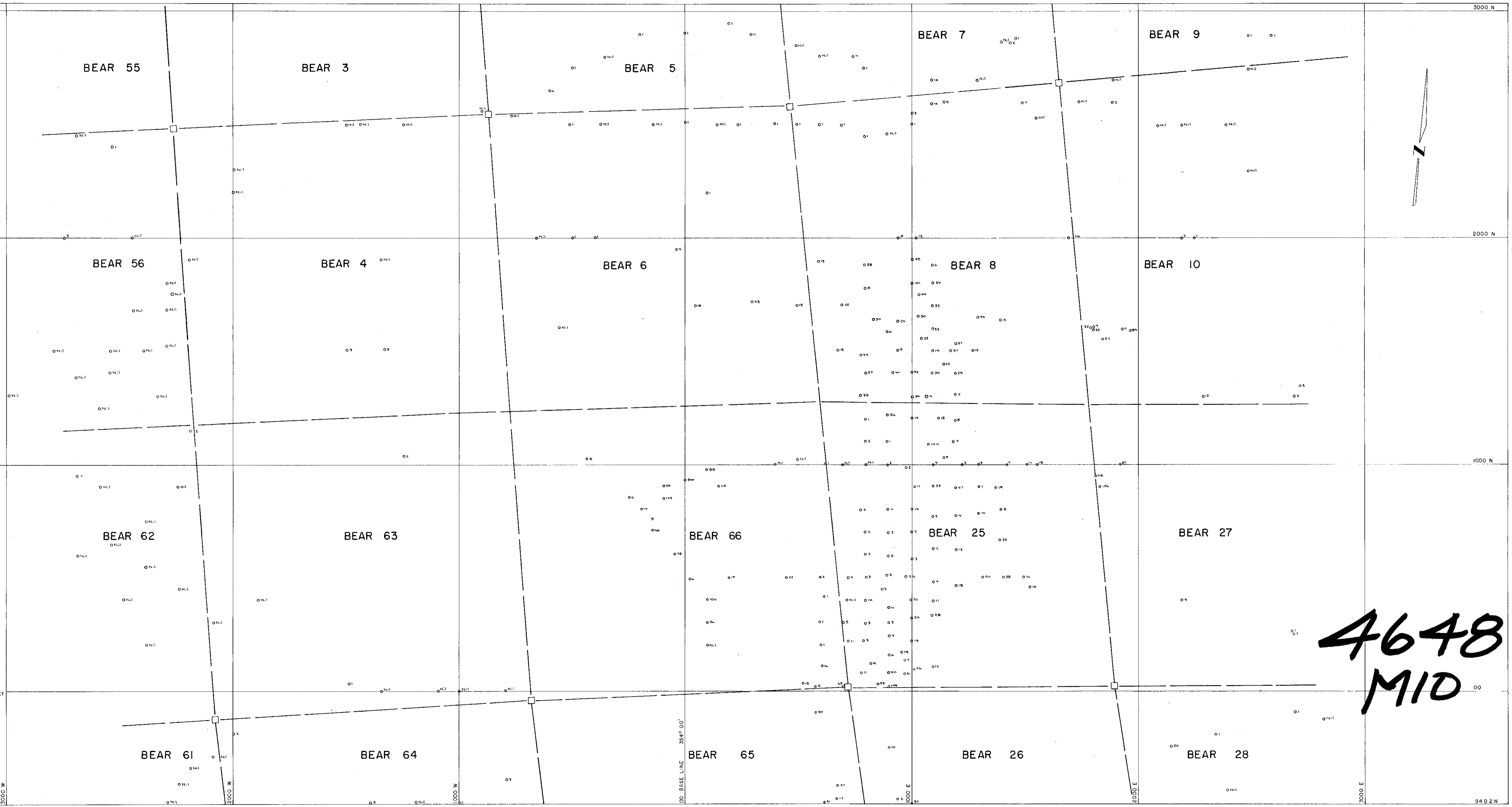
4648
M9

Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 4648 MAP #10

Canadian Nickel Co. Ltd.
ROCK GEOCHEMICAL
SURVEY - MOLYBDENUM
BEAR CLAIMS - GROUPS A, B, and C
OMINECA MINING DIVISION
BRITISH COLUMBIA



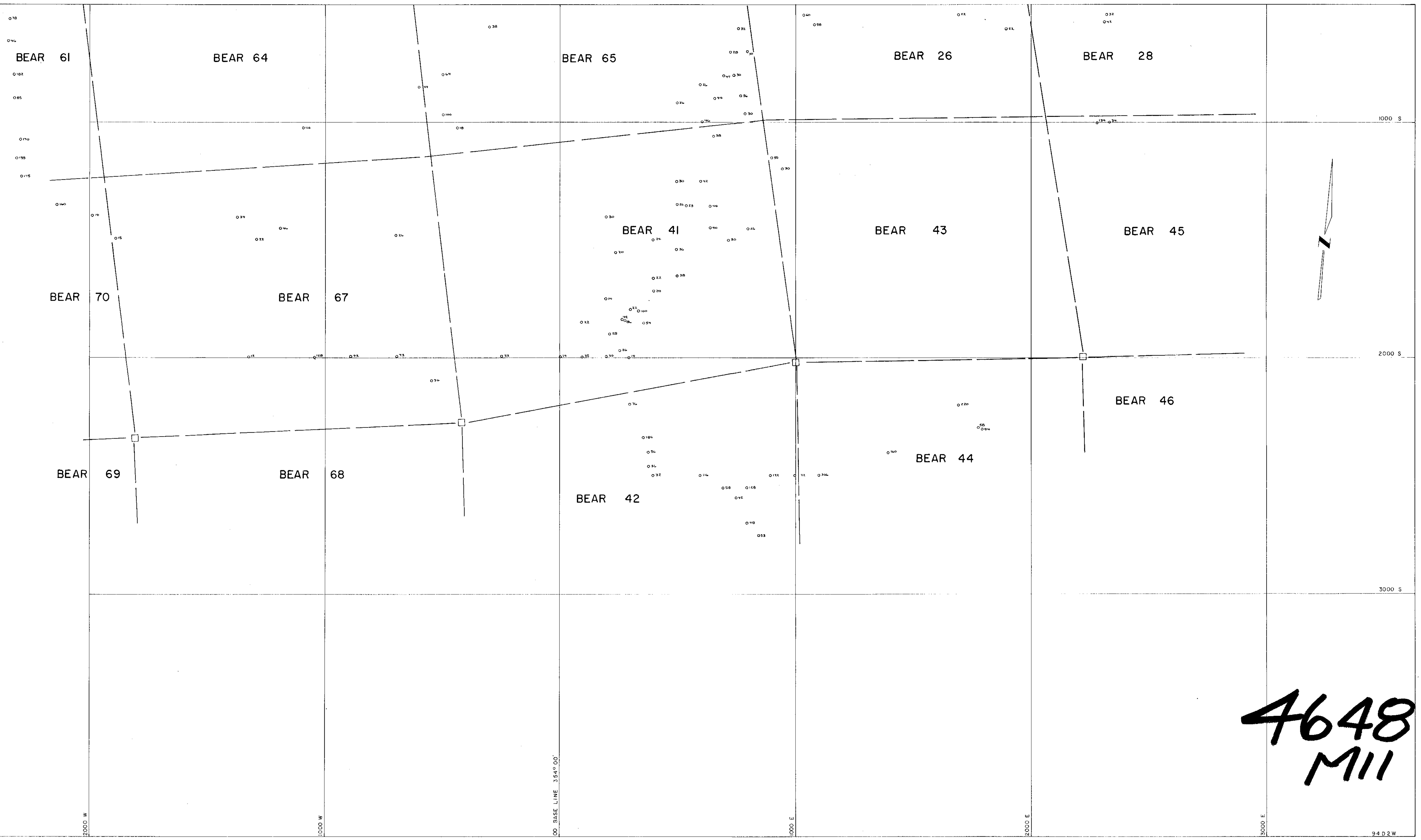
To accompany report by M.J. Gidluck Sept. 1973



