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63.985

REPORT
ON
GOLD FLACER PROPERTY
CONCOR-CHIBOUGAMAU MINES LIMITED
MILNET AREA
SUDBURY MINING DIVISION
PROVINCE OF ONTARIO
BY
R. J. COOK, GEOLOGIST

DECEMBER 1959

63.985

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J. COOK, B.Sc. M.Sc., F.G.S.
MINING CONSULTANT

INTRODUCTION

The property, described herein, is a gold placer prospect located in the Milnet Area, Province of Ontario. During the past several months a geological survey of the property has been made and a map of the property has been prepared on a scale of one inch equals four hundred feet.

PROPERTY

The property consists of 66 unpatented mining claims. This comprises approximately 2640 acres of land and land under water. The claims are located in Hutton, Parkin and Norman Townships, Sudbury Mining Division, Province of Ontario. The claims are numbered as follows:

S-90430 - 31 (inclusive)	2
S-91018 - 19 "	2
S-91762 - 70 "	7
S-95389	1
S-99411 - 20 "	10
S-99430 - 34 "	5
S-99491 - 95 "	5
S-100186- 94 "	9
S-105829- 40 "	12
S-107167	1
✓ S-107320- 28 "	9
✓ S-107362	1
	<hr/>
	66.

LOCATION AND ACCESS

The property is located approximately 10 miles north of the town of Capreol, Ontario. A good all weather road services the hamlet of Milnet from Capreol and passes through the property of Concor-Chibougamau Mines.

TOPOGRAPHY

The topography is one of low relief. Elevation differences are less than 100 feet. Hills consisting of basement complex rock are separated by low areas which are filled with unconsolidated deposits of Pleistocene and Recent Age.

TIMBER

The timber on the property consists principally of second growth poplar, birch, and spruce. The spruce is confined mainly to the higher ground.

GENERAL GEOLOGY

The geological formations of the area may be classified as Precambrian, Pleistocene and Recent. The areas of Precambrian rock outcrops have been outlined on the present map. They are of granitic composition and texture. The unconsolidated deposits are of Pleistocene Age and these have been modified very little during Recent time.

The outcrops of Precambrian rock formations were outlined during the survey. They consist principally of granite and granite-gneiss. The Precambrian geology is shown on Map no. 41C; Moose Mountain - Wanapitei Area; Ontario Dept. of Mines in Volume XLI, Part 4, 1939.

The Pleistocene deposits of the map area include those deposited by the agencies of ice, water, and wind. The deposits fall into three classifications - glacio-eolian, glacio-fluvial, and glacial. Of these three the glacio-fluvial are the predominant types; the glacio-eolian are surface deposits only and the glacial are limited to a thin veneer type of deposit plastered down on the rock controlled hills.

Along with the glacio-fluvial deposits may be included some deposits derived from the glacial till which was reworked by post-glacial waters. The presence of glacial till in the map area would indicate that at least some of the reworked and sorted waterlain deposits derived from this latter mentioned source.

The glacio-fluvial deposits of the map area are typical of those which occur in an area where there is sufficient slope of the land for stream flow but where sudden changes occur in the velocity of the waters causing deposition of their load. The streams may have at one time been subglacial and at a later time, as the ice retreated from the map area, been sub-aerial.

It is believed that the main flow of waters occurred in the channelways as shown on the map and that this was the main drainage system from north to south in the time immediately before the ice retreated allowing the waters to seek a lower drainage channel. This lower drainage channel is now the present site of the Vermilion River which drains through Fraser Lake and Ross Lake and then southward towards Capreol. It lies on the extreme western edge of the map area.

The glacio-fluvial deposits consist of boulders, gravel, sand, silt, and clay. The clay and silt adhere to the larger rock debris and the clay also occurs as clay balls and clayey layers within the gravels and sands. Better gold values are encountered where a clay seam or layer exists in the deposits. The clay seams are narrow and occur as lenses in the deposits.

The glacial deposits of the map area consist of till made up of boulders, clay and other rock fragments and plastered down as a thin veneer on the sides and tops of some of the rock knobs which form low lying hills on the property. The best example occurs in the large area shown near the centre of the property.

The glacio-eolian deposits were the last to be laid down in the map area and consequently these deposits conceal much of the detail of the glacio-fluvial deposits and the glacial deposits. The deposits consist principally of dune sands and silt with the possibility

some loess. These deposits of sand and silt appear elongate in a north-south direction roughly parallel to the deposits of glacio-fluvial origin.

There are deposits of Recent Age occurring in the low lying areas. They consist of swamp deposits and thin layers of silt or mud in the bottoms of small lakes or ponds. The map area has an ample cover of vegetation. There has been little, if any, erosion of the deposits by stream action during Recent time.

ECONOMIC GEOLOGY

The glacio-fluvial deposits contain placer gold in the map area. Gold content of economic importance has been discovered in the channelways where the glacio-fluvial deposits were deposited. The course of these channelways has not been arbitrary but has been controlled somewhat by masses of Precambrian rock which occur as rounded hills in the map area. There are some small rock cliffs in the area which have been caused by frost action and other weathering agencies since Pleistocene time, however, these are not numerous and there are no talus accumulations of significant size.

The channelways appear to have followed pre-existing structural lineaments which occurred in the Precambrian rock formations and which were modified by glacial action during Pleistocene time. These channelways trend in a north-south direction and roughly parallel

the present course of the Vermilion River.

NATURE OF THE GOLD

The placer gold which occurs in the deposits is not coarse but is of the "shot" size variety. It is readily concentrated using gravity separation in a medium of water. The gold fragments are free and are not associated with or attached to any other mineral or rock fragment. Nuggets are not common although pieces of gold of up to about 50 milligrams have been encountered.

There are two types of gold in the deposits which have different physical characteristics. One type occurs as bright yellow fragments of small size. This type appears to occur in the deposits nearer to the surface. The other type occurs as rusty coloured fragments and is usually coarser than the former. This type occurs at deeper horizons in the deposits. The significance of these different physical characteristics is not readily apparent. A study of the chemical composition and the texture of the two types may reveal features of importance.

Both types of gold are ubiquitous throughout the glacio-fluvial deposits. However, like all placers, concentrations occur in certain paystreaks within the deposits where conditions obtained which were favourable to the accumulation and concentration of the gold. These paystreaks are narrow and are limited in lateral extent.

They are, however, repetitive within the glacio-fluvial channelways.

ORIGIN OF THE GOLD

The origin of the placer gold concentrations in the glacio-fluvial deposits in the map area can probably be related to four important factors. In the case of the map area there are two main features which distinguish it from the glaciated Precambrian as a whole. These are:

1) The existence of a pre-glacial north-south valley, which no doubt marked a river system, and which controlled ice movements and drainage to a marked degree.

2) The occurrence to the north of the area of the Porcupine and Shining Tree lode deposits.

Two other features of importance are:

1) The possibility of there being pre-glacial placer gold concentrations which were not entirely dissipated by glacial action.

2) The concentrating powers of the torrential glacial streams.

The fact that the flow of the glacial streams was more or less confined to pre-existing valleys between rock prominences could have been of prime importance, effecting concentration in the map area.

Respectfully Submitted,

December 11, 1959

R. J. Cook

R. J. Cook, Geologist.



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**REPORT ON
REFRACTION SEISMOGRAPH SURVEY
FOR
CONCOR CHIBOUGAMAU MINES LIMITED
MILNET, ONTARIO**

REPORT ON
REFRACTION SEISMOGRAPH SURVEY
FOR
CONCOR CHIBOUGAMAU MINES LIMITED
MILNET, ONTARIO

Abstract

Concor Chibougamau Mines Limited has under its control 36 mining claims in the area around Milnet, Ontario. This group is situated in a portion of the Vermillion River channel long known for its gold placer potentialities.

A means of detecting old river channels and deeper sections within these channels was desired as a method of choosing the most favourable drill test locations. An experimental refraction programme involving the use of a small one channel seismograph unit was carried out for the company by Sulmac Exploration Services Limited.

The results of the survey are encouraging and a continuation of the programme has been recommended.

