

3645

GEOCHEMICAL AND GEOPHYSICAL REPORT

FIR, HAN, JUS, LENA AND SHOY

GROUPS OF MINERAL CLAIMS

JUSTINE AND HANSON LAKE AREA

CANADIAN EXPLORATION LIMITED

ENDAKO MINES DIVISION

OMINECA MINING DIVISION

ENDAKO, B. C.

(Latitude 54° 15', Longitude 125°)

93 K / 2W, 3E, 6E, 7W

Field work undertaken during period

11 May 1971 to 18 August 1971

E. T. Kimura

May 4, 1972

Department of  
Mines and Petroleum Resources  
ASSESSMENT REPORT  
NO. 3645 MAP .....

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INTRODUCTION

Soil geochemical, geochemical water and ground magnetometer surveys were conducted over Fir, Han, Jus, Lena and Shov Groups of Mineral Claims during period 11 May 1971 to 18 August 1971. Work was undertaken as part of commitments for assessment work on mineral claims. The claims are located in areas surrounding Justine and Hanson Lakes which are approximately nine to twelve miles due north of Endako Village. All mineral claims are owned by Canadian Exploration Limited, Endako Mines Division (formerly Endako Mines Limited).

SUMMARY

Approximately 2,900 soil samples were collected over 409 mineral claims. These samples were assayed for Mo, Cd, Ag, Cu, Pb and Zn content. Results indicated several anomalous areas in Cu, Pb and Zn. The higher Cd values generally overlapped higher Zn values. Isolated and spotty Ag and Mo anomalies were also indicated.

Geochemical water survey of drainages and groundwater springs indicated several geochemical targets.

Ground magnetometer survey was conducted over 33 line miles. Although several localized areas registered slightly higher and lower than background readings, the overall survey showed no significant variations in magnetic susceptibility.

MINERAL CLAIM GROUPS

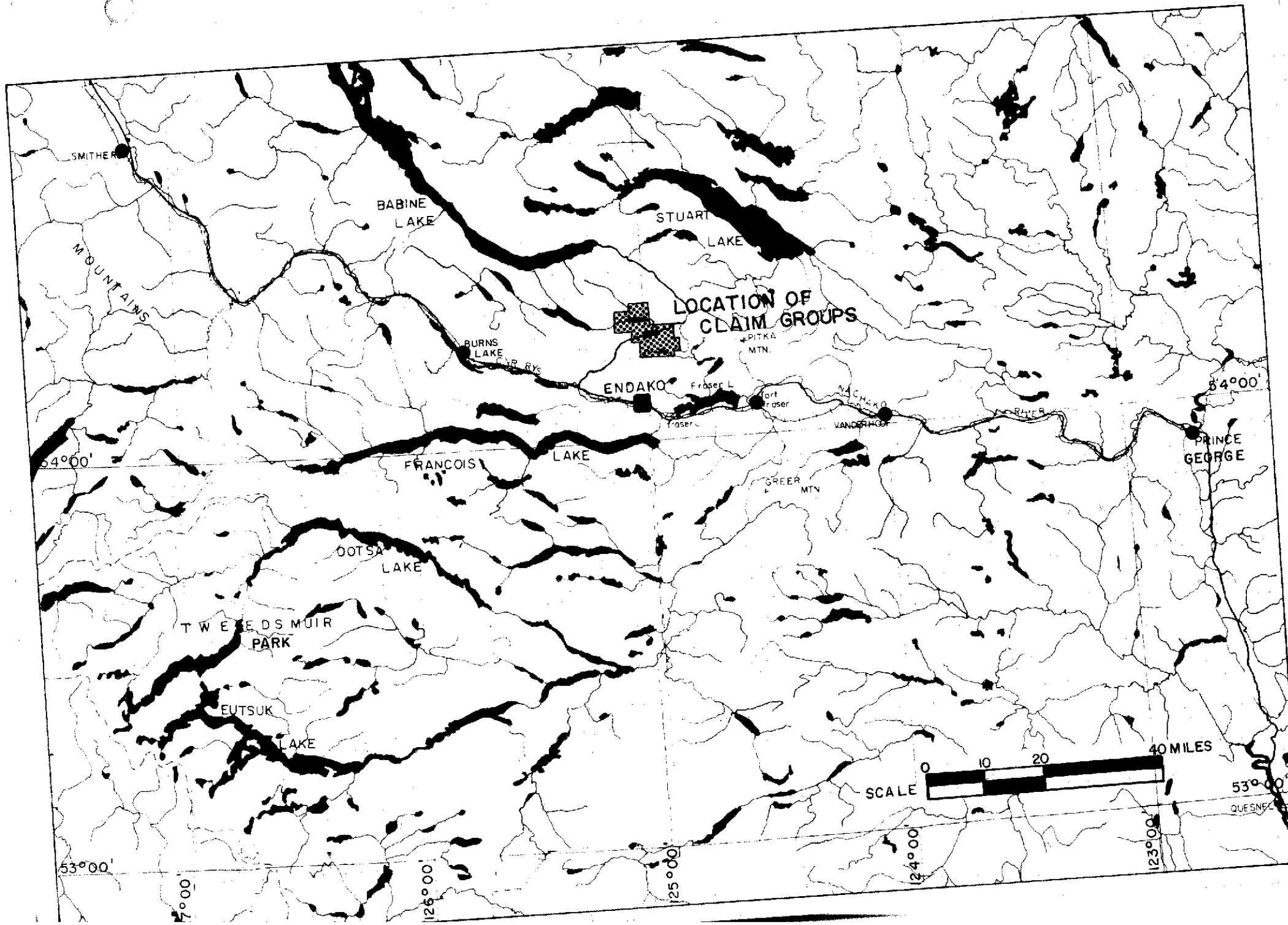
A total of 409 mineral claims is recorded as Fir, Han, Jus, Lena and Shov Mineral Claims at Justine and Hanson Lakes. The property is geographically located about 12 miles due north of Endako Village in the Omineca Mining Division at Latitude 54° 15' N, Longitude 125° W. All mineral claims are owned by Canadian Exploration Limited, Endako Mines Division.