4648
MID

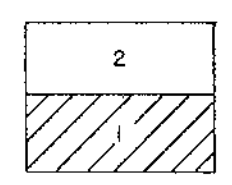
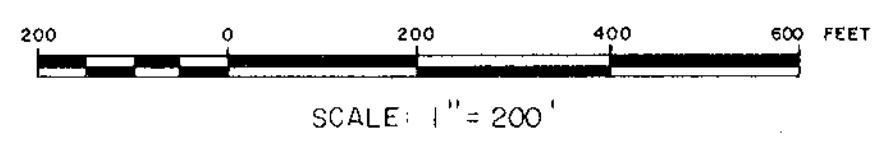
LEGEND

- 45 ZINC VALUES (P.P.M.)
- o ROCK CHIP SAMPLE SITE
- CLAIM BOUNDARY
- CLAIM POST
- BEAR 7 CLAIM NUMBER



Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. **4648** MAP #11

Canadian Nickel Co. Ltd.
ROCK GEOCHEMICAL
SURVEY - ZINC
BEAR CLAIMS - GROUPS A, B, and C
OMINECA MINING DIVISION
BRITISH COLUMBIA

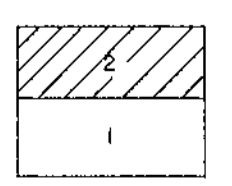
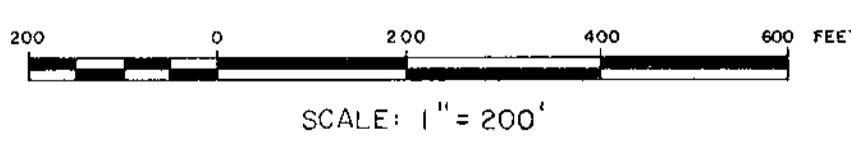


To accompany report by M.J. Gidluck Sept. 1973

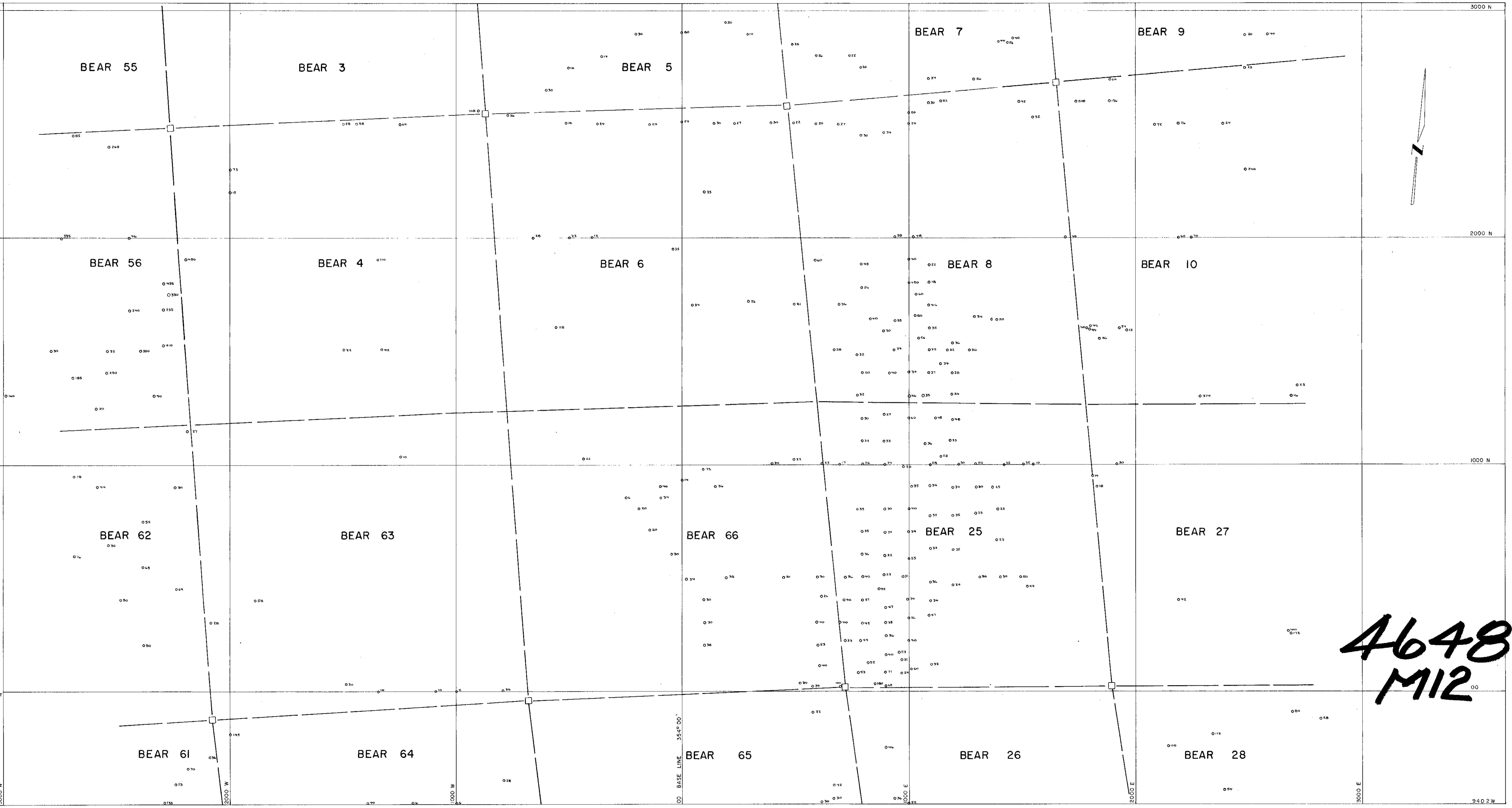
4648
M11

Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 4648 MAP #12

Canadian Nickel Co. Ltd.
ROCK GEOCHEMICAL
SURVEY - ZINC
BEAR CLAIMS - GROUPS A, B, and C
OMINECA MINING DIVISION
BRITISH COLUMBIA