Purpose

As with any other geophysical survey the method used must be tailored to the geological target. In the present instance it is desired to explore the bedrock surface for old river channels and deeper portions within them, and thus a means of accurately determining the depth of overburden is required. There are three geophysical methods for making such determinations, that is:

- i) Reflection Seismograph
- ii) Refraction Seismograph
- iii) Resistivity

Of these, the first two are easily the most reliable and about equally so. Resistivity is much too dependent on lateral variations in overburden conditions to be accurate under some conditions. The reflection seismograph method would be, in general, faster than the refraction method but requires multi-channel equipment at present. The refraction technique may be used employing one channel equipment or employing more elaborate multi-channel equipment. Taking into account the need for the combination of portability, accuracy and

relative inexpensiveness, the model MD-1 portable refraction Seismograph was chosen for the job.

The results of the experimental survey are shown on the accompanying plan.

Property - Location, Description and Accessibility

The 36 claim property is located in the Vermillion River area near Milnet, Ontario. This area is approximately 25 miles north of Sudbury.

The claims lie in Hutton and Parkin Townships and their location is more precisely shown on the claim index map included with the report.

The property is readily accessible by road from Capreol or by rail to Milnet on the main line of the Canadian National Railway.

Geology

The Vermillion River gravel beds from Meteor Lake south to the Blezzard Valley in the interior of the Sudbury basin have been known to carry gold values in placer form for many years. The Ontario Bureau of Mines reports have contained references to these gravels since

1897. Sporadic prospecting has undoubtedly gone on since the late nineteenth century.

According to Coleman's report (Ontario Bureau of Mines, Vol. X, 1901) the source of the gold is thought to be Huronian sediments since many of the pebbles and boulders within the gravels can be identified as belonging to this geological period. The Vermillion River Valley may represent a large post glacial river system and the gravels formed by the movement of glacial debris by this system. If this is the case rather than their being lacustrine deposits, then it would be logical to explore for old river channels and for old pools within these channels. This would involve determining the configuration of the bedrock surface.

Geophysics

Method:

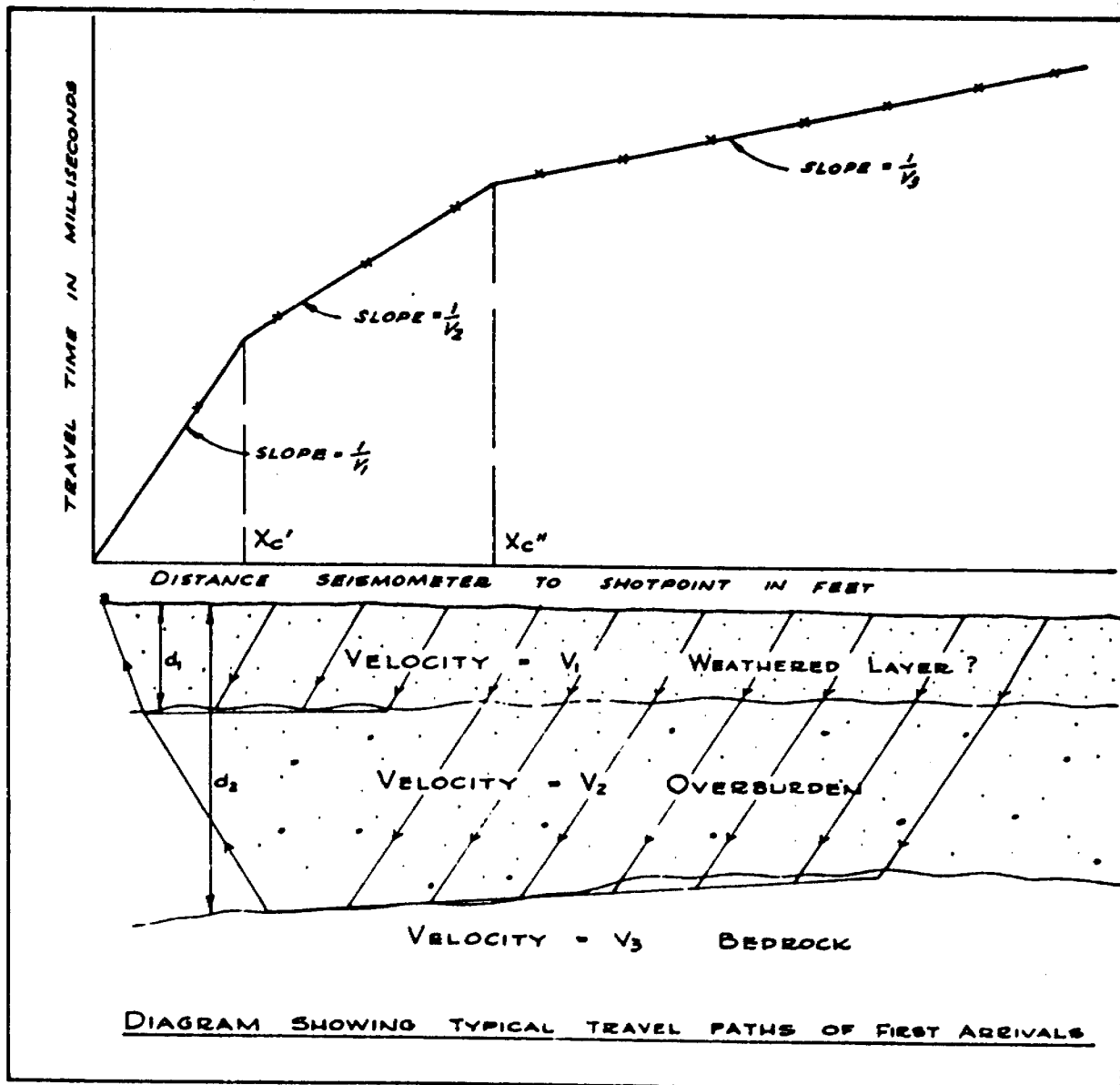
The refraction seismic survey was carried out on lines outlined by R.J. Cook, the company's consultant, using a Model MD-1 Refraction Seismograph. The mechanics of the operation are quite straightforward in that a source of sound energy is applied to the ground surface, in this

case a hammered plate, an electric cap or dynamite depending on the distance from the shot point to the seismometer, and the time of this energy to reach the seismometer measured. The position of application of this energy is moved away from the seismometer in regular intervals and a set of velocity curves such as indicated in Figure 1 may be built up. The aforementioned diagram shows schematically the method of application and calculation.

In getting overburden depths under the lake the velocities out to V_3 were established on shore and then dynamite lowered to the bottom of the lake, through the ice in this case, and exploded. Knowing the depth of water, the overburden velocities and the distance from the seismometer to the shot point and the travel time, the only unknown is the thickness of the unconsolidated muck at the lake bottom -- this is probably reasonably uniform in thickness-- and therefore the depth to bedrock under each shot point can be calculated.

Discussion of Results:

The programme consisted of three phases:



FORMULAE FOR CALCULATION

$$d_1 = \frac{X_{c'}}{2} \sqrt{\frac{V_2 - V_1}{V_2 + V_1}}$$

$$d_2 = d_1 + \frac{X_{c''}}{2} \sqrt{\frac{V_3 - V_2}{V_3 + V_2}} + \frac{d_1}{V_1 \sqrt{V_3^2 - V_2^2}} \left[V_3 \sqrt{V_2^2 - V_1^2} - V_2 \sqrt{V_3^2 - V_1^2} \right]$$

SAMPLE CALCULATION

$V_1 = 1500$ ft per sec.
 $V_2 = 3500$ " " "
 $V_3 = 15000$ " " "
 $X_{c'} = 80$ ft.
 $X_{c''} = 200$ ft.

$$d_1 = \frac{80}{2} \sqrt{\frac{3500 - 1500}{3500 + 1500}} = 40 \sqrt{\frac{2000}{5000}} = 25.3 \text{ ft}$$

$$\begin{aligned}
 d_2 &= 25.3 + \frac{200}{2} \sqrt{\frac{15000 - 3500}{15000 + 3500}} + (\text{very small term}) \\
 &= 25.3 + 77.4 = 102.7 \text{ feet}
 \end{aligned}$$

Figure 1

1. Trial determinations at locations of known overburden depths.
2. Profiling across the expected strike of the hidden channels.
3. Profiling along the channel to determine deeper portions.

