GEOLOGICAL RE-EVALUATION AND GEOCHEMICAL SOIL SAMPLING ON THE TOWER LAKE PROPERTY, CUNNINGHAM TOWNSHIP, ONTARIO

NTS 41 O/10

Latitude 47°43'N Longitude 82°41'W

for

Grand America Minerals Ltd.
510-540 Burrard St.
Vancouver, B.C. V6C 2K1

RECEIVED
NOV 24 1989
MINING LANDS SECTION

by

C.F. Staargaard
Consulting Geologist
912-510 W. Hastings St.
Vancouver, B.C. V6B 1L8

October 30, 1989

Dual. 2.6800

TABLE OF [illegible]

LIST OF FIGURES

SUMMARY AND RECOMMENDATIONS

The Tower property is situated in the Swayze Archean greenstone belt about 130 kilometres southwest of Timmins, Ontario. The claims are underlain by a tightly folded sequence of chert, chert breccia, iron formation, intermediate to felsic tuff and graphitic argillite. Several Pb-Zn occurrences are known on the property and uneconomic but interesting Cu-Zn-Pb deposits occur within this sequence a few kilometres on either side of the property. Previous work by Grand America in 1988 identified a number of MAXMIN II conductors on the property as well as confirming the presence of mineralized showings in the chert sequence.

During 1989, approximately 660 soil samples were taken over the chert sequence hosting known occurrences, which also was geologically mapped at a scale of 1:2500. The distributions of Cu, Pb, and Zn in soils exhibit some clearly defined anomalous trends while those of Mn, As, Ag, and Au do not. Gold values are at background levels. The most well defined Zn anomaly occurs north of Tower Lake and clearly crosscuts stratigraphy, as do several others, suggesting that Zn mineralization is structurally controlled. A weaker but persistent trend of anomalous values is associated with a graphitic argillite/oxide iron formation unit south of Springer Lake. Known mineralized occurrences on the property have only areally limited anomalies associated with them. The distribution of Pb values corresponds fairly closely with that of Zn while trends of weakly anomalous Cu values tend to follow stratigraphy rather than crosscut it. The latter are at levels to be expected from a generally higher background of Cu in chemical sediments relative to the enclosing mafic volcanics.

Detailed geological mapping served to more clearly define stratigraphy in the chert sequence. It revealed that most of the MAXMIN II conductors identified in 1988 are produced by graphitic argillite units and that anomalous magnetic responses must be attributed to magnetite in oxide facies iron formation and magnetite-bearing chert. Any response to potentially interesting pyrrhotite concentrations would certainly have been obscured by the high magnetic relief produced by magnetite concentrations.

In general, most of the geochemical and geophysical anomalies can be explained by units of graphitic argillite in the chert sequence and these do not have significant potential for interesting mineral deposits. The nature of known Pb-Zn occurrences on the property together with the distributions of Pb and Zn in soil suggest that these occurrences are structurally controlled and do not have high potential for economic base metal deposits. Essentially uniform background levels of gold both in soil and in 1988 rock samples suggest little potential for locating significant gold deposits.

No further work is recommended at this time. The 1989 program of work has been submitted for assessment credit and if accepted, will hold the claims covering the chemical sediments until January 25, 1992. The remainder will expire on January 25, 1991.

INTRODUCTION

At the request of Grand America Minerals, the author carried out followup mineral exploration work on the Tower Lake claims in the Swayze area of Ontario. Previous work commissioned by Grand America revealed a number of MAX-MIN conductors on the property and confirmed the presence of a number of lead-zinc occurrences in an Archean greenstone belt setting including chemical sediments and iron formation. Recommendations included limited soil sampling and trenching of known occurrences.

On review of the available data, the planned program of work was modified somewhat to include detailed mapping as well as a more comprehensive soil sampling survey. The objective was to more clearly identify the nature and extent of known showings and determine the property's potential for stratabound volcanogenic massive sulphide deposits. This report describes the results of this work, which employed three people and took place in the period between September 20 and October 6, 1989

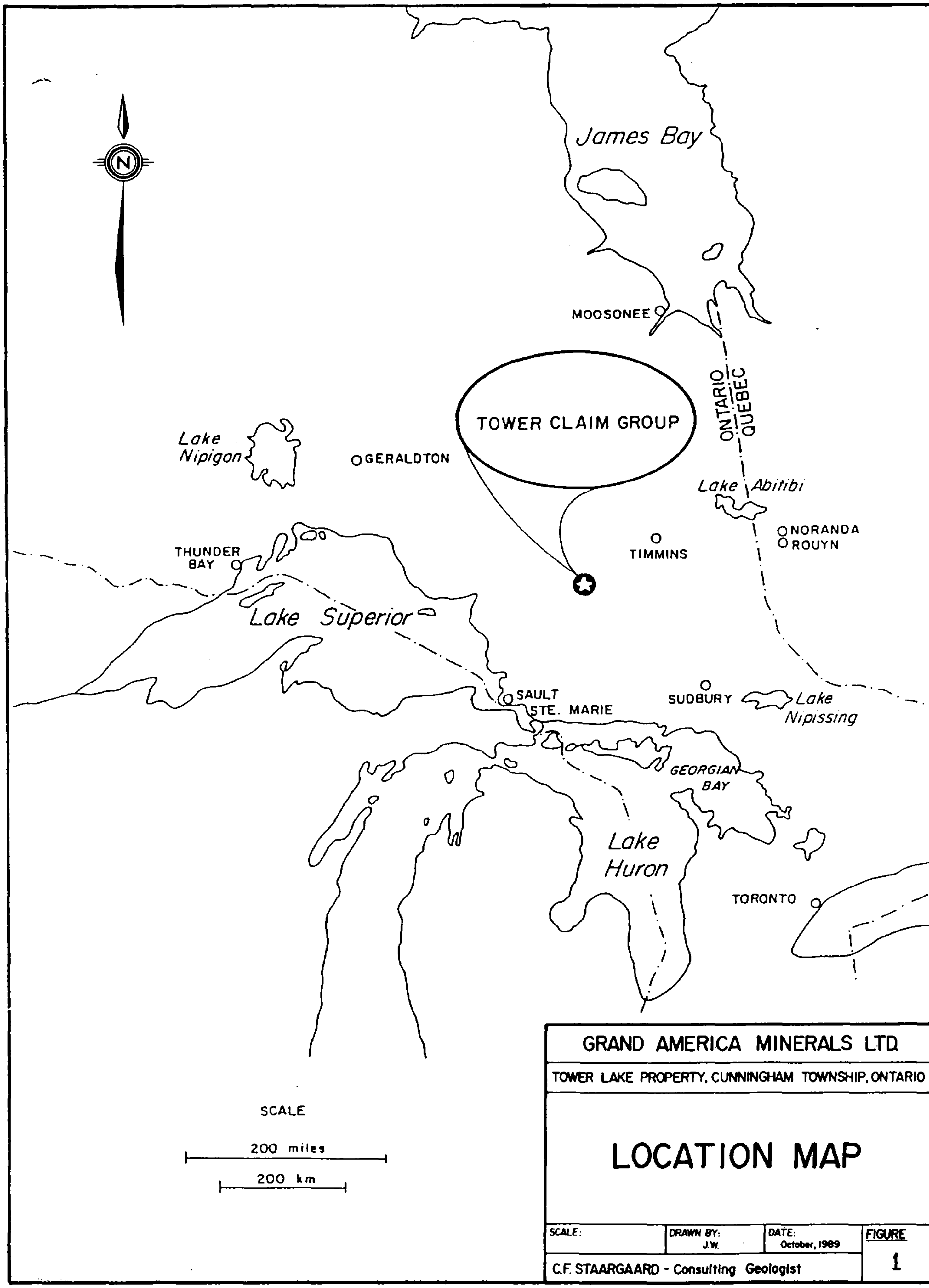
LOCATION AND ACCESS

The property is located about 62 km south of Foleyet, Ontario and about 22 km northeast of Sultan, Ontario, in Cunningham Township, which is situated in the Porcupine Mining Division(Fig. 1). Recent logging activities by E.B. Eddy Forest Products(Ramsay, Ontario; (705)299-3831) have resulted in a gravelled road leading almost to the southern end of the property and a 4WD track from there cutting across its southwest corner(Fig. 2). These roads are to be extended north most of the way to Tower Lake early in 1990.

The property is characterized by rolling topography with some cliffs up to a few tens of metres in height, the elevations ranging between 380 and 430 metres A.S.L. Most of the positive relief is due to chert layers in bedrock. Vegetation consists of a mature forest of jack pine, spruce, cedar, and poplar. Bedrock exposure is generally good. A number of old bush roads are present and those useful for drill access have been marked on the geological map.

CLAIM STATUS

The property consists of 17 contiguous unpatented mineral claims, the particulars of which are listed below(Fig. 3). The recording of 1989 work would allot another 20 days to the claims marked with an asterisk, which would keep them in good standing until January 25, 1992. No work was performed on the unmarked claims in 1989 because of their low potential to host economic mineralization.



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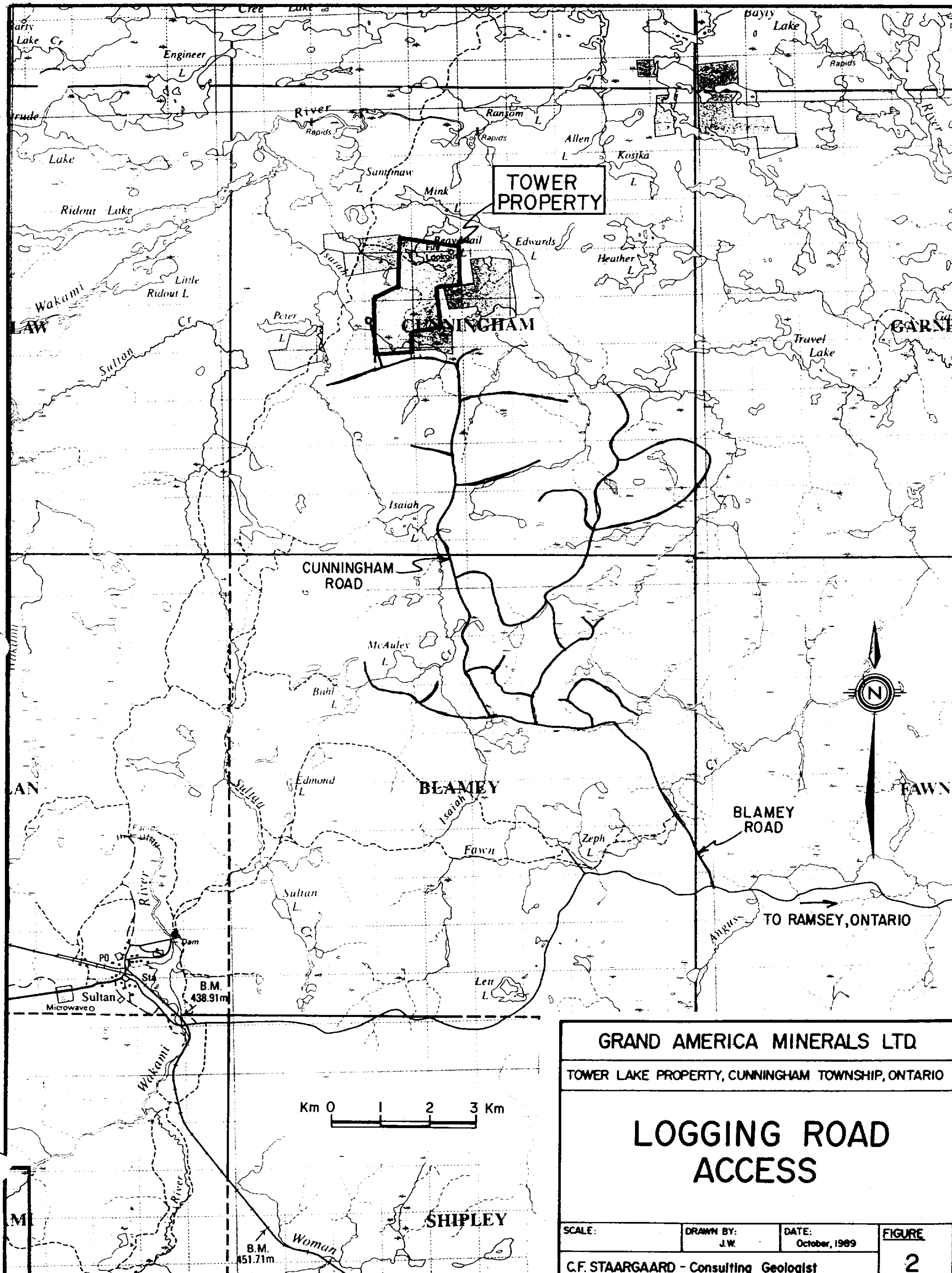
TOWER LAKE PROPERTY, CUNNINGHAM TOWNSHIP, ONTARIO