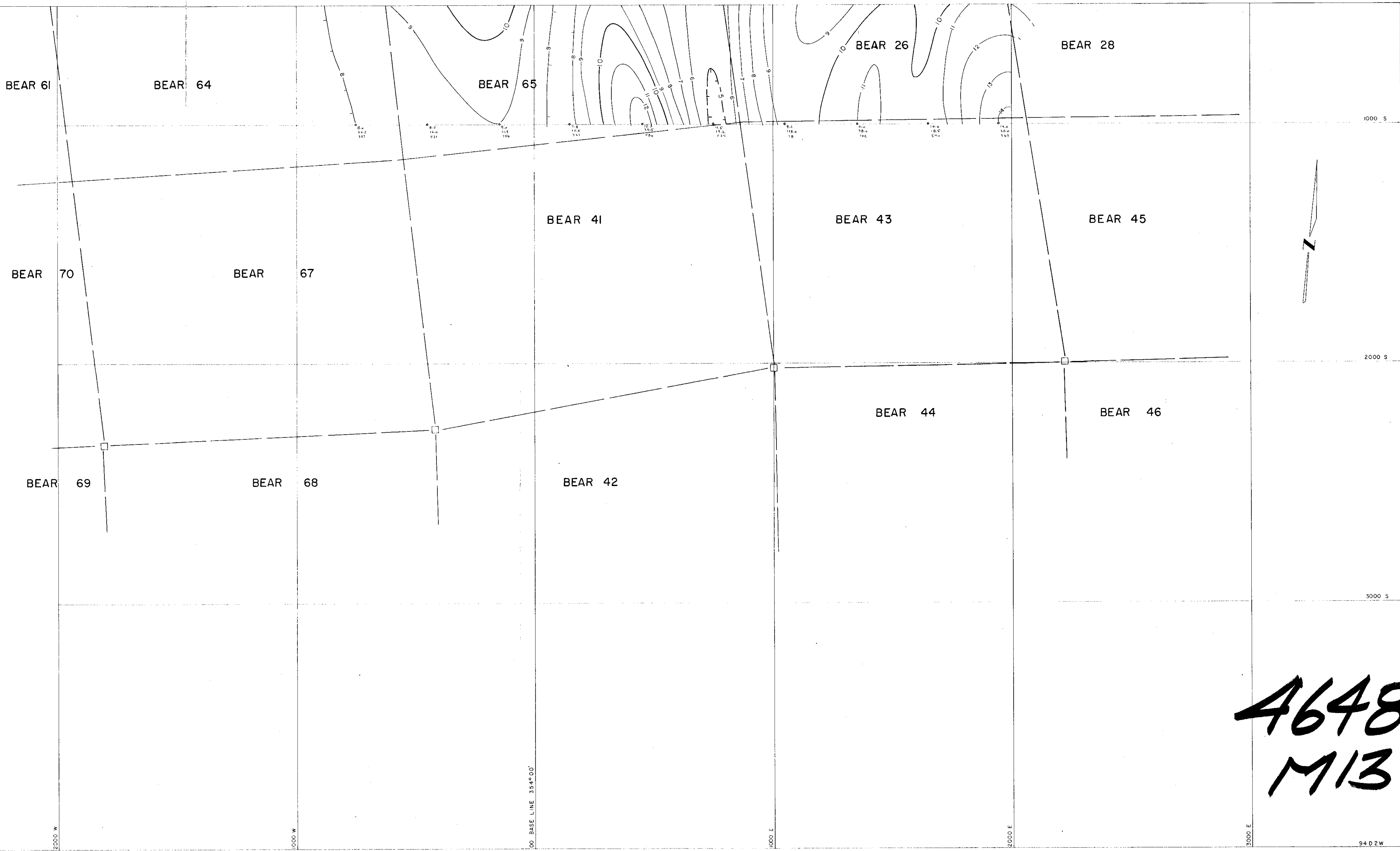
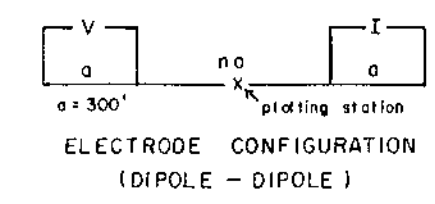
To accompany report by M.J. Gidluck Sept. 1973



4648
M12

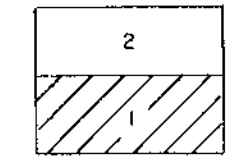
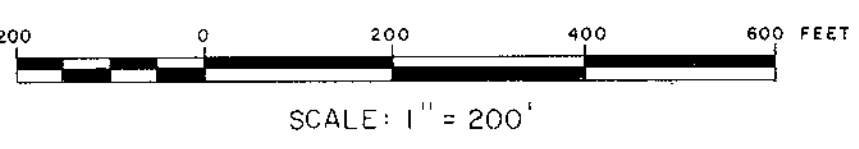
LEGEND
 CONTOUR INTERVAL - 1 PERCENT
 1 AND 10 PERCENT CONTOUR
 5 PERCENT CONTOUR
 INTERMEDIATE CONTOUR
 RELATIVE LOW
 CLAIM BOUNDARY
 CLAIM POST
 CLAIM NUMBER

7.2 - APPARENT FREQUENCY EFFECT IN PERCENT
 6.2 - APPARENT METAL FACTOR
 1163 - APPARENT RESISTIVITY IN $\frac{\text{ohm } \Omega}{2 \text{ ft}}$



Department of
 Mines and Petroleum Resources
 ASSESSMENT REPORT
 NO. 4648 MAP #13

Canadian Nickel Co. Ltd.
 I.P. SURVEY
 APPARENT FREQUENCY EFFECT
 BEAR CLAIMS - GROUPS A, B, and C
 OMINECA MINING DIVISION
 BRITISH COLUMBIA

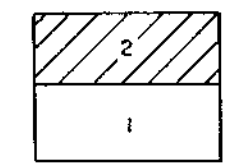
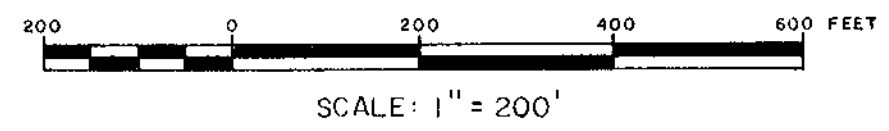


