83-#287 - #11349

GEOCHEMICAL SOIL SURVEY REPORT

ON THE

BEAR CLAIM GROUP

CARIBOO MINING DIVISION

NTS 93 A / 12
(Longitude 52 deg 32', Latitude 121 deg 47')

OWNER AND OPERATOR
GIBRALTAR MINES LTD.
McLEESE LAKE, B.C.

Author: G. O. Bysouth

Submitted: 15 July 1983

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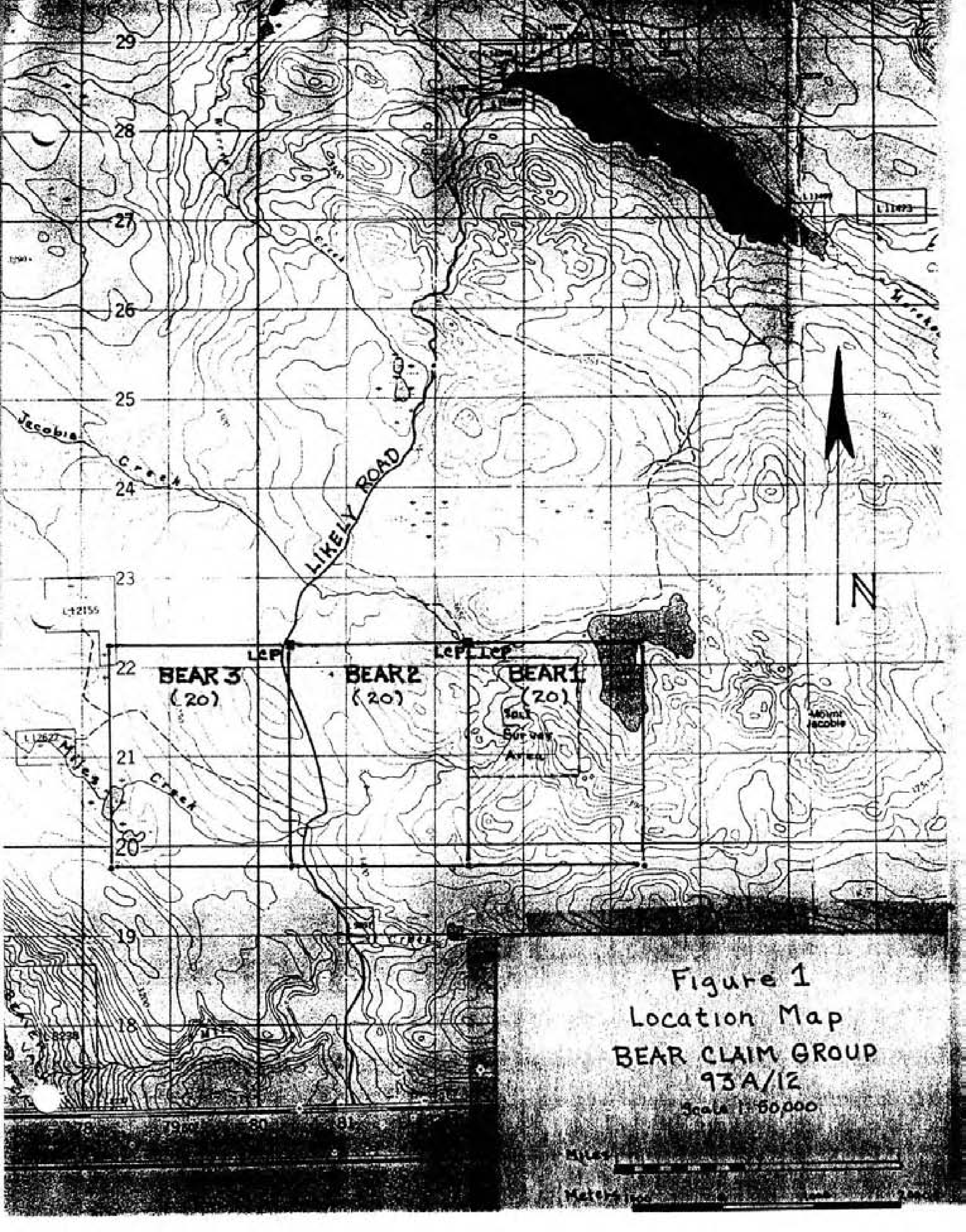


Figure 1
Location Map
BEAR CLAIM GROUP
93A/12
Scale 1:50,000

1.0 INTRODUCTION

The Bear Claim Group is located about 4 miles (6.4 km) west of Bootjack Lake and it's northeastern corner includes part of Jacobie Lake. The nearest settlement is Likely, B.C. which lies about 14 miles (22.5 km) to the norhteast. Access is via the Likely road which runs through the claim block and links Likely with Highway 97 at 150 - Mile House.

