927/8W,9W 1835 N.T.S. 92-P-8,9 GEOCHEMICAL REPORT on the  $\lfloor \backslash \rfloor$ DEER LAKE MINES OPTION AUREL LAKE AREA, B.C. 92P/8W, 9W D.B. Petersen

A.G. Troup

December, 1973

CLAIMS :

Names

Record Numbers

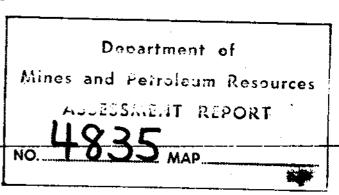
LV-27 to LV-68 incl. 115217 to 115258 incl. LV-69 Fr. to LV-72 incl. 115259 to 115262 incl.

# LOCATION:

Little Fort Area, British Columbia N.T.S. 92-P-8,9 120 22'W 51 31'N Kamloops Mining Division

DATES:

June 14 to August 2, 1973



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<u>Drainage Sample Programme</u> (con	<u>Illustration No.</u> ht'd)	Scale
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Geochem Map showing Zn results # 9 in PPM for "B" Horizon soil samples	G.C6161	l inch = 1350 feet

# GEOCHEMICAL REPORT on the DEER LAKE MINES OPTION LAUREL LAKE AREA, B.C.

N.T.S. 92-P-8,9

#### SUMMARY:

During the 1973 field season a detailed geochemical programme was carried out over a block of 46 claims located in the Little Fort area of British Columbia. Results of that programme have revealed three broad zones within which the copper and zinc content of the soils is significantly higher than over surrounding areas. In addition drainage systems on the property were found to be transporting extremely high concentrations of copper. It is recommended that an induced polarization survey be carried out to investigate the possibility of there existing significant bodies of porphyry copper type mineralization on the property.

#### GEOCHEMICAL REPORT

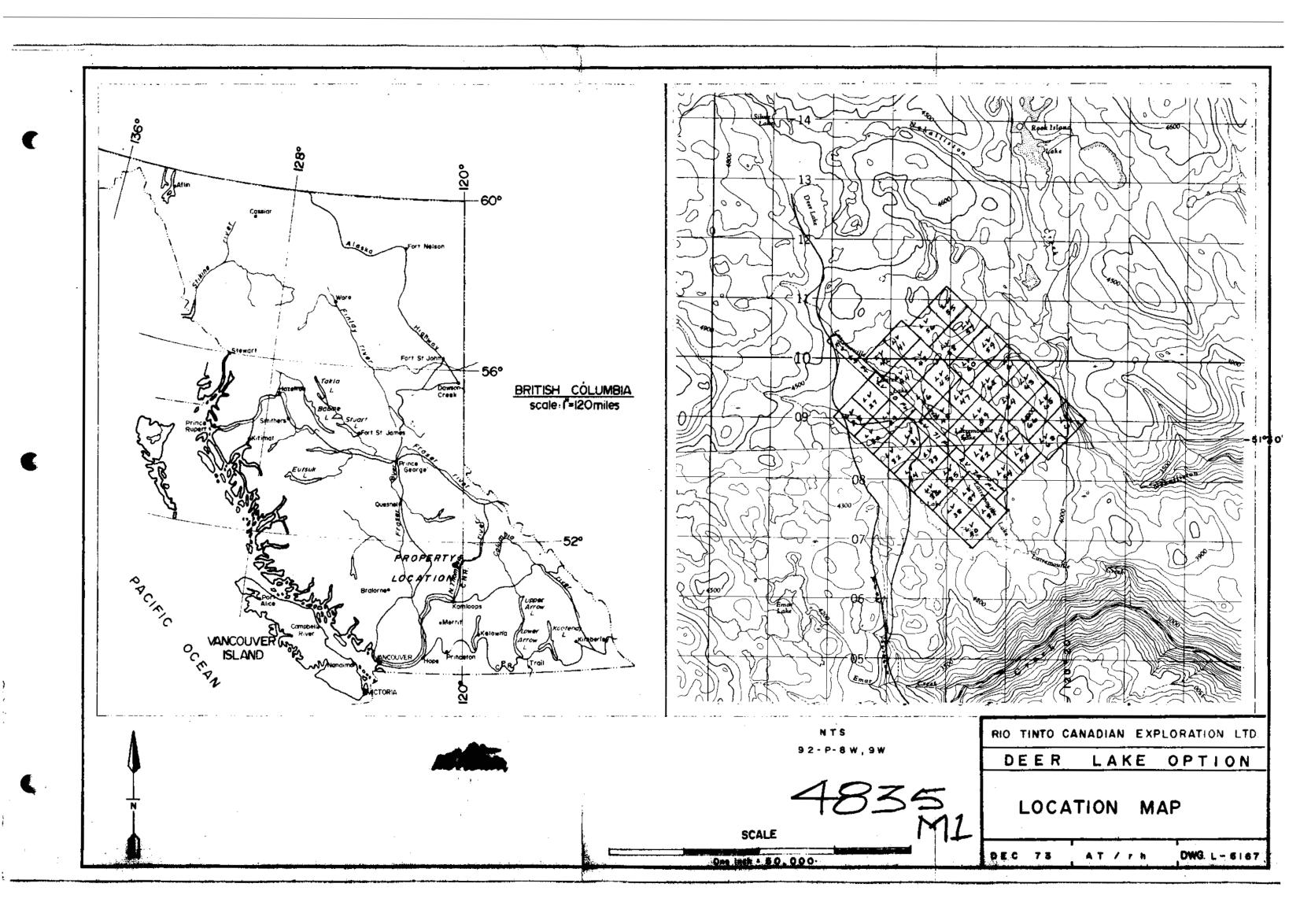
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DEER LAKE MINES OPTION LAUREL LAKE AREA, B.C. N.T.S. 92-P-8,9

#### INTRODUCTION

Attention was drawn to the Laurel Lake area in the late summer of 1972 by results of a regional geochemical survey carried out earlier that year. Results of that survey suggested this area to be a first class target for porphyry copper type mineralization. Consequently, in early August a contractor, Jack Altenburg, was employed to locate a block of 154 claims over the ground of interest. These claims were later found to be in conflict with a block of 46 claims, the L.V. Claims, held by Deer Lake Mines Limited (N.P.L.) (The Deer Lake claims were not shown on claim maps at the time the Rio Tinto staking programme was planned). Since the L.V. claims were situated over the area of greatest interest, the ground was eventually optioned from Deer Lake Mines.

During the months of June and July, 1973, a detailed soil sampling programme was carried out over the L.V. claims. The programme was co-ordinated by Mr. A. Troup and Mr. L. Haynes.



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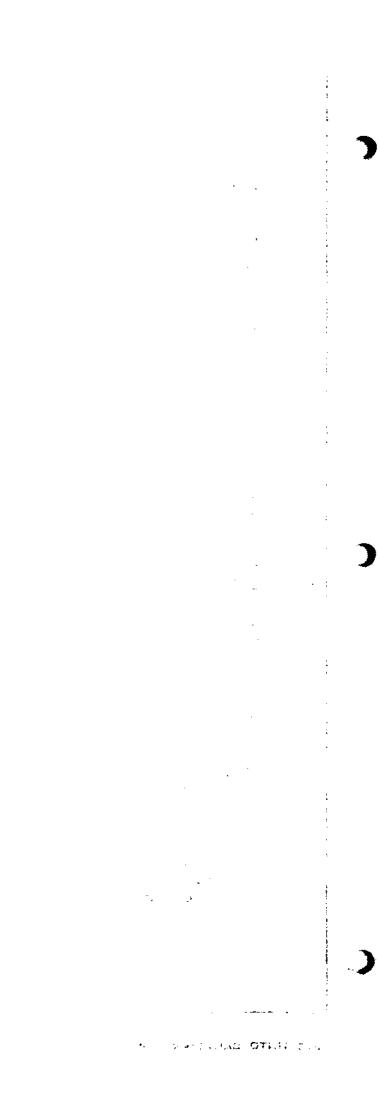
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Department of Mines and Potroleum Resources ASSEES/AE.IT REPORT No. 4835 MAP #)



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#### LOCATION AND ACCESS:

The L.V. Claim group is located approximately 7 air miles northwest of the town of Little Fort, B.C. Good access is provided to the centre of the property by a recent logging road which intersects Highway 24 approximately 11 miles west of Little Fort. Several older logging roads, passable by 4-wheel drive vehicle, provide additional access to the north and northeast edges of the property.

#### GEOLOGICAL SETTING:

The Laurel Lake area is situated on a plateau-like area near the north end of the Thompson Plateau. The property is at a mean elevation of 4,000 feet a.s.l. and a maximum of 300 feet of relief exists within the area covered by the claims. Immediately south of the property, Emar Creek occupies a deep "V" shaped valley 1500 feet below the plateau.

The area has been mapped by the Geological Survey of Canada at a scale of 1 inch to 4 miles (G.S.C. Memoir 363, R.B. Campbell and H.W. Tipper). This work shows the Laurel Lake area to straddle the northeast margin of the Thuya Batholith, where diorites and granodiorites of Triassic or Jurassic age are in contact with Triassic age volcanics and sediments of the Nicola group.

During the present survey, bedrock in the vicinity of the property was found to be obscured by an extensive blanket of Quaternary glacial till. However, sufficient outcrop was observed to suggest that the underlying geology may be considerably different from, and far more complex than suggested by the G.S.C. work. The following discrepancies have been noted:

1) Several outcrops of diorite and granodiorite are seen to the north and northwest of Lynn Lake, suggesting the contact between the Thuya Batholith and Nicola group rocks may be several miles north of, and much more irregular than shown on the government maps. 2) Much of the area east of Latremouille Lake, indicated to be underlain by Nicola group rocks on G.S.C. maps, is in fact underlain by a complex pyroxenite-gabbroic unit that appears to have intruded the Nicola rocks.

# SAMPLING, SAMPLE PREPARATION AND ANALYTICAL PROCEDURE:

The geochemical programme was carried out by a 4 man crew working from the Aurora Lakes Fishing Lodge located on the western border of the claim block. The work was carried out over a period of 7 weeks and involved the taking of 738 soil samples and 149 drainage samples.

Soil samples were collected at 200 foot intervals along 800 foot spaced northeast-southwest trending lines. Due to the extremely rocky nature of the soils, mattocks were used in taking the samples. Whenever possible samples were taken from the "B" soil horizon. Where "B" horizon material could not be obtained the "AH" soil horizon was sampled and the samples recorded as such.

Due to the lack of relief in this area, drainage patterns were found to be indistinct and to consist of interconnected boggy depressions that only rarely carry free flowing water in a developed channelway. Active stream sediment was seldom encountered, and the only media that could be routinely sampled was the organic rich peat layer developed in the channel beds. The drainage sampling programme involved sampling this organic rich media at a depth of 25 cm. beneath the sediment-water interface. In addition, whenever possible a sample was taken from the "B" soil horizon developed beneath the drainage channel. This was accomplished by digging through the overlying peat layer with a shovel or mattock.

All samples were placed in Kraft paper envelopes and shipped to the Rio Tinto Laboratory in North Vancouver. Here the samples were oven-dried at approximately 60°C. The dried samples were sieved through 80-mesh bolting cloth and the oversized material discarded. Analysis was carried out on the minus 80-mesh fraction by atomic absorption spectrometer after digestion with hot concentrated nitric and perchloric acid. The Cu, Mo, Ni, Pb and Zn concentrations in ppm were obtained by the company analyst, Mr. E. Paski, Jr.

#### PRESENTATION OF RESULTS:

### Soil Sample Results

The results of the soil sampling programme are shown on 6 accompanying drawings all at a scale of 1 inch to 800 feet. The sample locations are shown on drawing L-8256. The values in ppm obtained for the elements Cu, Mo, Ni, Pb and Zn are shown on drawings G.C.-8257 to G.C.-8261 inclusive.