Mineral claims are grouped as follows:

<u>Group</u>	<u>Mineral Claims</u>	<u>Record Numbers</u>	<u>Record Date</u>
Fir 1	Fir 1 - 16	98515-98530	May 25, 1971
	Han 76 - 79	99216 - 99219	June 4, 1971
	Lena 1 - 16	100809 - 100824	July 9, 1971
	Lena 49 - 52	103063 - 103066	Aug. 17, 1971

Fir 17	Fir 17 - 54 Fir 55 - 59	98531 - 98568 99174 - 99178	May 25, 1971 June 4, 1971
Han 1	Han 1 - 10 Han 25 - 28 Han 65 Fr. Lena 53 - 77	98649 - 98658 98673 - 98676 99205 103067 - 103091	May 25, 1971 May 25, 1971 June 4, 1971 Aug. 17, 1971
Han 15	Han 11 - 16 Han 80 - 89 Han 104 - 117 Han 118 Fr.	98659 - 98664 100758 - 100767 100782 - 100795 100796	May 25, 1971 July 9, 1971 July 9, 1971 July 9, 1971
Han 53	Fir 33 - 35 Fir 67 - 76 Han 53 & 54 Han 55 Fr. Han 63 & 64 Jus 51 - 59 Jus 90 - 101	98547 - 98549 98569 - 98578 98681 & 98682 98683 98690 & 98691 98621 - 98629 100857 - 100868	May 25, 1971 May 25, 1971 May 25, 1971 May 25, 1971 May 25, 1971 May 25, 1971 July 9, 1971
Han 57	Han 17 - 24 Han 49 - 62 Han 66 - 75 Han 119 - 130	98665 - 98672 98677 - 98689 99206 - 99215 100797 - 100808	May 25, 1971 May 25, 1971 June 4, 1971 July 9, 1971
Han 94	Han 90 - 103 Han 131 - 134 Eena 78 - 86	100768 - 100781 103101 - 103104 103092 - 103100	July 9, 1971 Aug. 17, 1971 Aug. 17, 1971
Jus 1	Jus 1 - 20 Jus 21 & 22 Jus 43 Jus 45 - 50 Jus 79 - 83 Jus 84 Fr. Jus 85 & 86 Jus 87 Fr. Jus 88 & 89	98579 - 98598 99186 & 99187 98619 99188 - 99193 99194 - 99198 99199 99200 & 99201 99202 99203 & 99204	May 25, 1971 June 4, 1971 May 25, 1971 June 4, 1971 June 4, 1971 June 4, 1972 June 4, 1972 June 4, 1971 June 4, 1971
Jus 70	Jus 23 - 42 Jus 44 Jus 60 - 78	98599 - 98618 98620 98630 - 98648	May 25, 1971 May 25, 1971 May 25, 1971
Lena 20	Lena 17 - 48	100825 - 100856	July 9, 1971
Shov 1	Fir 60 - 66 Shov 1 - 32 Shov 33 Fr.	99179 - 99185 100869 - 100900 100901	June 4, 1971 July 9, 1971 July 9, 1971





An appended mineral claim map on 1" = ½ mile scale (Appendix III) shows location of mineral claims at Justine and Hanson Lakes.

#### TOPOGRAPHY AND ACCESS

The general landscape within mineral claim area is dominated by Shovel Creek valley which appears as a broad trough, deeply incised within a system of low rounded hills. Most of the terrain has a strong easterly grain which is approximately parallel to local axis of valley. Maximum relief taken from the highest hill to lowest point in the valley is about 2,000 feet. Terrain above 3,500-foot level is gently rolling except along valley sides where slopes of over 20 degrees prevail. Lower valley slopes generally lie between 20 and 40 degrees. Steep slopes often correspond with either bedrock exposure or talus accumulations.

Drainage patterns show a marked degree of derangement due to glacial scouring and deposition. No evidence of wide-spread stream rejuvenation is apparent in the present topography. Local lake basins caused by glacial overdeepening have acted as temporary base levels for stream erosion; as a result, most streams have low gradients except along oversteepened valley slopes. Within claim area, Shovel Creek valley drops about 100 feet over a distance of eight miles. The resulting stream course is meandering and swampy. Fine sediment appears to have been deposited along valley bottom in glacial-formed depressions which are marked now by shallow lakes, swamps and muskeg. Some downcutting is evident along Shovel Creek west of Hanson Lake but elsewhere the stream channel is barely entrenched within the flat valley bottom. Valley slopes above Shovel Creek are moderately well-drained by numerous youthful streams; alluvial fans are developed where these streams enter the valley floor. Upland areas are poorly drained by networks of swamps, small lakes and sluggish creeks which lack well-developed drainage channels to the major valleys. Overall drainage patterns show a distinct reticulate configuration which cannot be attributed to glacial derangement.

The mineral claim area, until October 1971, was accessible only by helicopter and fixed-wing aircraft. Numerous swamps along valley floors and over scattered locations on upland regions provided convenient landings for helicopter-supported field work. Hanson and Helene Lakes were used for fixed-wing aircraft. Alpine Helicopters Ltd. and Transprovincial Airlines Ltd. were employed to transport crews and supplies from Endako Mines to field sites.

A nine-mile long four-wheel drive access road was constructed from Duncan Creek to within one mile of Hanson Lake during September - October 1971. This road will serve as main access to areas surrounding Hanson Lake. As yet the area from Justine to Jean Lakes will not be accessible by vehicle.

#### GENERAL GEOLOGY

Reference is made to G. S. C. Memoir 252 by J. E. Armstrong for regional geologic interpretation. A large proportion of Justine and Hanson Lakes area is underlain by Topley intrusions of Middle and Upper Jurassic age. The more basic rock types such as foliated gneissic diorite, amphibolite and schistose amphibolite probably represent the oldest rock units of batholith. These rocks are intruded by pink granite and quartz monzonite which are probably correlative to Casey alaskite and Glenannan quartz monzonite rock units (Lode Metals in British Columbia 1965, pp. 114 - 135). The Topley rocks are, in turn, intruded by several varieties of porphyry dykes and irregular stock-like bodies. All above rocks are in part overlain by younger Ootsa Lake Group and Endako Group volcanic rocks of Upper Cretaceous and Tertiary age. These rocks are generally exposed as relatively extensive belts along easterly and north-easterly margin of mineral claim area and also as isolated remnants at higher elevations.

Structural trends are inferred from several major drainage systems which transect the area in easterly, northeast, and northwest directions. The easterly trend is most dominant and can be depicted from Shovel Creek valley and Helene Lake. Several subsidiary drainages with deep ravines complement major trends.

#### FIELD WORK AND SURVEY CONTROL

Field work for geochemical and ground magnetometer surveys was conducted mainly from week-long fly camps. Several traverses, particularly for fill-in detail, were conducted by field crews on a daily basis from Endako Mines. All fly camps and daily traverse locations were supported by either helicopter or fixed-wing aircraft.

All survey lines were controlled by chain and compass. For most part, lines were run in easterly directions; these were tied into north-trending lines which were produced from known geographical locations on contour maps. Aerial photographs on 1" = 1/2 mile scale were used extensively for ground location control.