The Bear claims were staked in 1981 by Gibraltar Mines Limited to cover several regional geochemical anomalies outlined earlier in the year. This report covers a grid - type geochemical soil survey carried out over one of these regional anomalies. The objective of this project was to obtain a more detailed evaluation of trace metal dispersion in order to indentify areas of highest ore-bearing potential.

Field work was done on an intermittent basis during the period June 9 - 23, 1983. A total of 222 samples were collected and analysed for copper and molybdenum.

2.0 MINERAL CLAIMS

The mineral claims of the Bear Group are shown in Figure 2, and claim information is tabulated below:

CLAIM NAME	RECORD NO.	NO. OF UNITS	ANNIVERSARY DATE
Bear 1	3848	20	July 30
Bear 2	3849	20	July 30
Bear 3	3881	20	August 6

All claims are owned by Gibraltar Mines Limited.

3.0 TOPOGRAPHY AND GEOLOGY

The Bear claims cover a poorly drained hilly terrain typical for this part of the Interior Plateau. Most of the ground slopes to the southwest towards Beaver Valley except at the eastern end of the property where Jacobie Lake occupies a deep depression bounded on the west, south and east by a prominent chain of hills. As shown in Figure 1, the sampling area covers the northwestern end of this chain and includes the headwaters of Miles and Jacobie Creeks. The two watersheds are separated by a prominent topographic divide which trends northwesterly across the sampling grid. The tributary valleys are shallow and poorly defined and are occupied by sluggish streams or, in areas of low gradient, wide tracts of swampy ground. In contrast, intervening steeper ground is usually dry and rocky, with abundant rock exposure. The two extremes are also expressed in vegetation - poorly drained areas are covered by dense growths of alder, willow, spruce and cedar while the dry rocky ground supports open jackpine and balsam forests. Most of the area appears to be underlain by glacial til which would account for the poorly developed drainage patterns. Glacial direction is inferred to be from southeast to northwest.

As would be expected, two classes of soils are evident within this environment. One is a normal immature soil having recognizable but weak horizon development which has been formed over glacial till, colluvium or even bedrock under well drained conditions. The other can be called a hydromorphic soil lacking any horizon development and usually consisting of various mixtures of silt, clay and organic matter. These soils were formed under extreme wet conditions, probably over impervious glacial till. Over 80% of the soils fall into one class or the other while the remainder could be regarded as transitional types.

Rock exposure forms only about 10% of the surface within the sampling area and most of these occur at higher elevations along the divide. The prevalent rock type is a pyroxene porphyry consisting of 20 to 60% dark green euhedral pyroxene phenocrysts in a dense mottled green and maroon matrix. The remainder are of the same color and general appearance but lack obvious phenocrysts and usually carry abundant secondary quartz and carbonate. These rocks are interpreted to represent a sequence of andesitic or basaltic volcanic flows and associated pyroclastics.

4.0 SOIL SURVEY

4.1 FIELD METHODS

Soil samples were collected along north trending lines spaced 500 - feet apart. An attempt was made to maintain a 200 - foot sample space and collect only B - horizon samples but due to the abundant seepage zones and swamps, numerous hydromorphic soils, often organic - rich, had to be collected at odd intervals. Each sample site was evaluated and pertinent information recorded. Sample depth ranged between three - and seven - inches except over swampy ground where depths of eight to ten - inches were common. All samples were collected in standard kraft bags. Survey control was by chain and compass.

4.2 ANALYTICAL METHODS

All samples were analysed at the Gibraltar Mines Assay Laboratory. The procedure for the determination of copper and molybdenum is as follows:

1. Samples are oven dried and seived to -20 mesh.

2. 5 g of sample is weighed out and placed in a beaker.

3. 30 ml. of concentrated nitric acid containing 5% potassium chlorate is added.

4. The sample is digested under heat until all brown fumes disappear.

5. 20 ml. of concentrated hydrochloric acid is then added and the sample is further digested under heat for three minutes.

6. 25 ml. of 1% aluminum chloride is added and the solution made up to 200 ml. with water then filtered.

7. A 50 ml. sample is taken and copper and molybdenum determined using a Varian Techtron AA6 Atomic Absorption Spectrometer.

4.3 RESULTS AND INTERPRETATION

Copper and molybdenum distributions are shown in Figures 3 and 4. All concentrations are in p.p.m. Of the 222 samples collected, 70 have been classified as hydromorphic soils. The remainder are samples of normal soils, consisting of both B- and C- horizon material.