To accompany report by M.J. Gidluck Sept. 1973

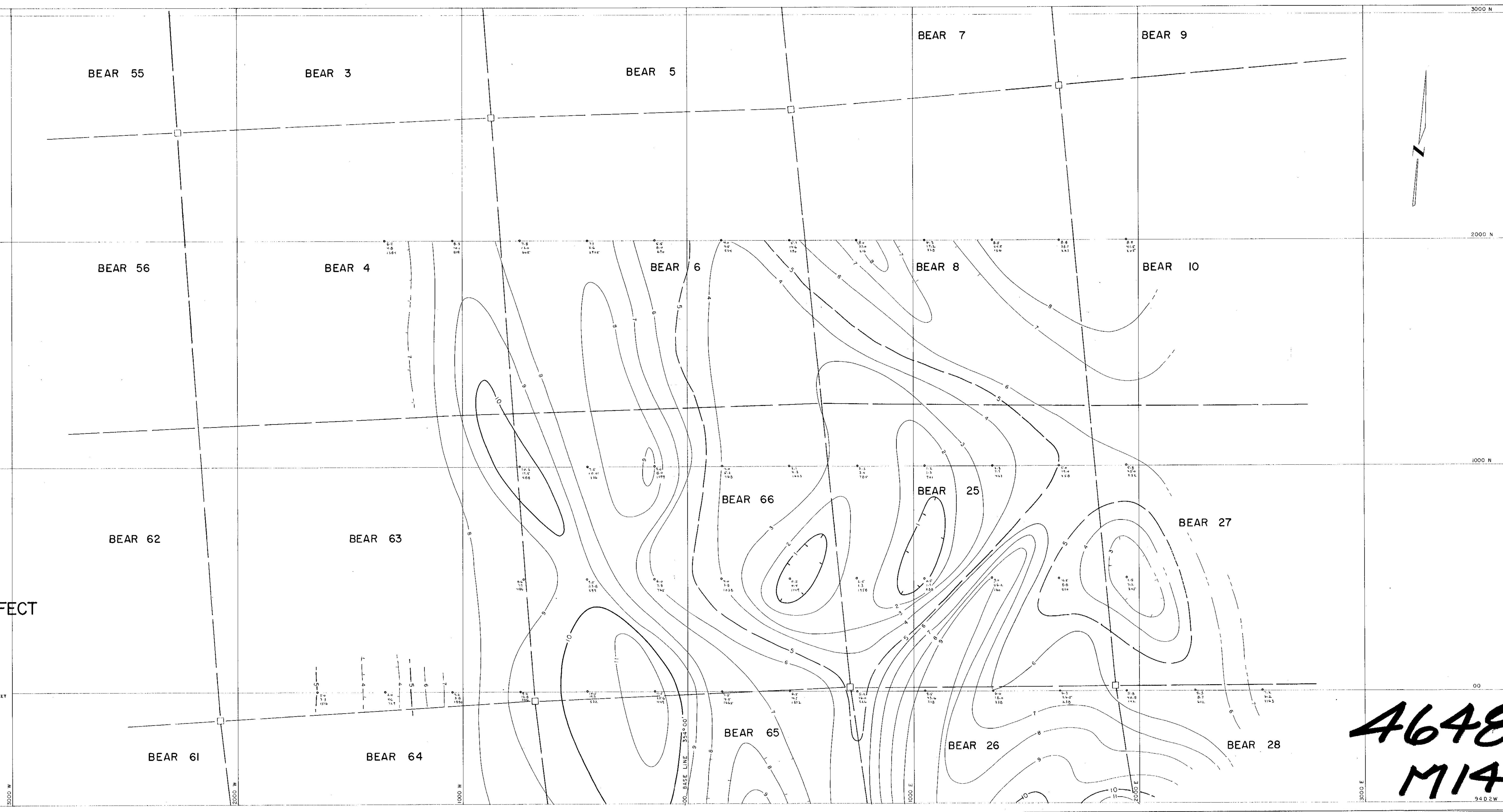
4648
 M13

Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 4648 MAP #14

Canadian Nickel Co. Ltd.
I.P. SURVEY
APPARENT FREQUENCY EFFECT
BEAR CLAIMS - GROUPS A, B, and C
OMINECA MINING DIVISION
BRITISH COLUMBIA



To accompany report by M.J. Gidluck Sept. 1973



4648
M14

LEGEND

CONTOUR INTERVAL - LOGARITHMIC - $\frac{\text{ohm ft}}{2 \pi}$

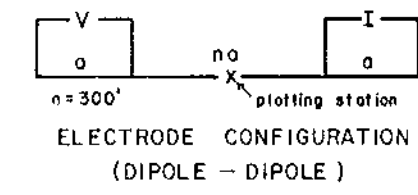
CLAIM BOUNDARY

CLAIM POST

BEAR CLAIM NUMBER

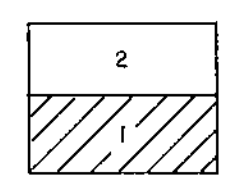
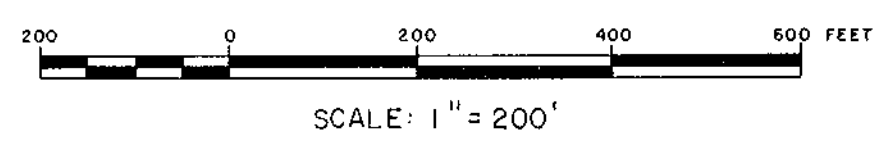
RELATIVE LOW

7.2 - APPARENT FREQUENCY EFFECT IN PERCENT
6.2 - APPARENT METAL FACTOR
116.3 - APPARENT RESISTIVITY IN $\frac{\text{ohm ft}}{2 \pi}$



Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 4648 MAP #15

Canadian Nickel Co. Ltd.
I.P. SURVEY
APPARENT RESISTIVITY
BEAR CLAIMS - GROUPS A, B, and C
OMINECA MINING DIVISION
BRITISH COLUMBIA

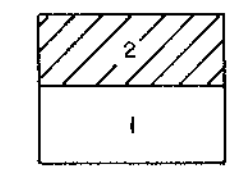
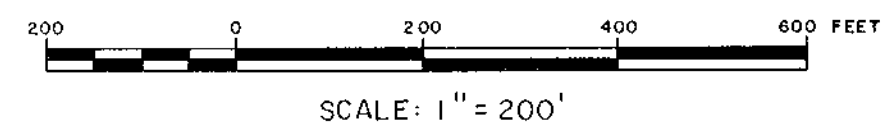


To accompany report by M.J. Gidluck Sept. 1973

4648
M15

Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 4648 MAP #16

Canadian Nickel Co. Ltd.
I.P. SURVEY
APPARENT RESISTIVITY
BEAR CLAIMS - GROUPS A, B, and C
OMINECA MINING DIVISION
BRITISH COLUMBIA



To accompany report by M.J. Gidluck Sept. 1973



4648
M16

LEGEND

CONTOUR INTERVAL - LOGARITHMIC

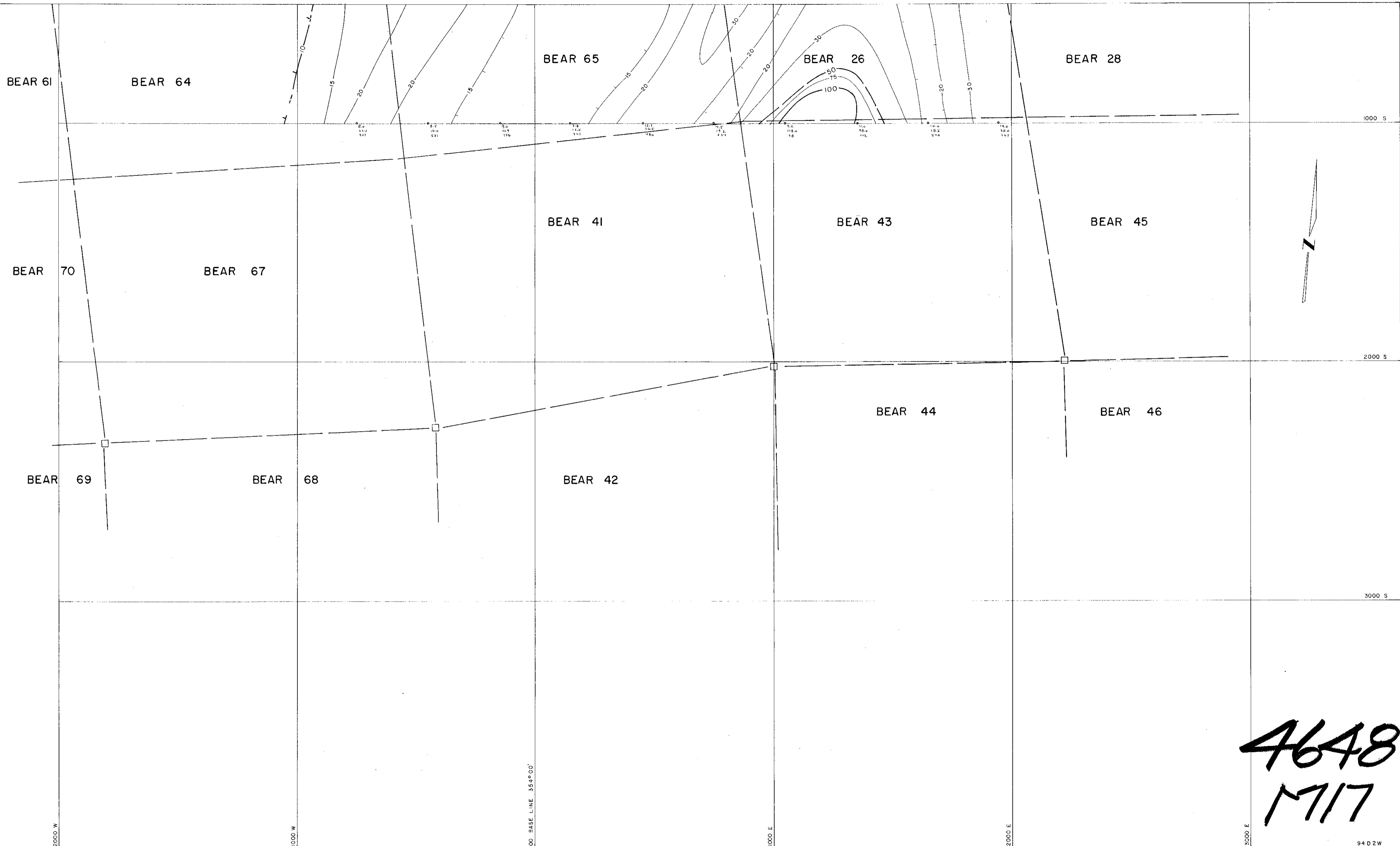
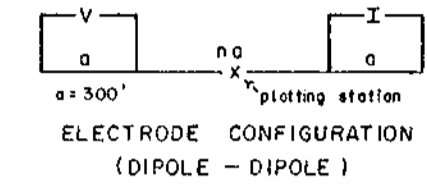
CLAIM BOUNDARY