Threshold and anomalous levels for each of the metals of interest have been derived for "B" horizon and "AH" horizon soils and are shown in Tables I and II. The "B" horizon statistics were carried out on approximately 1490 samples taken from both the L.V. claims, and a number of adjacent claims held by Rio Tinto. The "AH" horizon statistics were carried out on 81 samples collected over this same area. Previous work in this part of B.C. has shown all of the elements of interest to display a log normal distribution in the two media sampled. Therefore, statistical manipulations were carried out on the logs of the values. Threshold and anomalous levels were taken at the mean plus two standard deviations and the mean plus three standard deviations respectively for each of the metals investigated.

In contouring the soil sample results the soil horizon has been taken into consideration. Thus, for example, the threshold contour for copper will enclose all "B" horizon samples having greater than 76 ppm Cu but only "AH" horizon samples containing greater than 440 ppm Cu.

## Drainage Sample Results

The results of the drainage sampling programme are shown on the 12 accompanying maps L-6150, G.C.-6151 to G.C. 6155 inclusive, L-6156, and G.C.-6157 to G.C.-6161 inclusive, all at a scale of 1 inch to  $\frac{1}{4}$  mile.

Threshold, anomalous and very anomalous levels for copper and threshold levels for each of the other elements of interest have been derived for the two sample media. These data are shown in Tables III and IV. During the present survey an insufficient number of drainage samples were taken from beyond the anomalous area for meaningful statistical computations. Therefore, the above metal levels have been established from the results of previous work in this part of B.C.

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#### TABLE I

Threshold and Anomalous Metal Values in "B" Horizon Soils - Deer Lake Option:

METAL	THRESHOLD VALUE	ANOMALOUS VALUE
Cu	76 ppm	174 ppm
Mo	6 ppm	16 ppm
Ni	39 ppm	<b>73</b> ppm
Pb	28 ppm	43 ppm
Zn	108 ppm	182 ppm

(Data on the minus 80-mesh fraction; analysis on the A.A. after digestion with hot concentrated nitric and perchloric acid).

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## TABLE II

Threshold and Anomalous Metal Values in "AH" Horizon Soils - Deer Lake Option:

METAL	THRESHOLD_VALUE	ANOMALOUS VALUE
Cu	440 ppm	1060 ppm
Mo	40 ppm	117 ppm
Ni	54 ppm	154 ppm
Pb	17 ppm	27 ppm
Zn	70 ppm	172 ppm

(Data on the minus 80-mesh fraction; analysis on the A.A. after digestion with hot concentrated nitric and perchloric acid).

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### TABLE III

Significant metal values computed for organic rich stream sediment samples - Deer Lake Option:

METAL	THRESHOLD	ANOMALOUS	VERY ANOMALOUS
Cu	250 ppm	500 ppm	1,000 ppm
Mo	30 ppm		
Ni	63 ppm		
Pb	20 ppm		
Zn	75 ppm		

(Data on the minus 80-mesh fraction; analysis on the A.A. after digestion with hot concentrated nitric and perchloric acid).

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### TABLE IV

Significant metal values computed for "B" horizon soils developed beneath drainage channels - Deer Lake Option:

METAL	THRESHOLD	ANOMALOUS	VERY ANOMALOUS
Cu	150 ppm	300 ppm	600 ppm
Mo	7 ppm		
Ni	45 ppm		
Pb	18 ppm		
Zn	125 ppm		

(Data on the minus 80-mesh fraction; analysis on the A.A. after digestion with hot concentrated nitric and perchloric acid).

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#### **DISCUSSION OF RESULTS:**

#### Soil Sample Results

Examination of the results of the soil sampling programme has revealed the following:

1. Scattered, erratic high values of copper and zinc occur throughout the sample area, but no broad zones of highly anomalous concentrations of either of these elements are present. However, several small zones of above threshold concentrations of one or both of these elements exist within the area sampled. It is possible to define three areas within each of which there is a clustering of these smaller zones of higher copper and/or zinc concentrations. These are indicated on the sample location map as Area "A", "B", and "C".

<u>Area "A"</u> is located immediately southeast of Deer Lake. Here, several zones of elevated copper values, of up to 200 ppm Cu in "B" horizon soils are clustered within an area of approximately 4,000 feet in diameter. A small zone of elevated zinc values is partially coincident with higher copper values near the south edge of this area.

<u>Area "B"</u> is situated east of Laurel Lake and northwest of Deer Lake. This is essentially a broad zone of elevated zinc values with several smaller zones of higher copper values occurring peripheral to and partially coincident with the zinc anomaly. The area is roughly circular and of approximately 3,500 feet in diameter.

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Area "C" lies to the south and west of Laurel Lake. This is the smallest of the three areas. It consists of several small partially overlapping zones of elevated zinc and/or copper values scattered over an area of approximately 2,500 feet in diameter.

Due to the presence of an extensive blanket of glacial till over this property it is very possible that metal values obtained from soils are not entirely indicative of bedrock concentrations of these metals. Within the three areas discussed above many of the zones of elevated metal values are believed to occur over areas having a somewhat thinner till cover than much of the surrounding ground. It is therefore possible that each of these three areas could conceal important, low grade, bedrock concentrations of copper mineralization of dimensions greater than any or all of the overlying soil anomalies.

2. In contrast to results obtained in other parts of the province the zinc content of the organic rich media sampled on this property is consistently lower than that of the "B" horizon soils. This situation is womewhat puzzling. Perhaps climatic topographic and soil conditions in this area are such that zinc is being actively leached from the overburden environment and thus is not available for buildup in the organic media.

3. No significant soil anomalies for the elements Mo, Ni or Pb are present within the area sampled. These metals will therefore not be discussed further.

#### Drainage Sample Results

The results of the drainage sampling programme reveal the following:

1. In both media sampled, very high and very low concentrations of copper occur scattered somewhat erratically over the entire property. However, both media show a clustering of very anomalous values over two distinct and very broad areas. The larger of these is situated both over and down drainage from Area "A" highlighted by the soil survey. The second area centres on Laurel Lake and the eastern tip of Goose Lake. In this second area almost all of the anomalous streams are found to be draining either Area "C: or the western margin of Area "B".

The very high copper concentrations detected in the drainage systems on this property must, almost certainly, be the result of a widespread sulfide source of this metal. The clustering of higher drainage values over or adjacent to the three soil anomalies, enhances the possibility of there existing important low grade copper mineralization, in bedrock, in the vicinity of these areas.

2. Zinc values are not significantly high in either of the media sampled. However, both media show a slight zinc enrichment in samples taken in the vicinity of Area "C".

As was the case with the soil sample results, the organic rich drainage samples are consistently lower in content of this metal than the underlying "B" horizon soils.

3. No significant drainage anomalies are present for the elements Mo, Ni or Pb.

#### CONCLUSIONS AND RECOMMENDATIONS:

The results of the present survey have shown very high concentrations of copper to be distributed both in the drainage systems and to a lesser extent in the soils over this property. Three distinct zones that appear to have potential for low grade porphyry copper type mineralization have been defined. However, due to an extensive and perhaps locally very thick till cover there is no assurance that surface metal concentrations will conform to or be indicative of bedrock distributions of metal.

It is recommended that an induced polarization survey be carried out over that portion of the property containing Areas "A", "B", and "C". Any chargeability anomalies encountered should be tested by diamond drilling.



D.B. Petersen, B.Sc., P.Eng.

a. Troup

A.G. Troup, M.Sc.

December, 1973

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# QUALIFICATIONS - A. Troup

RIG TINTO CANADIAN EXPLORATION LTD.

# Academic

Honours Geology: Geochemistry:	McMaster University, Ontario McMaster University, Ontario	

# Practical

1964-1966	Geological N	Mapping and			
	Geochemical	Exploration:	Student	Vacation	Work

1967-1973 Geologist-Geochemist: Placer Development and Rio Tinto Canadian Exploration Limited.

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COST	STATEMENT	
FOR GEC	CHEMICAL WORK	
ON DEE	R LAKE GROUP	
	- 1973 -	
LABOR COSTS		• .
A. Troup - geologist 615-555 Burrard St., Vancouver,B.C.	June 4-July 5 incl.; July 9-11 incl.;July 14-18 incl.;July 22;July 25-31 incl.;Aug.2-10 incl.; Nov. 21-Dec.9 incl. -76 man days @ \$44.00	\$3,344.00
L. Haynes - geologist 615-555 Burrard St., Vancouver,B.C.	June 4-July 1 incl.; July 14-18 incl.; July 22; July 25-31 incl.; Aug.2-10 incl. -50 man days @ \$28.20	\$1,420.00
G. Hawkins 506-3465 Redpath St., Montreal 109, P.Q.	June ll-July l incl.; July 14-18 incl.; July 22; July 25-31 incl; Aug.2-8 incl. -41 man days \$ \$29.20	\$1,197.20
N. Pritchard- student #8 - 110 Ulster St., Winnipeg, Manitoba	June 22-July l incl.; July 14-18 incl.; July 22. -16 man days @ \$23.68	\$ 378.88
Dr. M. Mehrtens 2400 - 120 Adelaide St.W. Toronto, Ontario	July 9-11 incl. -3 days @ \$75.00	\$ 225.00
D. Petersen 228 Bestwick Drive,	July 9-11th incl.	
Kamloops,B.C. R. Hettervig 615-555 Burrard St., Vancouver,B.C.	-3 days @ \$56.00 draughting - equivalent to 20 days @ \$24.00	\$ 168.00 <u>\$ 480.00</u> <u>\$7,213.08</u>