The copper distribution patterns appear to be complex but anomalies are evident. The two soil types show up as two very different trace metal populations and must be treated separately. This fact is well illustrated by simple statistics; hydromorphic soils have a mean of 133, a median of 116 and a standard deviation of 79.15, while the normal soils have a mean of 45, a median of 35 and a standard deviation of 40.4. If the median is taken as background and the threshold defined as twice background, then 232 ppm would be anomalous for hydromorphic soils and 70 ppm anomalous for normal soils. In our experience, however, the 232 ppm value for hydromorphic soils is very high and we would rather assign 90 ppm as a useful threshold value. In other words, copper concentrations above 90 ppm in drainages would be considered possibly indicative of a significant sulfide source. This approach is supported by the fact that the degree of copper enrichment in hydromorphic soils compared to adjacent normal soils is itself abnormal and requires some special mechanism to produce it beyond normal hydrochemical or biochemical enrichment processes. But unfortunatley, no simple metal - rich source can be identified from the data. With only a few exceptions, all hydromorphic soils show a large increase in copper concentration relative to adjacent normal soils, and, although the highest values are clustered within the drainages and swamps, there are no well defined downstream dispersion patterns. Such a wide distribution of anomalous values can only be explained by assuming the existance of numerous very local copper - rich sources, and at this point, a concept involving differential leaching of copper sulfides entrained within a till cover appears most likely. The few anomalies in normal soils all lie within, or close to, the drainage anomalies as should be considered related to the same processes.

Molybdenum distribution appears relatively simple and several small anomalies can be outlined. Since no significant difference exists between soil types, the two can be calculated together to give a mean of 6, a median of 4, and a standard deviation of 14. If the median is taken as background and threshold defined as twice background, then 8 ppm can be regarded as a threshold value for all soils. As shown in Figure 4, most of the molybdenum "highs" lie within the southwestern quarter of the grid. No distribution patterns are evident and the very high values appear randomly distributed. In other words, the data does not indicate any obvious molybdenum - rich source area but rather tends to support the concept of glacially entrained molybdenum - bearing mineralization.

5.0 STATEMENT OF EXPENDITURES

GEOCHEMICAL SOIL SURVEY - BEAR CLAIMS 1983

(1) Field Work

E. Oliver

June 9 -10	16 hrs	
June 14	10 hrs	
June 16	10 hrs	
June 22-23	20 hrs	
	56 hrs @ $20.00/hr	= $1120.00

G. Barker

June 9 -10	16 hrs	
June 14	10 hrs	
June 16	10 hrs	
June 22-23	20 hrs	
	56 hrs @ $20.00/hr	= $1120.00

(2) Supervision and Report Preparation

G. Bysouth

June 9 -10	10 hrs	
July 11-19	20 hrs	
	30 hrs @ $31.25/hr	= $937.50

(3) Vehicle

1980 suburban 4X4
6 days @ $50.00 = $300.00

(4) Assaying

222 samples for Cu & Mo @ $6.00 per sample = $1332.00

(5) Supplies = $100.00

Total Cost = $4909.50

6.0 CONCLUSIONS

Drainages and swamps throughout the sampling area have been sufficiently enriched in copper to provide numerous scattered hydromorphic anomalies. The distribution of these anomalies suggest there are numerous source areas, and at this point, a concept involving the leaching of scattered sulfide material entrained within the glacial till cover provides the best secondary dispersion model. The distribution of copper anomalies in normal soils and all molybdenum anomalies is consistent with this interpretation. Regardless, more work is required to define probable bedrock source areas.

G.D. Bysouth

G. D. Bysouth
Senior Geologist
Gibraltar Mines Limited

APPENDIX A

STATEMENT OF QUALIFICATION

I, Garry D. Bysouth, of Gibraltar Mines Limited, Mcleese Lake, B.C., do certify that:

1. I am a geologist
2. I am a graduate of the University of B.C., with a B.Sc. degree in geology in 1966.
3. From 1966 to the present I have been engaged in mining and exploration geology in B.C.
4. I personally supervised this soil sampling program and interpreted the results.

G.D. Bysouth

Garry D. Bysouth

Form. No. Mill - 1

GIBRALTAR MINES LIMITED

ASSAY CERTIFICATE

Soils

Date June 14th, 19 83

Sample No.	% Ox. Cu.	Total Cu. (PPM)	% MoS_2 (PPM)	hydromorphic		soil
83 00050		56	8		flat	B_1
51		28	4		top of hill	B_2
53		66	4		drainage	B_1
54		50	6		drainage	B_2
56		56	4			B_2
57		114	4		drainage	B_2
58		32	8		hillside	B_2
59		122	4	organic [illegible]	pond	
60		34	4		W face hill	B_2
61		28	6		N face hill	B_2
63		84	6		flat	B_1
64		36	170		flat	B_1
65		38	2			B_2
67		48	6		N face hill	B_2
40		32	4		face of outcrop	B_2
41		92	42		#39 S face hill	B_2
43		48	6		flat fr 42 t[illegible]	B_2
47		36	6		flat to 49 t[illegible]	B_2
48		210	6		flat	B_1
10		188	4	humus	drainage	
11		36	4			B_1
12		206	4		drainage	B_2
01		38	4		N face hill	B_2
02		32	4		drainage	B_2

cc: Assay Lab.