## SOIL GEOCHEMICAL SURVEY

### Introduction

Soil geochemical survey was conducted over the entire mineral claim area which covers approximately 31 square miles. Samples were collected at 200-foot intervals along east-west lines which were spaced from 750 to 1,500 feet apart. In several instances lines were up to 3,000 feet apart. North-south baselines for control purposes were also sampled.

Physiographic development of terrain has resulted in a variety of soil deposits and in varying degrees of soil development. As a result, interpretation of geochemical survey has been tempered by location of samples, ground slope, drainage patterns, suspected overburden depths and the general complexities of local soil deposits.

Glaciation has been the principal geomorphological agent; later fluvial cycles and patterns have locally transformed glaciated land forms. Generally, glacial and glacio-fluviatile deposits are present along valley floors and walls whereas till deposits predominate on upland regions. Colluvial deposits consisting largely of glacial till and talus are common along steep-sided valley walls, particularly along south-facing slope of Shovel Creek and Hanson Lake. Local alluvial deposits are encountered close to valley floors. Reference is made to an appended map (Appendix XVI) which shows soil distribution over the region.

Soil development is variable. The degree of development is largely dependent on type of deposit, ground slope and drainage. For most part it is rather poor although the B-horizon is usually recognizable. In many instances, where soil depth is thin or if poor drainage and swampy conditions prevail, the B-horizon is essentially undeveloped.

Vegetation over the region is also variable and in most cases, reflects local ground water conditions. Swamp grasses, willow, alder and black spruce cover swampy valley bottoms where varying depths of decomposed black organic matter overlying impervious alluvial clay predominates. Stands of large cottonwood are common to gravel alluvial fans. Sparse aspen and a variety of low bushes cover well-drained colluvial deposits especially along south-facing slopes. Open jack pine forests are characteristic of well-drained outwash deposits, whereas thick second growth jack pine dominates more recently-burned area north of Justine Lake. Thick growths of balsam and spruce are common on upland regions and on north-facing slopes where poorly-drained glacial material is encountered. Small alder groves are scattered throughout, especially where water table is within a few feet of surface.

### Sampling

Majority of soil samples were obtainable from small four-to-six inch deep holes; occasionally deeper depths were required where humus layer was thick. Samples were collected, wherever possible from B-horizon. Where soil development was poor, samples were frequently collected from either C-horizon or composites of B and C-horizons. Occasionally organic-rich material was sampled when depth of humus was excessive. Teflon or plastic spoons were utilized to scoop about 150 grams of material into heavy kraft paper envelopes. Samples were generally dried under room temperature conditions prior to shipment to laboratory.

### Assay Method

All soil samples were assayed for molybdenum, silver, cadmium, copper, lead and zinc at Placer Development Geochemistry Laboratory, Vancouver, B. C., and at Warnock Hersey International Limited, Vancouver, B. C.

The processing and analytical method of soil geochemical samples at Placer Development Geochemistry Laboratory are as follows. Samples are dried in a hot air dryer, then sifted in -80 mesh nylon sieves. Portions of -80 mesh fractions are weighed with precision torsion balance. Samples are digested in a mixture of hot perchloric and nitric acid, and then prepared for analysis by atomic absorption spectrophotometry. A Perkin-Elmer 403 instrument is used for analysis of molybdenum, cadmium, copper, lead and zinc. Other portion of sample is digested in boiling nitric acid, then water and 20% T.O.T.P. dissolved in heptane are added. The solution is shaken and centrifuged prior to analysing for silver by atomic absorption.

The sample processing and analytical methods at Warnock Hersey are unavailable in detail. The -80 mesh material is analysed for the six metals by atomic absorption. The detection limits for the various determinations are as follows:

<u>Metal</u>	<u>Detection Limit</u>
Molybdenum	1.0 ppm
Silver	0.2 ppm
Cadmium	0.25 ppm
Copper	0.5 ppm
Lead	1.0 ppm
Zinc	0.25 ppm

## Results

Soil geochemical survey indicated several anomalous areas. Appended soil geochemical maps (Appendices IV to IX) show sample locations, metal contents and interpretation of results.

1. A lead-zinc anomaly has been outlined in an area one mile northeast of Hanson Lake. Anomaly covers an area about one square mile along steep north side of Shovel Creek valley. In addition to lead and zinc, silver and copper show some erratically high values within and surrounding anomaly area.
2. A zinc anomaly is defined along steep south-facing slope above Hanson Lake. Anomaly covers an area of 1,500 feet by 4,000 feet and is elongated in easterly direction. Lead values are also significantly higher than background across interpreted limits of anomaly.
3. A small copper anomaly is situated along north side of divide separating Hanson and Helene Lakes. Zone covers an area 800 feet by 2,200 feet. High zinc values are coincident and also extend easterly beyond anomalous copper values.
4. A lead-zinc anomaly of comparatively low tenor is indicated along divide between Hanson and Justine Lakes and about three miles northwest of Justine Lake. Anomaly covers approximately one square mile, but actually there appears to be little correlation or overlap of two anomalous metal zones. Additionally anomalous area is situated in glacial till which locally is overlain by thin mantle of talus and rock debris. Therefore it is difficult to assess significance of this anomaly.

In addition to above four anomalies, some isolated high silver and copper values were encountered over mineral claim area. Some of these erratic highs are spread over several contiguous sample locations. It is felt that sample locations were possibly situated in local areas which could largely be influenced by secondary dispersion agents, such as surface runoff, swamp environments and glacial transport. As a result they are not considered as geochemical targets.

Cadmium is closely associated with zinc and therefore high cadmium values more or less mirror zinc anomalies. Molybdenum showed no significant anomalous patterns with exception of a few higher than background values over copper anomaly on Hanson-Helene Lake divide.

In summary, the source for various geochemical anomalies is still unexplainable due to limited control on geological interpretation of very sparse outcrop occurrences. No mineralization has been uncovered.

## GEOCHEMICAL WATER SURVEY

### Introduction

Water samples were collected from numerous streams, springs, and seepages over mineral claim area. Samples were taken on a random basis with no particular grid or spacing interval. In most cases, samples were located along soil geochemical lines.

All water from sample locations was mobile. For this survey, surface water included streams; no standing water such as swamps, ponds and lakes were sampled. Ground water samples were collected where springs and seepages emerged at surface or along banks.

### Sampling

Water samples were collected in eight-ounce size polyethylene bottles with caps of same material. All bottles and caps were initially rinsed with the water at sample site, and then carefully filled and capped so that as little air as possible would be locked into sample. Precautions were taken to eliminate any organic and other solid impurities from water sample. The pH of water was recorded at sample site by using pH paper. Samples were placed in a cool dark storage box prior to shipment to laboratory. A total of 100 samples was collected over mineral claim area.