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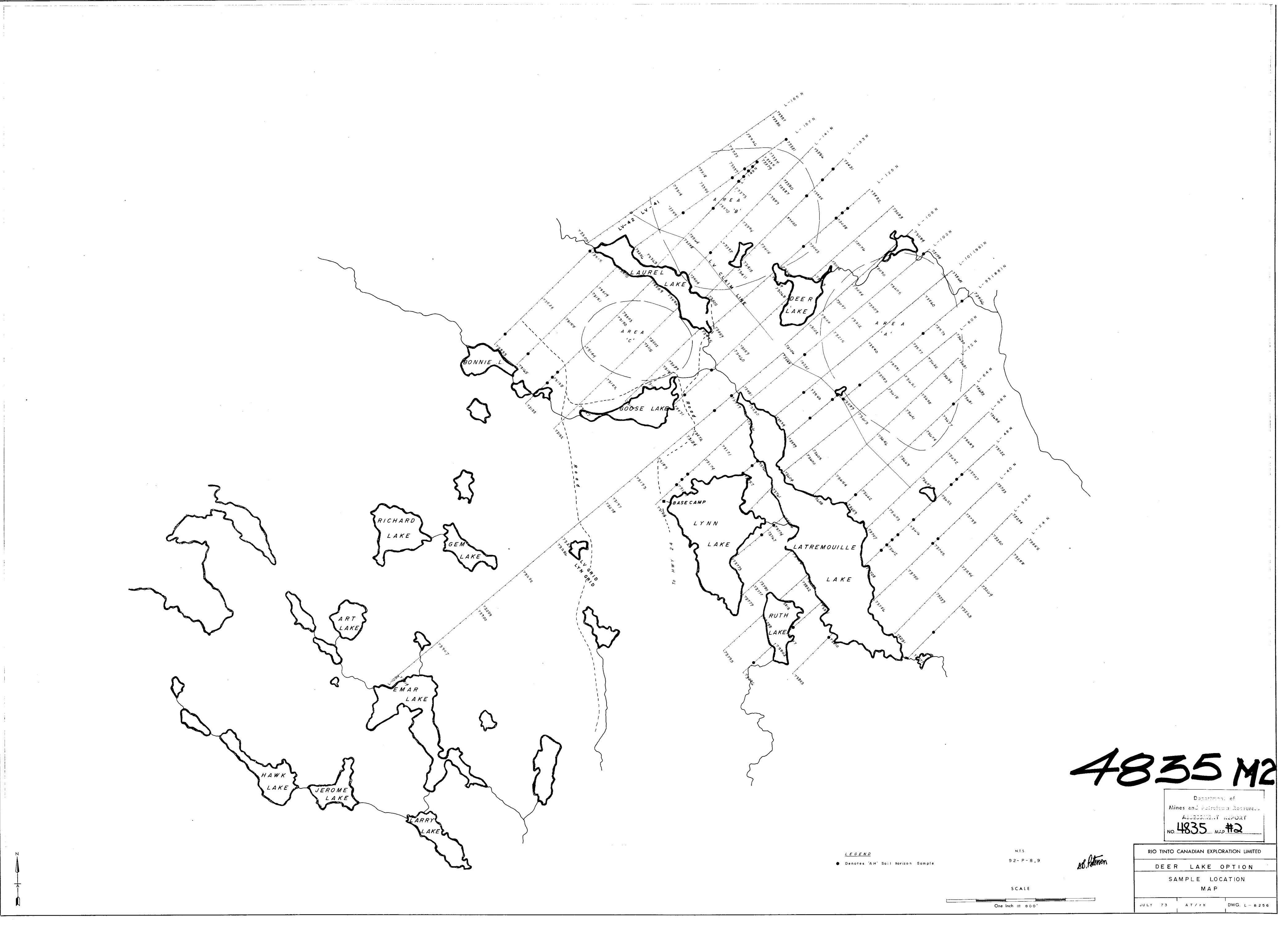
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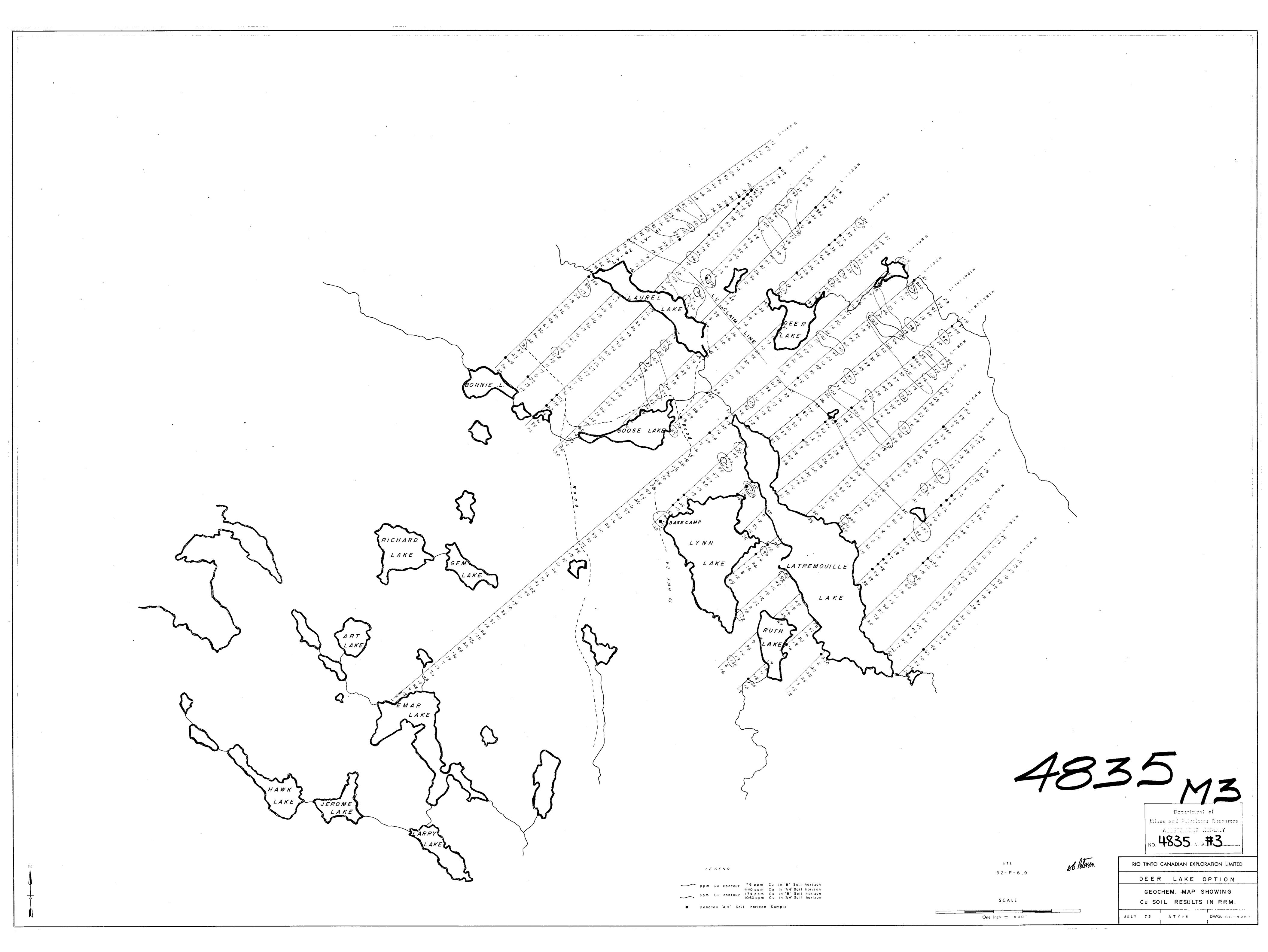
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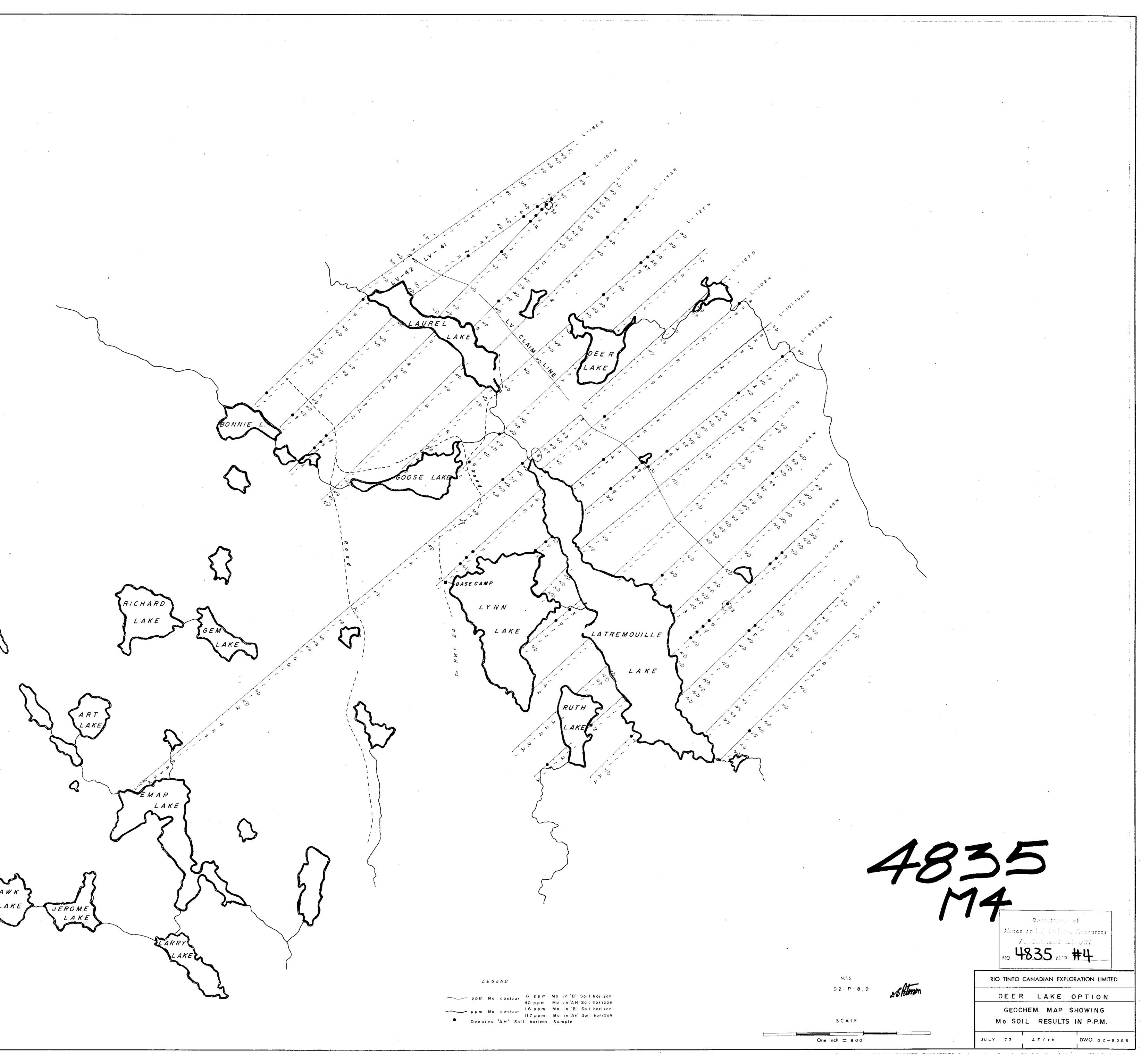