CLAIM POST

BEAR 7 CLAIM NUMBER

RELATIVE LOW

7.2 - APPARENT FREQUENCY EFFECT IN PERCENT
6.2 - APPARENT METAL FACTOR
163 - APPARENT RESISTIVITY IN ohm ft.
2 π



Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 4648 MAP #17

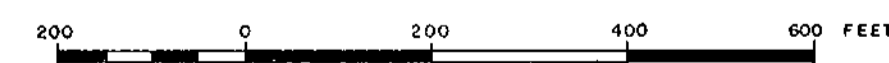
Canadian Nickel Co. Ltd.

I.P. SURVEY
APPARENT METAL FACTOR

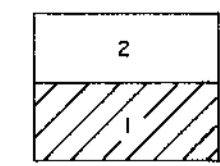
BEAR CLAIMS - GROUPS A, B, and C

OMINECA MINING DIVISION

BRITISH COLUMBIA



SCALE: 1" = 200'

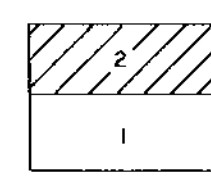
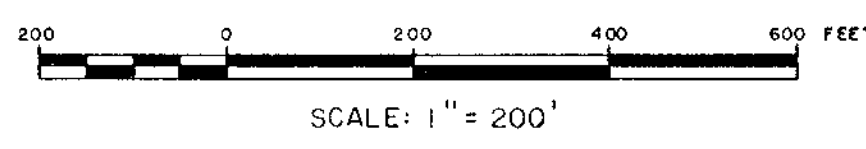


To accompany report by M.J. Gidluck Sept. 1973

4648
M17

Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 4648 MAP #18

Canadian Nickel Co. Ltd.
I.P. SURVEY
APPARENT METAL FACTOR
BEAR CLAIMS - GROUPS A, B, and C
OMINECA MINING DIVISION
BRITISH COLUMBIA