### Assay Method

Water samples were analysed for molybdenum, silver, copper, lead and zinc by Chemex Labs Ltd., North Vancouver, B. C. The processing and analytical methods of hydrogeochemical samples at Chemex Labs are unavailable; their detection limits for various metals is as follows:

<u>Metal</u>	<u>Detection Limit</u>
Molybdenum	1 ppb.
Silver	1 ppb.
Copper	1 ppb.
Lead	2 ppb.
Zinc	1 ppb.

## Results

The following results are concluded from analyses of water samples.

1. Zinc and scattered copper anomalies were obtained in some samples which drain parts of lead-zinc soil geochemical anomaly one mile east of Hanson Lake. A weak expression was obtained from one water sample which was collected from zinc anomaly on north shore of Hanson Lake.
2. Zinc and copper expressions were obtained from two water samples which were collected from drainages originating from copper-zinc soil anomaly on Hanson-Helene Lake divide.
3. An isolated molybdenum high was obtained from one sample which was collected about one mile southeast of Hanson Lake.
4. Silver and lead showed no "highs".
5. The pH for water fluctuated between 5.5 to 6.5 over entire mineral claim area.

Water sample results complement soil geochemical targets at Hanson Lake for copper and zinc. No expressions were obtained from water samples which were collected in area one to two miles northwest of Justine Lake. Reference is made to appended maps (Appendices X to XIV) which show locations and diagrammatic quantitative metal content of water samples.

## MAGNETOMETER SURVEY

### Introduction

Ground magnetometer survey was conducted over mineral claims north of Hanson Lake and Shovel Creek to Helene Lake. Soil geochemical survey lines and sample locations were utilized for magnetometer survey control. A total of approximately 33 line miles was covered on survey.

### Instrumentation

Three Jalander Fluxgate Magnetometers were used for survey. Two instruments operated at ten-gamma sensitivity and third instrument at five-gamma sensitivity. These light-weight



oil-dampened fluxgate magnetometers are carried by a strap around operator's neck; after instrument is roughly levelled with aid of level bubble, a rapid convertible reading is obtainable by engaging current push button. Instruments were calibrated daily to correspond with magnetic susceptibility at several established stations. Adjusted conversions were calculated between three magnetometers in order to arrive at standardized readings.

### Results

Magnetic susceptibility across surveyed area appears to be relatively uniform. Readings ranged from 2,000 to 6,000 gammas with majority averaging about 3,800 to 4,200 gammas. Two local areas showed slight fluctuations from background.

1. At the extreme west end of mineral claim area, a group of higher than background susceptibility ranging from 5,000 to 6,000 gammas can be contoured to represent an irregular northeasterly-trending lobe.
2. A peculiar elongated north-trending low magnetic susceptibility appears in an area one mile east of Helene Lake.

No reasons other than possible rock type changes can be suggested for local fluctuations.

Reference is made to appended map (Appendix XV) which shows contoured ground magnetometer survey results.

### STATEMENT OF EXPENSES

The following expenses were incurred by Canadian Exploration Limited, Endako Mines Division for conducting soil geochemical survey, geochemical water survey and ground magnetometer survey over their mineral claim groups at Justine and Hanson Lakes.

#### I. GEOCHEMICAL SURVEY

<u>Personnel</u>	<u>Period Employed</u>	<u>Time and Rate</u>	<u>Cost</u>
P. Buckley	28 - 30 June 1971		
	1, 2, 6-9 July 1971		
	9 - 12, 17, 18 Aug. 1971	107 hrs @ \$3.15	\$337.05

G. D. Bysouth	11-13, 17-21 May 1971 28-30 June 1971 1, 6 July 1971 9-11 Aug. 1971	99 hrs @ \$6.25	\$618.75
J. A. Chapman	9-12 Aug. 1971	20 hrs @ \$4.75	\$ 95.00
J. B. Cyr	11-13, 17-21, 31 May 1971 9-12, 16-18 Aug. 1971	116 hrs @ \$4.75	\$551.00
E. T. Kimura	11-13, 17-21, 31 May 1971 28-30 June 1971 1,2, 6-9 July 1971 9-12 Aug. 1971	124 hrs @ \$8.00	\$992.00
H. N. McLeod	31 May 1971 1-3, 28-30 June 1971 1,2,6 July 1971 9-12, 16-18 Aug. 1971	117 hrs @ \$3.75	\$438.75
A. J. Peters	11-13, 17-21, 31 May 1971 1-3, 28-30 June 1971 1, 2, 6 July 1971 9 - 12, 16 - 18 Aug. 1971	150 hrs @ \$4.25	\$637.50
W. R. Ridgway	11-13, 17-21, 31 May 1971 1-3, 28-30 June 1971 1, 6 July 1971	158 hrs @ \$3.15	\$497.70
D. W. Sargent	28-30 June 1971 1, 2 July 1971 9-12, 16-18 Aug. 1971	71 hrs @ \$3.15	\$223.65
N. D. Smith	11-13, 17-21, 31 May 1971 9-12, 16-18 Aug. 1971	150 hrs @ \$3.15	\$472.50
K. J. Taylor	11-13, 17-21, 31 May 1971 6 July 1971 9-12, 17, 18 Aug. 1971	114 hrs @ \$3.75	\$427.50
L. E. Thon	11-13, 17-21, 31 May 1971 28-30 June 1971 1, 6 July 1971 9-12 Aug. 1971	101 hrs @ \$4.10	\$414.10
S. W. Wilson	11-13, 17-21, 31 May 1971 28-30 June 1971 1, 2, 6 July 1971 4, 5, 9-12, 16-18 Aug. 1971	204 hrs @ \$3.25	\$663.00