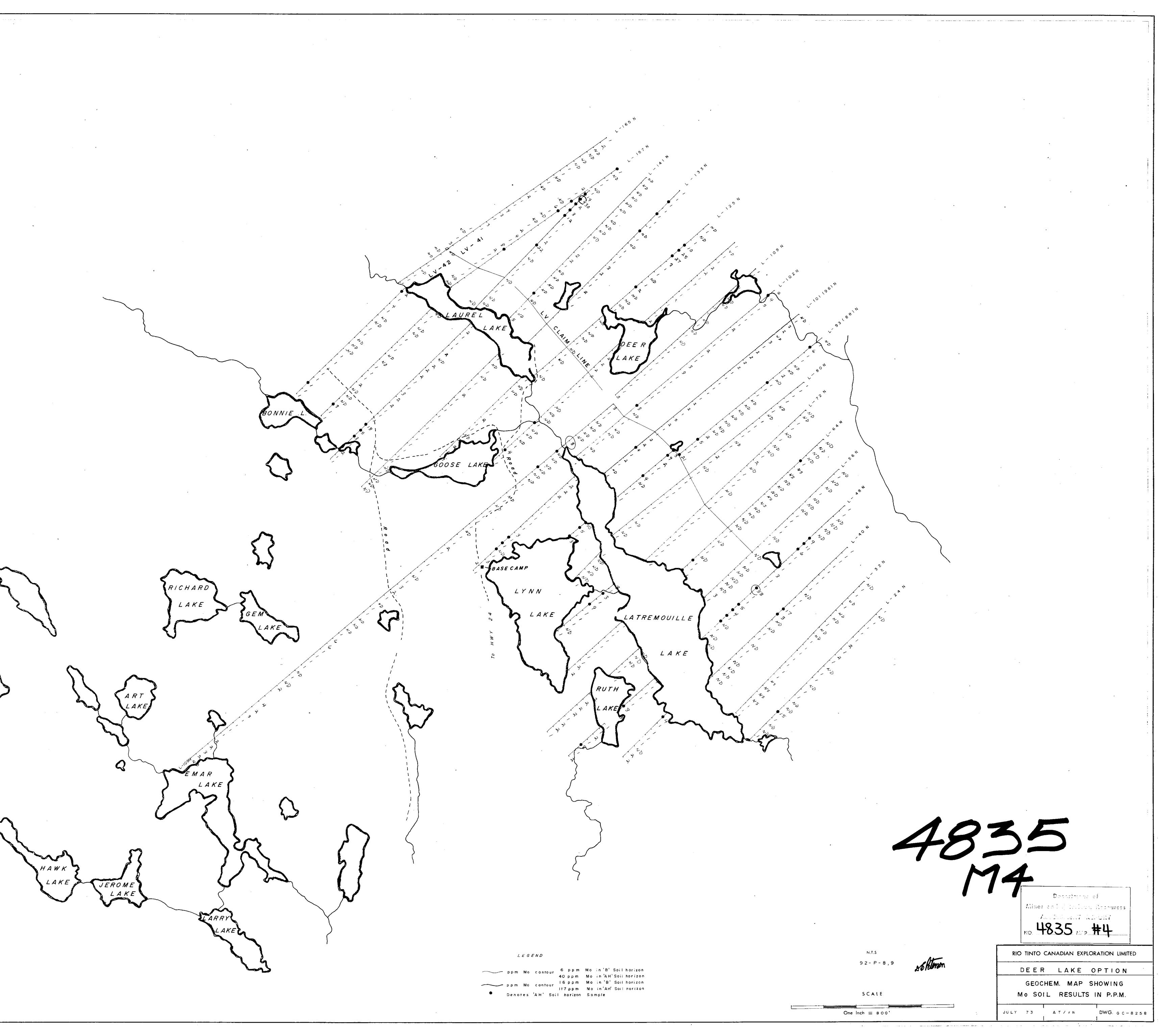
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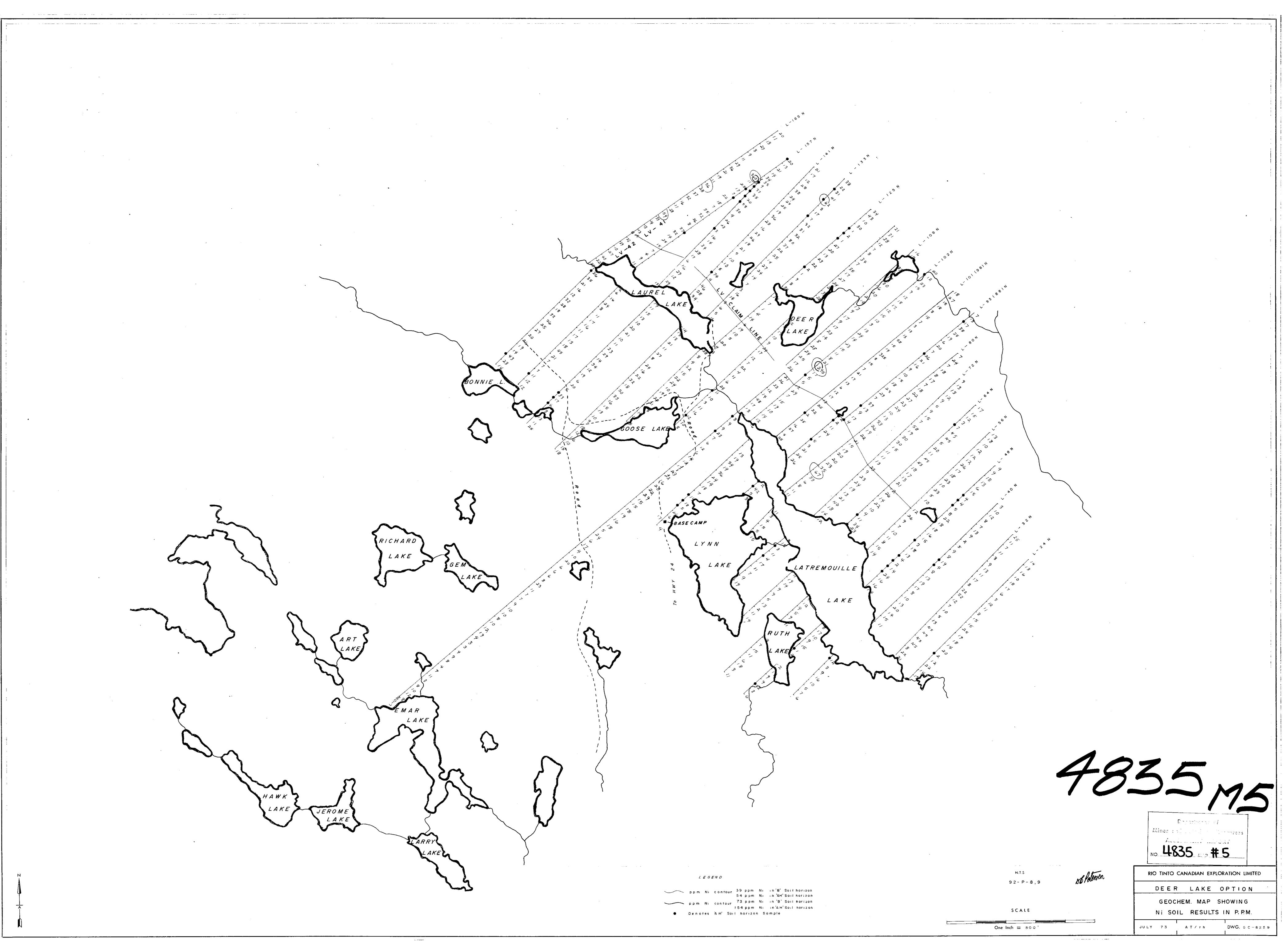
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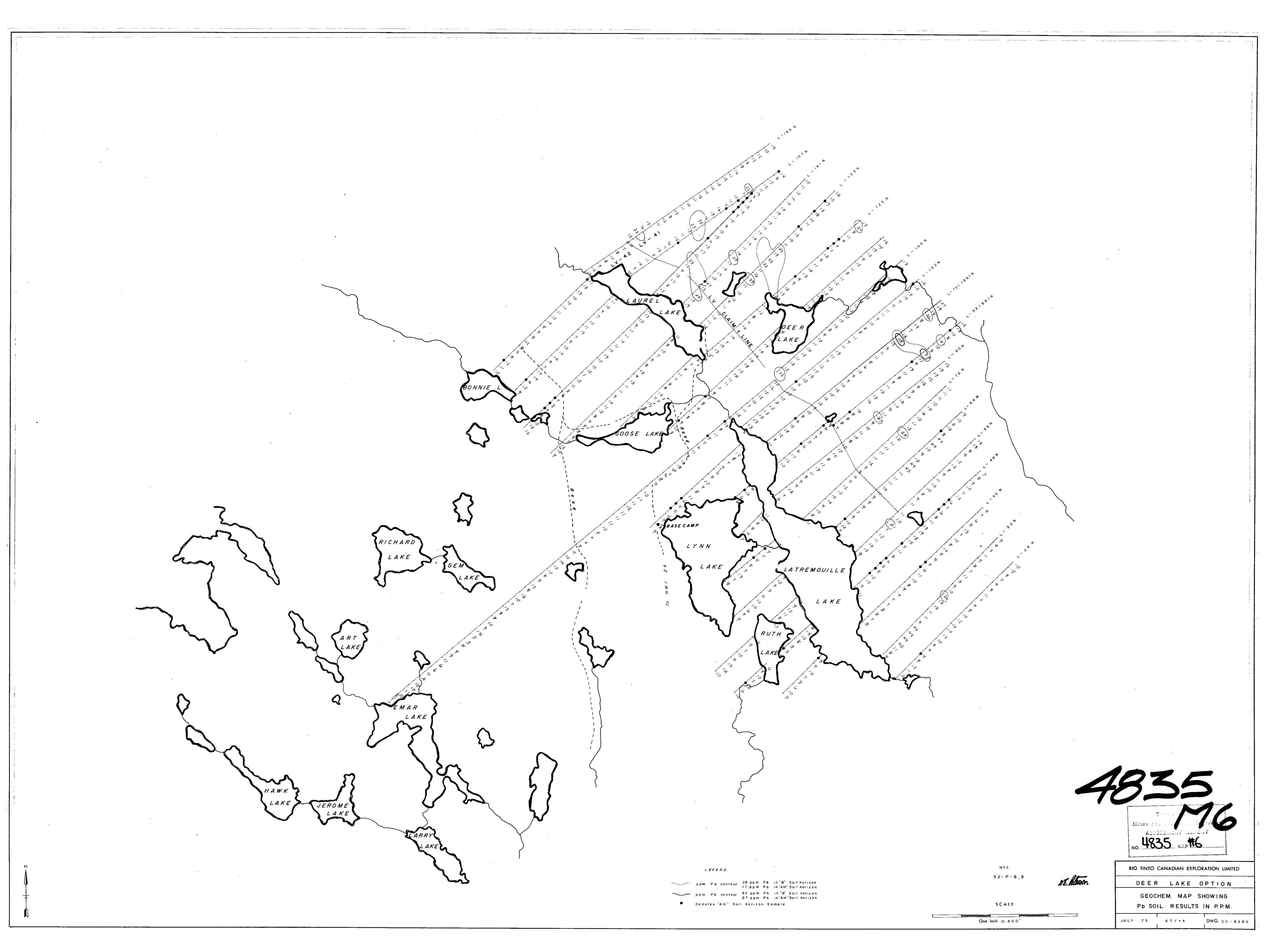
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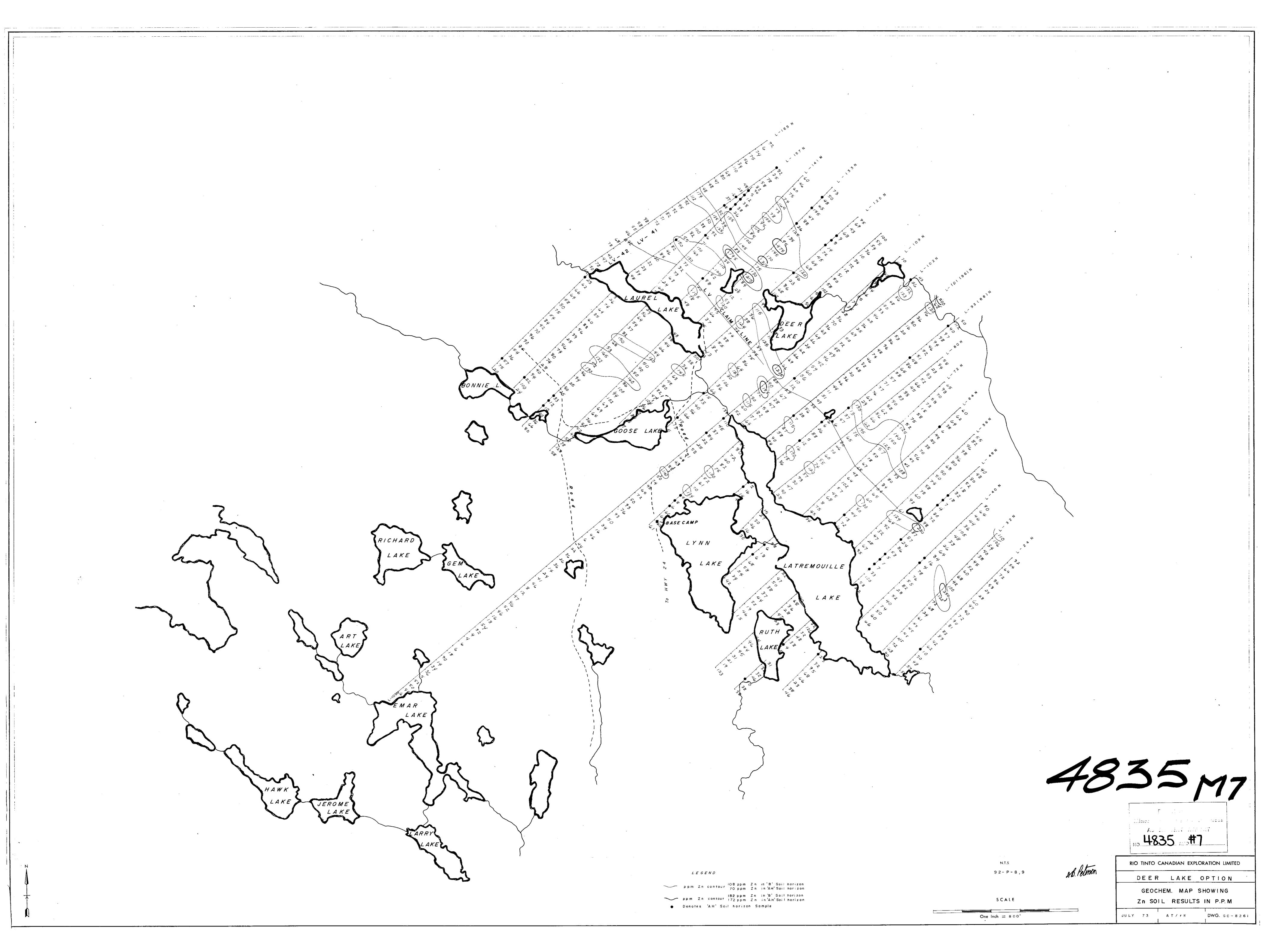
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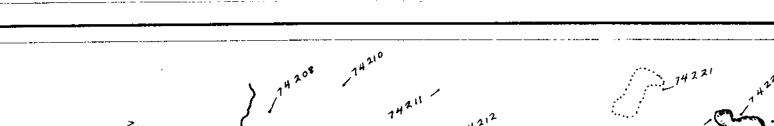