LOCATION MAP

SCALE:	DRAWN BY: J.W.	DATE: October, 1989	FIGURE 1

C.F. STAARGAARD - Consulting Geologist



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LOGGING ROAD ACCESS

SCALE:	DRAWN BY: J.W.	DATE: October, 1989	FIGURE 2

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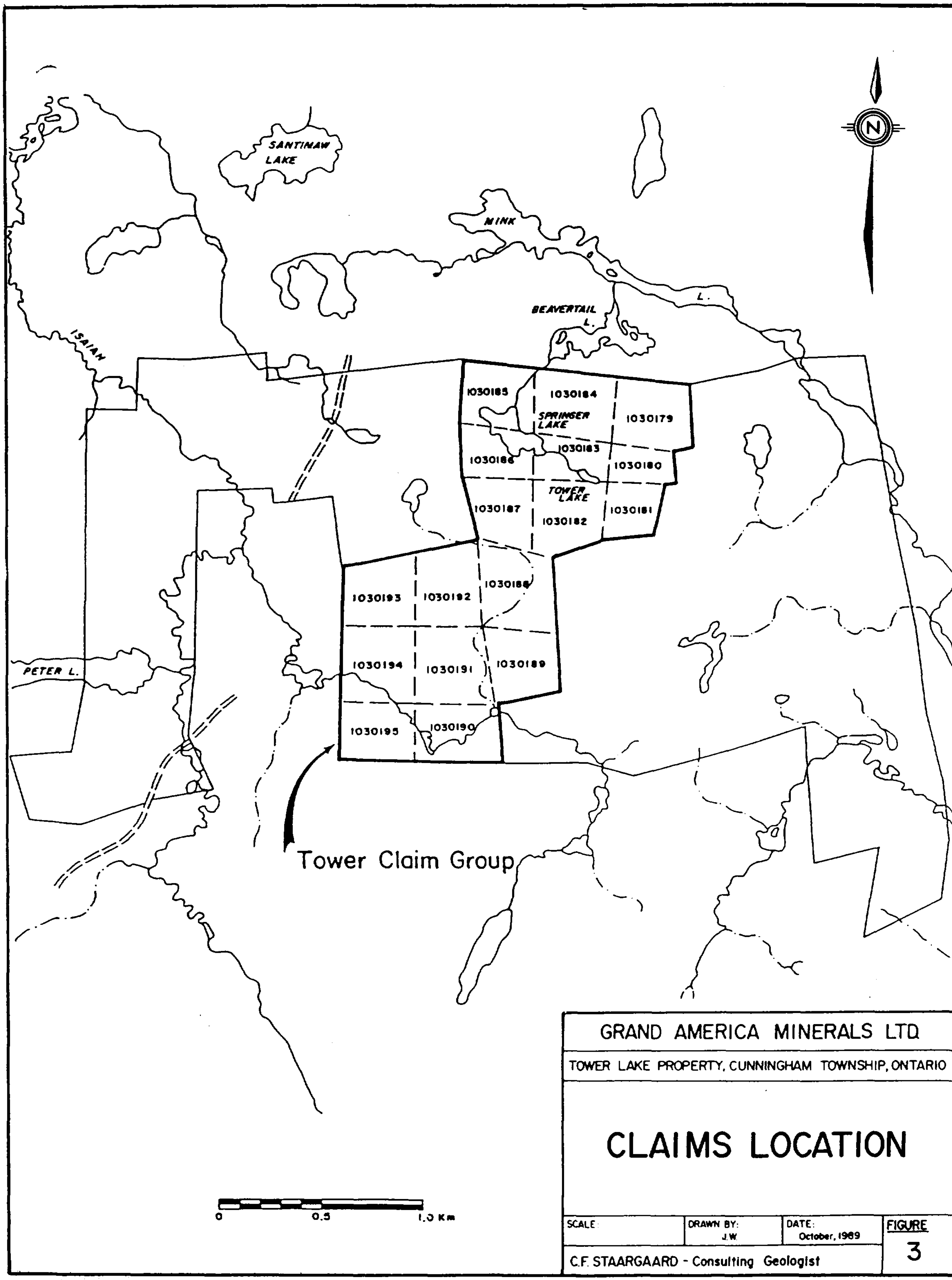

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TOWER LAKE PROPERTY, CUNNINGHAM TOWNSHIP, ONTARIO

CLAIMS LOCATION

SCALE:	DRAWN BY: J.W.	DATE: October, 1989	FIGURE 3

C.F. STAARGAARD - Consulting Geologist

Claim No.	Record Date	Recorded Assessment (days as of Sept. 89)	Expiry
1030179*	1/25/88	80	1/25/91
1030180*	"	80	"
1030181*	"	80	"
1030182*	"	80	"
1030183*	"	80	"
1030184*	"	80	"
1030185*	"	80	"
1030186*	"	80	"
1030187*	"	80	"
1030188*	"	80	"
1030189*	"	80	"
1030190	"	80	"
1030191	"	80	"
1030192	"	80	"
1030193	"	80	"
1030194	"	80	"
1030195	"	80	"

PREVIOUS WORK

Interest in the area is recorded from 1904, when highly magnetic iron formations were the focus of exploration efforts for iron ore by the Ridout Mining Company. In 1927, small amounts of galena and sphalerite were found in chert and most of the activity since then has been related to base metals. The following is a chronological listing of work on the claims, much of which is poorly documented, in particular that from before 1980:

1953	Page-Harley Mines, Ltd.	-	648.5 metres of diamond drilling in 7 holes
1956	Maneast Uranium Corporation, Ltd.	-	158.2 metres of diamond drilling in 3 holes
1965	Consolidated Shunsby Mines, Ltd.	-	one diamond drill hole totalling 125.6 metres
1969	" " " "	-	geological mapping, soil geochemistry
1974	Grandora Explorations Ltd.	-	soil geochemistry
1978	M.W. Resources Ltd. (formerly Consolidated Shunsby)	-	376.7 metres of diamond drilling in 5 holes
1980	Placer Development (option from M.W. Resources)	-	EM-16, EM-17, and magnetic surveys

1988 Grand America Minerals, Ltd. - preliminary geological mapping and sampling, magnetic survey, MAX MIN II survey

REGIONAL GEOLOGY

The claims are situated in the Swayze greenstone belt which in turn lies within the Archean Abitibi Subprovince. Regionally, the belt is dominated by mafic volcanics which, in the general area of the claims, include metamorphosed flows of Mg and Fe-rich tholeiitic basalt. A series of broadly concordant intrusive bodies of gabbroic rocks are thought to represent roughly coeval sills within the mafic volcanic pile.

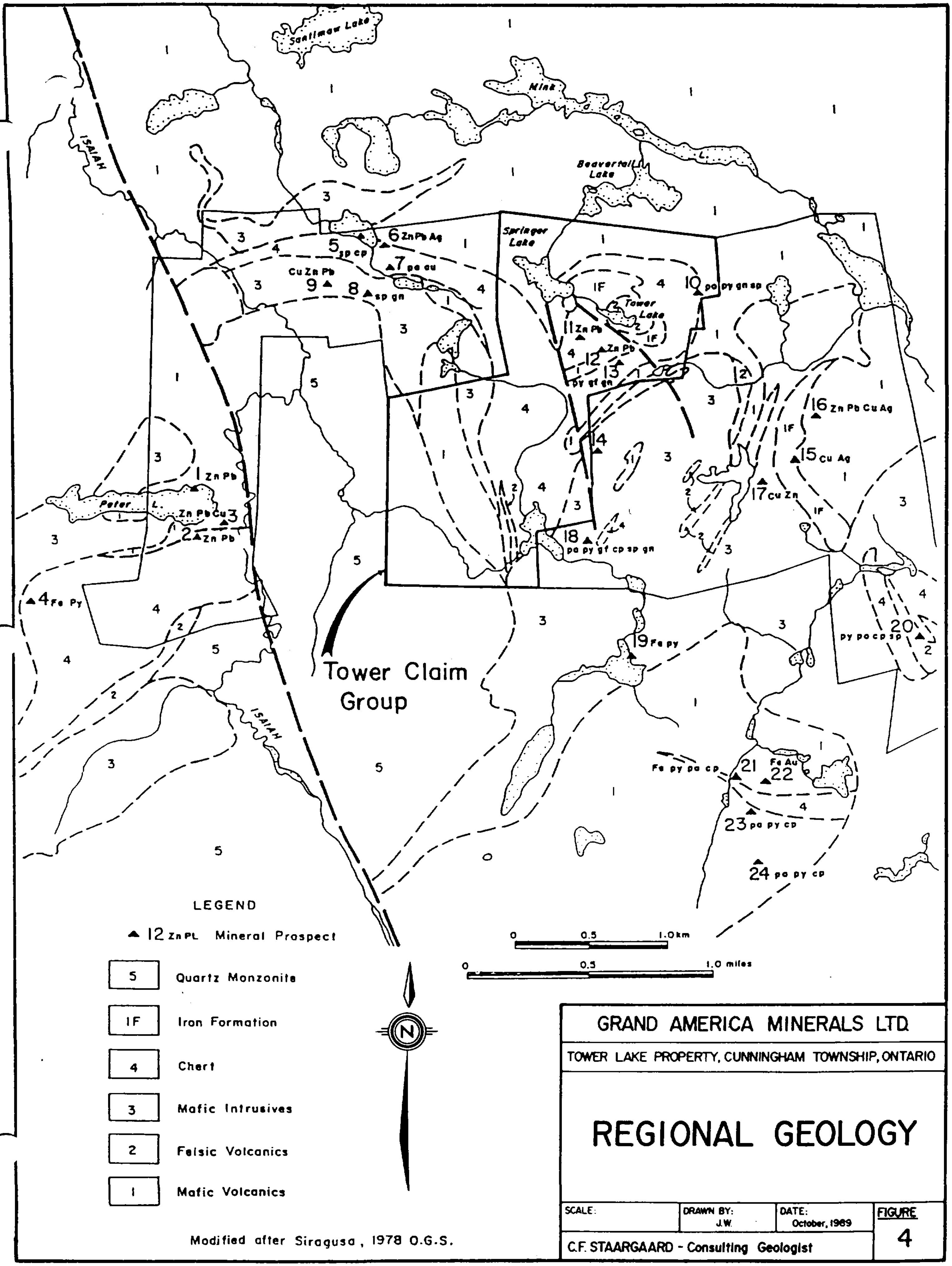
Within this sequence, and partly covered by the claim group, is a relatively thick band of chert and oxide iron formation together with subordinate amounts of variably graphitic argillite and intermediate to felsic volcaniclastic rocks(Fig. 4). Numerous base metal showings are found in this band, particularly in a unit of chert breccia. The largest of these is the Shunsby deposit, which is about 1 km east of the Tower property and is estimated to contain about 2.4 million tons grading 2.4% Zn and 0.4% Cu. Smaller but higher grade pods within this body contain up to 80,000 tons grading 3.9% Cu, 6.2% Zn, 1.25 oz Ag/ton, and 0.03 oz Au/ton. Immediately to the west of the Tower claims is a smaller deposit estimated by Kidd Creek Mines to contain on the order of 100,000 tons grading 3% Zn, 1% Pb, and 0.5% Cu. Rather than being classic volcanogenic massive sulphide bodies, most of these occurrences are thought to be epigenetic, the metals being transported from elsewhere in the volcanic pile and deposited into structurally prepared zones in the brittle chert. As such, there is potential in the belt for both classic VMS deposits and those consisting of material remobilized from them.

A large intrusive body of potassic granite intrudes the volcano-sedimentary sequence immediately west of the property. Other and minor intrusive types include rare dykes of diabase, lamprophyre, and syenite, mostly of Proterozoic age.

Regionally, foliation and bedding tend to be oriented northwesterly and dips are subvertical or steeply to the southwest. Late north to northwesterly trending faults of generally sinistral character offset the main lithologies by up to 1.5 to 2 kilometres.

PROPERTY GEOLOGY

The claims are centred on a sequence of interbedded chert, chert breccia, oxide iron formation, graphitic argillite, and minor intermediate to felsic tuff, all of which are enclosed by mafic volcanics. These rocks have been deformed by at least two events, resulting in a complex and tight pattern of folds with northerly and westerly trending axial planes. A large northerly trending fault cuts through the middle of the claim group, essentially along the axial plane of one fold and offsets northerly trending strata on its west side from easterly trending strata to the east. Dips to the west of the fault are moderate to steeply to the west. Dips on


Santimaw Lake
Mink L.
Beavertail Lake
Springer Lake
Tower Lake
Peter L.
ISAIAH
Tower Claim Group
1 Zn Pb
2 Zn Pb
3 Zn Pb Cu
4 Fe Py
5 sp cp
6 Zn Pb Ag
7 po au
8 sp gn
9 Cu Zn Pb
10 po py gn sp
11 Zn Pb
12 Zn Pb
13 py gf gn
14
15 Cu Ag
16 Zn Pb Cu Ag
17 Cu Zn
18 po py gf cp sp gn
19 Fe py
20 py po cp sp
21 Fe py po cp
22 Fe Au
23 po py cp
24 po py cp
0 0.5 1.0 km
0 0.5 1.0 miles
N
LEGEND
12 Zn PL Mineral Prospect
5 Quartz Monzonite
1F Iron Formation
4 Chert
3 Mafic Intrusives
2 Felsic Volcanics
1 Mafic Volcanics
Modified after Siragusa, 1978 O.G.S.
GRAND AMERICA MINERALS LTD
TOWER LAKE PROPERTY, CUNNINGHAM TOWNSHIP, ONTARIO
REGIONAL GEOLOGY
SCALE:
DRAWN BY: J.W.
DATE: October, 1989
FIGURE 4
C.F. STAARGAARD - Consulting Geologist

its east side are low to moderate. Foliation tends to dip to the southwest at a moderate angle. A second, southwesterly dipping fault south of Tower Lake has an apparent dextral offset of about 100 metres. Brief descriptions of the mapped lithological units are listed below.