Total Personnel Cost

\$ 6,368.50

Office overhead @ 15% on wages

955.28

Direct Costs

Geochemical assaying: 2,919 samples @ \$4.20		\$12,259.80
Six determinations Mo Pb Zn Cu Cd & Ag		
Hydrogeochemical assaying: 100 samples @ \$6.50		650.00
Five determinations Mo Pb Zn Cu and Ag		
Transportation Costs		
1. Alpine Helicopter Ltd.		
a) Bell 47 G3 Bl Helicopter		
21 hrs @ \$150.00 (seven flights)	\$3,150.00	
b) Bell 206 Jet Ranger Helicopter		
6 hrs. 40 min. @ \$250.00 (four flights)	1,665.00	
c) Sikorsky S-55B Helicopter		
7 hrs. 20 min. @ \$300.00 (four flights)	<u>2,199.00</u>	
Total Helicopter Costs		7,014.00
2. Transprovincial Airlines Ltd.		
a) Beaver: 330 miles @ 80¢ (four flights)	264.00	
b) Otter: 1080 miles @ \$1.20 (seven flights)	<u>1,296.00</u>	
Total Fixed-wing Costs		1,560.00
Map compilations		
A. J. Peters 55 hrs @ \$4.25	233.75	
L. E. Thon 72 hrs @ \$4.10	<u>295.20</u>	528.95
Camp operations for following personnel		
P. Buckley 12 days:W. R. Ridgway 16 days		
G. Bysouth 17 days:D. W. Sargent 11 days		
J. Chapman 2 " :N. D. Smith 16 "		
J. B. Cyr 15 " :K. J. Taylor 16 "		
E. Kimura 18 " :L. E. Thon 16 "		
H. McLeod 16 " :S. W. Wilson 21 "		
A. J. Peters 22 days		
Total 198 man-days @ \$8.00		<u>1,584.00</u>
Total Geochemical Survey Expenditures		<u>\$30,920.53</u>

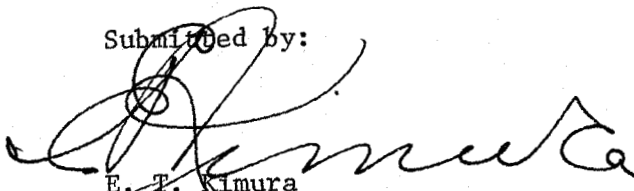
II. MAGNETOMETER SURVEY

<u>Personnel</u>	<u>Period Employed</u>	<u>Time and Rate</u>	<u>Cost</u>
P. Buckley	9-12, 16 Aug. 1971	30 hrs @ \$3.15	\$ 94.50
J. A. Chapman	9-12 Aug. 1971	20 hrs @ \$4.75	\$ 95.00
J. B. Cyr	16 Aug. 1971	8 hrs @ \$4.75	\$ 38.00
E. T. Kimura	9-12 Aug. 1971	20 hrs @ \$8.00	\$160.00
K. J. Taylor	16 Aug. 1971	10 hrs @ \$3.75	\$ 37.50
L. E. Thon	9-16 Aug. 1971	20 hrs @ \$4.10	\$ 82.00
Total Personnel Costs			\$ 507.00
Office overhead @ 15% on wages			76.05
<u>Direct Costs</u>			
Magnetometer rentals			
1. Elden Exploration Enterprises Ltd.		\$200.00	
2. C. Stephenson		<u>150.00</u>	350.00
Transportation costs included with geochemical survey expenditures.			
Map compilations and magnetometer calculations			
A. J. Peters	6 hrs. @ \$4.25		25.50
Camp operations for following personnel			
P. Buckley	3 days : E. T. Kimura	2 days	
J. A. Chapman	2 " : K. J. Taylor	1 "	
J. B. Cyr	1 " : L. E. Thon	2 "	
Total 11 man-days @ \$8.00			<u>88.00</u>
Total Magnetometer Survey Expenditures			<u>\$ 1,046.55</u>
<u>GRAND TOTAL GEOCHEMICAL AND MAGNETOMETER SURVEY EXPENDITURES</u>			<u>\$31,967.08</u>

CONCLUSION

Geochemical survey over mineral claims at Justine and Hanson Lakes indicated several lead, zinc and copper anomalies. Source for anomalies is unknown. Results from ground magnetometer survey were essentially flat and inconclusive.

Submitted by:



E. T. Kimura  
Senior Geologist  
Canadian Exploration Limited  
Endako Mines Division

ETK/sac

APPENDICES

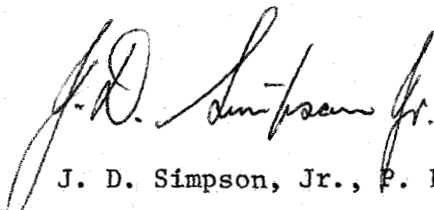
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II	Statement of Qualification	
III	Mineral Claim Map	1" = $\frac{1}{2}$ mile
IV	Soil Geochemical Survey: Molybdenum,	1" = $\frac{1}{4}$ mile
V	Soil Geochemical Survey: Silver,	1" = $\frac{1}{4}$ mile
VI	Soil Geochemical Survey: Cadmium,	1" = $\frac{1}{4}$ mile
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XVII	Declaration for Statement of Expenses	

APPENDIX I

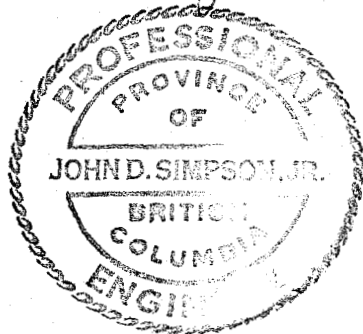
CERTIFICATION

I, J. D. Simpson Jr. of Canadian Exploration Limited, Endako Mines Division, Endako, B. C., do hereby certify that:

1. I am a registered Professional Engineer in the Province of British Columbia.
2. I have carefully reviewed the data and examined the report of E. T. Kimura on exploration work which was undertaken during the period 11 May to 18 August 1971 on the Fir, Han, Jus, Lena and Shov Groups of Mineral Claims. The mineral claims are owned by Canadian Exploration Limited, Endako Mines Division, and are located in the Omineca Mining Division near Endako, B. C. (Latitude  $54^{\circ} 15'$ , Longitude  $125^{\circ}$ )
3. To the best of my knowledge the interpretation of data, conclusions and expenditures which are claimed for the performance of work are valid.



J. D. Simpson, Jr., P. Eng.

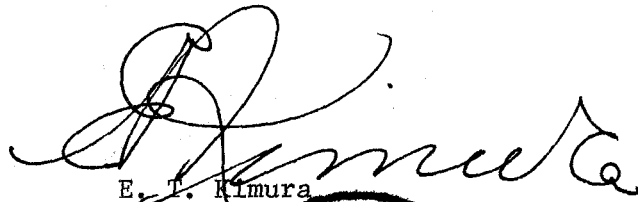


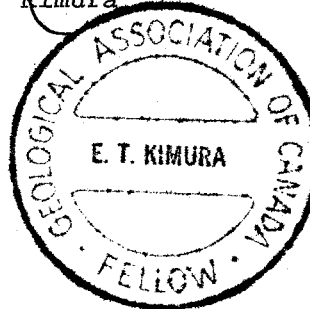
APPENDIX II

STATEMENT OF QUALIFICATION

I. E. T. Kimura, of Canadian Exploration Limited, Endako Mines Division, Endako, B. C., do hereby certify that:

1. I am a geologist.
2. I am a graduate of University of British Columbia with a B.A. degree in Geology and Physics in 1955.
3. From 1954 until the present I have been engaged in mining geology, both in underground and open pit operations, and in exploration geology in British Columbia, Saskatchewan and Yukon Territory.
4. I personally supervised and participated in the field work and have reviewed and assessed the data resulting from this work.