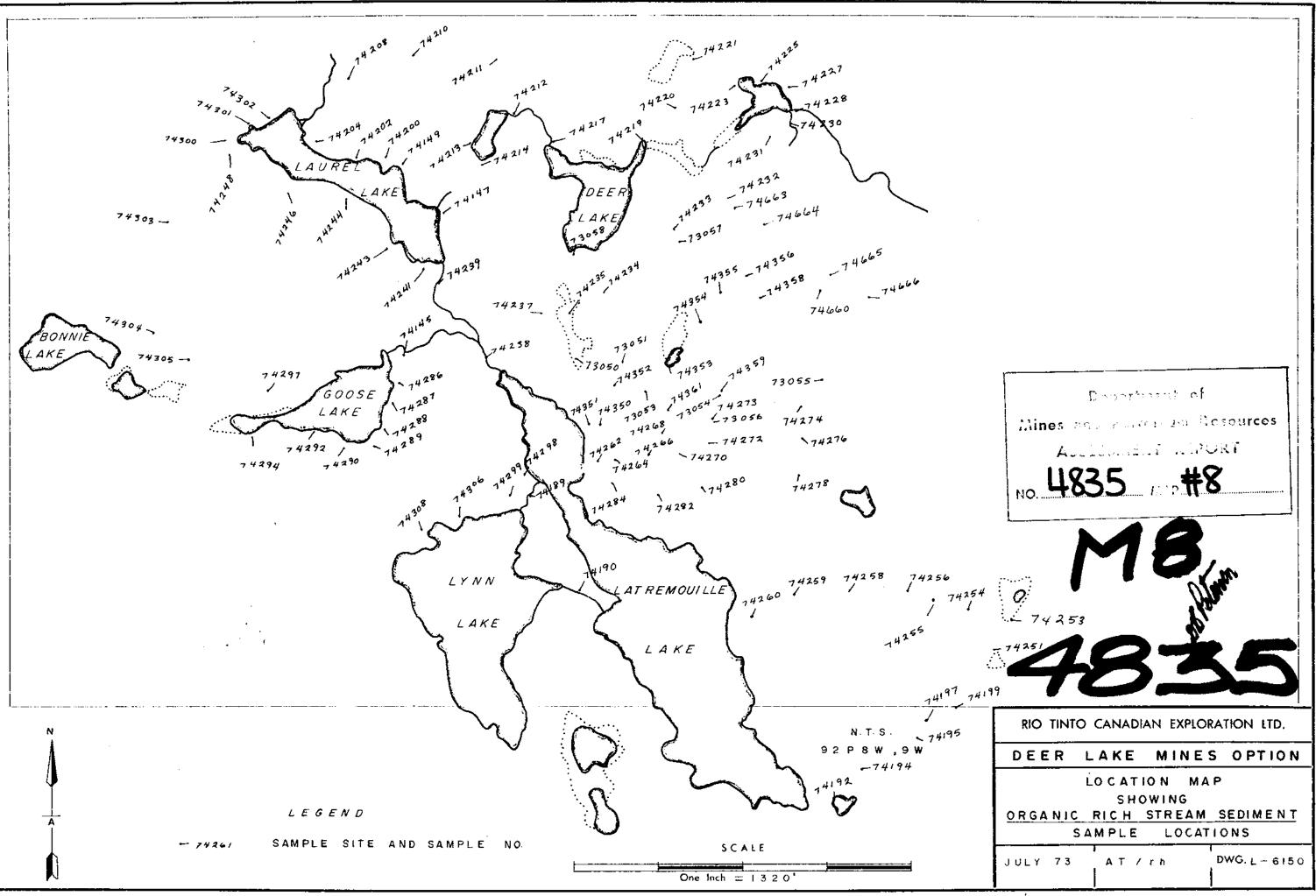


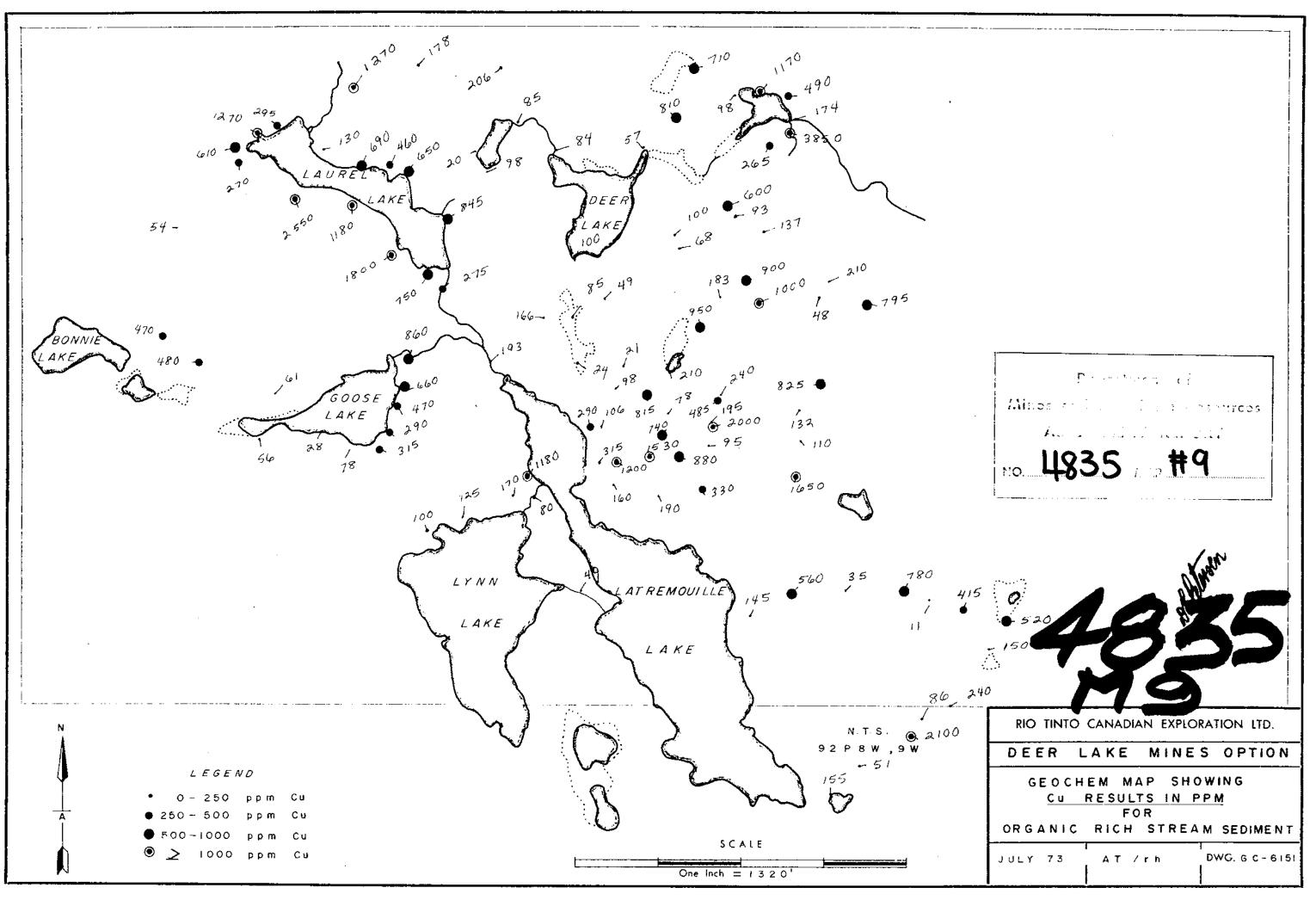


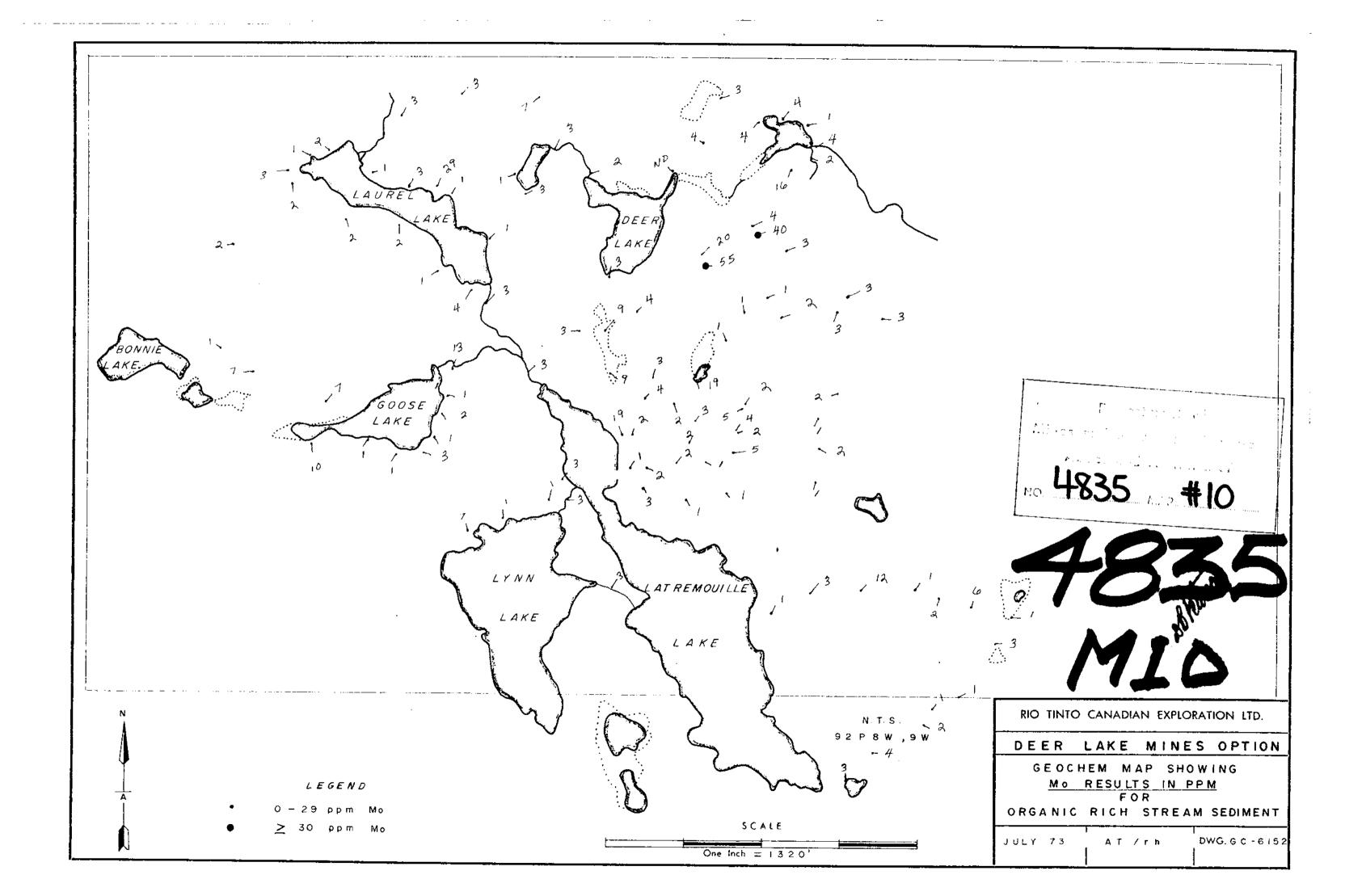


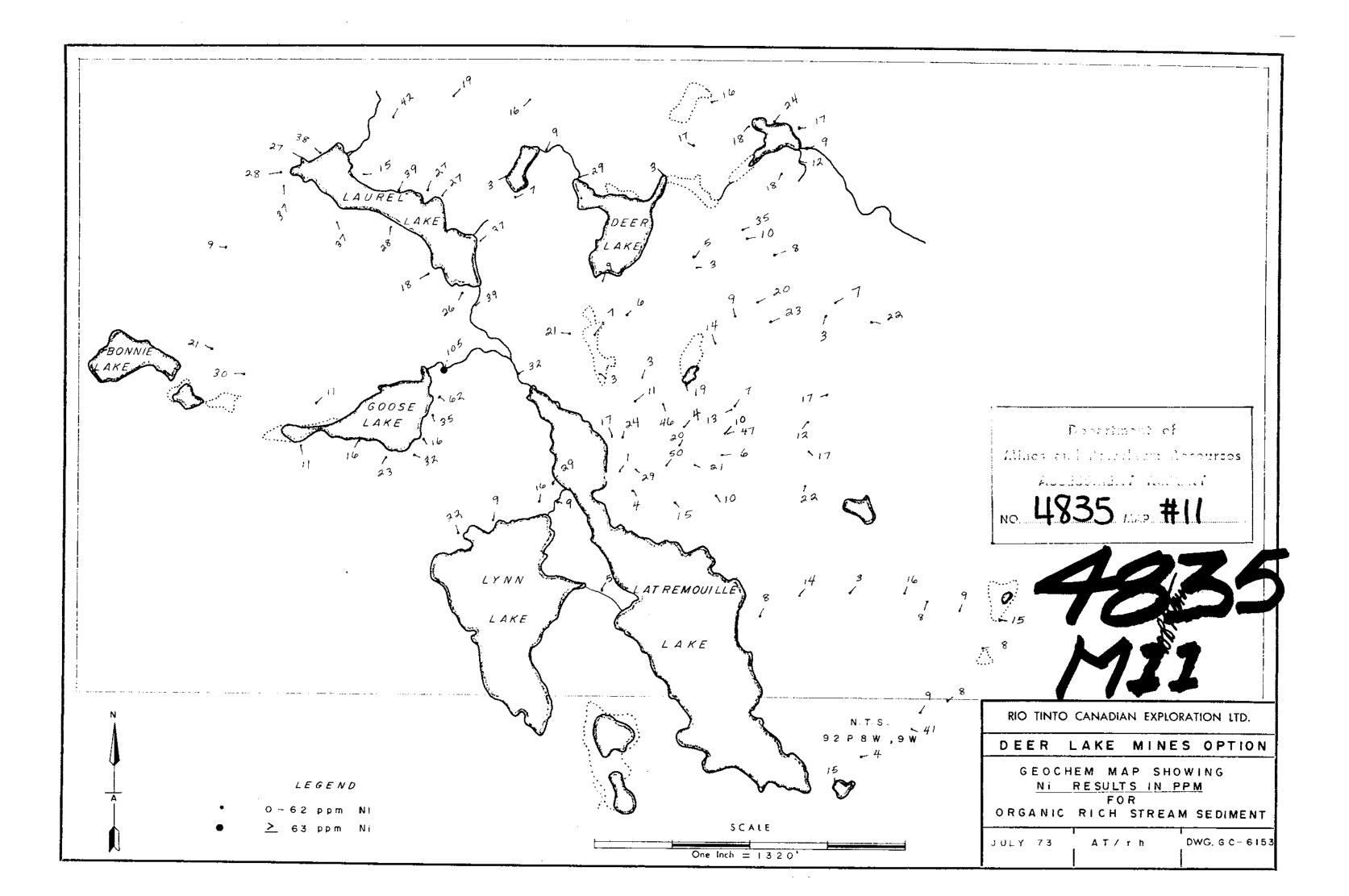