Unit 1 - Mafic Volcanics

This unit consists of finegrained, occasionally pillowed and variably carbonatized mafic flows that have been intruded by large amounts of fine to medium grained gabbro. The latter probably represent subvolcanic sills that, by analogy with the more regional situation, are coeval with the extrusives. Unit 1a consists of well-foliated and somewhat rusty-weathering mafic volcanics occurring mainly north of Tower Lake. Numerous boulders along the shores of Springer Lake consist of mafic fragmental rocks(1b) although this rocktype was only rarely seen in outcrop. Unit 1c is distinguished as it is a relatively homogeneous and larger body of fine to medium grained gabbro occupying the core of the large fold covered by the claims.

Unit 2 - Argillite/Chert

The description of this unit is taken mainly from old drill logs as it is only rarely exposed. It is comprised by intercalated layers of variably siliceous, graphitic argillite and grey chert. Highly contorted veinlets of calcite are common as is brecciation. Pyrite and pyrrhotite are locally very abundant, occurring as blebs, disseminations, fracture fillings, and occasionally along laminae.

Unit 3 - Variolitic Mafic Volcanic

This unit is best exposed between 7+00 and 8+00E, just north of the baseline. It is light green to gray, variably but generally highly carbonatized, and typically exhibits abundant varioles ranging in size from 1 to 5mm.

Unit 4 - Chemical Sediment

Unit 4 is comprised by an unusually thick horizon of chert and minor related sediments. The bulk of this material (Unit 4a) consists of a rather monotonous ferruginous(hematitic) chert. Surface oxidation generally obscures original textures and prevents discrimination during mapping but chert breccia is quite abundant and may even be the major component of this unit. The breccia consists of at least 50% fragments, a few centimetres long, of cm scale chert layers in a slightly less siliceous matrix. The fragments may be at any orientation and generally have rounded ends, suggesting intraformational rather than tectonic breccia. Small amounts of pyrrhotite and pyrite may be seen at surface. Drilling by Page Harley Mines in 1953 revealed considerable amounts of these sulphides at various levels in Unit 4 south of Tower Lake. Pyrrhotite is especially common and may be present in essentially massive horizons of over a metre in thickness. Also important is layered chert, which consists of 1-20 cm thick layers of chert with septae generally rich in magnetite and Fe-Mg silicate minerals such as chlorite and amphibole.

Magnetite is common in Unit 4 and re-interpretation of the 1988 magnetic survey suggests that, in addition to the mappable iron formation, there is a fairly coherent magnetic stratum (4c) in the chert that was not consistently distinguishable during field mapping. Unit 4b is sucrosic and limonitic chert.

Several bands of argillaceous and/or graphitic chert(4d) up to several hundred metres long were mapped in the western limb of the fold. One of these was observed to contain cm scale laminae of pyrite/pyrrhotite. Another is apparently intercalated with oxide iron formation. Finally, a translucent, iron poor chert was observed at the northern contact between Unit 4 chert and Unit 2 argillite in the area of 7+00E and 2+00N. This material is very similar to that hosting Pb-Zn mineralization at Trench A and on the the Shunsby property to the east.

Unit 5 - Iron Formation

All iron formation seen is of the oxide facies. The most abundant type is highly hematitic and apparently brecciated, with a magnetite matrix to chert fragments. Minor types include a dark green magnetite-chlorite-amphibole(grunerite) schist(5a) and classic BIF, banded on a scale of centimetres(5b).

Unit 6 - Felsic Tuff

Unit 6 is an intermediate to felsic volcanic rock occasionally exhibiting small quartz eyes. It is light grey to grey-green in colour, often cherty, and may contain angular fragments up to a cm or so in size. In places, it is a lapilli tuff, with occasional pyrrhotite-rich fragments. Near its contact with chert in the 3+50W/10+00S area, it may be intercalated with chert or, alternatively, Unit 4 chert may contain some tuffaceous layers.

Where this unit outcrops in the Tower Lake area, it is strongly foliated and on the south shore, may even actually be sheared quartz feldspar porphyry of unit 8.

Unit 7 - Intermediate Volcanic/Tuff

This unit is usually comprised by light grey-green lapilli tuff which may contain small plagioclase crystal fragments. Some portions may actually belong to unit 6 or vice-versa.

Unit 8 - Quartz Feldspar Porphyry

QFP is found mainly in the area of Tower and Springer Lakes. Away from this area, it occurs as crosscutting dykes intruding the other rock types. Relatively sparse phenocrysts of feldspar and variable but sparse proportions of quartz phenocrysts, both of which are up to 5mm across, are typical. Where this unit has been sheared, it may resemble Unit 6 felsic tuff.

Unit 9 - Quartz Monzonite

Leucocratic quartz monzonite with minor biotite outcrops in the southwestern most section of the property and is part of a large pluton several kilometres in diameter.

MINERALIZATION AND RESULTS OF PREVIOUS DRILLING

Two main occurrences of Pb-Zn mineralization are known on the property. In both cases, sphalerite and minor galena occur as fracture fillings in a tectonically brecciated unit of relatively iron-poor chert. The chert tends to be finer grained than the remainder of Unit 4 and tends to some degree of translucency.

Trench A is situated on the south shore of Tower Lake. Chip samples from the 1988 program graded about 6% Zn and 2% Pb over 2½ metres. However, it is impossible to determine the orientation of the mineralized zone due to the size of the trench. Prospecting around the trench failed to uncover more mineralization despite fairly good outcrop. This occurrence was the focus of at least seven drill holes by Page Harley Mines in 1953. According to records in the assessment files, Page Harley discovered a number of Pb-Zn occurrences along about 350 metres of a southwesterly trending structure leading from trench A. Although one of these holes along with a few filled in trenches were found during mapping, the exact locations of most were not recovered. Assay results were reported only for hole 21, in which 20 metres graded 1.49% Zn and 0.31% Pb. Sphalerite and galena were reported as occurring in narrow calcite veinlets in brecciated chert. Intersections in the other holes were of lesser width and, judging from qualitative descriptions, apparently of lower overall grade. Despite the uncertainty as to exact location of the holes, however, it is clear that this zone crosscuts stratigraphy and cannot represent a syngenetic stratiform deposit. A structurally controlled Pb-Zn deposit in this geological environment would be unlikely to be of sufficient size or grade to be economically interesting.

At trenches B and C, pyrite, sphalerite and galena are present in a sheared section of chert sandwiched between mafic volcanics. Pyrite is also present in relatively large amounts in the mafic volcanics and in brecciated and sheared float of the latter. Selected grab samples taken in 1988 contain up to 1.94% Zn and 0.48% Pb. This occurrence would seem to be limited in extent.

In 1978, M.W. Resources drilled five holes across the chert/mafic volcanic contact in the eastern portion of the claims, possibly on the basis of EM conductors. The latter were produced by graphitic argillite of Unit 2, which was seen to contain abundant pyrite along with traces of galena. Selected grab samples taken in 1988 from trenches in the area of 5+00N/2+00E returned values of up to 0.67% Zn and 0.1% Cu, suggesting that fine grained sphalerite and chalcopyrite are also present, not unusual for graphitic argillite in Archean greenstone terrain.

In 1953, three holes were drilled in the vicinity of a series of conductive argillite/iron formation horizons at about 10+00S/2+00W. The logs for these are useless in terms of identifying lithologies but no mineralization was noted. Immediately north of this, a sample was taken in 1988 from an outcrop of graphitic argillite containing banded pyrite. This sample contained arsenic and gold levels of 147 ppm and 26 ppb respectively. While these values are somewhat anomalous, they are not high enough to warrant further investigation, as graphitic argillite and especially oxide iron formations in this geological environment are often enriched in metals to some degree. More significant is the fact that interesting metal deposits are highly unlikely to be associated with them.

GEOPHYSICAL SURVEYS

The results of the 1988 magnetic and MAXMIN surveys have been respectively replotted and re-interpreted in the light of more detailed geological information.

In the case of the magnetic survey, the highly variable magnetite content of the chert and iron formations resulted in very erratic total field values, exacerbated by the relatively wide 25 metre station spacing that was used. To clarify overall magnetic patterns, a 3X3 smoothing matrix using a centre weighting of 3 and an inverse distance squared function was passed over the data and the results plotted on Figure 6. Although the wide station spacing precludes detailed analysis, it can be seen that there is another highly magnetic zone in addition to the oxide iron formation observed during mapping. It almost certainly is a section of the chert with a consistently higher than normal content of magnetite, but not to the extent of being a mappable unit. There are no magnetic anomalies that cannot be attributed to magnetite in chert or oxide iron formation.

Figures 7 and 8 show the distribution of conductive responses obtained during the 1988 MAXMIN II survey. It should be noted that this interpretation is qualitative and serves only to show the locations of conductive responses. A more quantitative analysis would have been undertaken had any of these been associated with interesting geochemical and/or geological features. In general, most of the more clearly defined conductors using both 1777 and 444 Hz frequencies may be attributed to graphitic argillite horizons mapped on surface, especially in the area south of Springer Lake, or to contacts between disparate rocktypes. Interference between numerous conductors south of Tower Lake prevents definitive interpretation in this area.

One of the stronger and more consistent conductive responses roughly coincides with a portion of the large northerly trending fault and/or shear zone extending south from Springer Lake. Several conductors roughly parallel stratigraphy in the area south of Tower Lake. Some of these are probably due to narrow graphitic argillite units noted during the 1953 drilling. The strongest one in this area, lying near the southern boundaries of claims P1030181 and 2, is due to the graphitic argillite exposed in trench F and encountered during the 1978 drilling. North of Tower Lake, one conductive trend is associated with the contact between the chemical sediments and the mafic volcanics to the north while another apparently coincides with a portion of the oxide iron formation horizon in this area. Several other anomalies occur on single lines and cannot be traced with any certainty.

GEOCHEMICAL SURVEYS

A total of 660 soil samples were taken at 25 metre intervals on lines spaced 100 metres apart over the portion of the claims underlain by the chert/IF/argillite sequence. Sample spacing in the immediate area of Pb-Zn occurrences at trenches A and B-C was reduced to 12.5 metres on lines spaced 50 metres apart. Soil horizon development is good to excellent, with almost all samples taken from well-developed B horizon. Some swampy areas precluded useful sampling. All samples were sent to Min-En/Swastika Labs in Timmins, Ontario, where they were analyzed for Cu, Pb, Zn, Mn, Ag, and As by ICP and for Au by AAS. Analytical results were plotted and contoured by computer.

In general, only Zn, Pb, and Cu showed a useful response and were included as figures in this report(Figs. 9-11). Mn was generally enriched over the chert sequence relative to the enclosing mafic volcanics but showed no interesting trends. Gold values are at background levels except for a few scattered point highs as were Ag values, which exhibited a number of point highs in the area of some of the Pb and Zn concentrations. As showed no interesting trends.

Zn showed the best response to the presence of known mineralization. Several well-defined trends are present in the data, many of the strongest of which, such as that north of Tower Lake, clearly crosscut stratigraphy, indicating that they are structurally controlled. Anomalies associated with trenches A and B-C are limited in extent. A northwesterly trend of higher Zn values can be seen in the western portion of the grid south of Springer Lake. It, as well as similar trends for Cu and Pb, roughly coincide with a unit of intercalated oxide iron formation and graphitic argillite. A very strong high occurs in the area of Trench F, where graphitic argillite has been shown to contain weak Cu-Pb-Zn mineralization.

Pb values essentially duplicate the pattern exhibited by Zn, except that they are more restricted in extent and magnitude for the most part as would be expected from its lower mobility.

The distribution of Cu values only weakly corresponds to that of Pb and Zn, tending to follow rather than crosscut stratigraphy where clearly defined trends exist. The response at trenches A and B-C is weak, as might be expected from the low Cu character of mineralization. Two weak trends in the western portion of the grid coincides with those of Pb and Zn and reflect the presence of weak base metal mineralization in units of graphitic argillite intercalated with oxide iron formation in this area.

All three metals show a strong northerly trend in the area between 8+00 to 11+00N at about 0+50E. Although only unmineralized cherts were mapped here, abundant angular boulders of graphitic argillite containing pyrite and pyrrhotite were noted in old trenches.

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M.W. Resources 1978	Diamond Drill Report, Tower Group, Cunningham Township, Assessment File T-2050 (Timmins)
Page-Harley Mines 1953	Diamond Drill Report, B Group, Cunningham Township, Assessment File T-2059 (Timmins)

STATEMENT OF QUALIFICATIONS

I, C.F. Staargaard, of 304-5951 Balsam Street, Vancouver, B.C., hereby certify that:

a) I have the following degrees:

1977 B.Sc. Geology - The Pennsylvania State University
1981 M.Sc. Geochemistry - Queen's University

b) I am a Fellow of the Geological Association of Canada.

c) I have practiced my profession throughout Canada on a continuous basis since 1979 and seasonally between 1975 and 1979.

d) I neither have, nor expect to receive, any interest in this property or Grand America Minerals Ltd.

e) This report is based on my personal observations on the property along with a review of all available data.