  
E. T. Kimura



DOMINION OF CANADA:  
PROVINCE OF BRITISH COLUMBIA.  
To Wit:

In the Matter of

EXPENDITURES FOR GEOCHEMICAL AND GEOPHYSICAL SURVEYS ON FIR, HAN, JUS, LENA AND SHOVS GROUPS OF MINERAL CLAIMS DURING PERIOD 11 MAY TO 18 AUGUST 1971.

I, E. T. Kimura

of Canadian Exploration Limited, Endako Mines Division, Endako, B. C.

in the Province of British Columbia, do solemnly declare that the following expenditures were incurred by Canadian Exploration Limited, Endako Mines Division in carrying out soil geochemical, geochemical water and ground magnetometer surveys for assessment work purposes on the Fir, Han, Jus, Lena and Shov Groups of Mineral Claims.

I Geochemical Survey	
Soil and water survey	\$30,920.53
II Ground Magnetometer Survey	<u>1,046.55</u>
Total Expenditures	<u>\$31,967.08</u>

Details on expenditures are available in Statement of Expenses; Geochemical and Geophysical Report, Fir, Han, Jus, Lena and Shov Groups of Mineral Claims. Justine and Hanson Lake Area, page 10 - 13.

And I make this solemn declaration conscientiously believing it to be true, and knowing that it is of the same force and effect as if made under oath and by virtue of the "Canada Evidence Act."

Declared before me at the VILLAGE  
of BURNS LAKE, in the  
Province of British Columbia, this 12th  
day of MAY 1972, A.D.

*[Handwritten signature of Notary Public]*

A Commissioner for taking Affidavits within British Columbia or  
A Notary Public in and for the Province of British Columbia.

★ 0

Commissioner for taking Affidavits  
in British Columbia



**In the Matter of**

EXPENDITURES FOR GEOCHEMICAL

AND GEOPHYSICAL SURVEYS ON FIR,

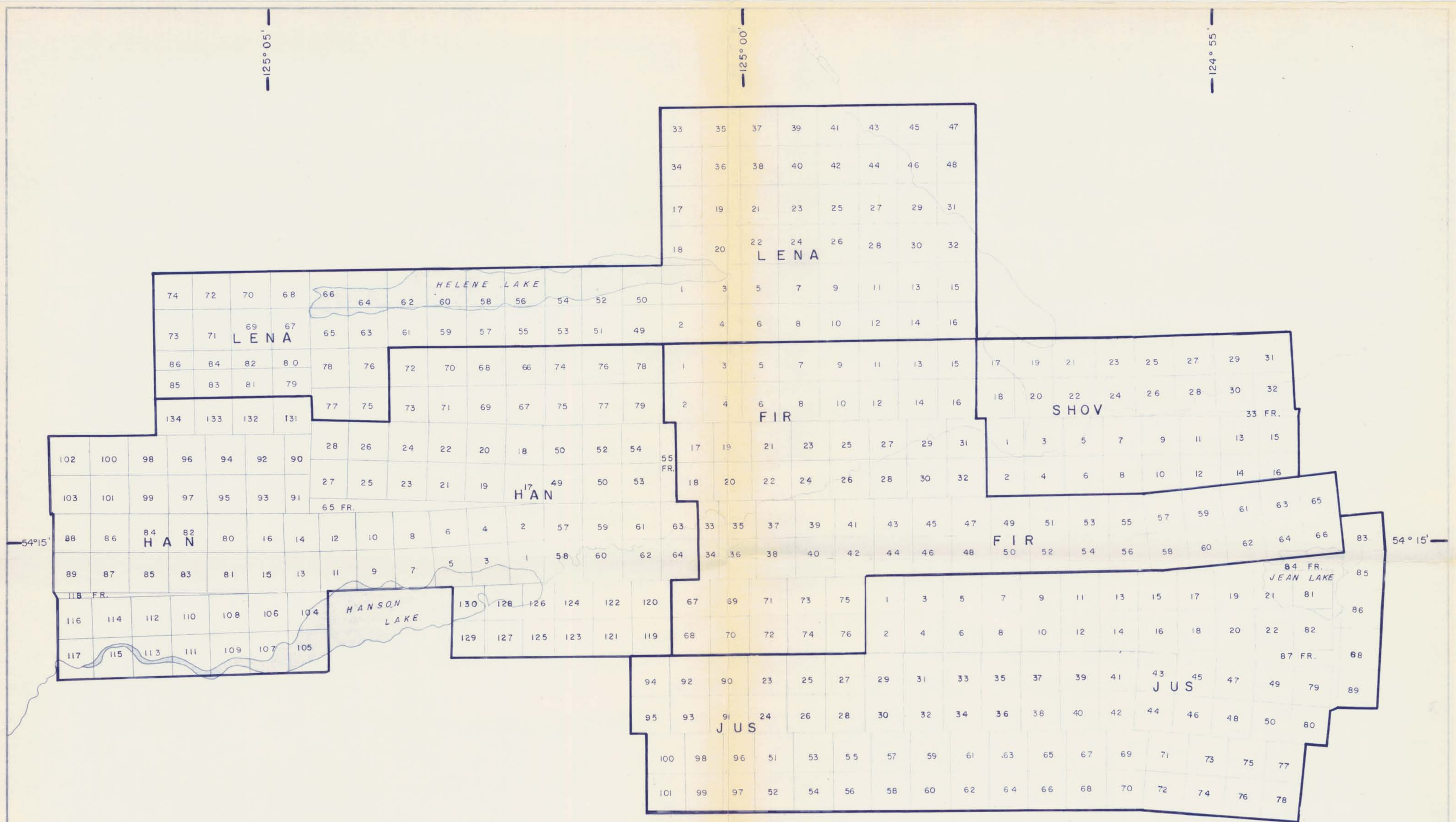
HAN, JUS, LENA AND SHOV GROUPS

OF MINERAL CLAIMS DURING PERIOD

11 MAY TO 18 AUGUST 1971.

**Statutory Declaration**

(CANADA EVIDENCE ACT)