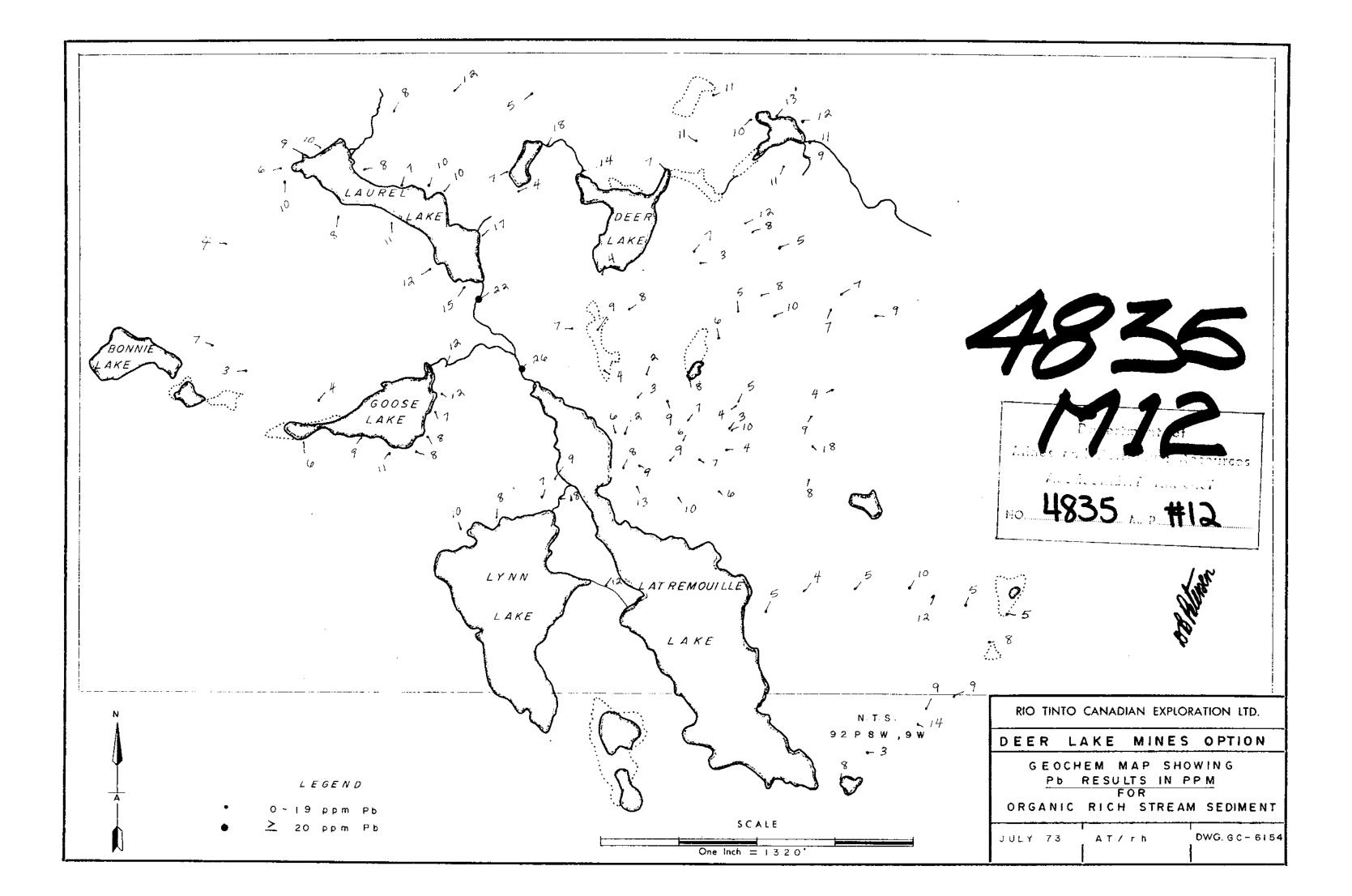


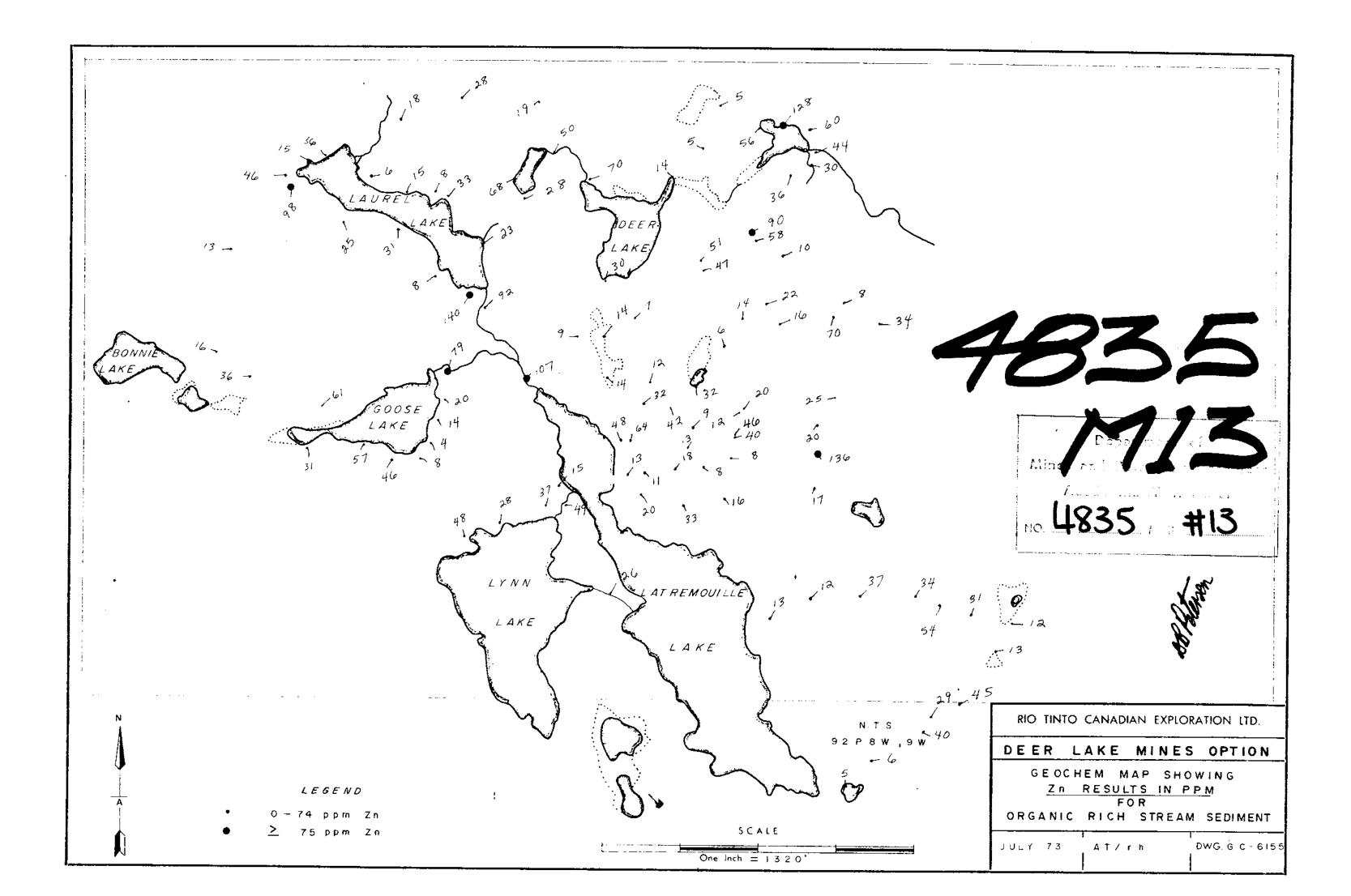




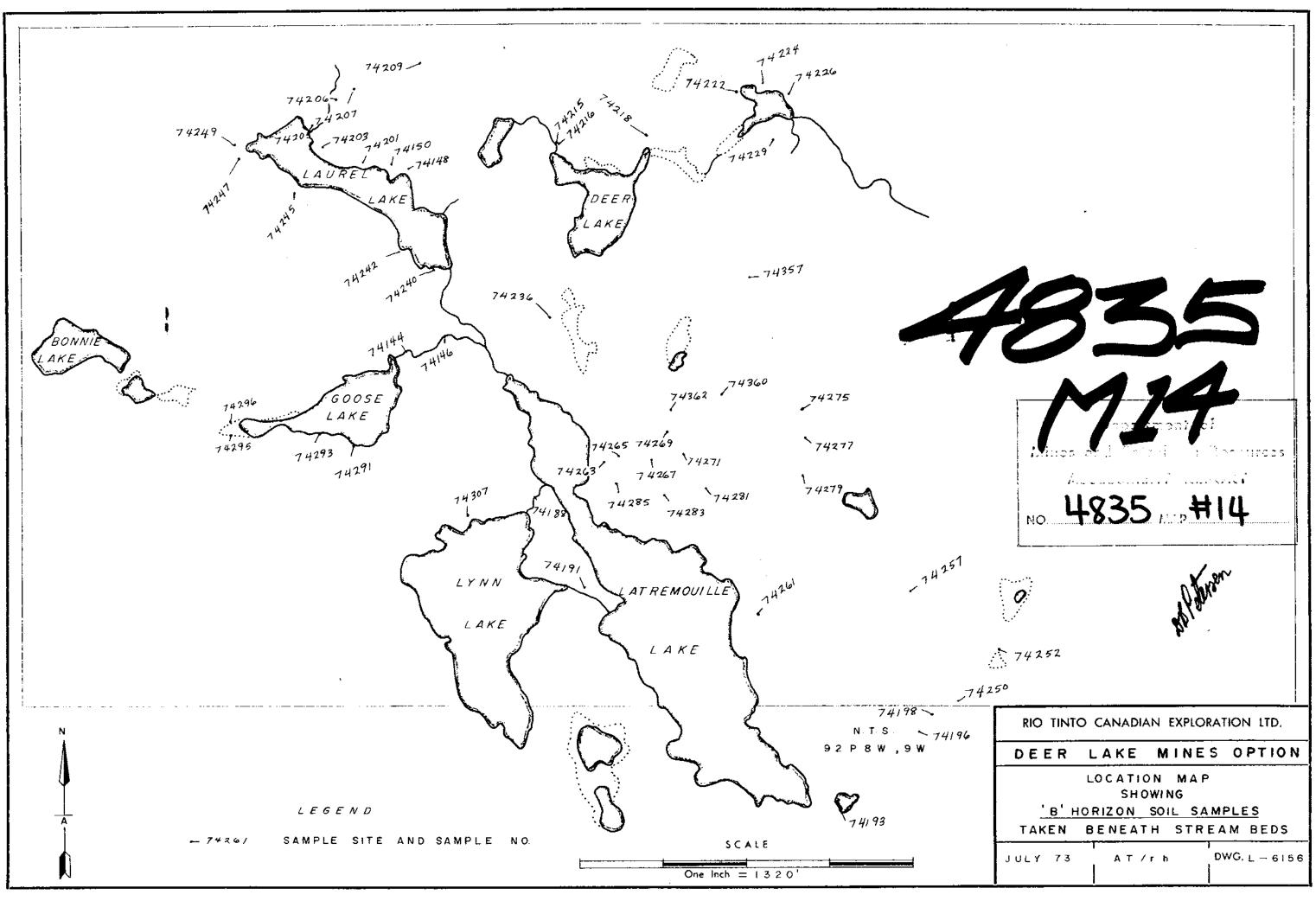


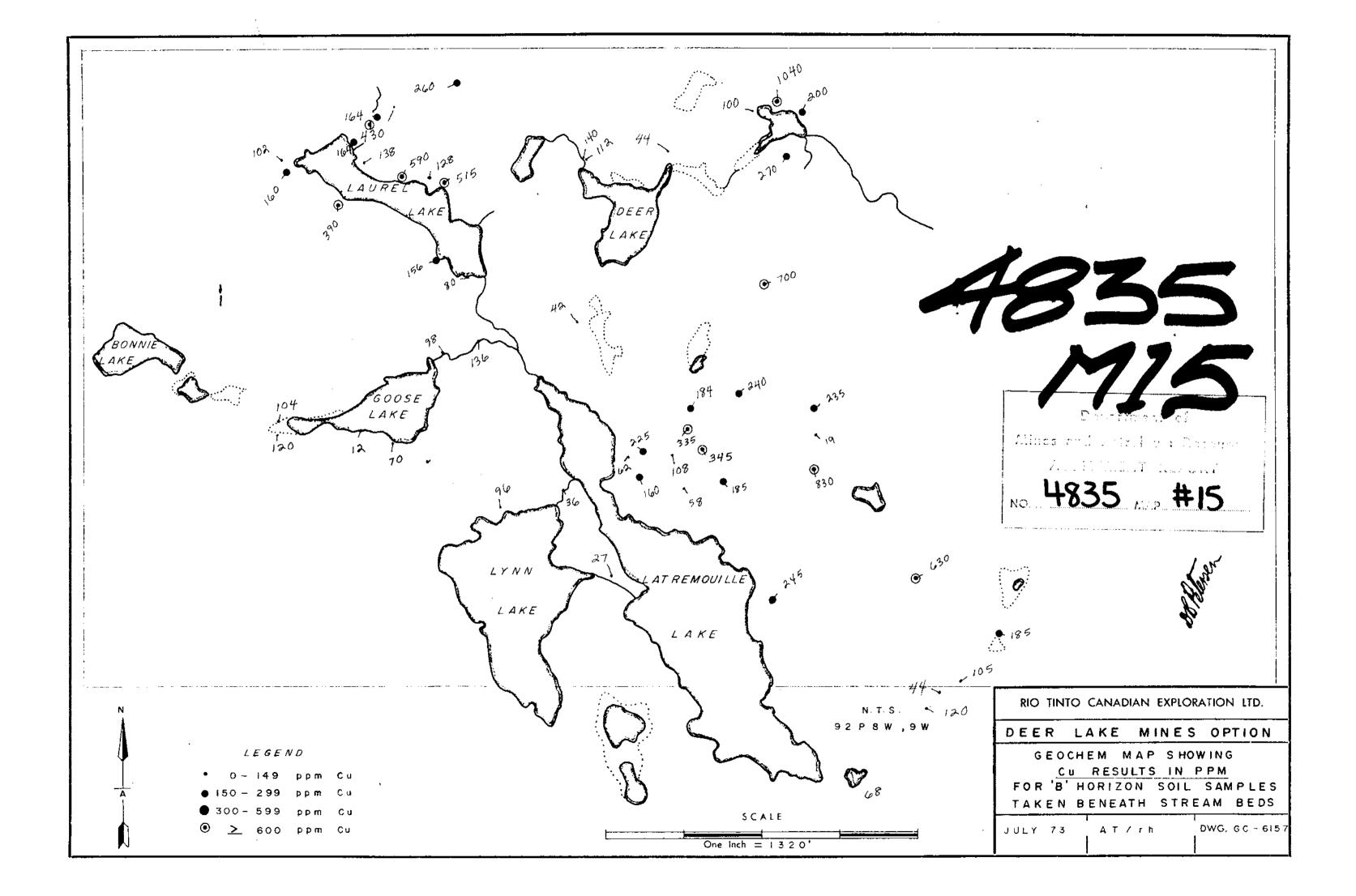