C.F. Staargaard
Consulting Geologist
912-510 W. Hastings St.
Vancouver, B.C.
V6B 1L8

APPENDIX A - GEOCHEMICAL VALUES

NORTH	EAST	PPM AG	PPM AS	PPM CU	PPM MN	PPM PB	PPM ZN	PPB AU
500	1130	1	8	9	69	24	103	5
500	1150	0.9	1	17	85	21	129	5
500	1175	0.9	2	11	126	16	191	10
500	1200	1.1	6	14	432	10	281	5
500	1225	0.8	14	84	345	46	319	10
500	1250	0.9	6	8	106	8	170	5
600	1100	0.8	1	32	157	13	96	5
600	1125	0.9	1	18	92	8	166	5
600	1150	0.9	5	12	68	6	93	5
600	1175	0.9	10	15	107	16	174	5
600	1200	0.7	8	13	339	11	250	5
600	1225	0.5	6	5	107	8	65	5
700	700	0.5	1	7	141	15	136	10
700	725	0.6	5	14	144	28	113	5
700	1025	0.7	7	11	142	11	139	5
700	1050	0.6	1	4	59	8	60	5
700	1075	0.6	10	18	340	14	168	5
700	1100	1.1	3	12	125	13	166	5
700	1120	1	6	58	229	24	254	5
700	1150	0.9	10	21	149	15	258	10
700	1175	0.8	20	46	492	24	234	5
800	1125	0.7	10	8	130	9	95	5
800	1150	1.4	11	17	136	11	186	5
800	1175	0.7	15	204	90	15	151	5
800	1200	1.1	14	21	365	9	168	10
900	650	0.7	24	31	230	39	177	5
900	675	0.6	12	26	223	25	159	5
900	700	0.7	5	7	79	8	75	5
900	725	0.5	7	13	154	17	118	5
900	750	0.6	15	15	196	15	144	5
900	775	0.9	1	7	92	16	130	5
900	800	0.6	1	7	94	13	115	5
900	825	0.7	4	15	215	22	131	5
900	850	0.8	1	10	98	11	71	5
900	1125	0.7	4	47	149	15	144	5
900	1155	0.6	42	256	632	82	659	20
900	1175	1.1	3	22	156	12	151	5
900	1200	0.8	1	11	141	14	162	10
1000	600	0.7	1	26	214	29	131	5
1000	625	0.5	4	9	147	9	139	5
1000	650	0.3	10	13	116	9	101	5
1000	675	0.4	17	24	330	18	103	5
1000	700	0.6	10	28	258	30	185	5
1000	725	0.9	11	89	1581	76	379	10
1000	750	0.8	7	35	250	18	443	5
1000	775	1.7	25	128	172	35	238	5
1000	800	1	9	14	104	18	155	5
1000	825	0.6	9	24	106	16	96	5
1000	850	0.8	14	9	99	13	164	5
1000	875	0.8	3	15	189	24	204	10
1000	900	0.9	13	10	121	14	99	5
1000	925	0.7	14	31	303	25	318	5
1000	950	0.8	1	24	313	31	238	5
1095	1150	2	1	458	492	361	647	10
1100	625	0.5	18	9	210	11	94	5
1100	650	0.8	15	12	182	15	137	5
1100	675	0.6	1	80	2172	41	291	5
1100	700	0.8	15	40	379	43	154	5

NORTH	EAST	PPM AG	PPM AS	PPM CU	PPM MN	PPM PB	PPM ZN	PPB AU
1100	725	0.6	7	8	168	9	70	5
1100	750	0.7	13	18	181	46	279	10
1100	825	0.7	3	9	168	23	126	5
1100	850	1.3	2	10	116	34	115	5
1100	875	0.8	1	14	257	25	173	10
1100	900	0.7	1	9	143	14	162	5
1100	925	0.9	7	15	118	6	187	5
1100	950	0.7	12	131	600	56	609	5
1100	975	0.5	1	18	235	22	174	10
1100	1000	0.7	1	48	223	22	256	5
1100	1120	0.7	11	49	110	26	219	10
1100	1175	0.7	1	61	189	31	314	5
1200	660	0.8	1	18	144	23	152	5
1200	675	0.7	14	21	125	23	129	5
1200	700	0.8	13	15	293	18	237	10
1200	725	0.7	1	38	319	24	321	5
1200	750	0.5	9	15	149	26	128	5
1200	800	0.5	3	8	85	10	85	5
1200	825	0.8	7	27	344	41	198	5
1200	850	0.9	1	72	3279	35	237	5
1200	875	1	1	7	101	9	73	10
1200	900	0.9	13	61	488	73	503	20
1200	925	0.9	1	7	241	11	98	5
1200	950	0.6	1	5	143	11	52	5
1200	975	0.8	5	16	186	14	98	5
1200	1125	1.7	1	75	50	25	132	10
1200	1150	0.7	1	50	213	69	239	5
1200	1175	0.6	5	18	242	22	188	5
1200	1190	0.7	5	36	257	27	259	10
1300	635	1	6	10	208	22	188	5
1300	650	0.9	7	11	313	22	141	5
1300	675	0.3	1	13	203	36	220	5
1300	700	0.3	1	11	146	20	178	10
1300	725	0.3	4	14	474	23	201	10
1300	750	0.7	1	7	112	8	127	5
1300	775	0.8	1	9	117	8	138	5
1300	800	0.7	5	7	86	9	101	5
1300	850	0.7	1	33	194	27	188	5
1300	875	0.5	1	55	635	46	414	5
1300	900	0.8	1	13	147	20	170	5
1300	925	0.9	1	80	248	19	178	5
1300	950	0.7	1	11	73	7	54	10
1300	1125	0.4	1	21	156	21	462	5
1300	1150	0.5	1	6	52	15	147	5
1300	1175	0.5	229	178	1	180	191	20
1325	1200	0.6	10	55	1323	23	732	1
1350	1200	0.9	24	13	155	18	113	1
1350	1300	0.8	7	63	1538	15	2286	7
1375	1200	0.8	31	13	617	23	245	2
1375	1300	0.5	5	9	214	12	170	5
1400	630	0.6	1	17	196	26	165	5
1400	700	1	1	9	83	12	119	10
1400	725	0.7	2	33	180	29	281	5
1400	750	0.8	1	11	108	46	249	5
1400	775	0.7	1	30	998	29	262	10
1400	800	0.8	1	14	207	20	171	5
1400	825	1.5	1	76	1135	47	1089	5

NORTH	EAST	PPM AG	PPM AS	PPM CU	PPM MN	PPM PB	PPM ZN	PPB AU
1400	850	0.7	1	35	469	40	348	5
1400	875	0.7	1	88	346	12	181	10
1400	900	0.9	5	40	140	26	251	5
1400	1050	1.3	1	143	19	22	119	10
1400	1075	0.5	1	29	245	22	142	5
1400	1125	0.9	1	9	211	2	126	5
1400	1150	0.8	1	5	87	2	48	10
1400	1175	0.8	1	9	138	4	86	5
1400	1200	0.8	1	29	246	12	129	5
1400	1225	0.9	1	18	142	1	335	5
1400	1250	0.9	1	29	381	27	255	5
1400	1275	0.9	1	8	392	11	223	10
1400	1300	0.7	1	33	437	14	285	5
1400	1400	0.3	1	8	172	7	186	1
1400	1500	0.4	1	7	128	13	155	7
1425	1100	0.7	1	11	119	7	101	5
1425	1200	0.6	6	22	882	11	44	3
1425	1400	0.7	4	10	119	23	381	1
1425	1500	1.3	1	9	128	13	150	1
1425	1600	0.6	1	6	178	11	146	1
1425	1700	0.6	10	19	370	43	195	2
1425	1800	0.7	1	6	213	5	124	1
1430	1300	0.9	1	23	142	12	168	1
1450	1100	0.7	9	13	131	12	77	5
1450	1200	1.2	21	17	182	16	36	8
1450	1300	0.6	1	8	167	5	129	2
1450	1400	0.6	1	11	238	10	263	1
1450	1500	0.4	1	6	324	4	102	2
1450	1600	1.1	2	9	250	17	99	1
1450	1700	0.8	1	8	106	38	149	2
1450	1800	0.6	3	8	226	11	157	1
1475	1100	0.7	2	103	225	11	441	5
1475	1200	0.7	52	35	683	10	72	1
1475	1300	0.4	1	4	88	5	58	2
1475	1400	0.8	24	44	727	35	304	2
1475	1500	0.3	1	25	267	13	100	1
1475	1700	0.8	1	9	131	11	175	3
1475	1800	0.6	6	6	101	3	189	1
1500	625	0.9	1	9	89	18	155	5
1500	650	0.7	1	11	250	19	236	5
1500	675	0.7	11	10	125	18	218	5
1500	705	1.3	1	50	156	31	559	10
1500	725	0.6	13	24	220	11	206	5
1500	750	0.9	9	30	777	35	563	10
1500	775	1.2	2	14	96	25	316	5
1500	800	0.7	7	20	273	23	256	10
1500	825	0.7	1	31	449	22	437	5
1500	850	0.9	1	9	95	16	230	5
1500	875	2	51	116	483	39	496	10
1500	900	1.5	5	35	295	22	365	5
1500	925	0.7	12	19	580	37	320	5
1500	950	0.8	16	12	209	8	173	5
1500	1050	0.9	1	8	118	6	141	10
1500	1075	0.7	9	8	109	6	102	5
1500	1100	0.8	17	41	155	5	388	5
1500	1200	0.3	3	61	2393	22	687	1
1500	1300	0.2	1	13	267	8	98	2

NORTH	EAST	PPM AG	PPM AS	PPM CU	PPM MN	PPM PB	PPM ZN	PPB AU
1700	1090	0.7	4	23	174	22	89	5
1700	1150	1.2	15	15	118	19	142	1
1700	1200	0.8	3	61	379	14	268	5
1700	1250	0.8	1	7	117	32	214	6
1700	1300	0.6	1	21	339	39	225	10
1700	1350	0.5	2	9	388	17	94	1
1700	1400	0.6	4	10	938	19	119	5
1700	1450	1.8	30	22	334	36	163	1
1700	1500	0.7	1	25	1339	64	235	5
1700	1700	0.8	12	26	224	24	195	1
1700	1800	0.7	21	17	399	21	131	1
1712	1100	0.9	5	8	62	4	52	1
1712	1150	1.2	20	23	773	21	203	6
1712	1200	0.7	2	10	383	17	111	5
1712	1250	0.7	1	9	144	52	357	4
1712	1300	0.6	1	15	272	8	123	5
1712	1350	0.5	1	9	282	16	80	1
1712	1400	0.7	1	8	386	13	155	5
1712	1450	0.9	40	18	278	26	200	1
1725	1150	0.8	29	23	466	16	88	2
1725	1200	0.1	1	10	155	1	33	5
1725	1250	0.4	1	11	263	21	235	1
1725	1300	40	0.1	1	27	4029	19	213
1725	1350	0.6	1	8	476	14	139	1
1725	1400	0.7	8	9	119	12	113	10
1725	1450	0.8	11	45	1191	21	453	2
1725	1500	0.8	3	6	139	11	138	5
1725	1700	0.7	10	7	138	7	51	2
1725	1800	1	10	14	511	16	137	6
1737	1100	0.8	7	23	132	11	42	1
1737	1150	0.8	19	8	108	5	36	4
1737	1200	0.8	6	8	557	8	58	5
1737	1250	0.8	7	18	190	13	239	2
1737	1300	0.6	1	13	544	16	123	5
1737	1350	0.5	1	6	128	8	74	1
1737	1400	0.2	1	12	470	14	241	5
1737	1450	0.3	1	16	332	18	199	2
1737	1500	1.1	1	6	112	14	105	5
1750	1150	0.3	22	8	75	6	30	1
1750	1200	0.9	1	62	50	7	61	5
1750	1300	0.4	1	8	316	3	50	10
1750	1350	0.9	11	14	221	11	132	1
1750	1400	0.7	1	12	685	18	247	5
1750	1500	0.9	1	6	191	16	182	5
1750	1800	0.8	17	13	353	16	156	1
1762	1100	1	58	107	397	10	167	82
1762	1150	0.9	17	12	110	9	46	3
1762	1200	0.4	2	73	185	20	194	5
1762	1300	0.8	1	15	204	13	71	5
1762	1350	0.7	1	7	159	9	140	1
1762	1400	0.5	1	4	51	8	42	5
1762	1500	0.8	1	10	310	19	96	5
1762	1600	0.9	8	5	195	11	120	5
1775	1100	0.7	9	14	218	1	55	5
1775	1150	0.7	43	11	134	4	60	2
1775	1200	0.6	31	13	632	18	123	10
1775	1250	0.6	23	51	712	26	143	3

NORTH	EAST	PPM AG	PPM AS	PPM CU	PPM MN	PPM PB	PPM ZN	PPB AU
1850	1800	0.6	20	26	1001	21	132	1
1850	1900	0.7	22	65	208	37	429	4
1862	1100	0.8	52	69	1204	14	190	1
1862	1150	1.2	24	12	195	15	95	1
1875	1100	1.2	1	51	370	16	100	10
1875	1150	0.7	16	24	461	21	146	1
1875	1250	0.4	1	19	428	15	119	7
1875	1400	0.7	7	16	349	41	222	5
1875	1500	0.7	3	6	145	19	204	5
1875	1600	1	1	68	1640	91	1655	5
1875	1700	0.5	9	10	99	58	165	2
1875	1800	0.9	18	12	271	12	156	1
1887	1100	7.6	39	47	130	95	65	1
1887	1150	0.9	7	11	95	11	75	2
1887	1200	0.9	7	8	186	11	181	5
1887	1250	0.3	1	11	340	9	128	8
1887	1300	0.2	1	7	135	5	28	5
1900	625	0.7	30	30	351	81	607	3
1900	650	1.1	14	19	246	122	273	1
1900	675	0.6	10	6	141	10	191	2
1900	700	0.7	8	15	228	31	270	2
1900	725	0.8	1	18	145	26	396	2
1900	750	0.9	15	9	122	23	361	5
1900	800	0.8	5	9	89	13	184	1
1900	825	0.8	15	10	94	10	134	1
1900	875	0.6	36	38	115	58	279	4
1900	950	0.6	8	19	113	8	76	1
1900	975	0.6	1	8	73	6	38	2
1900	1000	0.7	12	15	96	15	42	1
1900	1025	0.6	11	28	409	23	98	6
1900	1050	0.9	22	26	342	19	125	33
1900	1100	0.7	1	12	174	17	106	5
1900	1150	0.4	3	14	185	19	115	1
1900	1200	0.7	1	33	722	34	135	10
1900	1250	0.4	2	7	221	6	115	1
1900	1300	0.1	1	19	437	16	64	5
1900	1400	0.6	1	7	131	16	91	5
1900	1500	0.5	6	9	148	32	124	10
1900	1600	1	8	8	166	21	787	5
1900	1700	0.6	1	51	275	32	474	1
1900	1800	0.6	22	10	822	21	87	1
1900	1900	0.7	16	29	413	84	527	1
1925	700	0.4	9	62	3791	137	1636	2
1925	800	0.6	4	12	88	17	140	1
1925	1000	0.9	26	21	138	14	69	1
1925	1200	0.5	24	46	1147	60	402	3
1925	1300	0.4	1	15	98	6	56	7
1925	1400	0.6	9	7	130	36	116	1
1925	1600	0.4	3	22	603	16	1025	1
1925	1700	0.3	1	25	227	37	131	1
1925	1800	0.7	13	18	356	11	164	2
1925	1900	0.8	8	9	263	11	308	2
1950	700	0.6	8	27	795	33	1361	1
1950	800	0.7	5	8	117	18	170	1
1950	1200	0.6	8	17	290	11	58	2
1950	1300	0.4	4	23	293	15	105	3
1950	1400	0.7	11	7	249	22	154	1