The initial phase of the programme was accomplished by making depth determinations at two drill hole locations. The predicted depths as against drill determined depths were respectively 64 feet versus 62 feet and 117 feet versus 112 feet. These tests served to show that the method was quite adequate for the area in question.

The second phase, which constituted a river channel exploration test, included 45 separate seismometer points. Six of these were "spreads" across the river and Fraser Lake. It was found in most instances that it was necessary to use caps and dynamite for energy rather than the hammered plate. This was probably due to the absorption of much of the energy by the rather loose sandy gravel at the surface. If the results may be considered as having

a similar accuracy to those of phase one, then indications of possible channels are evident. The suggested pattern of these channels is shown on the index map on the accompanying plan. It is obvious in the case of lines B and E that the profiles should have been extended to the east for a more complete picture.

The final test was to determine if once knowing the location of the old channel could the variation in depth along it be estimated. Unfortunately the ground conditions deteriorated at the time of this survey as well as considerable difficulty in operating the equipment in the extreme cold and therefore insufficient work was carried out to make a true evaluation of this phase. Three determinations were made but with no continuity.

Summary and Conclusions

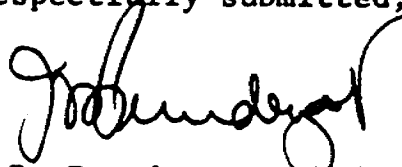
As a test programme the refraction work must be considered as having been successful. First, in trials beside drill holes it showed an unexpectedly high accuracy which should not be considered as the usual average. It is thought that plus or minus ten percent would be more the order of magnitude. Secondly, as a means of finding

channels it is thought to have demonstrated a sufficient ability to satisfy this requirement. Lastly, as a means of exploring the variations along the bottom of the channel it is an unknown quantity as far as these tests are concerned, however in consideration of its other proven accomplishments it is not thought that any large difficulty will be met in this use.

Recommendations

In light of the successful test programme it is recommended that the Refraction Seismograph method for locating old river channels be used to outline such channels on the Concor Chibougamau - Milnet property. This survey would best recommence after the snow has disappeared from the area.

Respectfully submitted,



J.B. Prendergast, M.A., P.Eng.

Toronto, Ontario

May 13, 1959



CONSOR CHIBOUGAMAU MINES LIMITED

Date of Survey: February 1 - 19th

Type of Instrument: Portable Seismic unit MD 1

Stations established: 46

Miles of Line: 1.59

Line Cutters: W.L. Ennis,
L. Gervais
C. Brunet

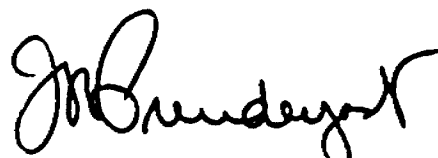
Instrument Operator: Floyd Falkner

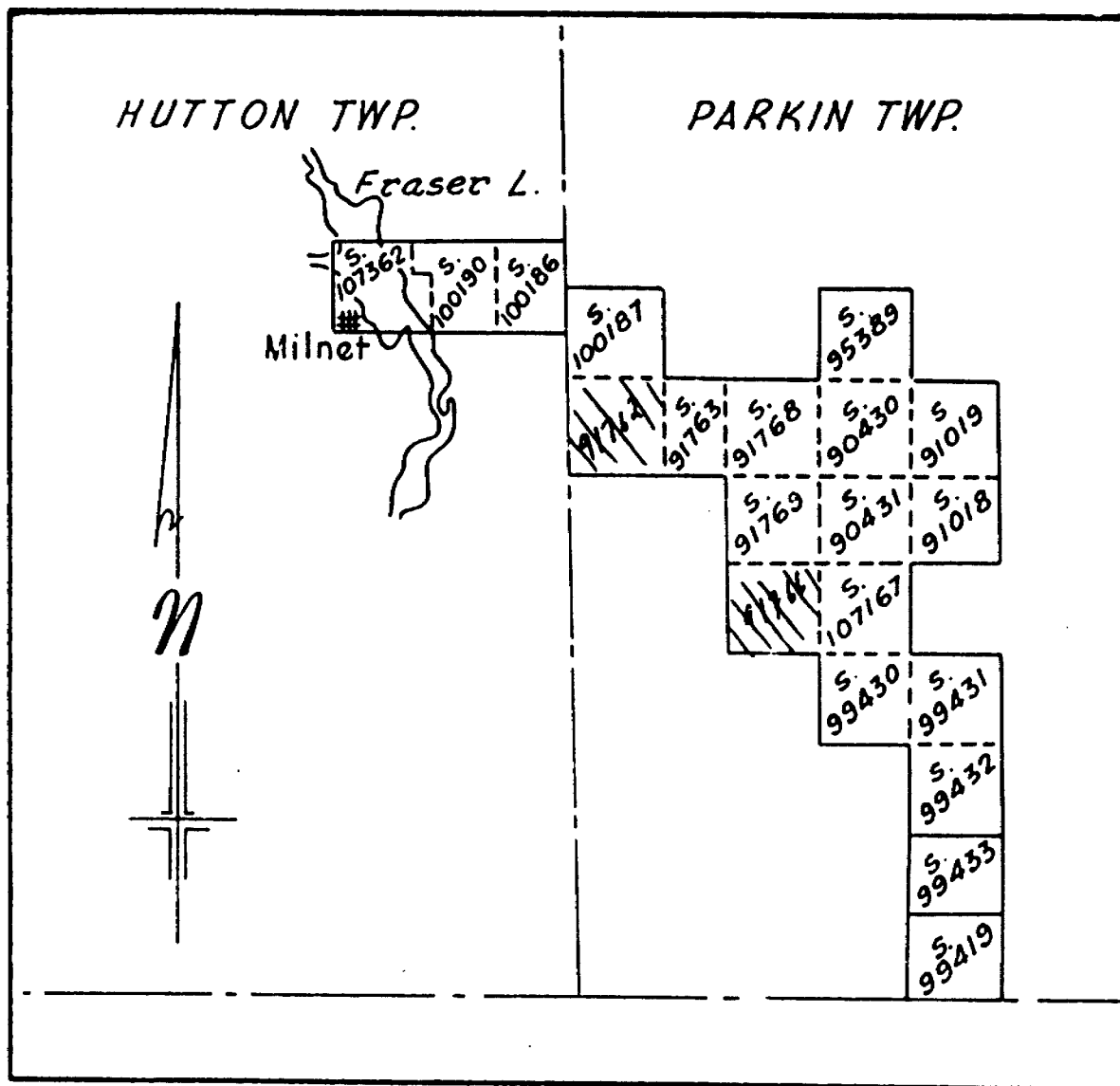
Consultants: Sulmac Exploration Services Limited
R.J. Cook

Draughtsman: E. George

Field Assistants: R. Date
W. Kleinhaupt

Toronto, Ontario
May 13, 1959


J.B. Prendergast, P.Eng.