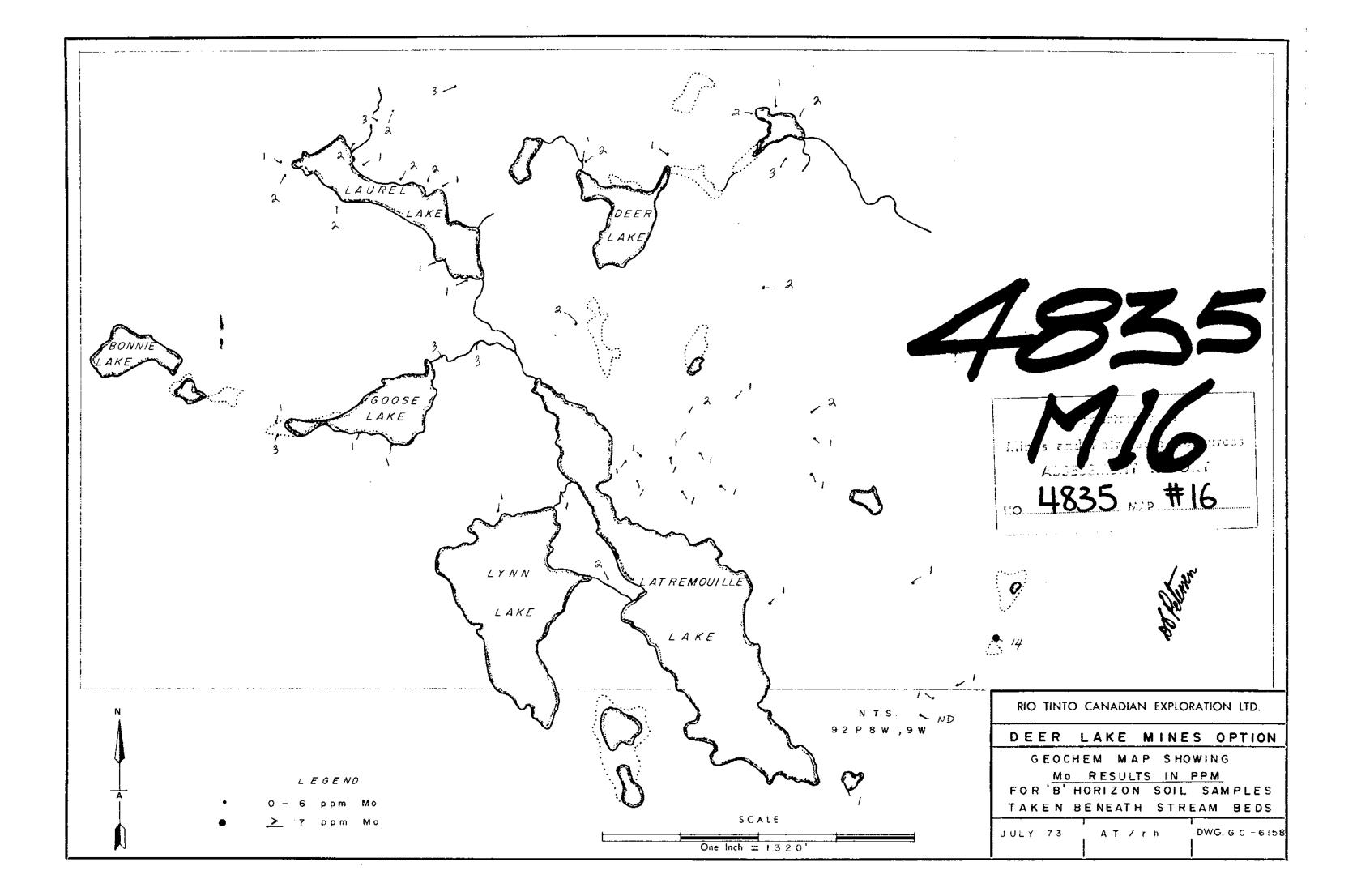


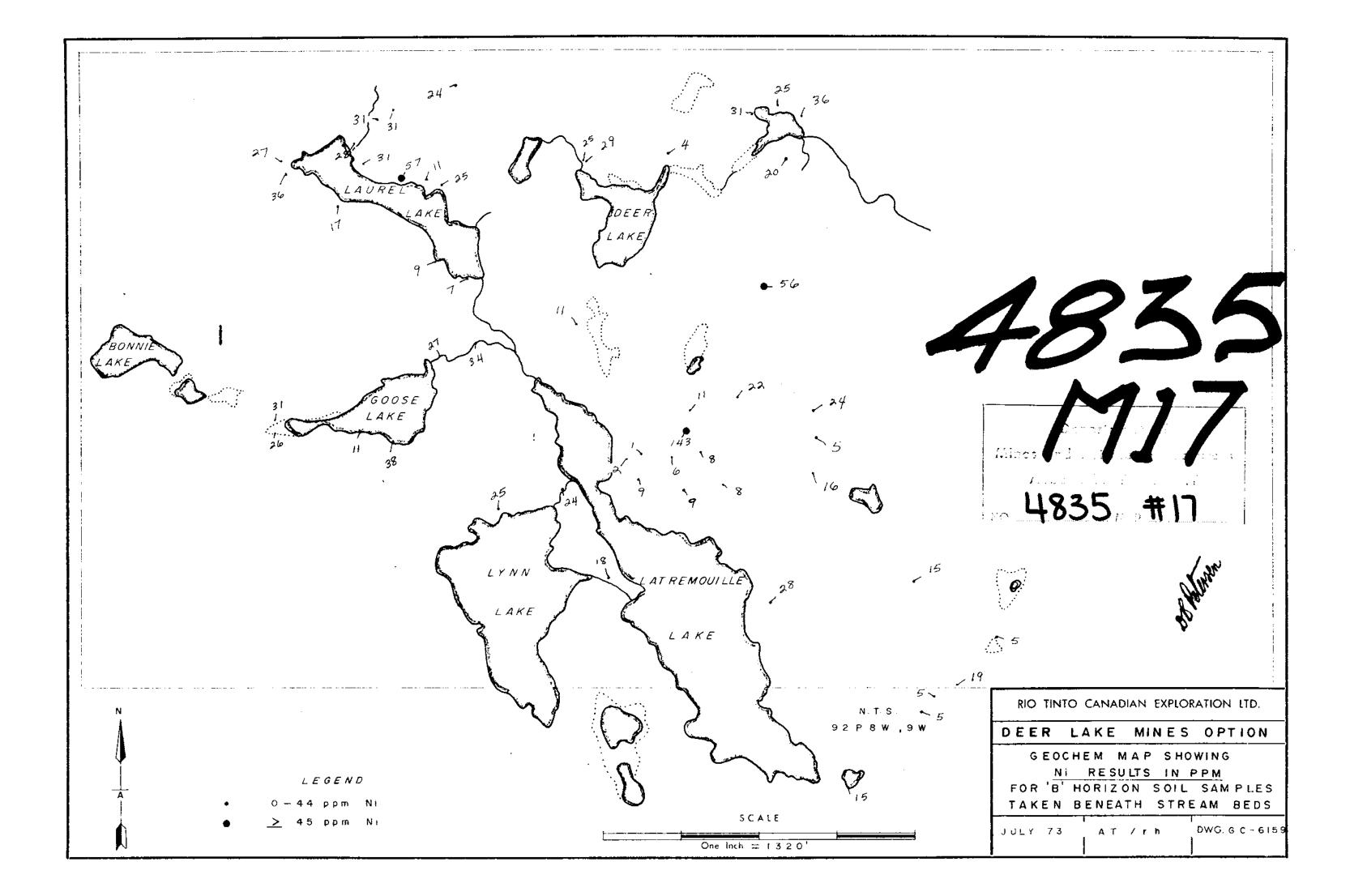


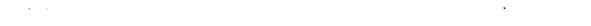
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