Assayer [signature]

Form. No. Mill - 1

GIBRALTAR MINES LIMITED

ASSAY CERTIFICATE

Soil Samples.

Date June 15, 1983.

Sample No.	% Ox. Cu.	Total Cu.	% MoS₂	hydromorphic		soil
83-00005		28 PPM	4		drainage	B_2
07		178	6		drainage	B_1
08		26	6		hillside	B_2
14		30	6			B_2
15		50	4			B_2
16		54	4		N face hill	B_1
17		44	4		N face hill	B_2
18		38	2		N face hill	B_2
19		72	6	wet B_1	drainage	
20		38	4		N face hill	B_2
21		48	4		✓	✓
22		30	4		✓	✓
23		34	4		top of knot	✓
24		116	6		drainage	✓
2? 26		36	6		S face hill	B_2
27		46	5		✓	B_2
29		24	6		W face hill	B_2
30		28	6		✓	B_2
31		24	5		✓	B_2
32		22	2		✓	B_1
35		48	2		✓	B_2
36		36	2		S face hill	B_2
38 note 37/39 are outcrops		120	4		✓	B_1
03		250	114	humus	drainage	
09		410	6	humus	drainage	
42		124	8	humus	stream - slow	
28		100	5	humus	drainage	
34		186	6		drainage	B_1
44		110	6		flat-swamp at 42	B_1
45		166	5	humus	✓	
46		338	6		✓	B_1
49		144	6	organic silt	stream flat	poorly defined
62		98	6	humus	swamp	charcoal
66		206	6	humus	drainage	
68		142	6	humus	[illegible]	

cc: Assay Lab.

Assayer [illegible]

Form. No. Mill - 1

GIBRALTAR MINES LIMITED

ASSAY CERTIFICATE

EXPLORATION (SOILS)

Date 18 JUNE, 19 83.

Sample No.	% Ox. Cu.	Total Cu.	~~%~~ MoS_2	Hydromorphic		soil
		ppm	ppm			
83-69		57	4		W face hill	B_2
70		31	5		W face hill	✓
71		162	9	Humus	Stream-W	
72		31	6		W face hill	B_2
73		16	3		W face hill	✓
74		64	3	silty clay	stream	
75		29	4		W face hill	B_2
76		18	5		drainage	✓
77		26	4		gentle slope SW	B_2
78		222	8	Humus	drainage	
83-80		289	10	✓		
81		33	4			B_2
82		29	28		drainage	B_2
83		21	3		S face hill	B_2
83-85		97	10		drainage	B_2
86		219	8		drainage	B_1
87		17	12			B_2
88		106	6	org. silt	creek floor S	
89		42	4		W face hill	B_1
90		33	3			B_1
91		23	4			B_2
92		246	3		drainage	B_1
93		23	18		flat	B_2
94		232	5	Humus	drainage	
95		74	17		N face hill	B_2
96		129	9	org. silt	creek floor	
97		158	8	Humus	swamp	
98		31	6		S face hill	B_2
99		77	6		drainage	B_2
100		194	6	Humus	swamp	
101		194	6		drainage	B_1
102		168	7		drainage	B_1

cc: Assay Lab.

Assayer DAW/83

GIBRALTAR MINES LIMITED

ASSAY CERTIFICATE

EXPLORATION (SOILS)

Date 18 JUNE, 19 83

Sample No.	% Ox. Cu.	Total Cu.	% MoS₂	Hydromorphic		soil
83-103		23	5			B2
104		65	5		Swamp	B1
83-106		24	3			B2
107		16	3		Upper fill	B2
108		30	3		✓	B2
109		202	9		drainage	B1
110		27	3		Space fill	B2
111		23	3		✓	B2
112		46	6		✓	B2
113		39	4		✓	B2
114		11.6	7	org silt	creek floor	

cc: Assay Lab.

Assayer DRV/ JS

Form. No. Mill - 1

GIBRALTAR MINES LIMITED

ASSAY CERTIFICATE

Soil

Date June 28 19 83

Sample No.	% Ox. Cu.	Total Cu. ppm	MoS₂ ppm	Hydromorphic		soil
81-115		111	3		drainage	B_1
83-116		28	3		N face hill	B_2
17		24	2		flat	B_2
18		123	3		N face slope gentle	B_1
19		39	2		✓	B_2
20		44	2		✓	B_1
21		19	1		top of hill	B_2
22		34	2		S face hill	B_2
24		44	1		N face hill	B_2
25		27	2		S face hill	B_2
27		28	3		S face hill	B_2
28		73	2	sandy gravel	Creek bank	
29		25	2			B_2
30		172	3		W face hill	B_2
31		60	3		✓	B_1
32		190	3	org. silt	drainage W	
33		28	1		drainage N	B_1
34		21	1		N face hill	B_1
36		66	3	humus	drainage [illegible]	
37		23	2		W face hill	B_2
38		22	2		✓	B_2
39		292	2		drainage	B_1
40		24	3		W face hill	B_2
41		64	3		✓	B_1
→ 42		318	3	silt sand	drainage	
43		37	1		W face hill	B_1
← 44		177	3		✓	B_1
45		42	1			B_1
46		32	1		W face hill	B_2
47		22	1	(46)		B_2
48		20	3			B_2
49		75	5		N face hill	B_2
50		34	4		✓	B_2

cc: Assay Lab.