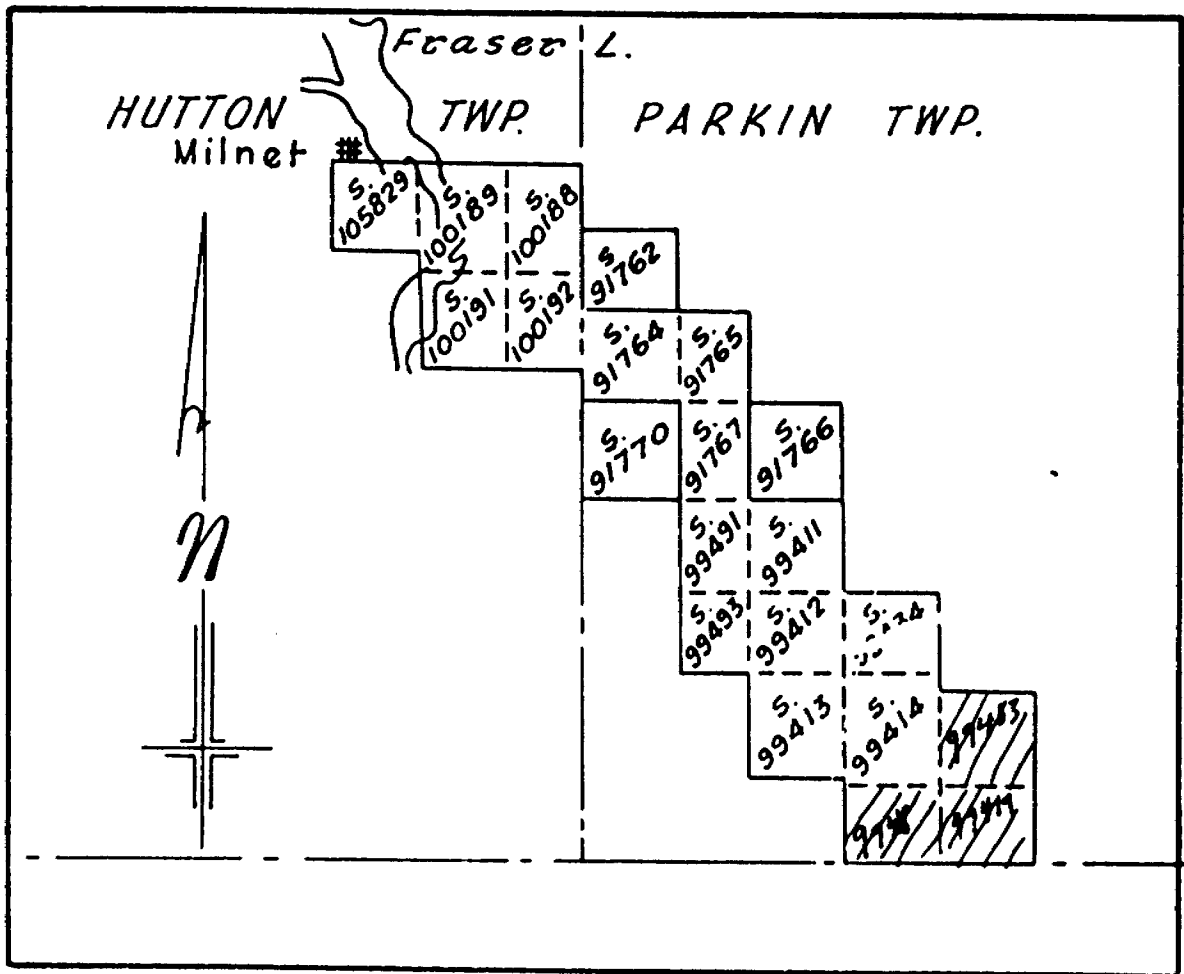


GROUP N°1

CONCOR CHIBOUGAMAU MINES
MILNET AREA

Sudbury M. D. - Prov. of Ontario

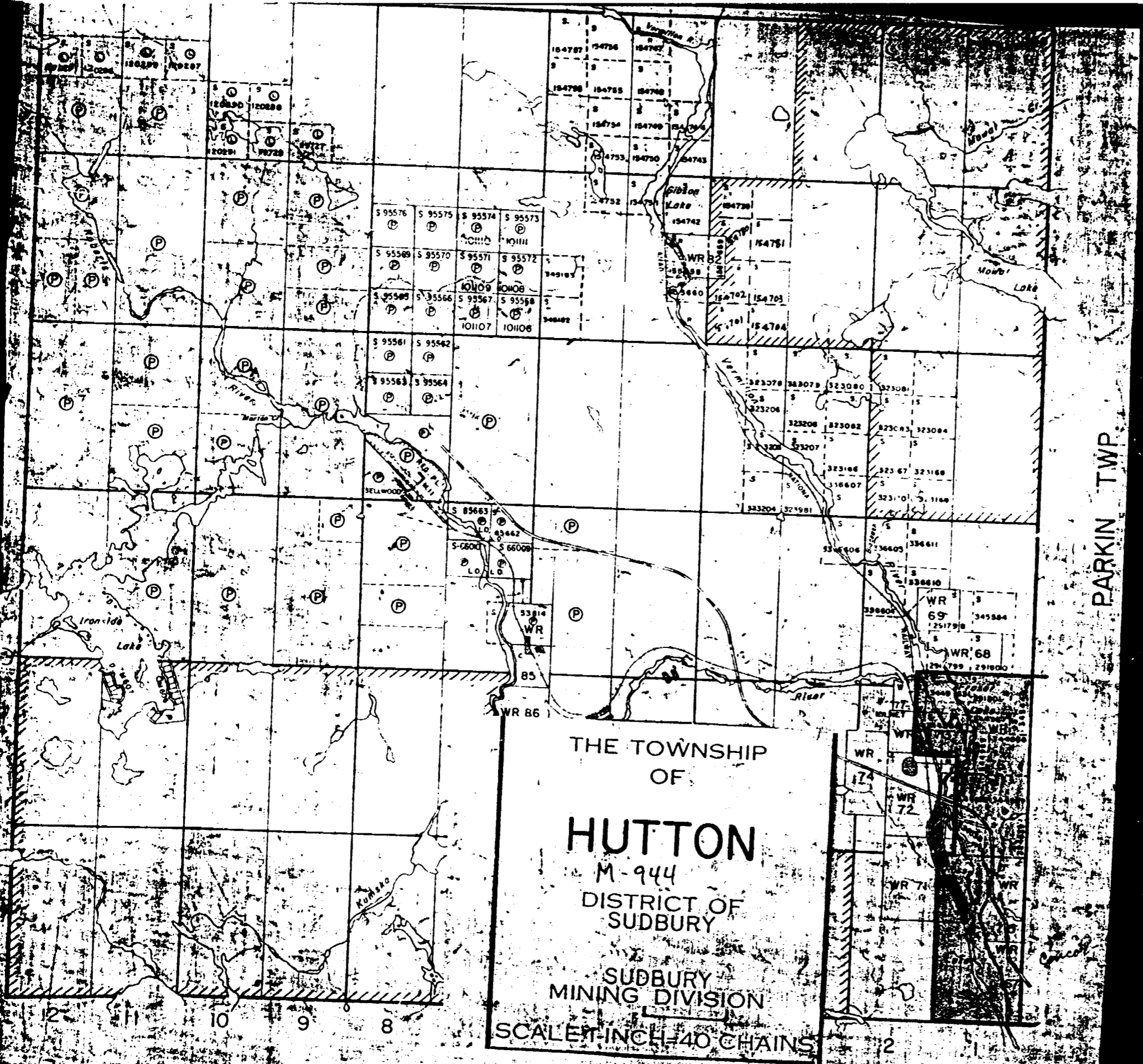




GROUP N°2

CONCOR CHIBOUGAMAU MINES
MILNET AREA

Sudbuny M. D. - Prov. of Ontario

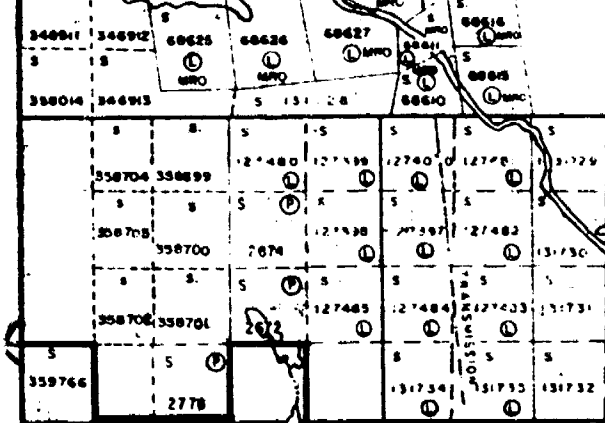