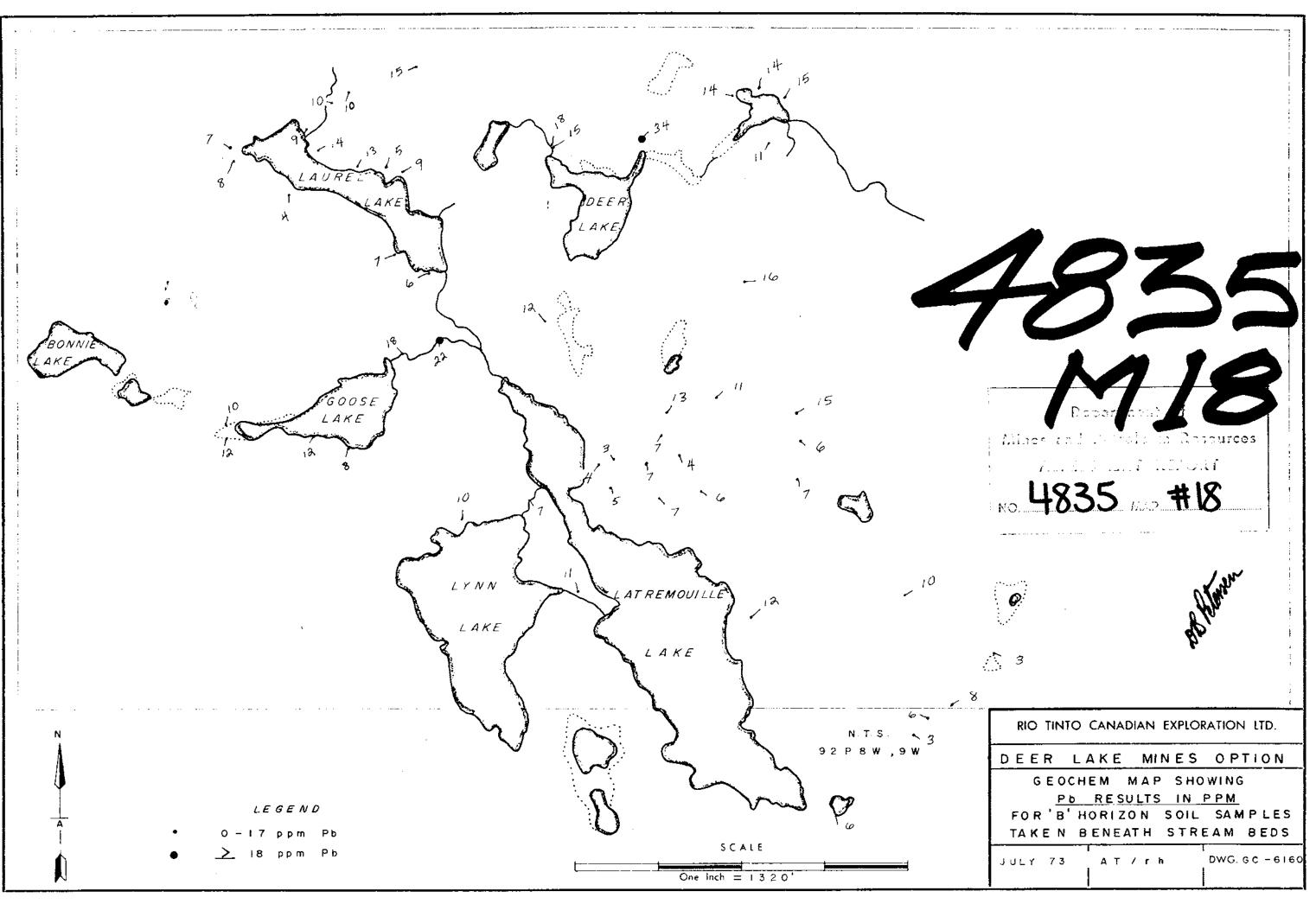


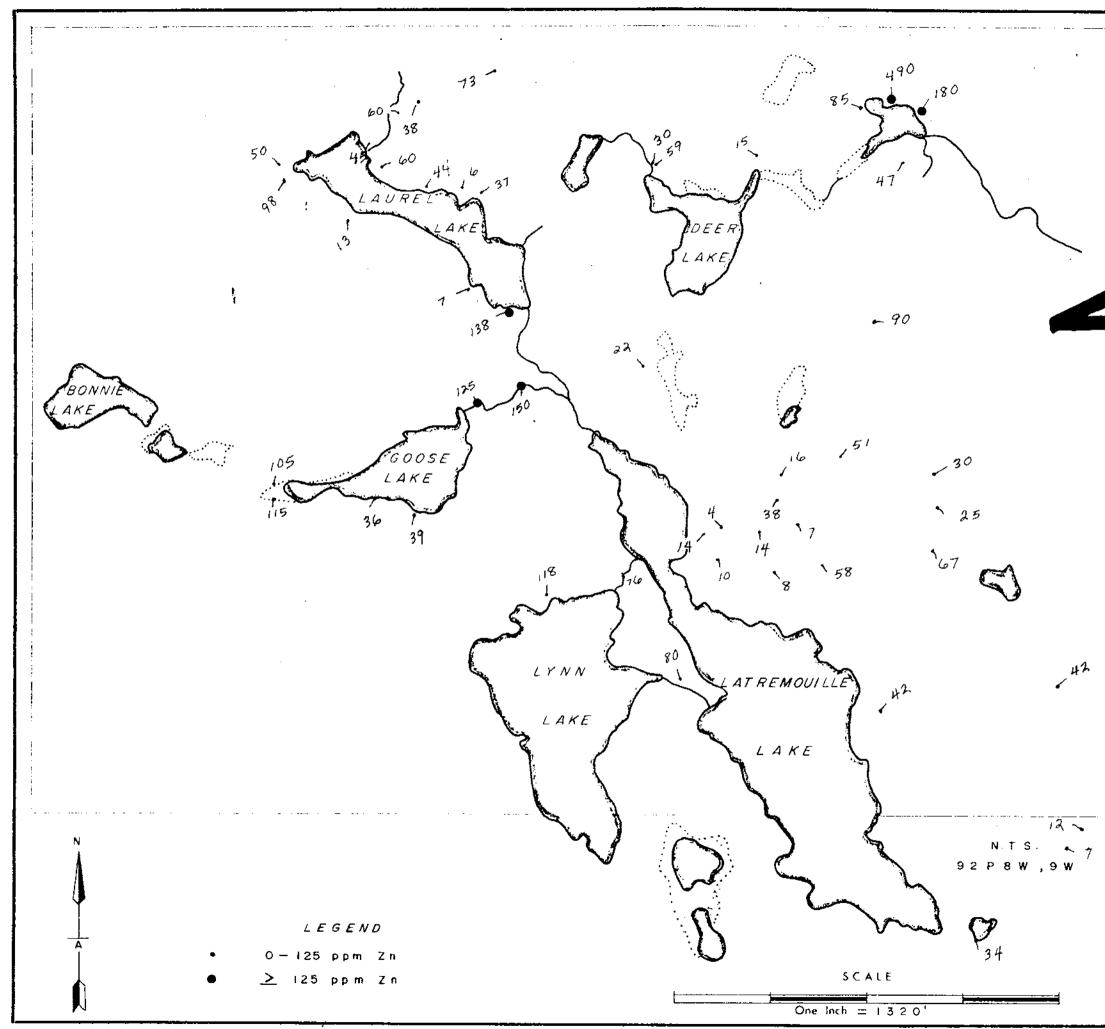












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