NORTH	EAST	PPM AG	PPM AS	PPM CU	PPM MN	PPM PB	PPM ZN	PPB AU
1950	1500	0.5	10	19	193	35	363	1
1950	1600	0.4	26	10	677	27	255	9
1950	1700	0.1	44	12	172	1	67	2
1950	1800	0.5	10	24	473	18	78	1
1960	1100	0.8	7	13	89	10	37	2
1975	700	0.6	3	15	200	22	379	2
1975	800	0.8	29	19	246	29	295	2
1975	1100	0.9	12	7	119	9	29	3
1975	1200	0.7	1	8	49	5	31	1
1975	1300	0.3	1	6	78	8	66	1
1975	1400	0.7	3	18	135	22	204	1
1975	1500	0.4	4	15	65	21	78	1
1975	1600	0.8	19	15	155	18	288	12
1975	1700	0.5	1	16	305	13	124	4
1975	1800	0.5	10	19	223	13	119	1
2000	700	0.8	10	9	108	23	340	1
2000	800	0.6	21	17	98	47	163	1
2000	1000	0.7	7	22	99	12	34	1
2000	1200	0.7	13	14	627	13	92	1
2000	1300	0.4	4	21	174	10	77	3
2000	1400	0.6	37	79	3272	79	482	85
2000	1500	0.6	1	11	212	12	75	1
2000	1600	0.5	16	25	174	73	520	3
2000	1700	1	18	12	267	125	355	3
2000	1800	0.8	13	15	222	19	110	1
2000	1900	0.5	5	13	245	7	132	1
2015	1100	0.7	8	12	126	12	32	2
2025	700	1.8	142	163	887	103	767	6
2025	800	0.6	8	17	50	39	93	1
2025	1000	0.7	20	13	87	9	41	3
2025	1100	0.7	21	23	170	16	37	1
2025	1200	0.2	8	18	626	7	67	5
2025	1300	0.1	23	20	2264	19	176	5
2025	1400	0.1	11	63	8443	62	480	2
2025	1500	0.7	1	20	115	1	31	2
2025	1600	0.7	20	87	139	28	155	1
2025	1700	0.4	1	10	206	6	212	4
2025	1800	0.4	13	39	622	38	340	1
2025	1900	0.7	9	16	122	11	63	2
2050	600	0.4	8	17	190	30	300	1
2050	700	0.5	4	10	50	37	129	3
2050	1000	0.6	1	10	130	6	39	2
2050	1050	0.5	5	10	116	9	28	1
2050	1100	0.6	4	10	135	13	42	1
2050	1150	0.4	1	19	91	8	32	1
2050	1200	0.2	1	7	570	3	37	14
2050	1250	0.6	1	17	201	14	159	6
2050	1300	0.6	1	17	319	6	301	4
2050	1400	1.1	33	31	491	27	125	2
2050	1500	0.8	44	27	1009	16	96	1
2050	1600	0.6	1	27	729	14	392	4
2050	1700	0.7	24	30	212	22	141	4
2050	1900	0.6	18	29	408	78	518	1
2062	1000	0.7	23	20	160	15	42	1
2062	1050	0.5	1	27	178	12	40	1
2062	1100	0.7	14	14	249	18	152	1
2062	1200	0.1	1	29	13114	65	207	1

NORTH	EAST	PPM AG	PPM AS	PPM CU	PPM MN	PPM PB	PPM ZN	PPB AU
2062	1250	0.4	1	27	362	24	191	1
2075	600	0.6	10	15	115	33	281	1
2075	700	0.7	27	32	131	120	390	2
2075	1000	0.6	6	11	79	7	26	1
2075	1100	2.8	59	121	1183	99	741	1
2075	1150	0.6	3	12	79	10	31	3
2075	1200	0.3	1	15	1434	13	83	1
2075	1250	0.2	1	29	2077	27	208	55
2075	1300	0.6	1	24	430	6	494	4
2075	1400	0.7	1	14	1066	36	103	3
2075	1500	0.6	8	9	258	11	66	1
2075	1600	0.3	6	10	1398	10	213	45
2075	1700	0.6	4	11	129	12	184	2
2075	1800	0.8	4	44	223	18	996	1
2075	1900	0.9	1	15	96	13	49	1
2087	1000	0.7	11	17	93	5	32	2
2087	1050	0.8	1	12	71	7	31	3
2087	1100	0.8	16	10	368	22	996	2
2087	1150	0.7	33	93	751	173	256	2
2087	1200	0.3	3	15	910	16	126	1
2087	1250	0.6	1	16	782	12	184	3
2100	600	0.6	17	17	234	42	299	2
2100	700	0.7	22	13	112	52	231	1
2100	1000	0.5	5	8	101	8	32	1
2100	1050	0.7	1	8	88	5	50	1
2100	1100	0.1	1	32	2201	22	245	1
2100	1150	0.4	35	53	1210	21	400	2
2100	1200	0.4	1	13	162	11	115	1
2100	1250	0.8	13	20	366	20	139	1
2100	1300	0.5	18	22	1723	128	590	3
2100	1400	0.6	49	31	2142	1	141	3
2100	1500	0.6	1	7	110	13	43	2
2100	1700	0.4	1	7	103	3	100	1
2100	1800	0.7	2	7	118	10	119	2
2100	1900	0.6	1	10	85	9	47	1
2112	1000	0.7	8	16	112	19	34	2
2112	1050	0.6	1	32	146	12	46	1
2112	1100	0.5	1	16	179	5	82	1
2112	1150	1.3	35	90	493	17	101	1
2112	1200	0.2	1	17	96	3	240	1
2112	1250	0.7	36	15	601	41	375	12
2112	1300	0.6	4	9	308	27	241	2
2125	600	0.6	12	10	134	31	256	1
2125	700	0.9	21	28	132	63	673	2
2125	1000	0.5	18	30	171	11	32	1
2125	1050	0.6	5	38	337	24	57	1
2125	1100	0.6	1	57	148	9	68	1
2125	1150	0.3	1	16	84	8	41	1
2125	1200	0.2	1	8	842	9	137	1
2125	1250	0.6	2	11	226	9	1221	1
2125	1300	0.5	1	17	128	28	144	4
2125	1400	0.5	1	32	924	25	108	1
2125	1500	0.3	1	16	1686	17	200	1
2125	1600	0.8	4	11	221	14	61	1
2125	1700	0.5	10	11	130	21	64	3
2125	1800	0.6	2	14	118	13	81	1
2125	1900	0.7	5	13	105	9	75	1

NORTH	EAST	PPM AG	PPM AS	PPM CU	PPM MN	PPM PB	PPM ZN	PPB AU
2137	1000	0.7	5	22	134	8	35	3
2137	1050	0.6	13	13	167	14	70	1
2137	1100	0.4	1	27	80	8	39	1
2137	1150	0.1	1	201	5324	51	422	12
2137	1200	0.8	1	10	100	5	206	2
2137	1250	0.5	1	14	117	7	128	1
2137	1300	0.5	59	65	151	1	138	5
2150	600	0.7	8	9	80	16	150	4
2150	800	0.4	5	10	112	16	64	1
2150	1000	0.8	20	9	129	9	38	2
2150	1050	0.5	3	7	85	8	37	1
2150	1100	0.6	1	18	233	14	62	1
2150	1150	0.8	4	9	95	11	190	1
2150	1200	0.6	1	9	127	10	155	1
2150	1250	0.7	1	10	93	6	123	1
2150	1300	0.4	2	12	140	5	58	6
2150	1400	0.7	1	13	326	5	150	1
2150	1500	0.4	13	18	898	21	259	2
2150	1600	0.8	5	14	291	15	211	1
2150	1700	0.4	7	13	228	27	420	1
2150	1800	0.6	10	8	107	5	92	2
2162	1000	0.8	14	8	95	8	31	1
2162	1050	0.8	6	12	103	13	57	2
2162	1100	0.6	2	14	169	7	55	1
2162	1150	0.5	4	9	183	8	163	1
2162	1200	0.5	1	10	170	76	551	2
2162	1250	0.7	9	14	141	11	83	1
2162	1300	0.6	1	12	74	4	49	1
2175	600	1	3	6	70	10	238	2
2175	800	0.5	23	46	221	30	228	1
2175	900	0.8	39	45	211	29	70	37
2175	1000	0.5	3	7	71	9	24	1
2175	1050	0.7	8	19	237	15	78	14
2175	1100	0.8	4	9	147	9	57	2
2175	1150	0.8	7	7	53	10	88	1
2175	1250	0.7	6	12	614	18	203	2
2175	1300	0.6	3	23	113	10	52	2
2175	1400	1.1	12	13	110	11	255	6
2175	1500	0.7	6	11	115	6	273	1
2180	700	0.6	8	24	94	19	43	1
2187	1000	0.5	9	13	107	10	44	1
2187	1050	0.8	1	13	125	15	49	2
2187	1100	0.8	2	6	73	12	82	3
2187	1150	0.9	53	44	992	18	193	1
2187	1250	0.9	4	34	147	10	360	1
2187	1300	0.7	6	21	113	16	53	3
2200	600	0.9	3	11	134	8	137	2
2200	700	0.7	17	32	201	17	124	16
2200	800	0.3	1	16	430	14	80	3
2200	900	0.6	16	27	96	10	34	1
2200	1000	0.5	16	20	170	19	64	2
2200	1050	0.5	7	24	683	11	49	1
2200	1150	0.8	13	31	344	21	443	2
2200	1250	0.6	1	8	111	8	92	5
2200	1300	0.7	4	14	82	10	46	1
2200	1400	0.7	2	7	85	6	128	3
2200	1500	0.5	3	12	87	14	167	2

NORTH	EAST	PPM AG	PPM AS	PPM CU	PPM MN	PPM PB	PPM ZN	PPB AU
2200	1600	0.5	2	20	108	7	103	2
2212	1000	0.6	12	38	150	11	80	1
2212	1200	0.5	1	8	85	14	220	1
2212	1250	0.5	1	12	137	7	123	1
2212	1300	0.6	1	13	592	7	177	3
2225	600	0.7	8	8	83	14	67	1
2225	700	0.7	9	16	109	11	57	1
2225	800	0.6	11	18	126	18	70	1
2225	900	0.6	11	12	111	12	55	2
2225	1000	0.6	11	17	104	10	55	1
2225	1100	0.9	2	44	898	19	691	1
2225	1150	1	5	9	66	5	208	2
2225	1200	0.5	1	13	164	4	149	1
2225	1250	0.8	3	50	125	8	103	5
2225	1300	0.7	1	13	134	4	245	17
2225	1400	0.5	1	10	100	12	59	2
2225	1500	0.9	7	8	74	12	127	1
2225	1600	0.8	1	7	79	1	147	1
2235	1600	0.7	1	8	81	2	83	3
2237	1000	0.7	3	18	91	8	72	1
2237	1100	0.8	6	12	120	9	235	2
2237	1150	0.8	20	25	145	17	88	1
2237	1200	0.5	1	19	214	8	87	3
2250	600	0.5	1	8	91	8	52	3
2250	700	0.5	2	12	280	12	30	2
2250	800	0.5	5	7	78	15	58	4
2250	1000	0.5	13	9	110	12	44	1
2250	1150	0.7	6	30	94	11	38	1
2250	1200	0.5	1	12	73	2	38	2
2250	1300	0.6	3	13	109	9	123	5
2262	1200	0.3	1	12	69	3	41	1
2275	800	0.6	2	6	126	10	55	2
2275	900	0.7	23	17	157	22	159	2
2275	1200	0.5	2	34	181	12	56	30

APPENDIX B - TECHNICAL DATA STATEMENT FOR ASSESSMENT CREDIT

Ministry of Northern Development and Mines

Ontario

Geophysical-Geological-Geochemical Technical Data Statement

File ________

TO BE ATTACHED AS AN APPENDIX TO TECHNICAL REPORT
FACTS SHOWN HERE NEED NOT BE REPEATED IN REPORT
TECHNICAL REPORT MUST CONTAIN INTERPRETATION, CONCLUSIONS ETC.

Type of Survey(s) GEOCHEMICAL

Township or Area CUNNINGHAM

Claim Holder(s) GRAND AMERICA MINERALS LTD

Survey Company C.F. STAARGAARD CONSULTING

Author of Report C.F. STAARGAARD

Address of Author 912-510 W. HASTINGS, VANCOUVER B.C.