Assayer [illegible]

GIBRALTAR MINES LIMITED

ASSAY CERTIFICATE

Soil

Date June 28 19 83

Sample No.	% Ox. Cu.	Total Cu. ppm	MoS₂ ppm	Hydromorphic		soil
83-151		32	1.			B_2
52		55	2.			B_2
53		178	5	Humus	swamp	
54		19	2.			B_2
55		41	8.		drainage	B_2

cc: Assay Lab.

Assayer

Form. No. Mill - 1

T.

GIBRALTAR MINES LIMITED

ASSAY CERTIFICATE

_:PLORATION (SOILS)

Date ......3. JULY...., 19 83

Sample No.	% Ox. Cu.	Total Cu.	% MoS₂			
		ppm	ppm	Hydromorphic		soil
83-192		97	4		N facing hill	B_1
193		30	2		✓	B_2
194		36	3		✓	B_1
195		34	3		✓	B_1
196		32	2		✓	B_2
197		41	3		flat	B_1
198		30	3		✓	B_2
199		26	3		✓	B_2
200		33	3		✓	B_2
201		91	5		✓	B_2
83-203		33	4		✓	B_2
83-205		36	5		✓	B_2
83-207		41	3		gentle S face slope	B_2
208		39	3		✓	B_2
209		32	5		✓	B_2
210		53	5		✓	B_1
211		55	4		✓	B_1

cc: Assay Lab.

Assayer: D.A.W.

Form. No. Mill - 1

GIBRALTAR MINES LIMITED

ASSAY CERTIFICATE

XPLORATION (SOILS) Date 3 JULY, 19 83.

Sample No.	% Ox. Cu	Total Cu	% MoS₂	Hydromorphic		soil
		ppm	ppm			
83-156		33	6			B_1
157		29	2			B_1
158		48	5			B_1
159		98	3	Clay	drainage	
160		99	4	✓	N face hill	
161		35	3		✓	B_2
162		22	2		✓	B_2
163		39	2		top-hill	B_1
164		158	7		drainage	B_1
165		39	3		N face hill	B_2
83-167		51	3		S face hill	C
168		215	5		drainage	B_1
169		38	3		SW face hill	B_2
170		48	4		✓	C
171		291	5		drainage	B_1
172		38	2		W face hill	B_2
173		24	3		✓	B_2
174		29	2			B_1
175		26	4			lithosoil
83-177		26	2		drainage	B_2
178		24	3			B_2
179		153	3		drainage	B_1
180		35	4		S face hill	B_2
181		50	3		✓	B_2
182		40	5		drainage	B_1
183		73	20			B_2
184		43	4		drainage	B_1
83-186		32	4		W face hill	B_2
187		42	3		✓	B_1
188		[illegible]	4		top of hill	B_2
83-190		[illegible]	[illegible]		drainage	B_1

cc: Assay Lab.

[illegible]