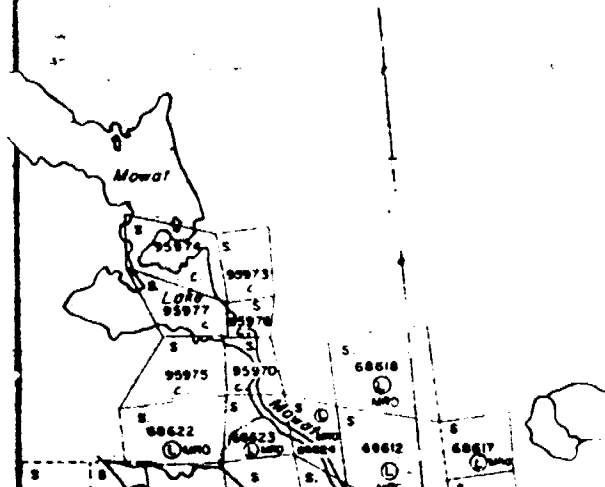
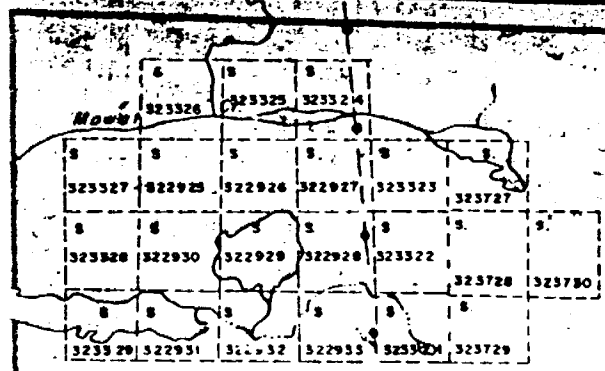
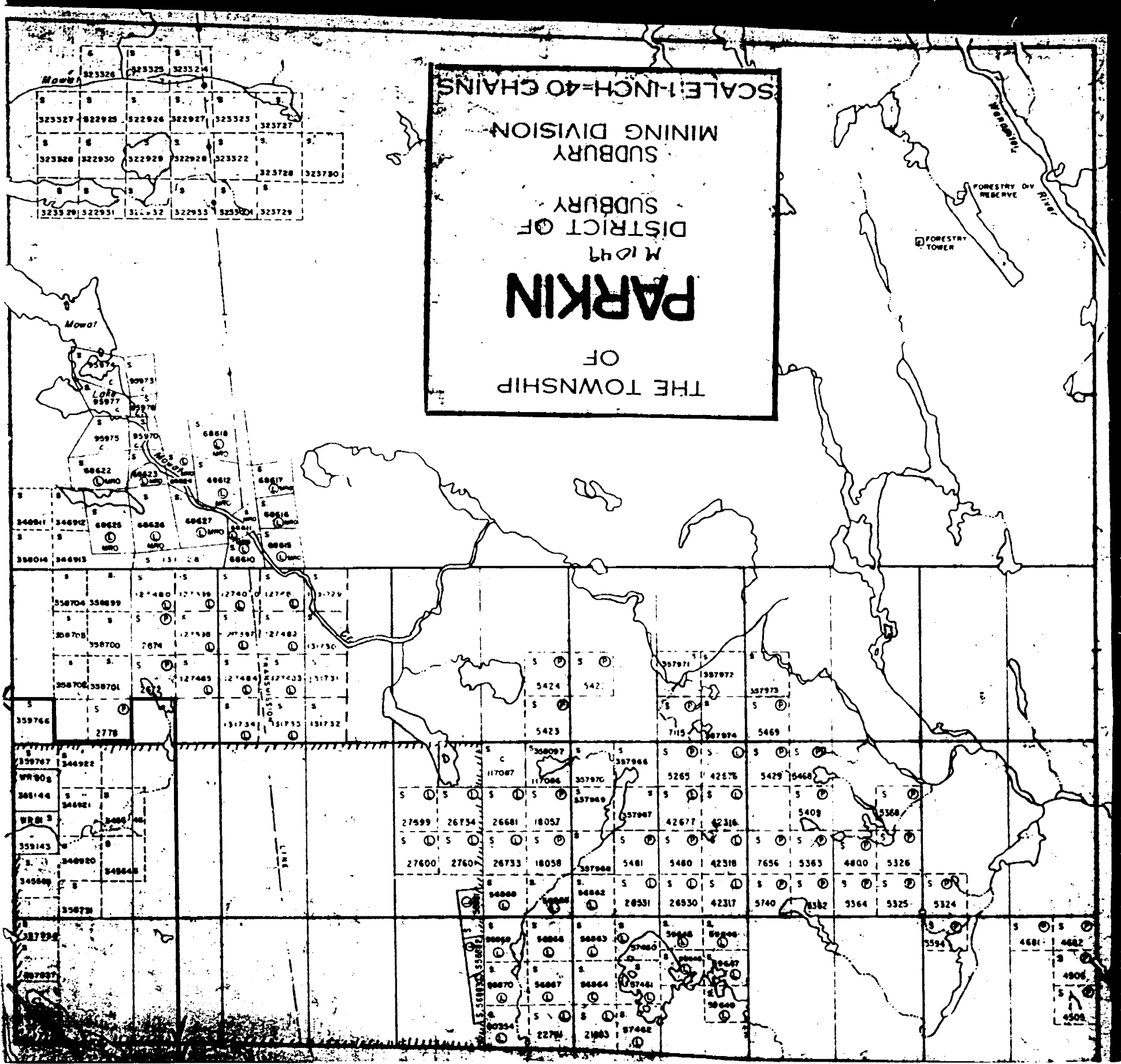


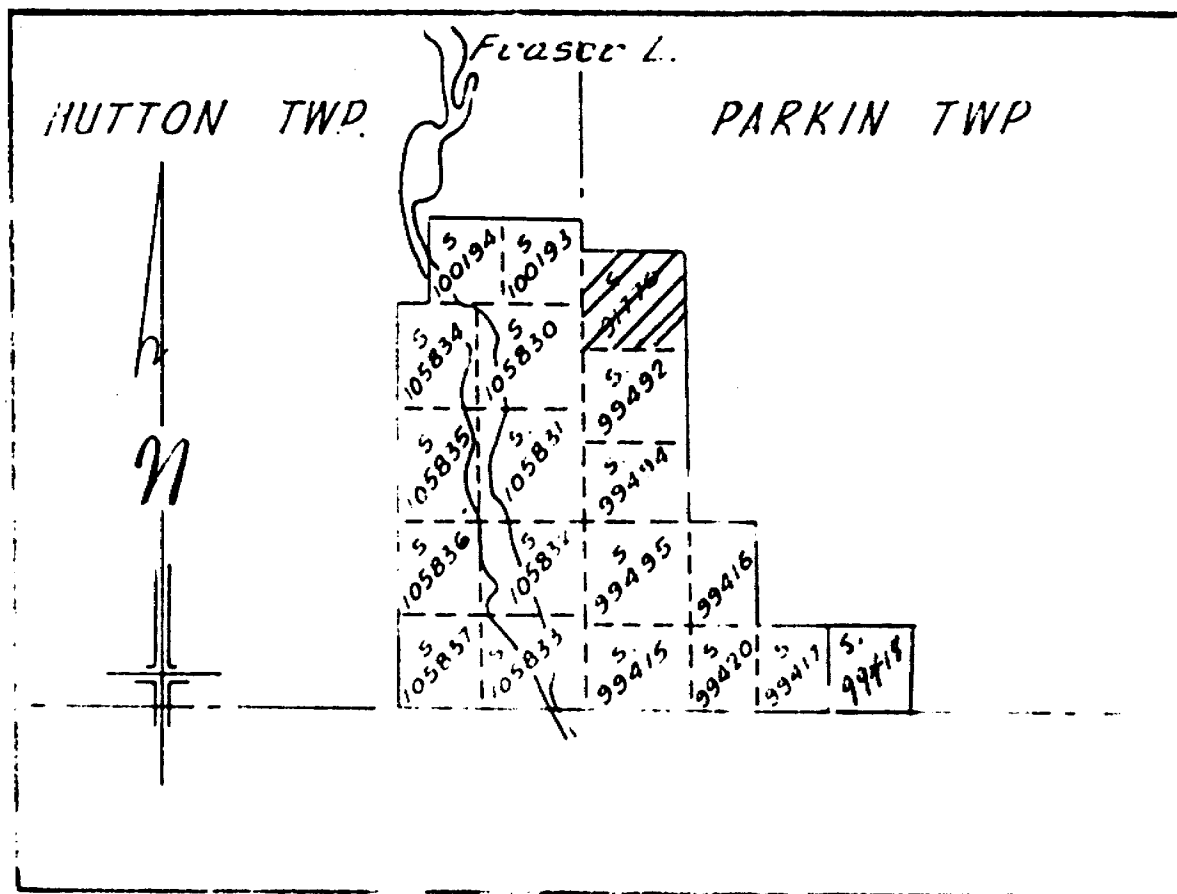
THE TOWNSHIP
OF
HUTTON
M-944
DISTRICT OF
SUDBURY
SUDBURY
MINING DIVISION
SCALE 1 INCH = 40 CHAINS

PARKIN TWP.