To accompany report by M.J. Gidluck Sept. 1973

3000 W

2000 W

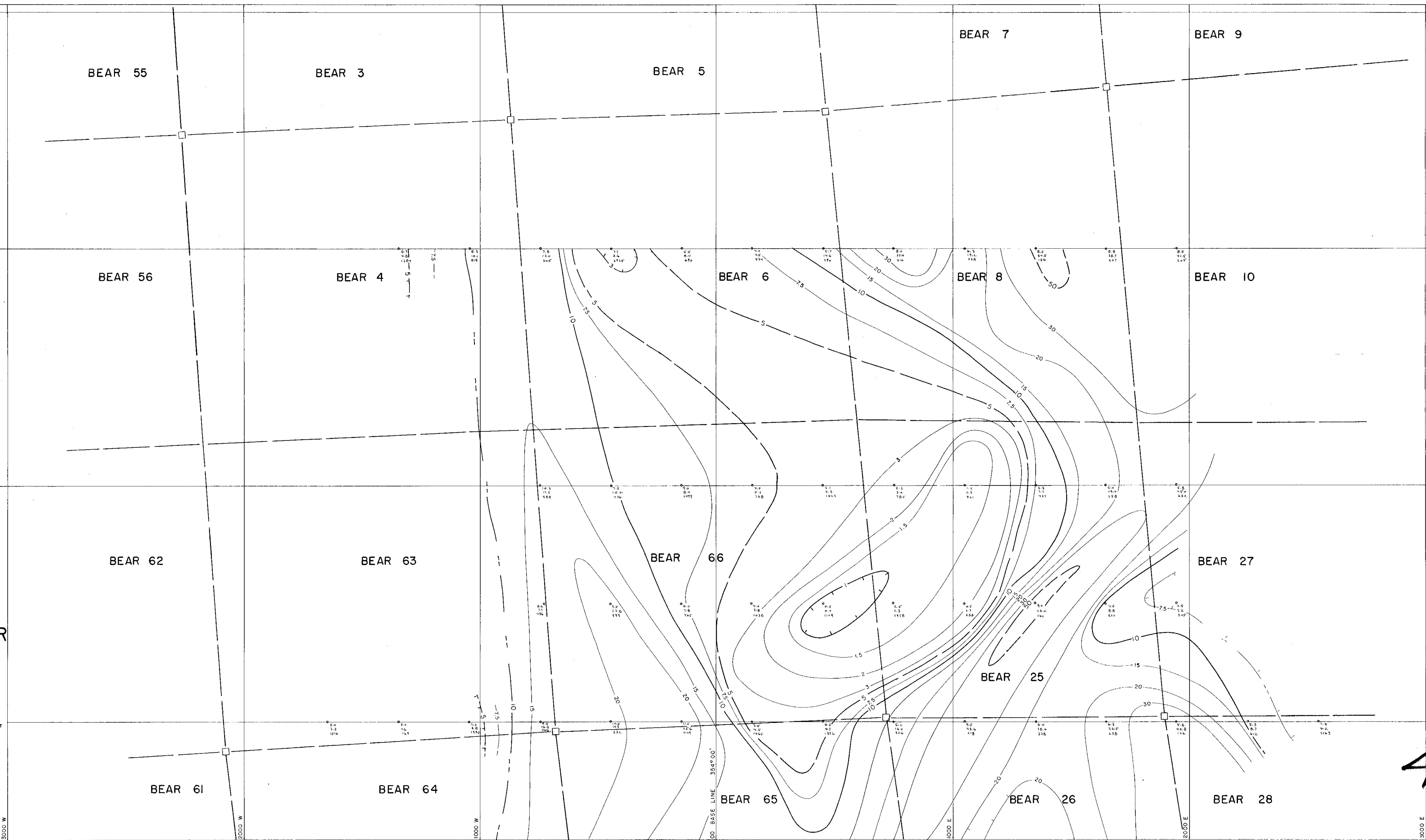
1000 W

00 BASE LINE 354° 00'

1000 E

2000 E

3000 E



3000 N

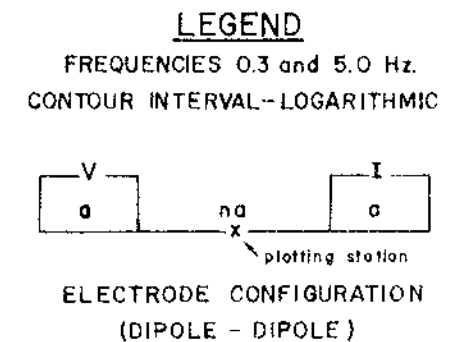
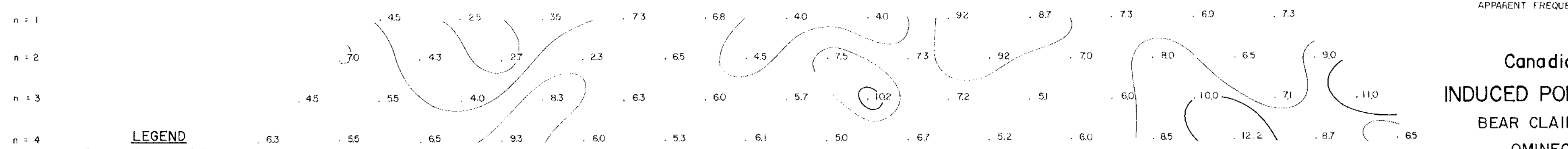
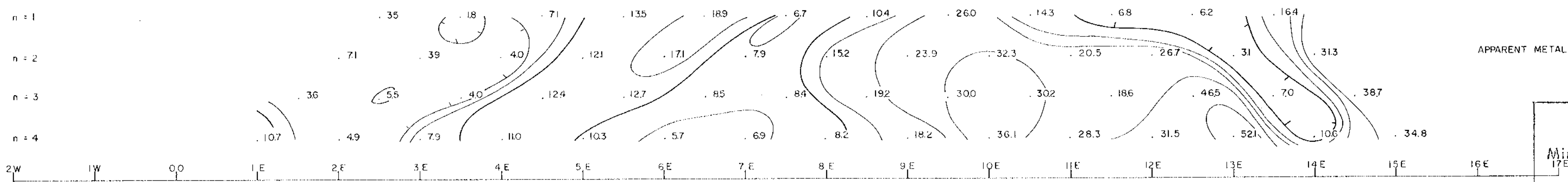
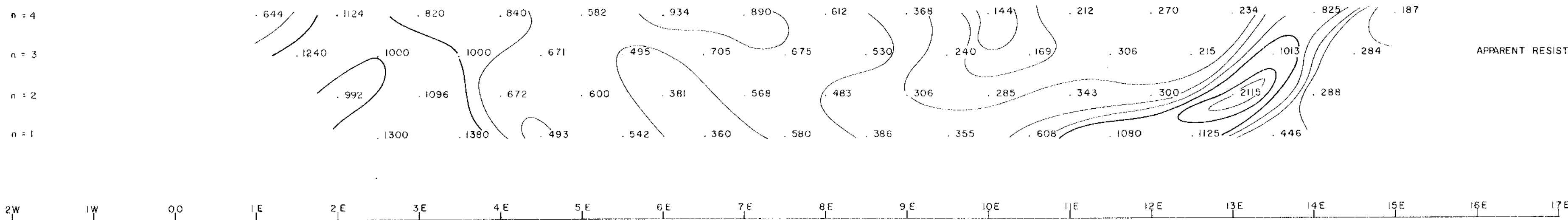
2000 N

1000 N

00

4648
M18

94 D.2 W



Department of
 Mines and Petroleum Resources
 ASSESSMENT REPORT
 NO. **4648** MAP. **#19**

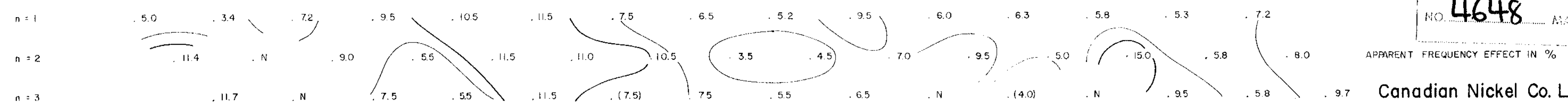
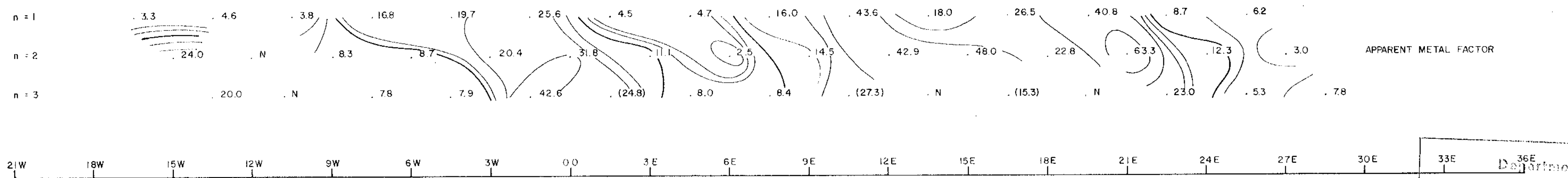
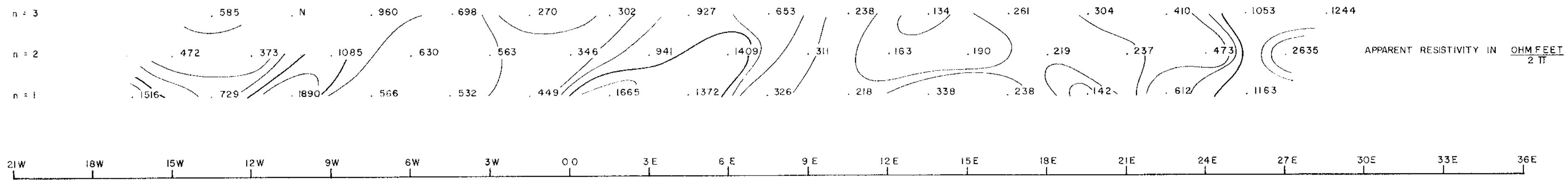
Canadian Nickel Co. Ltd.
 INDUCED POLARIZATION SURVEY
 BEAR CLAIMS - GROUPS A, B and C
 OMINECA MINING DIVISION
 BRITISH COLUMBIA