Covering Dates of Survey SEPT 22 - OCT 6 1989 (linecutting to office)

Total Miles of Line Cut previously established grid (1988)

SPECIAL PROVISIONS CREDITS REQUESTED

ENTER 40 days (includes line cutting) for first survey.

ENTER 20 days for each additional survey using same grid.

	DAYS per claim
Geophysical	
—Electromagnetic	
—Magnetometer	
—Radiometric	
—Other	
Geological	
Geochemical	20

AIRBORNE CREDITS (Special provision credits do not apply to airborne surveys)

Magnetometer ______ Electromagnetic ______ Radiometric ______
(enter days per claim)

DATE: 11/2/89 SIGNATURE: [signature]
Author of Report or Agent

Res. Geol. ________ Qualifications 2.6800

Previous Surveys

File No.	Type	Date	Claim Holder

MINING CLAIMS TRAVERSED
List numerically

(prefix)	(number)
P	1030179
P	1030180
P	1030181
P	1030182
P	1030183
P	1030184
P	1030185
P	1030186
P	1030187
P	1030188
P	1030189

If space insufficient, attach list

TOTAL CLAIMS 11

OFFICE USE ONLY

837 (85/12)

GEOCHEMICAL SURVEY – PROCEDURE RECORD

Numbers of claims from which samples taken: P1030179 – P1030189, P1030191, P1030192

Total Number of Samples: 662

Type of Sample (Nature of Material): soil

Average Sample Weight: 250 g

Method of Collection: mattock

Soil Horizon Sampled: B

Horizon Development: good - excellent

Sample Depth: 5 - 20 cm

Terrain: rolling hills - elevation ranging between 380 - 430 metres ASL

Drainage Development: fair

Estimated Range of Overburden Thickness: 0 - 10 metres

SAMPLE PREPARATION

(Includes drying, screening, crushing, ashing)

Mesh size of fraction used for analysis: - 80

all samples dried and screened for - 80 mesh fraction

General

ANALYTICAL METHODS

Values expressed in: per cent ☐ p. p. m. ☒ p. p. b. ☒ Au

(Cu,) (Pb,) (Zn,) Ni, Co, (Ag,) Mo, (As,) (circle)

Others: Mn, Au

Field Analysis (tests)

Extraction Method

Analytical Method

Reagents Used

Field Laboratory Analysis

No. (— tests)

Extraction Method

Analytical Method

Reagents Used

Commercial Laboratory (tests)

Name of Laboratory: MIN-EN LABORATORIES

Extraction Method: ACID DIGESTION

Analytical Method: ICP AAS

Reagents Used: HOT AQUA REGIA

General

Ministry of Northern Development and Mines
Ontario

DOCUMENT No. W 8906-525

Report of Work 2.12903
(Geophysical, Geological and Geochemical

Mining Act

41010NE0016 2.12903 CUNNINGHAM 900

Type of Survey(s)	Mining Division	Township or Area
GEOCHEMICAL	PORCUPINE	CUNNINGHAM TWNSHP.

Recorded Holder(s)	Prospector's Licence No.
GRAND AMERICA MINERALS LTD	T5121

Address	Telephone No.
510 - 540 BURRARD ST, VANCOUVER, B.C.	(604) 662 - 8797

Survey Company: C.F. STAARGAARD - CONSULTING GEOLOGIST

Name and Address of Author (of Geo-Technical Report)	Date of Survey (from & to)
C.F. STAARGAARD 912-510 W. HASTINGS ST VANCOUVER BC	22 9 89 (Day Mo. Yr.) – 6 10 89 (Day Mo. Yr.)

Credits Requested per Each Claim in Columns at right

Special Provisions		Days per Claim
For first survey: Enter 40 days. (This includes line cutting)	Geophysical	
	- Electromagnetic	
	- Magnetometer	
For each additional survey: using the same grid: Enter 20 days (for each)	- Other	
	Geological	
	Geochemical	20
Man Days	Geophysical	Days per Claim
Complete reverse side and enter total(s) here	- Electromagnetic	
	- Magnetometer	
	- Other	
	Geological	
	Geochemical	
Airborne Credits		Days per Claim
Note: Special provisions credits do not apply to Airborne Surveys.	Electromagnetic	
	Magnetometer	
	Other	

Total miles flown over claim(s).

Date	Recorded Holder or Agent (Signature)

Mining Claims Traversed (List in numerical sequence)

Mining Claim Prefix	Number	Mining Claim Prefix	Number	Mining Claim Prefix	Number
P	1030179				
P	1030180				
P	1030181				
P	1030182				
P	1030183				
P	1030184				
P	1030185				
P	1030186				
P	1030187				
P	1030188				
P	1030189				

Total number of mining claims covered by this report of work: 11

RECEIVED ... 2 ... 1989 MINING LANDS SECTION

Certification Verifying Report of Work

I hereby certify that I have a personal and intimate knowledge of the facts set forth in this Report of Work, having performed the work or witnessed same during and/or after its completion and annexed report is true.

Name and Address of Person Certifying: C. F. STAARGAARD address same as above

Telephone No.	Date	Certified By (Signature)
(604) 687-...	Nov 2 1989	[signature]

ONTARIO GEOLOGICAL SURVEY ASSESSMENT FILES OFFICE FEB ... 1990 RECEIVED

For Office Use Only

Total Days Cr. Recorded	Date Recorded	Mining Recorder	Received Stamp
220	Nov. 21/89	[signature]	NOV 21 1989
	Date Approved as Recorded	Provincial Manager, Mining Lands	
	9 Feb 90	[signature]	

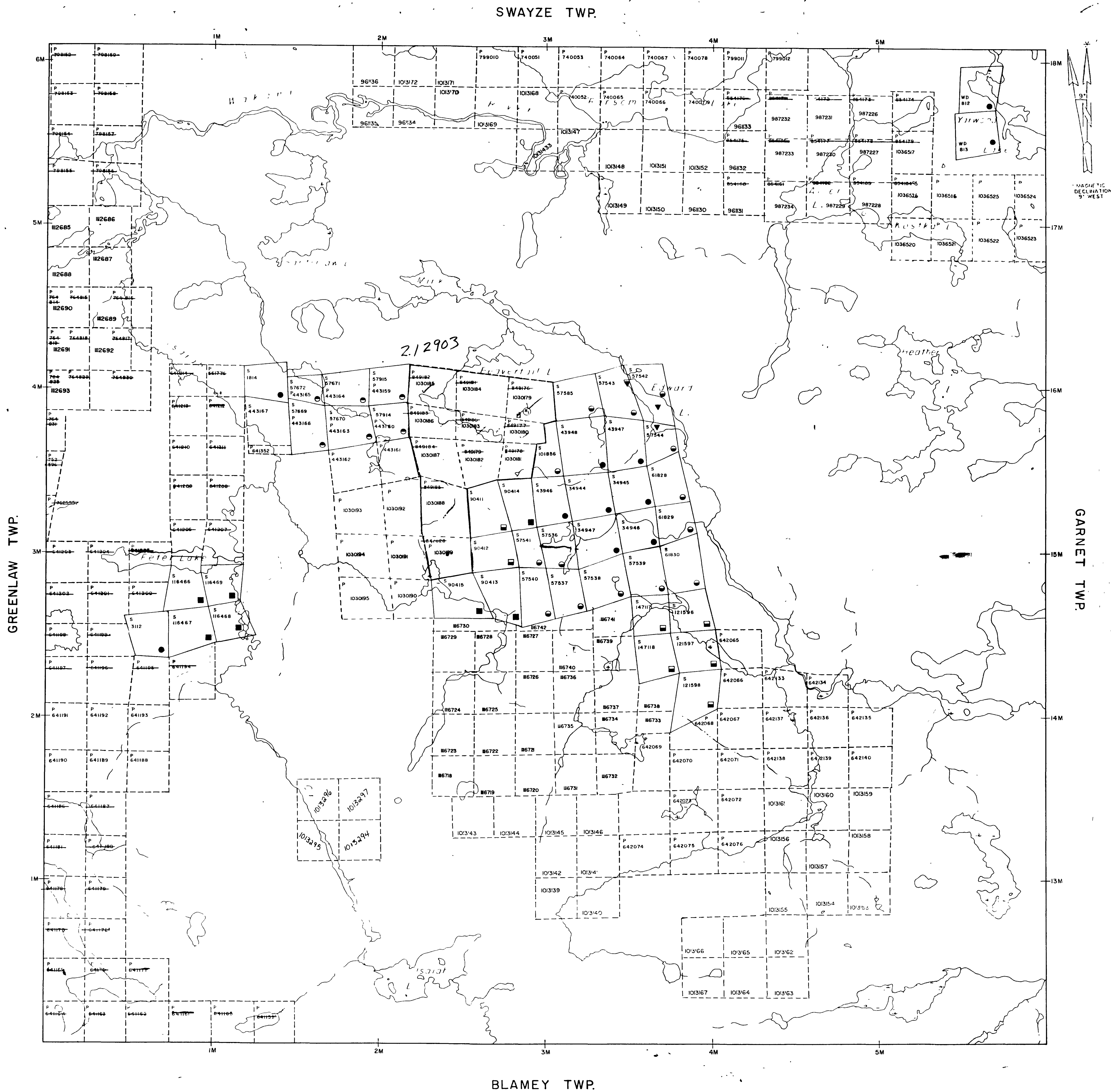
PORCUPINE MINING DIVISION RECEIVED NOV 21 1989

1362 (89/06)

M.R.O. – MINING RIGHTS ONLY
S.R.O. – SURFACE RIGHTS ONLY
M.+ S. – MINING AND SURFACE RIGHTS

Description	Order No	Date	Disposition	File

(R) CROWN RESERVE



HIGHWAY AND ROUTE No
OTHER ROADS
TRAILS
SURVEYED LINES
TOWNSHIPS BASE LINES ETC
LOTS MINING CLAIMS PARCELS ETC
UNSURVEYED LINES
LOT LINES
PARCEL BOUNDARY
MINING CLAIMS ETC
RAILWAY AND RIGHT OF WAY
UTILITY LINES
NON PERENNIAL STREAM
FLOODING OR FLOODING RIGHTS
SUBDIVISION OR COMPOSITE PLAN
RESERVATIONS
ORIGINAL SHORELINE
MARSH OR MUSKEG
MINES
TRAVERSE MONUMENT

DISPOSITION OF CROWN LANDS

TYPE OF DOCUMENT	SYMBOL
PATENT SURFACE & MINING RIGHTS	●
SURFACE RIGHTS ONLY	◓
MINING RIGHTS ONLY	◒
LEASE SURFACE & MINING RIGHTS	■
SURFACE RIGHTS ONLY	⬒
MINING RIGHTS ONLY	⬓
LICENCE OF OCCUPATION	▼
ORDER IN COUNCIL	OC
RESERVATION	(R)
CANCELLED	⊗
SAND & GRAVEL	(S)

NOTE MINING RIGHTS IN PARCELS PATENTED PRIOR TO MAY 6 1913 VESTED IN ORIGINAL PATENTEE BY THE PUBLIC LANDS ACT R.S.O. 1970 CHAP 380 SEC 63 SUBSEC 1

Metres 500 0 1000 Metres
Chains 10 0 10 20 30 40 50 60 70 Chains
Feet 500 0 1000 2000 3000 4000 5000 Feet

SCALE 1:20 000

RECEIVED NOV 7 1989

TOWNSHIP
CUNNINGHAM

M.N.R. ADMINISTRATIVE DISTRICT
CHAPLEAU
MINING DIVISION
PORCUPINE
LAND TITLES / REGISTRY DIVISION
SUDBURY *Revised Sept 15/86*