WISNER TWP.

SCALE: 1-INCH=40 CHAINS
MINING DIVISION
SUBBURY
DISTRICT OF
M 1047
PARKIN
OF
THE TOWNSHIP





GROUP N°3

CONCOR CHIBOUSAMAU MINES
MILNET AREA

Sudbury M. D. - Prov. of Ontario



FOR ADDITIONAL
INFORMATION

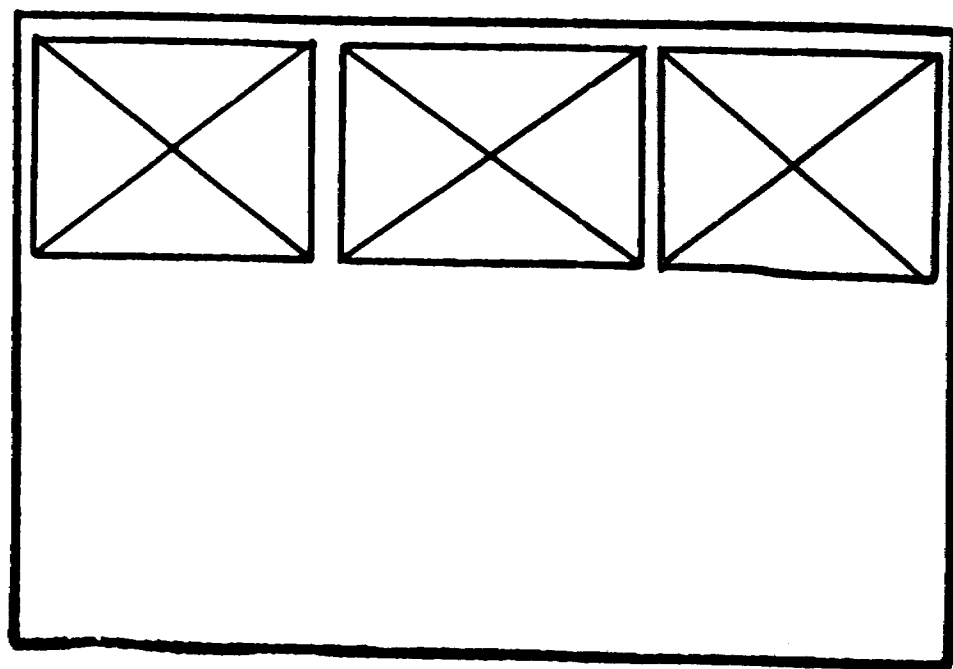
SEE MAPS:

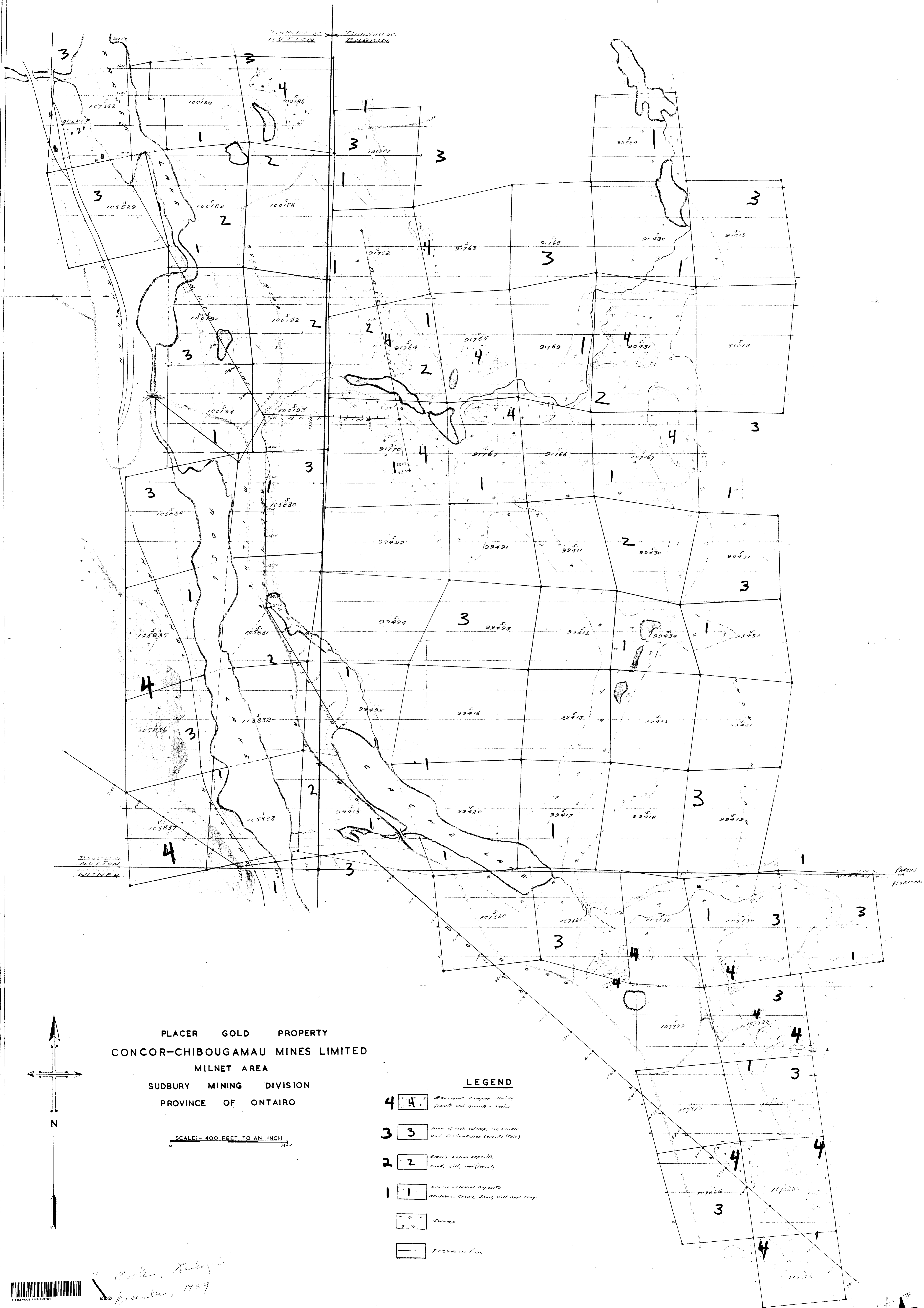
HUTTON-0028 # 3-5

SEE ACCOMPANYING
MAP(S) IDENTIFIED AS

HUTTON-0028, #1, #2

LOCATED IN THE MAP
CHANNEL IN THE FOLLOWING
SEQUENCE (X)