SCALE 1"=100
 LINE 00

To accompany report by M. J. Gidiuck Sept 1973

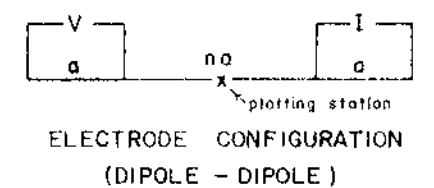
P.T. MAKULOWICH AUG/73

4648-M19



Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. **4648** MAP. #20

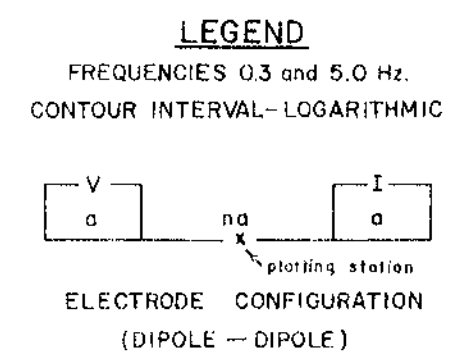
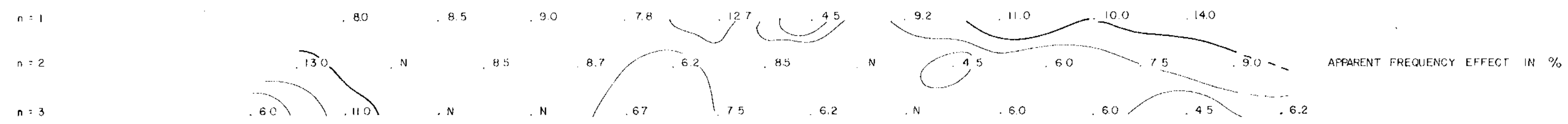
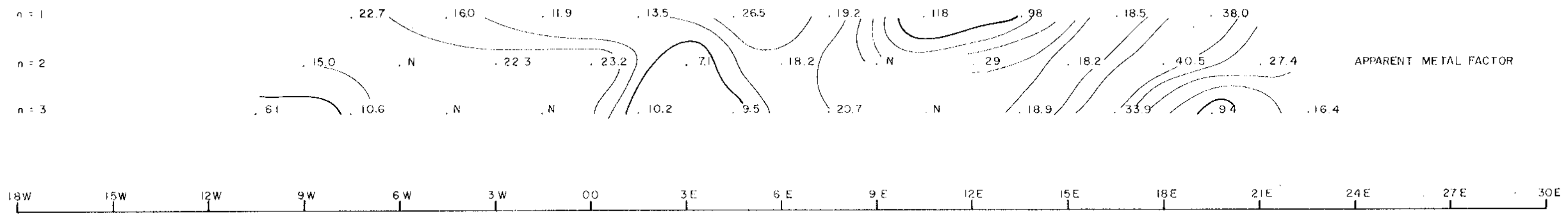
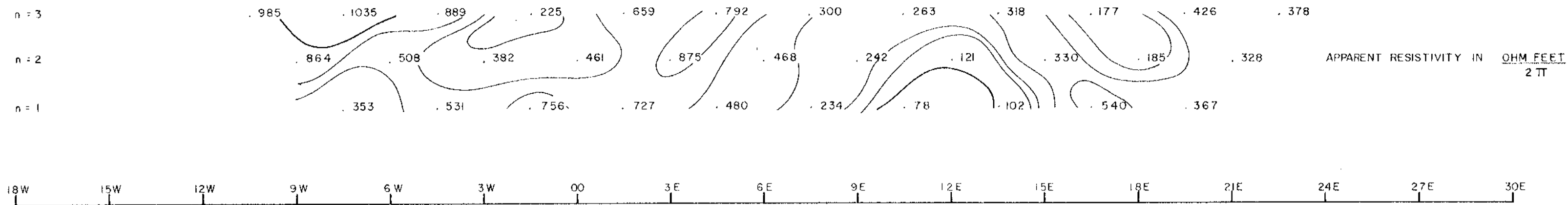
LEGEND
FREQUENCIES 0.3 and 5.0 Hz.
CONTOUR INTERVAL—LOGARITHMIC



Canadian Nickel Co. Ltd.
INDUCED POLARIZATION SURVEY
BEAR CLAIMS - GROUPS A, B, and C
OMINECA MINING DIVISION
BRITISH COLUMBIA
SCALE 1" = 300'
LINE 00

4648-M20

To accompany report by M.J. Gidluck Sept. 1973



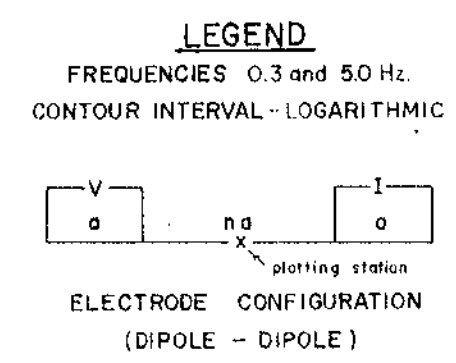
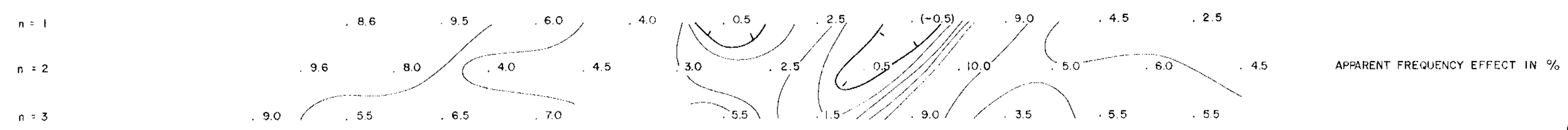
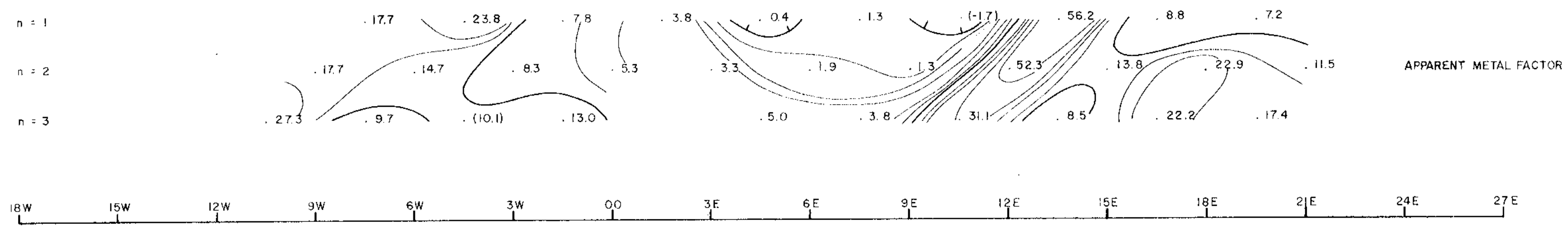
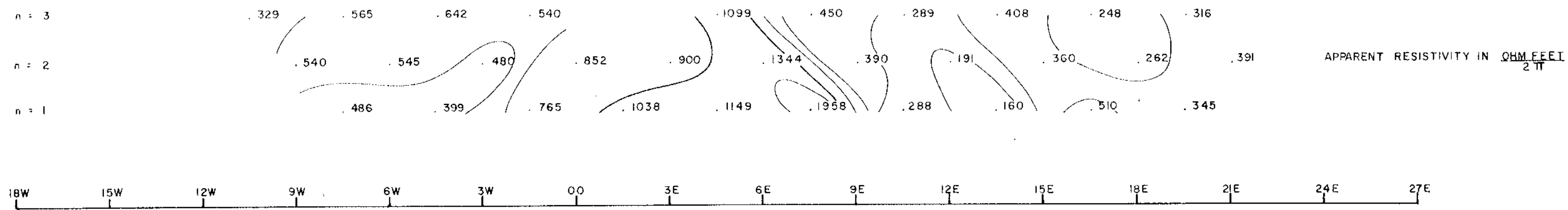
Department of
 Mines and Petroleum Resources
 ACCESSIBILITY REPORT
 NO. **4648** MAP #21

Canadian Nickel Co. Ltd.
 INDUCED POLARIZATION SURVEY
 BEAR CLAIMS - GROUPS A, B, and C
 OMINECA MINING DIVISION
 BRITISH COLUMBIA
 SCALE 1"=300'
 LINE 1000 S