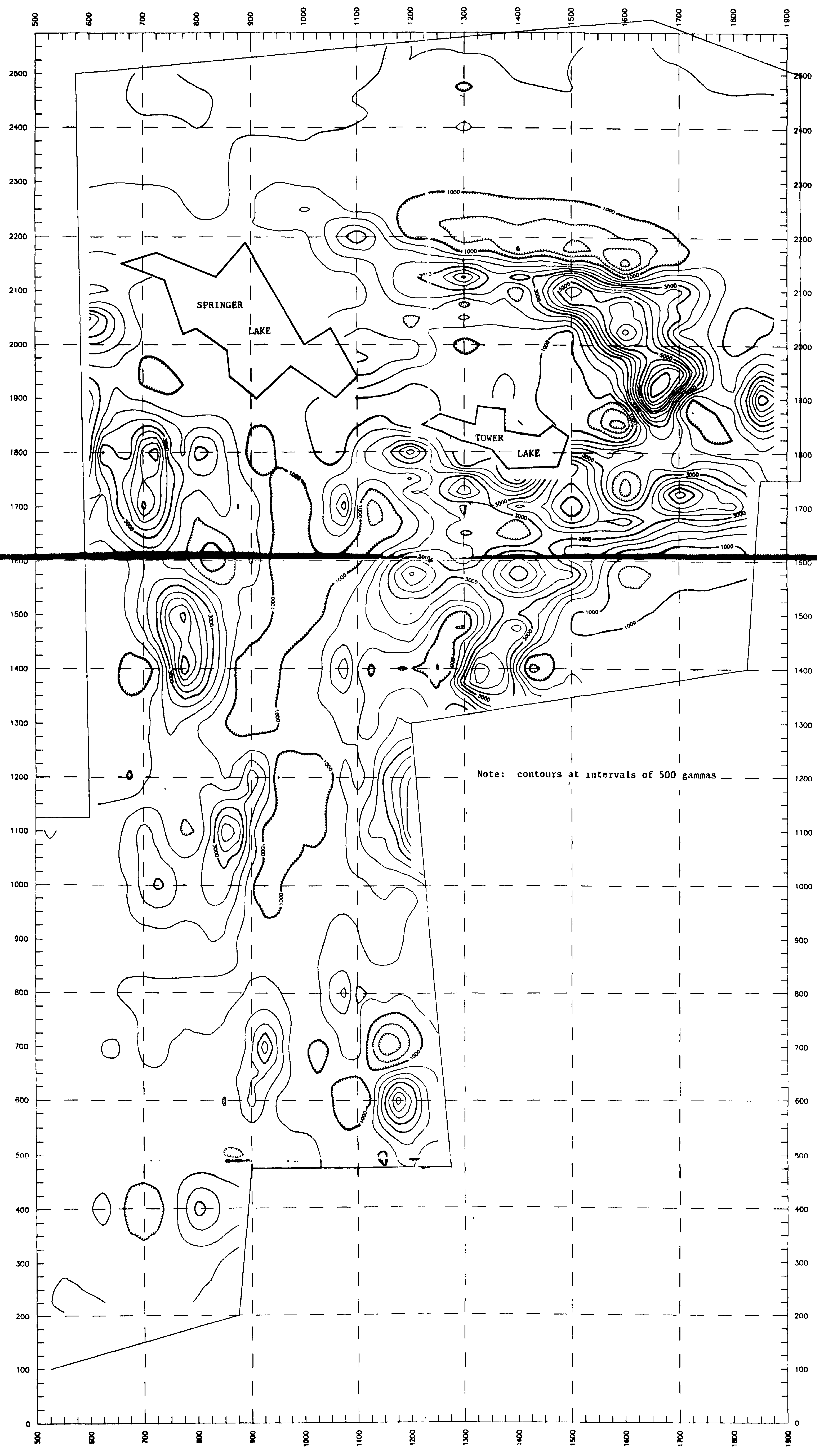
Ministry of Natural Resources — Ministry of Northern Development and Mines — Ontario

Date AUGUST, 1986 — Number G-1095

CK-Angie Sept 15/86

CUNNINGHAM TWP. G-1095

41O10NE0016 2.12903 CUNNINGHAM 200



2.12903

METRES 0 50 100 200 300 METRES

GRAND AMERICA MINERALS LTD.

TOWER LAKE PROPERTY, CUNNINGHAM TOWNSHIP, ONTARIO

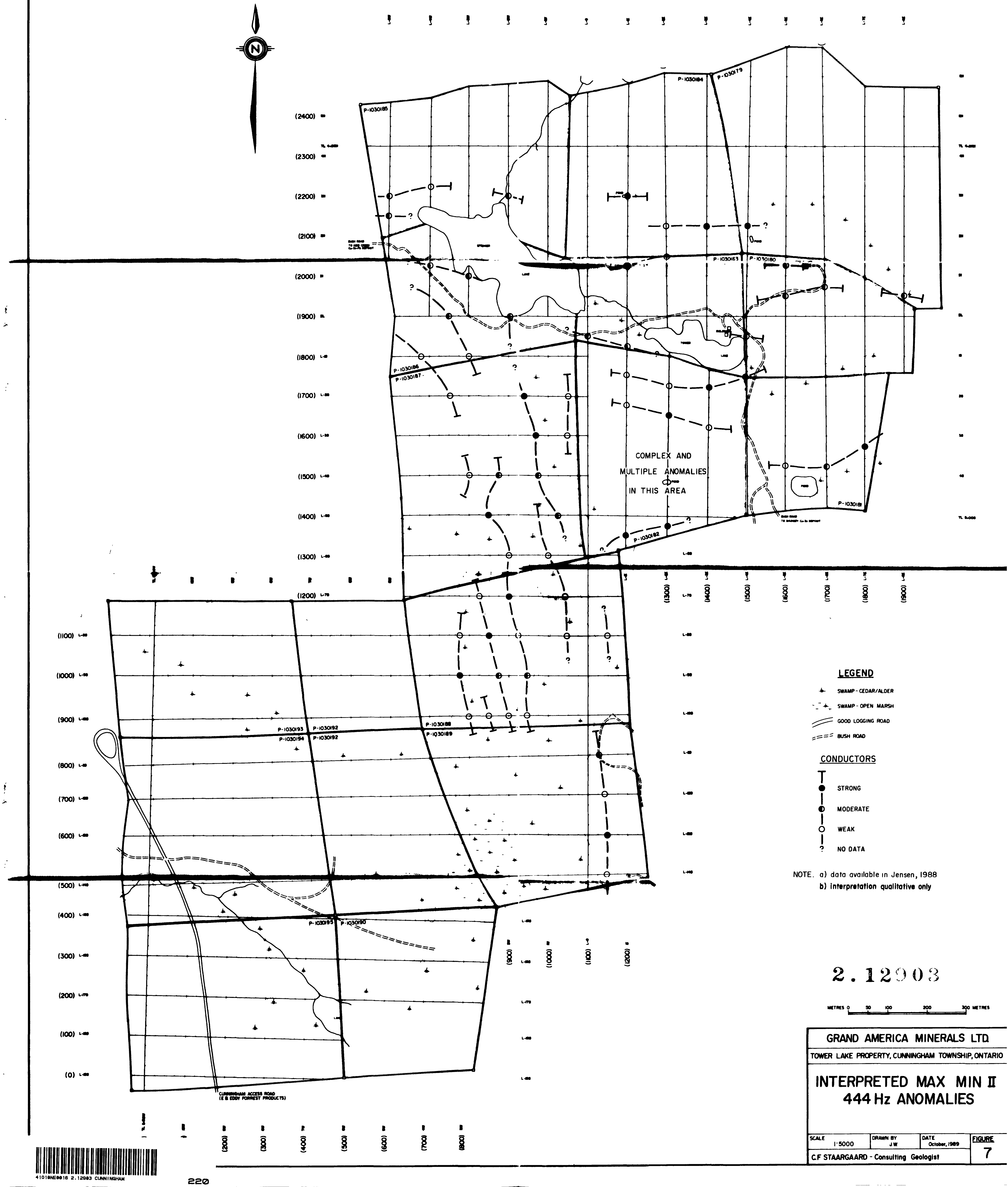
SMOOTHED MAGNETIC VALUES

SCALE	DRAWN BY J W	DATE October, 1989	FIGURE 6

C F STAARGAARD - Consulting Geologist

41O10NE0016 2.12903 CUNNINGHAM

210



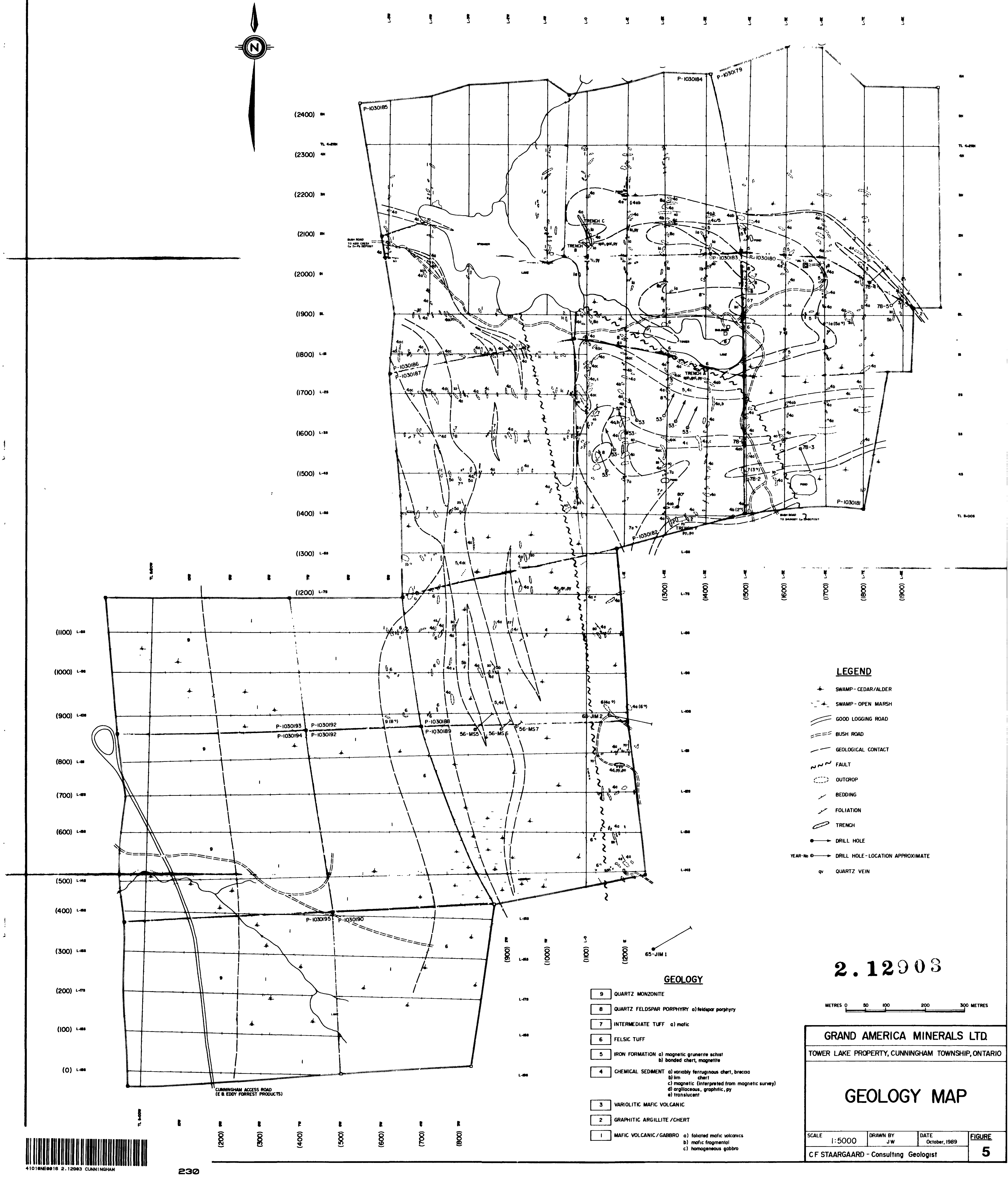
GRAND AMERICA MINERALS LTD.

TOWER LAKE PROPERTY, CUNNINGHAM TOWNSHIP, ONTARIO

INTERPRETED MAX MIN II 444 Hz ANOMALIES

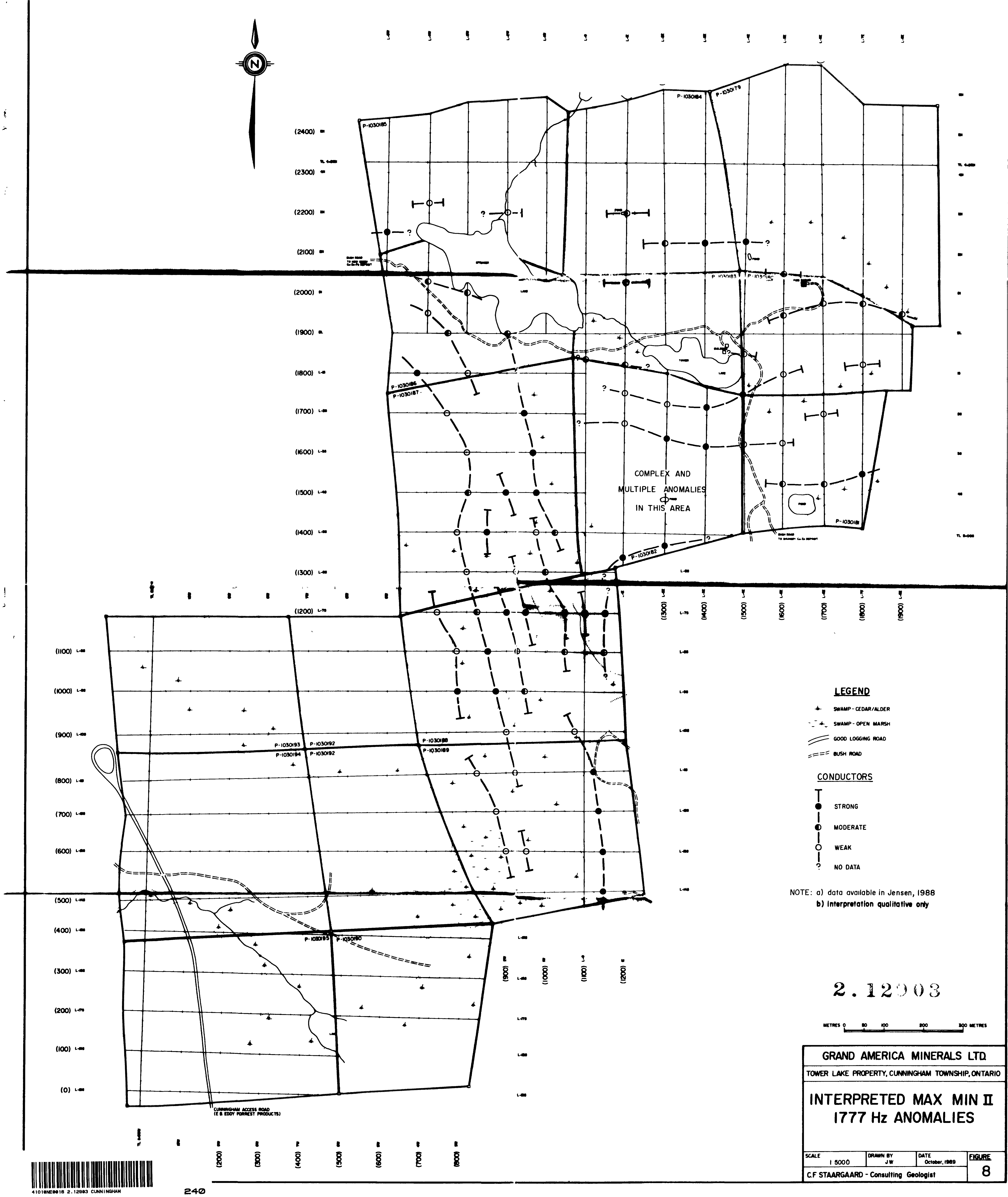
SCALE	DRAWN BY	DATE	FIGURE
1:5000	J.W.	October, 1989	7