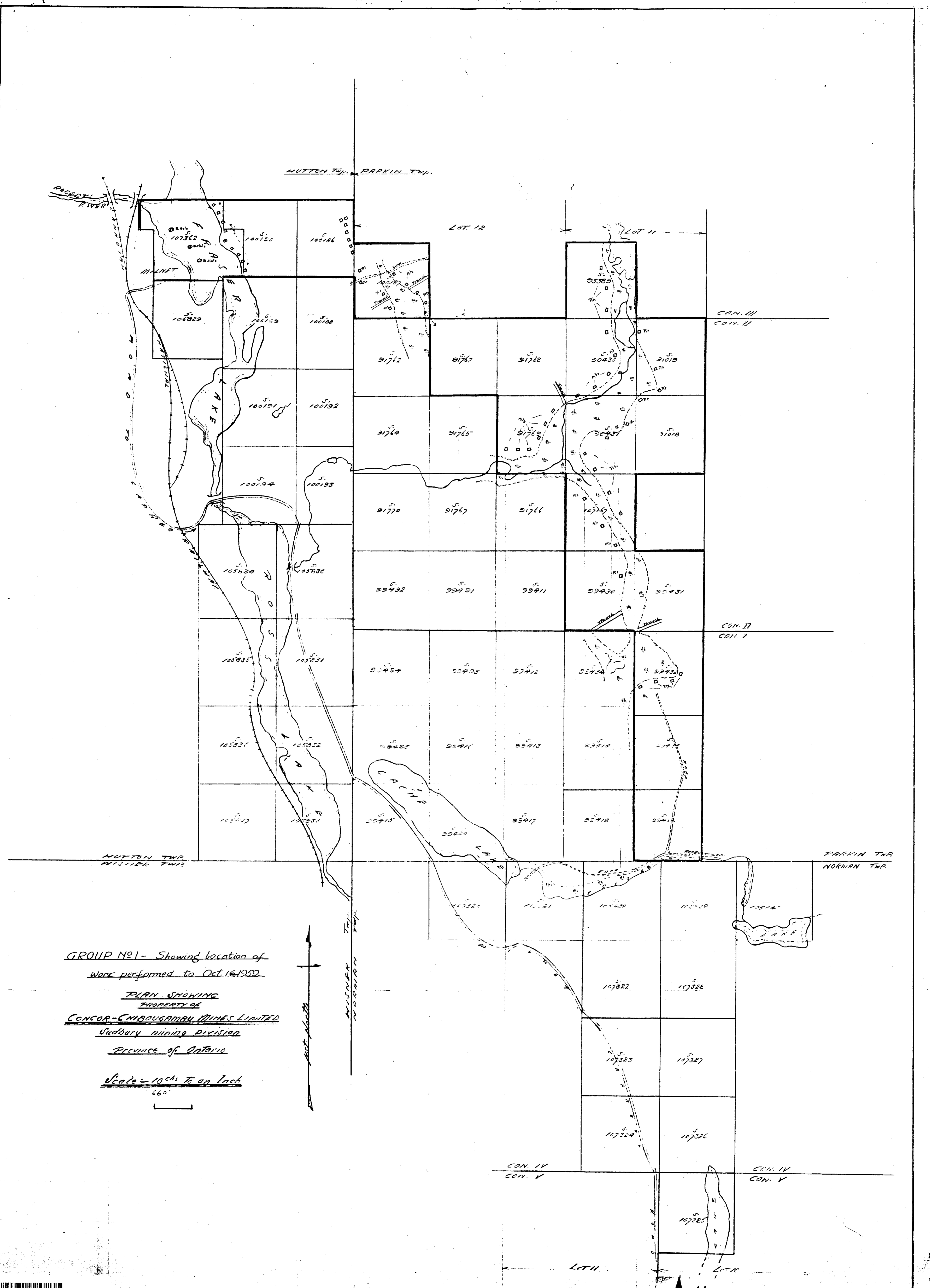
PLACER GOLD PROPERTY
 CONCOR-CHIBOUGAMAU MINES LIMITED
 MILNET AREA
 SUBBURY MINING DIVISION
 PROVINCE OF ONTARIO

SCALE: 400 FEET TO AN INCH

LEGEND

- 4 4. Pavement complex. Mainly Granite and Granite - Quartz
- 3 3. Area of rock outcrop, till cover and Glacio-Eolian deposits (thin)
- 2 2. Glacio-Eolian Deposits. Sand, silt, and (loess)
- 1 1. Glacio-Fluvial Deposits. Boulder, gravel, sand, silt and clay.
- * * * Swamp
- — — Traveling lines

Cook, Geologist
 December, 1959

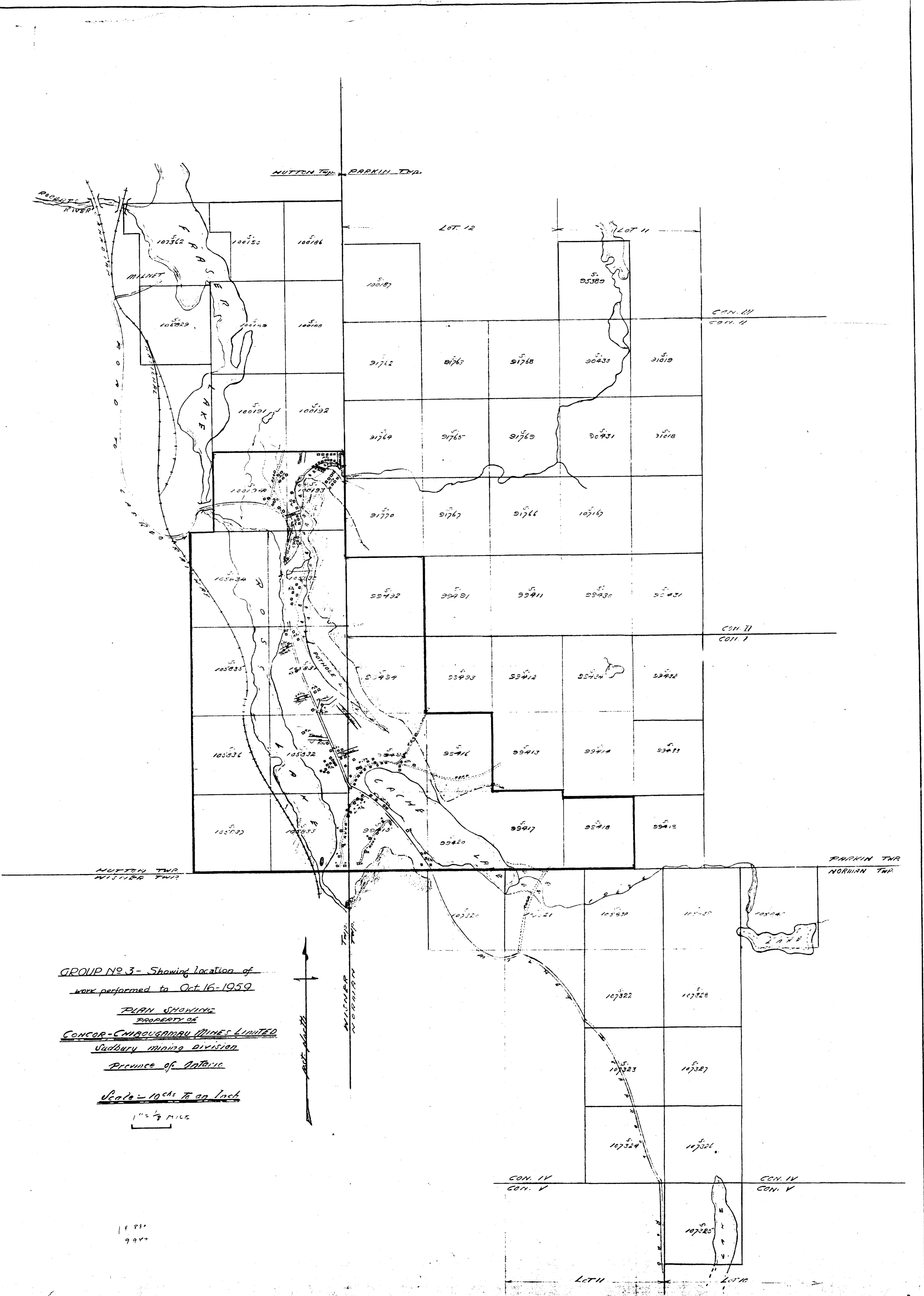


GROUP No 1 - Showing location of
work performed to Oct. 16, 1959

PLAN SHOWING
PROPERTY OF
CONCOR-CAMBOURGEMRU MINES LIMITED
Sudbury mining division
Province of Ontario

Scale - 10 CHS TO an Inch
60'