4648 M21

To accompany report by M.J. Gidluck Sept 1973

P.T. MAKULOWICH AUG/73

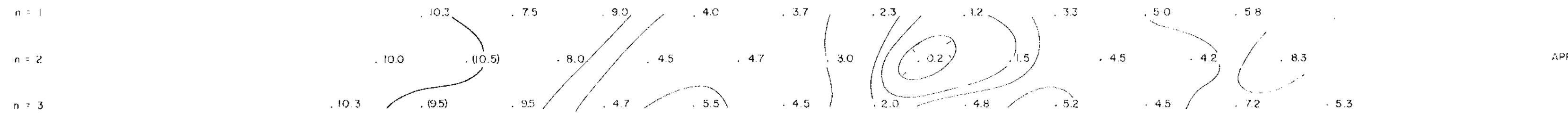
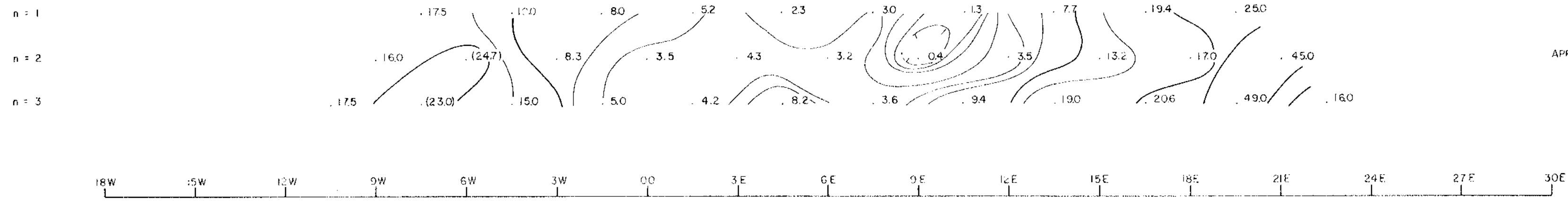
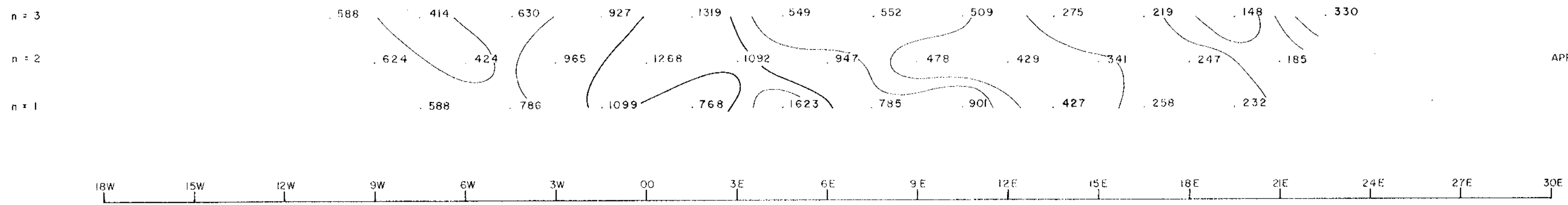


Department of
 Mines and Petroleum Resources
 ASSESSMENT REPORT
 NO. **4648** MAP #22

Canadian Nickel Co. Ltd.
 INDUCED POLARIZATION SURVEY
 BEAR CLAIMS - GROUPS A, B, and C
 OMINECA MINING DIVISION
 BRITISH COLUMBIA
 SCALE 1" = 300
 LINE 500 N
 To accompany report by M.J. Gidluck Sept. 1973

4648

M22

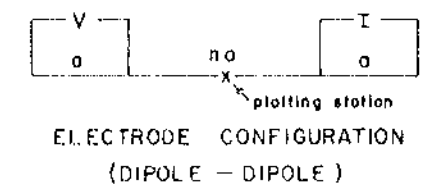


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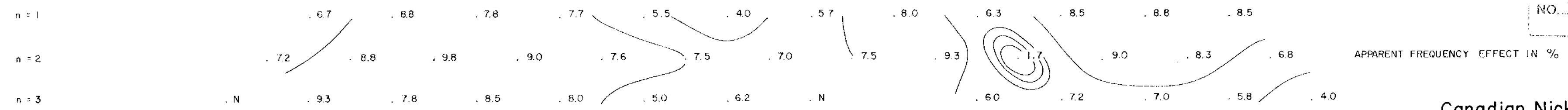
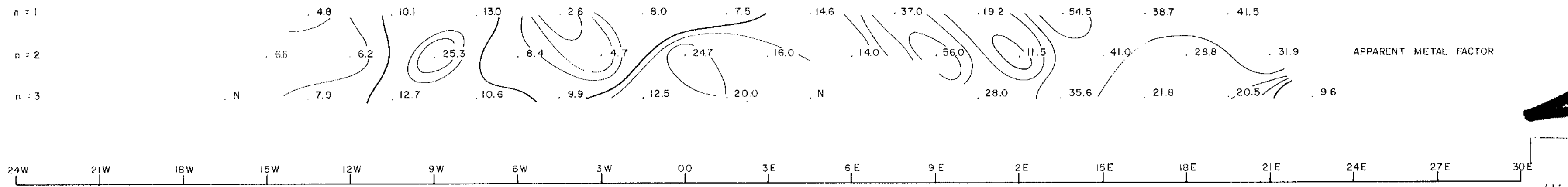
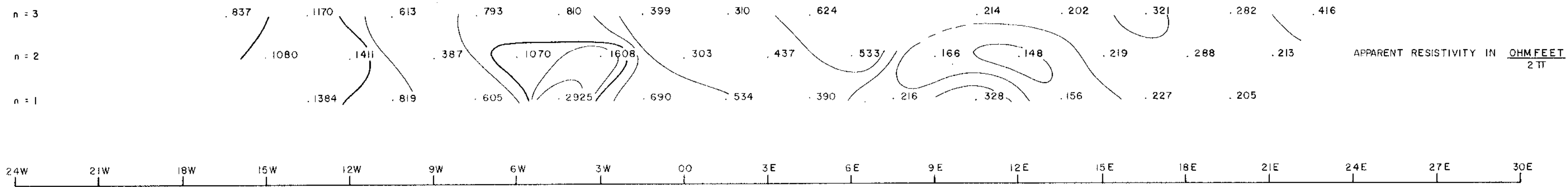
NO. **4648** #23

M23

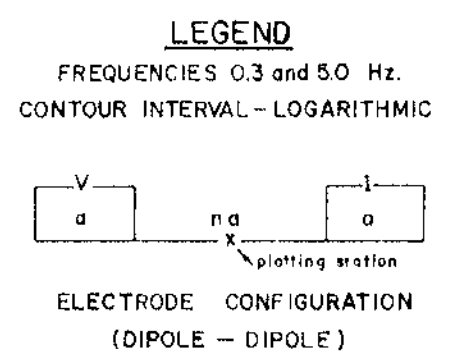
LEGEND
 FREQUENCIES 0.3 and 5.0 Hz.
 CONTOUR INTERVAL - LOGARITHMIC



Canadian Nickel Co. Ltd.
 INDUCED POLARIZATION SURVEY
 BEAR CLAIMS - GROUPS A, B, and C
 OMINECA MINING DIVISION
 BRITISH COLUMBIA
 SCALE 1" = 300'
 LINE 1000 N
 To accompany report by M.J. Gidluck Sept. 1973



4648
M724
 Mines and
 2-1-73
 NO. **4648** MAP #24



Canadian Nickel Co. Ltd.
 INDUCED POLARIZATION SURVEY
 BEAR CLAIMS - GROUPS A, B, and C
 OMINECA MINING DIVISION
 BRITISH COLUMBIA
 SCALE 1"=300'
 LINE 2000N
 To accompany report by M.J. Gidluck Sept. 1973