Form. No. Mill - 1

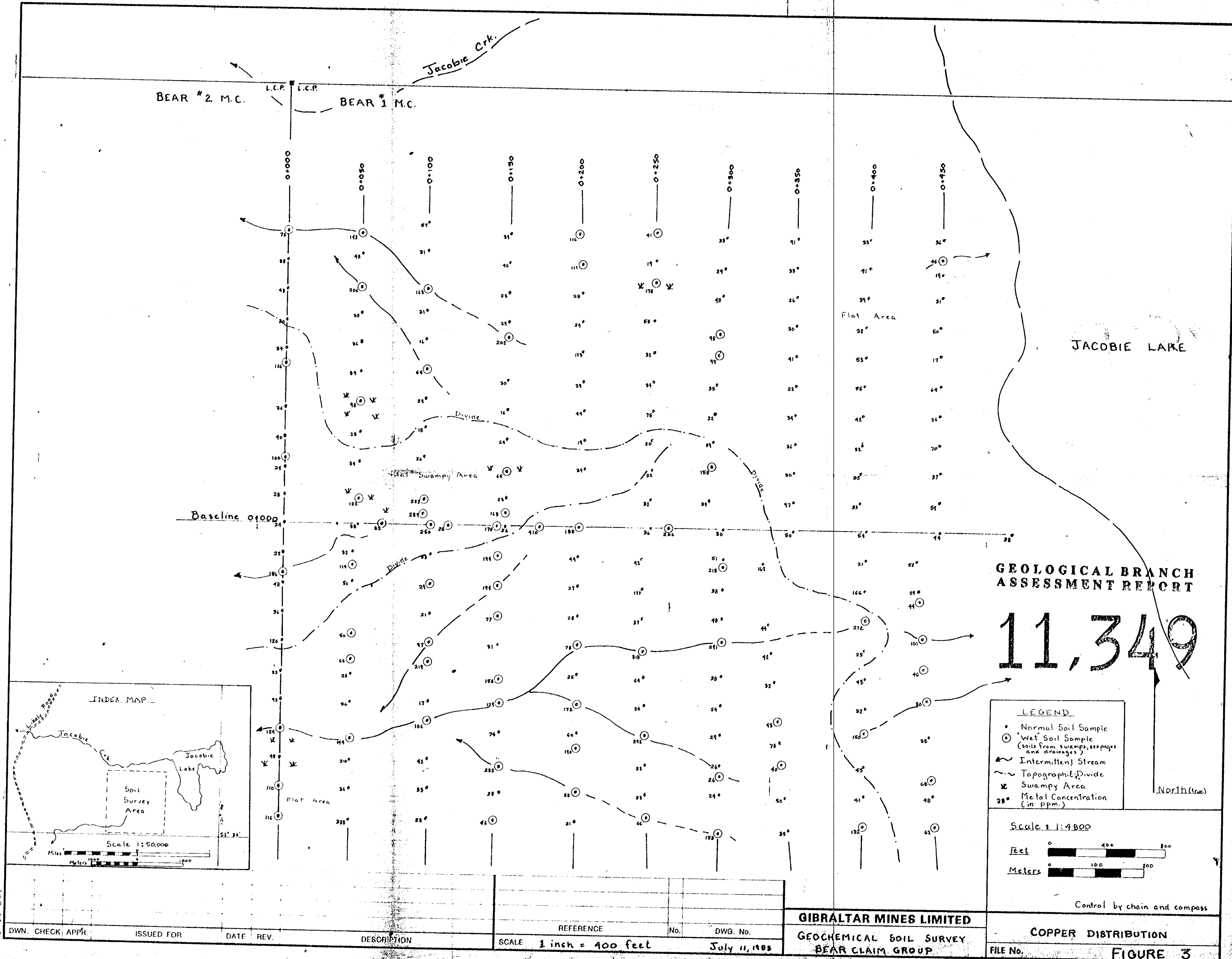
GIBRALTAR MINES LIMITED

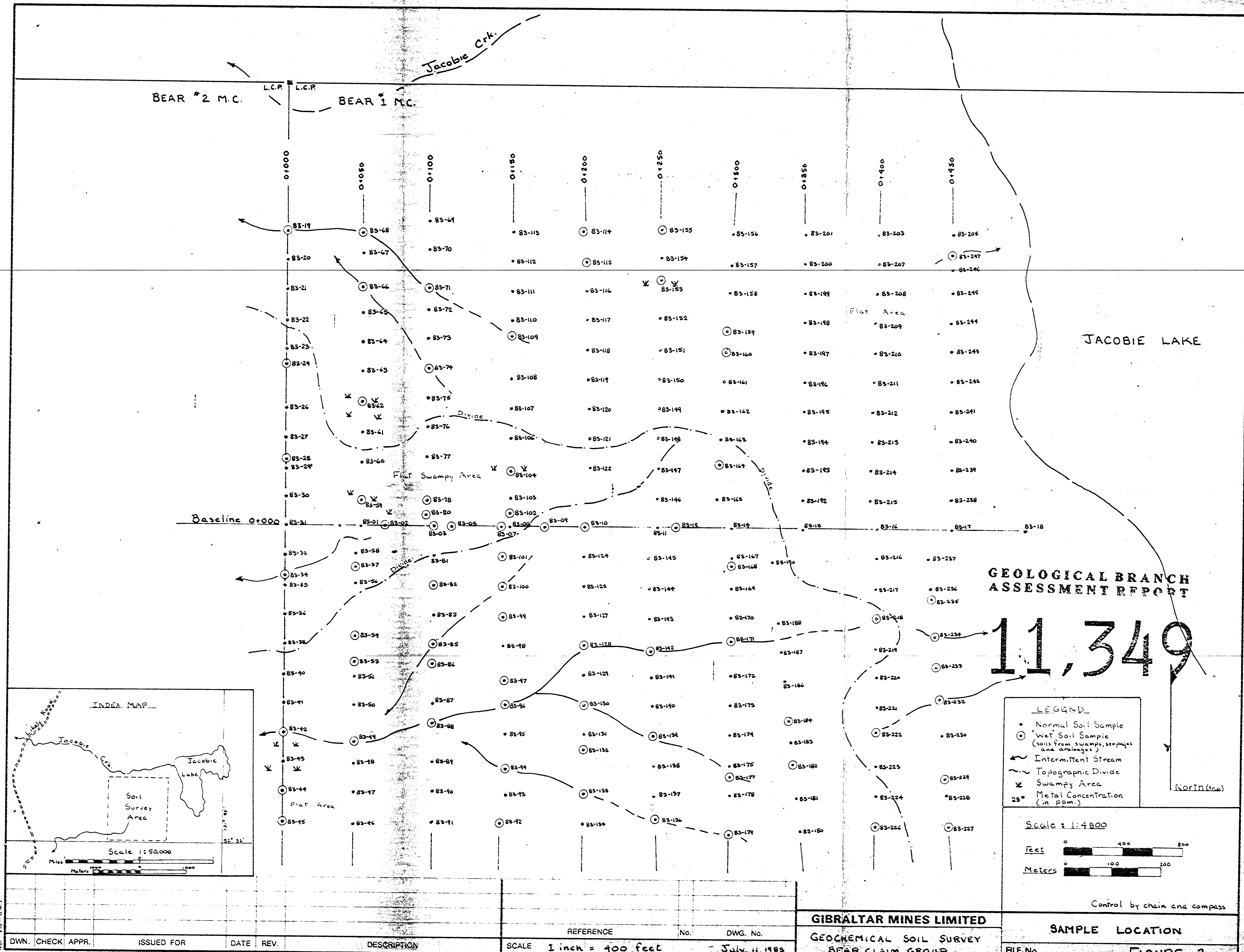
ASSAY CERTIFICATE

PLORATION (SOILS) Date 4 JULY 19 83

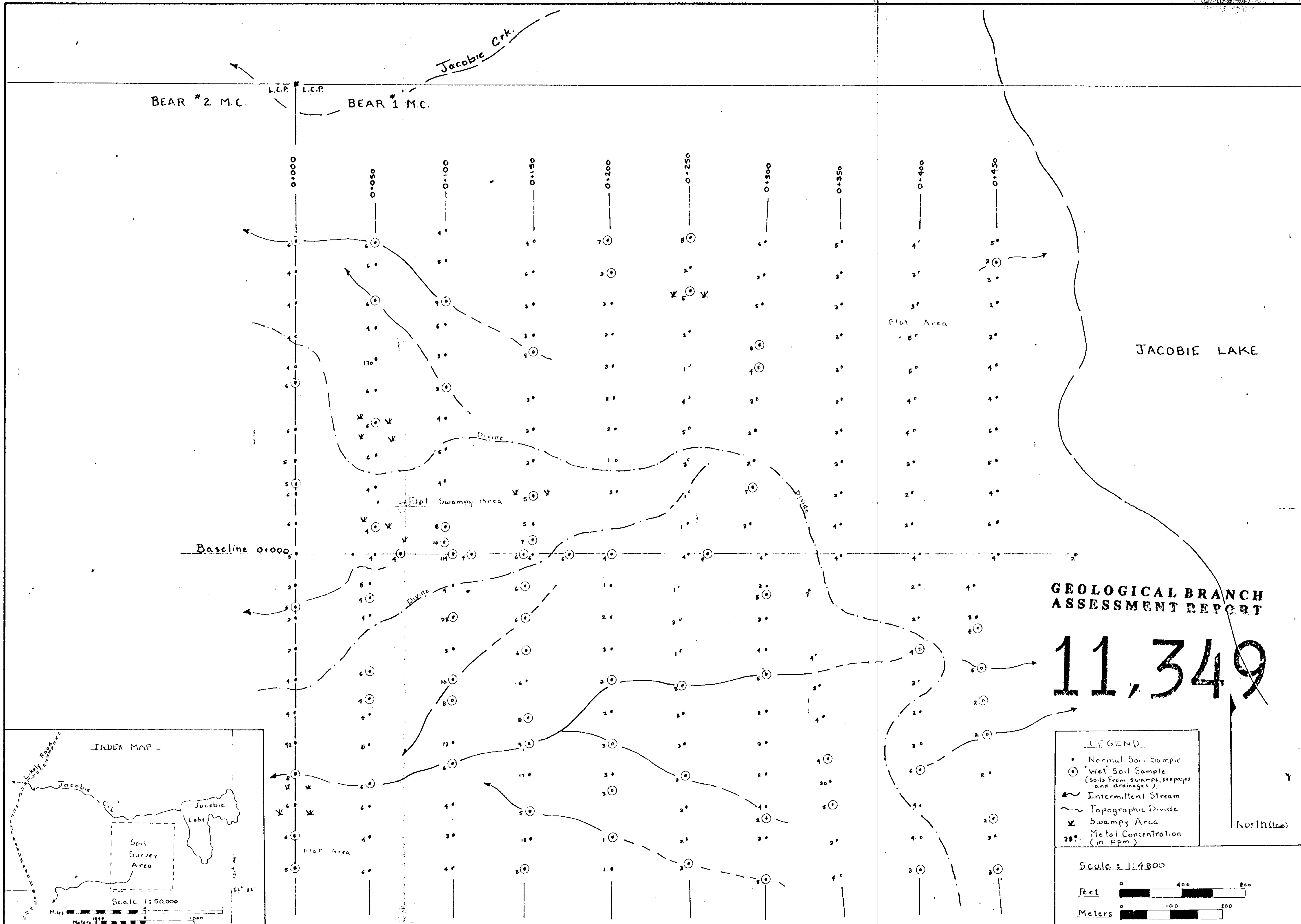
Sample No.	% Ox. Cu.	ppm Total Cu.	ppm MoS_2	Hydromorphic		soil
83-212		42	4		flat	B_1
213		32	3		✓	B_2
214		35	2		N face hill	B_1
215		33	2		✓	B_1
216		21	2		✓	B_1
217		166	2		✓	B_1
218		272	4	org silt	drainage NW	
219		25	3		N face hill	B_2
220		43	3		E face hill	B_2
221		32	3		✓	B_2
222		150	2		drainage	B_1
223		45	4		top	B_2
224		41	4		S face hill	B_2
83-226		132	3		drainage	B_1
227		62	3		drainage N	B_1
228		48	3		E face hill	B_2
229		68	2		drainage E	B_1
230		35	2		E face hill	B_1
83-232		20	2		drainage E	B_2
233		46	2		drainage E	B_1
234		101	5	org. silt	creek E	
235		44	4		drainage	B_1
236		29	3		N face hill	B_1
237		52	4		✓	B
238		59	6		N face hill	B
239		37	4		N [illegible]	[illegible]
240		70	5	humus	drainage	[illegible]
241		26	6	✓	flat	
242		64	4	✓	✓	
243		17	4	✓	✓	
244		50	3		✓	B_1
245		31	2			B_2
83-247		46	3	humus	drainage	[illegible]
83-[illegible]		19	[illegible]		[illegible]	[illegible]