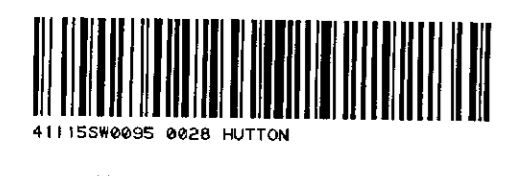


GROUP NO 3 - Showing location of
 work performed to Oct. 16-1959

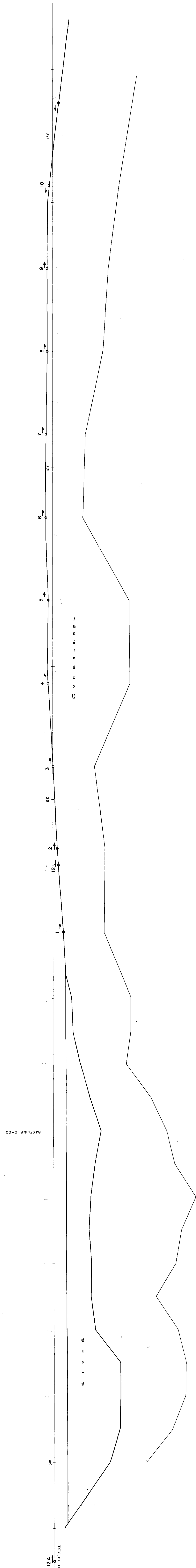
PLAN SHOWING
 PROPERTY OF
 CONCOR-CMBOUGAMAU MINES LIMITED
 Sudbury Mining Division
 Province of Ontario

Scale - 10 chs. to an Inch
 1" = 1/2 MILE

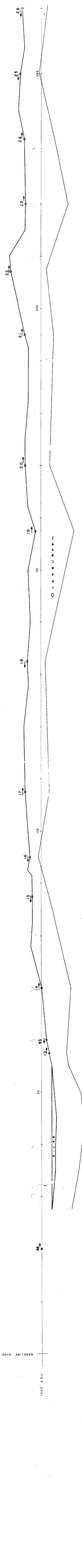
19 880
 9980



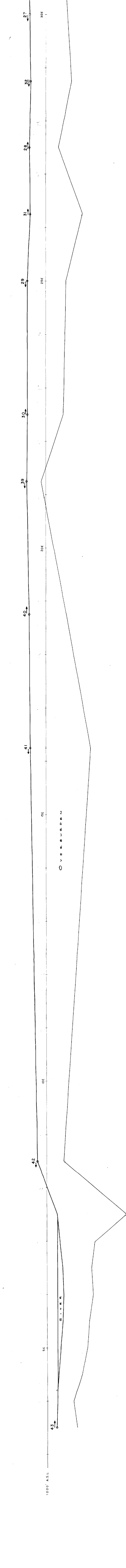
LINE B



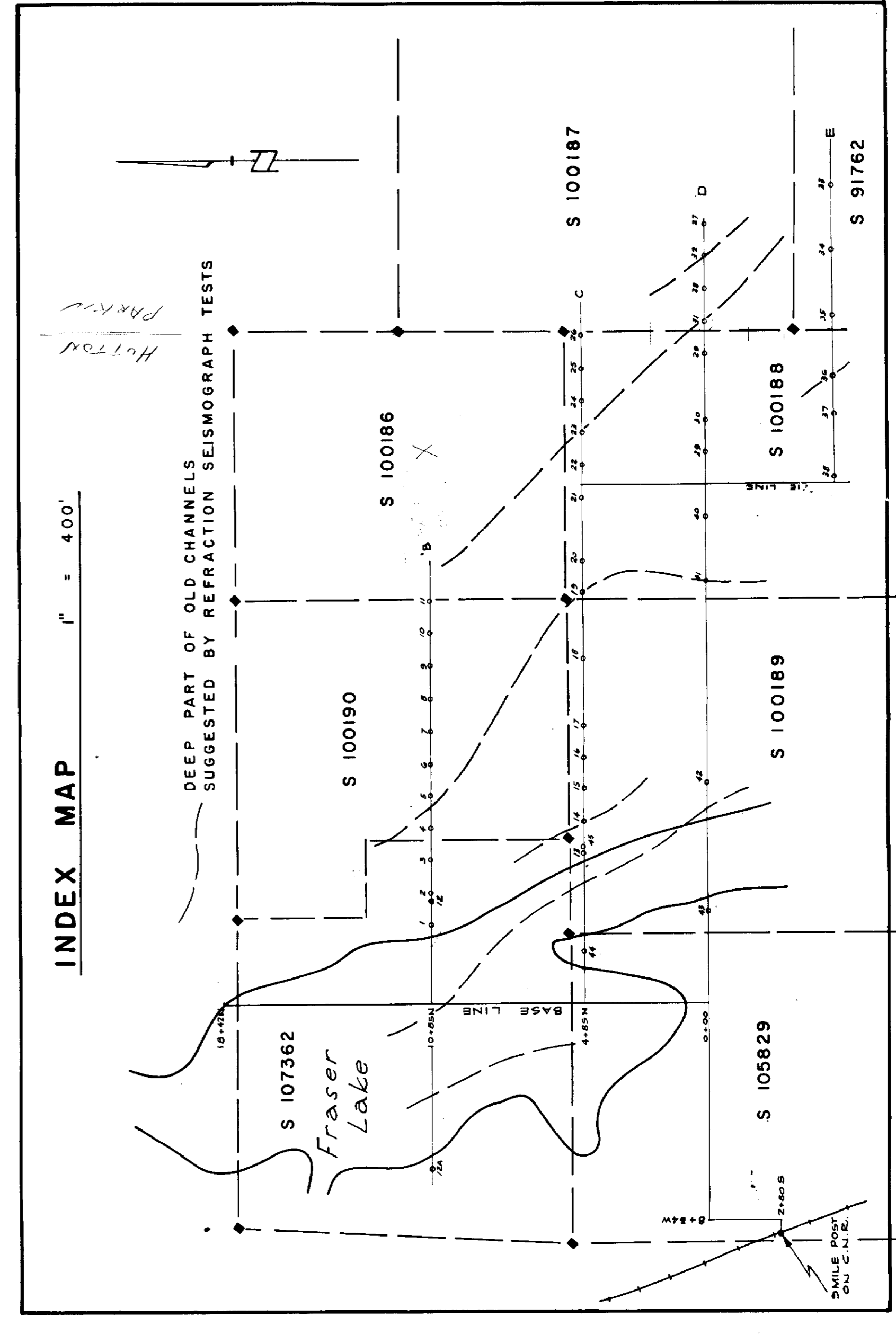
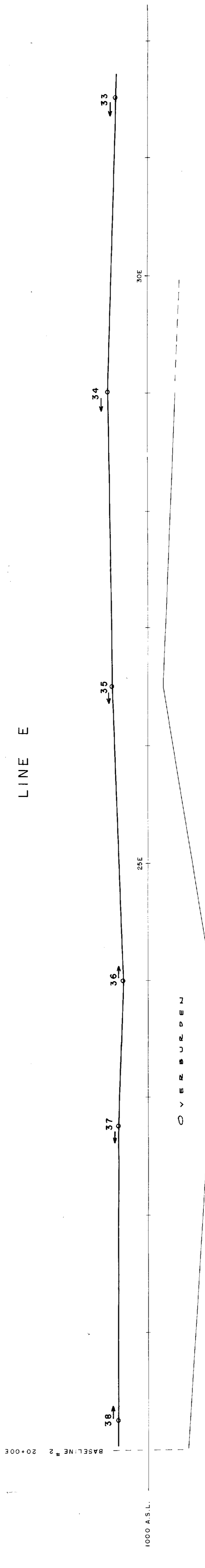
LINE C



LINE D



LINE E



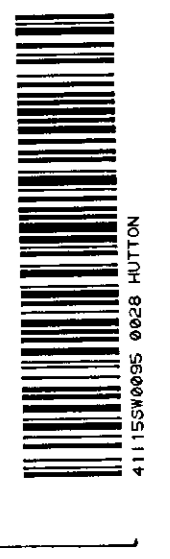
PROFILES OF SEISMIC BED ROCK DETERMINATIONS
CONCOR CHIBOUGAMAU MINES LIMITED
 MILNET - ONTARIO

SURVEY BY
SULMAC EXPLORATION SERVICES LIMITED

SCALE
 HORIZONTAL 1" = 20'
 VERTICAL 1" = 20'

MARCH 17, 1959

HUTTON-0028, #4



CONCOR-CHIBOGAMAU MINES LTD. PLAN SECTION

Milnet Area - Province of Ontario

SCALE 1" = 200 FT. MARCH 1959

LEGEND

- DRILL HOLE
- TEST PIT
- GOLD BEARING CHANNEL