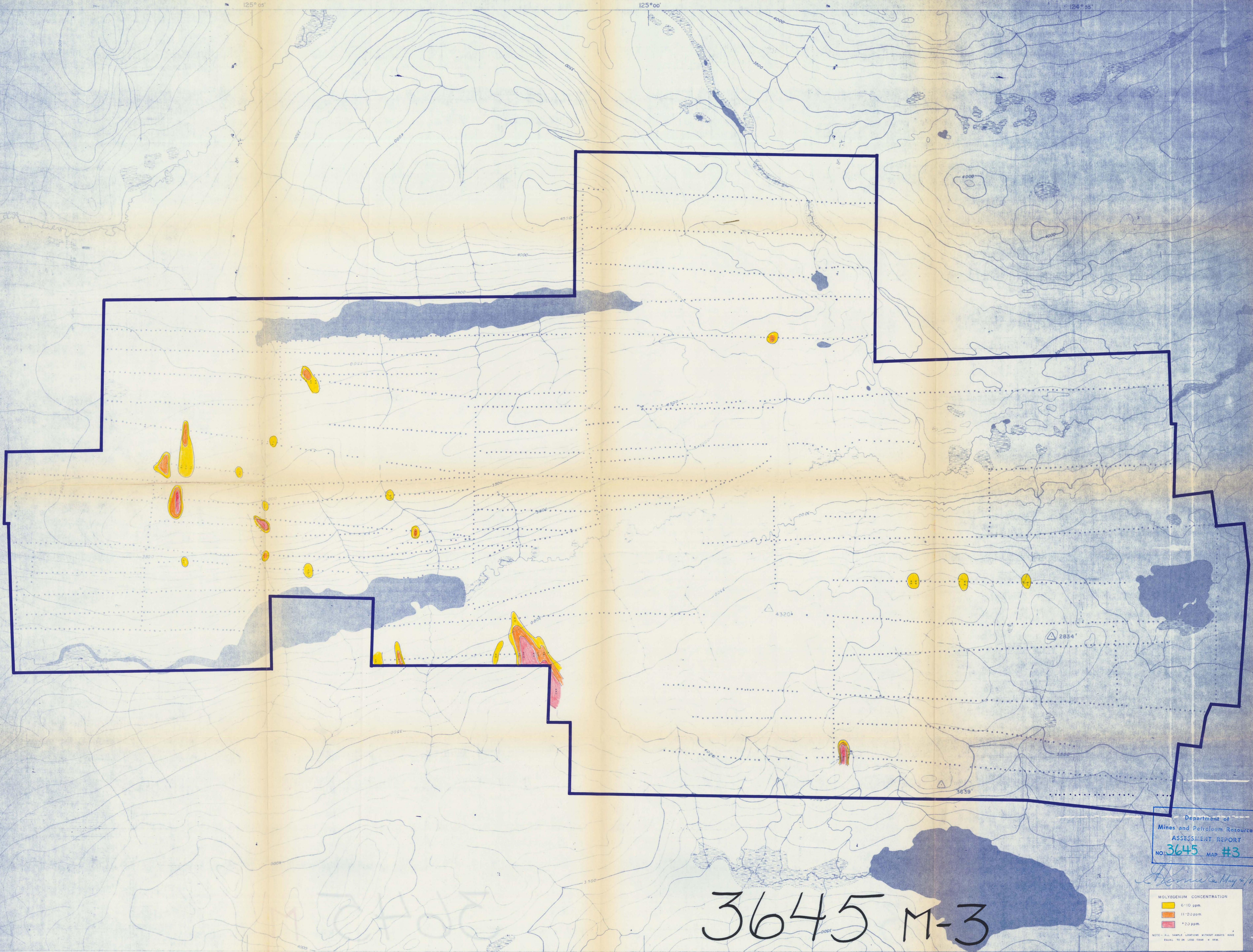
Department of  
 Mines and Petroleum Resources  
 ASSESSMENT REPORT  
 NO. 3645 MAP #2

*R. Smith* May 4/72

APPENDIX III

DRAWN A J P	SCALE 1" = 1/2 MI.	ENDAKO MINES LIMITED	TO ACCOMPANY GEOCHEMICAL AND GEOPHYSICAL REPORT
TRACED	DATE APRIL '72	JUSTINE AND HANSON LAKES PROJECT	ON GROUPS - FIR, HAN, JUS, LENA, AND SHO
APPROVED		MINERAL CLAIMS	FILE No.