Assay Lab [illegible]


Jacobie Crk.
L.C.P.
L.C.P.
BEAR #2 M.C.
BEAR #1 M.C.
0+000
0+050
0+100
0+150
0+200
0+250
0+300
0+350
0+400
0+450
Flat Area
JACOBIE LAKE
Divide
Flat Swampy Area
Baseline 0+000
Divide
Divide
GEOLOGICAL BRANCH
ASSESSMENT REPORT
11,349
Flat Area
INDEX MAP
Likely Road
Jacobie Crk.
Jacobie Lake
Soil Survey Area
Scale 1:50,000
Miles
Meters
LEGEND
Normal Soil Sample
"Wet" Soil Sample (soils from swamps, seepages and drainages)
Intermittent Stream
Topographic Divide
Swampy Area
Metal Concentration (in ppm.)
North (true)
Scale 1:4800
Feet
Meters
Control by chain and compass
DWN. CHECK APPR.
ISSUED FOR
DATE REV.
DESCRIPTION
REFERENCE
No.
DWG. No.
SCALE 1 inch = 400 feet
July 11, 1983
GIBRALTAR MINES LIMITED
GEOCHEMICAL SOIL SURVEY
BEAR CLAIM GROUP
COPPER DISTRIBUTION
FILE No.
FIGURE 3



Jacobie Crk.
L.C.P.
L.C.P.
BEAR #2 M.C.
BEAR #1 M.C.
0+000
0+050
0+100
0+150
0+200
0+250
0+300
0+350
0+400
0+450
Baseline 0+000
Divide
Flat Swampy Area
Flat Area
JACOBIE LAKE
GEOLOGICAL BRANCH
ASSESSMENT REPORT
11,349
INDEX MAP
Likely Road
Jacobie Crk.
Jacobie Lake
Soil Survey Area
Scale 1:50,000
LEGEND
Normal Soil Sample
"Wet" Soil Sample (soils from swamps, seepages and drainages)
Intermittent Stream
Topographic Divide
Swampy Area
Metal Concentration (in ppm.)
North (true)
Scale: 1:4800
Feet
Meters
Control by chain and compass
DWN. CHECK APPR. ISSUED FOR DATE REV. DESCRIPTION
REFERENCE No. DWG. No.
SCALE 1 inch = 400 feet
July 11, 1983
GIBRALTAR MINES LIMITED
GEOCHEMICAL SOIL SURVEY
BEAR CLAIM GROUP
SAMPLE LOCATION
FILE No.
FIGURE 2
NCI-210-GML



DWN.	CHECK	APPR.	ISSUED FOR	DATE	REV.	DESCRIPTION

REFERENCE | No. | DWG. No.

SCALE 1 inch = 400 feet | July 11, 1983

GIBRALTAR MINES LIMITED

GEOCHEMICAL SOIL SURVEY
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FILE No. FIGURE 4