C.F. STAARGAARD - Consulting Geologist



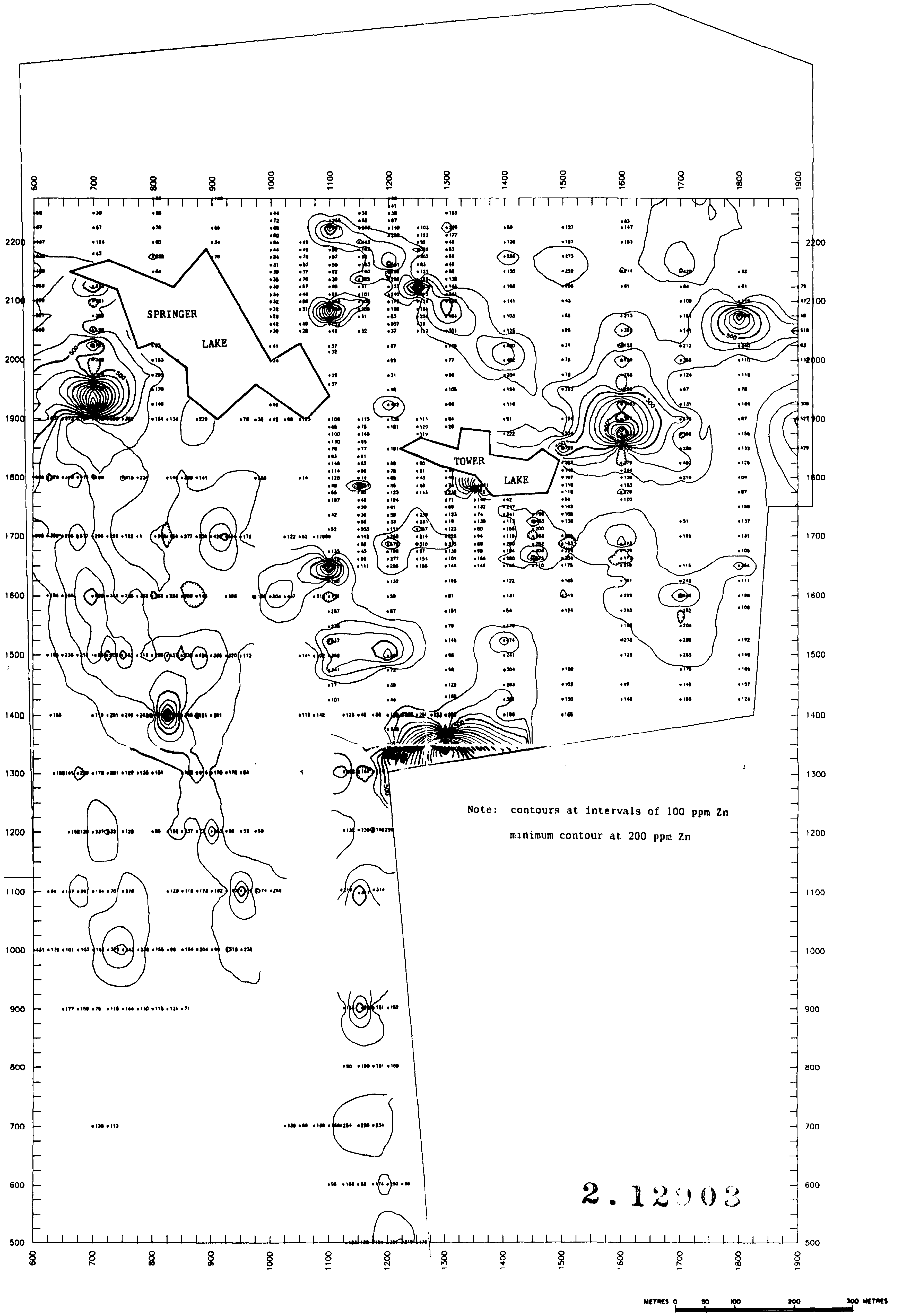
41010NE0016 2.12903 CUNNINGHAM

230



41010NE0018 2.12983 CUNNINGHAM

240

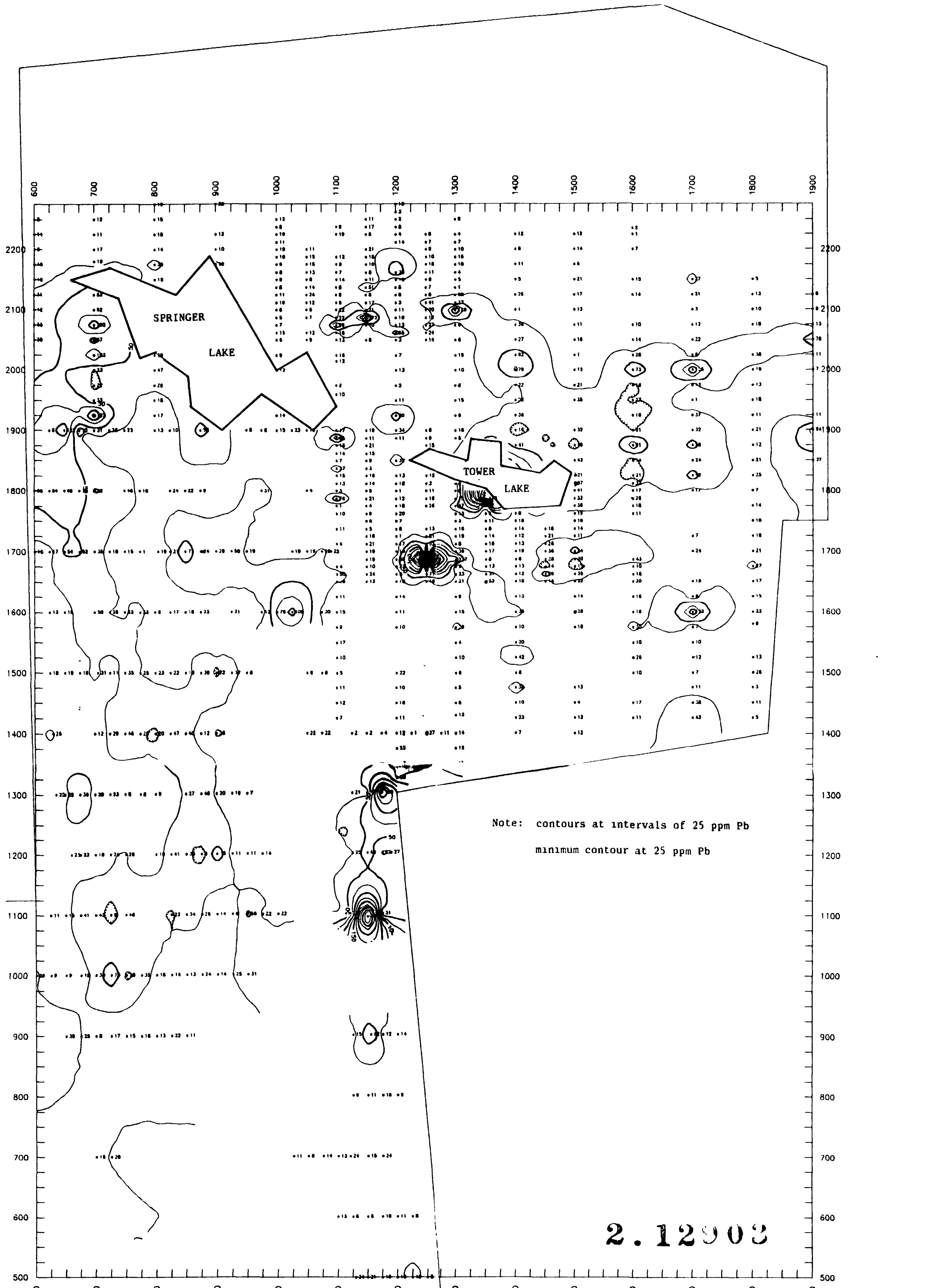


GRAND AMERICA MINERALS LTD.

TOWER LAKE PROPERTY, CUNNINGHAM TOWNSHIP, ONTARIO

PPM ZN IN B HORIZON SOILS

SCALE	DRAWN BY: J.W.	DATE October, 1989	FIGURE 9
C.F. STAARGAARD - Consulting Geologist			



METRES 0 50 100 200 300 METRES

GRAND AMERICA MINERALS LTD.

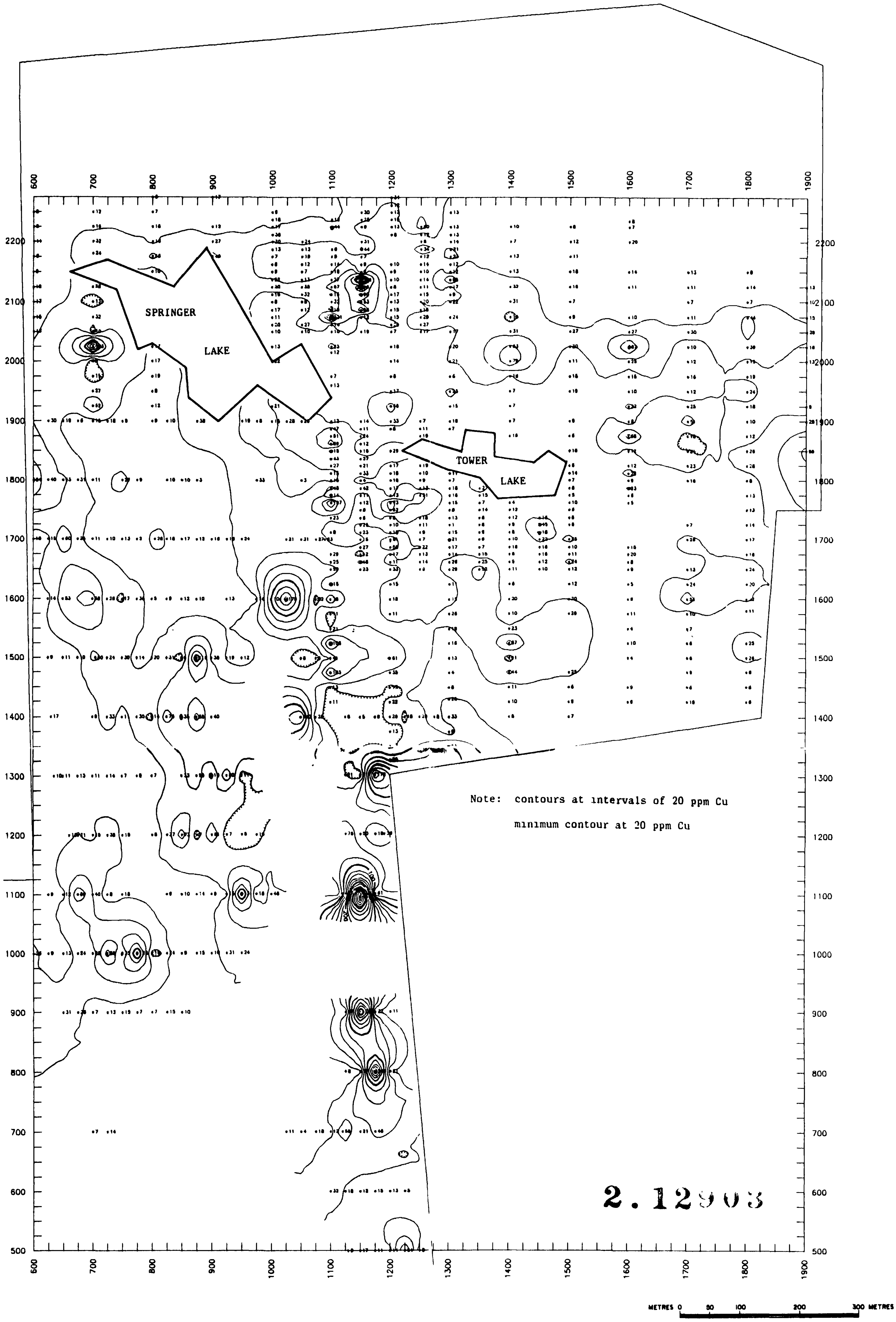
TOWER LAKE PROPERTY, CUNNINGHAM TOWNSHIP, ONTARIO

PPM PB IN B HORIZON SOILS

SCALE	DRAWN BY: J W	DATE October, 1989	FIGURE 10
C.F STAARGAARD - Consulting Geologist			

41010NE0016 2.12903 CUNNINGHAM

260



GRAND AMERICA MINERALS LTD.

TOWER LAKE PROPERTY, CUNNINGHAM TOWNSHIP, ONTARIO

PPM CU IN B HORIZON SOILS

SCALE	DRAWN BY: J W	DATE October, 1989	FIGURE 11

C F STAARGAARD - Consulting Geologist

41010NE0016 2.12903 CUNNINGHAM

270