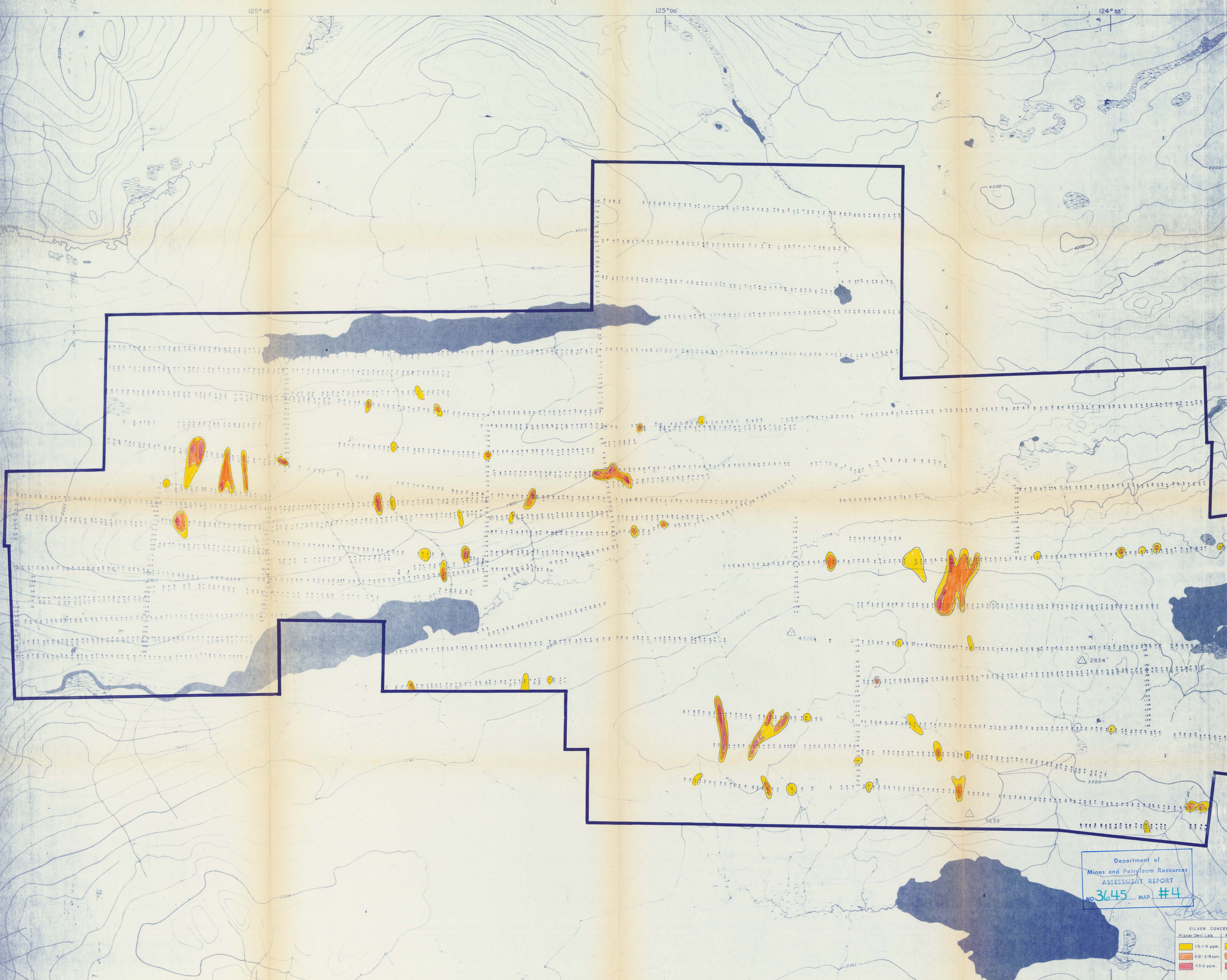


Department of  
Mines and Petroleum Resources  
ASSESSMENT REPORT  
NO. 3645 MAP #3

MOLYBDENUM CONCENTRATION  
 6-10 ppm  
 11-20 ppm  
 >20 ppm  
 NOTE - ALL SAMPLE LOCATIONS WITHOUT ASSAYS HAVE  
 EQUAL TO OR LESS THAN 4 ppm

3645 M-3





Department of  
Mines and Petroleum Resources  
ASSESSMENT REPORT  
NO 3645 MAP #4

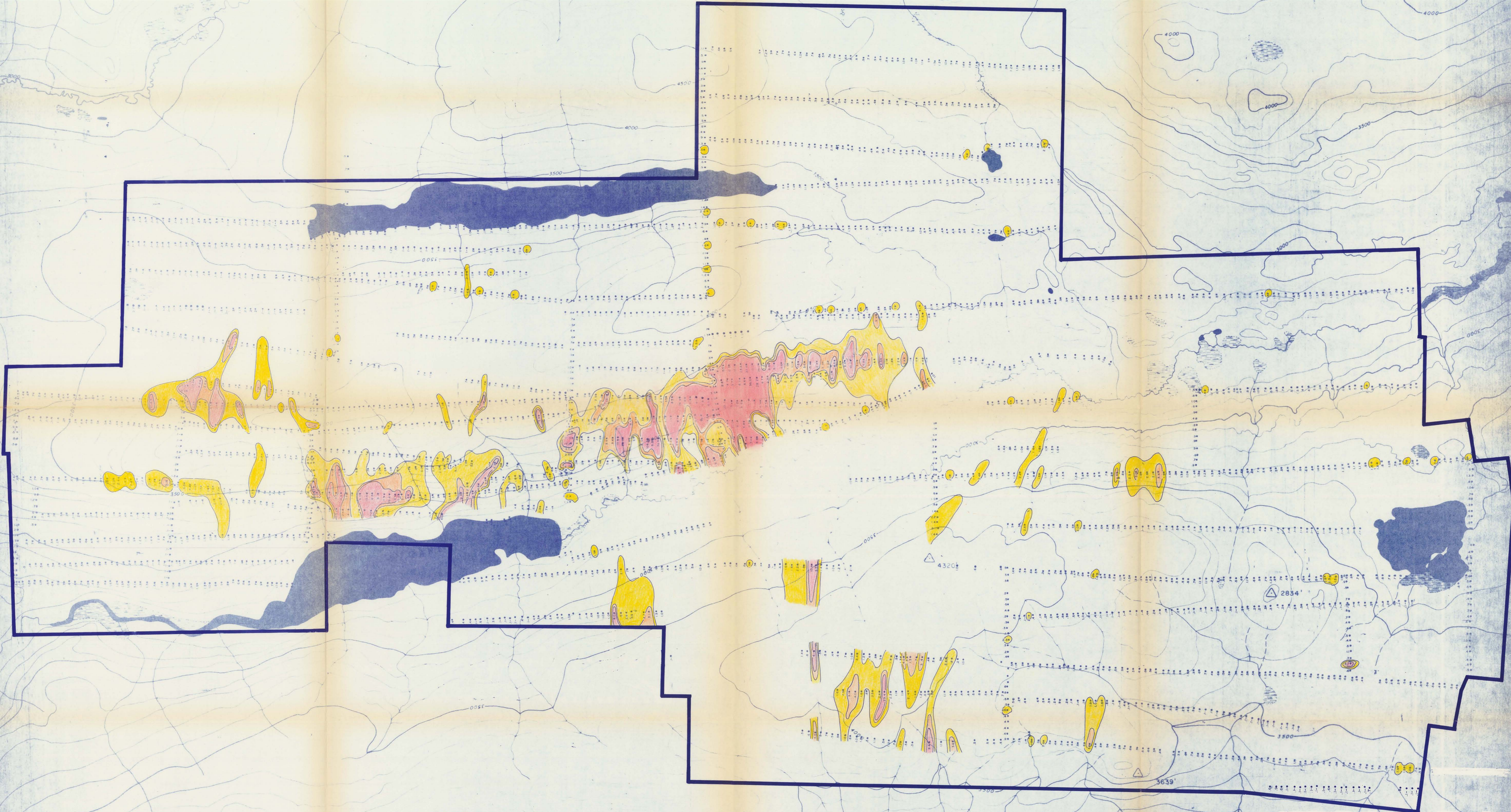
SILVER CONCENTRATION	
Placer, Devl. Lab.	Worrock-Hersey
1.5-1.9 ppm	3.0-4.9 ppm
2.0-2.9 ppm	5.0-7.9 ppm
3.0-3.9 ppm	8.0-9.9 ppm



125°05'

125°00'

124°55'



Department of  
Mines and Petroleum Resources  
ASSESSMENT REPORT  
NO. 3645 MAP #5

*L. Smith May 4/71*

CADMIUM CONCENTRATION	
1.5-2.9 ppm.	Yellow
3.0-4.4 ppm.	Orange
>4.4 ppm.	Red

125°05'

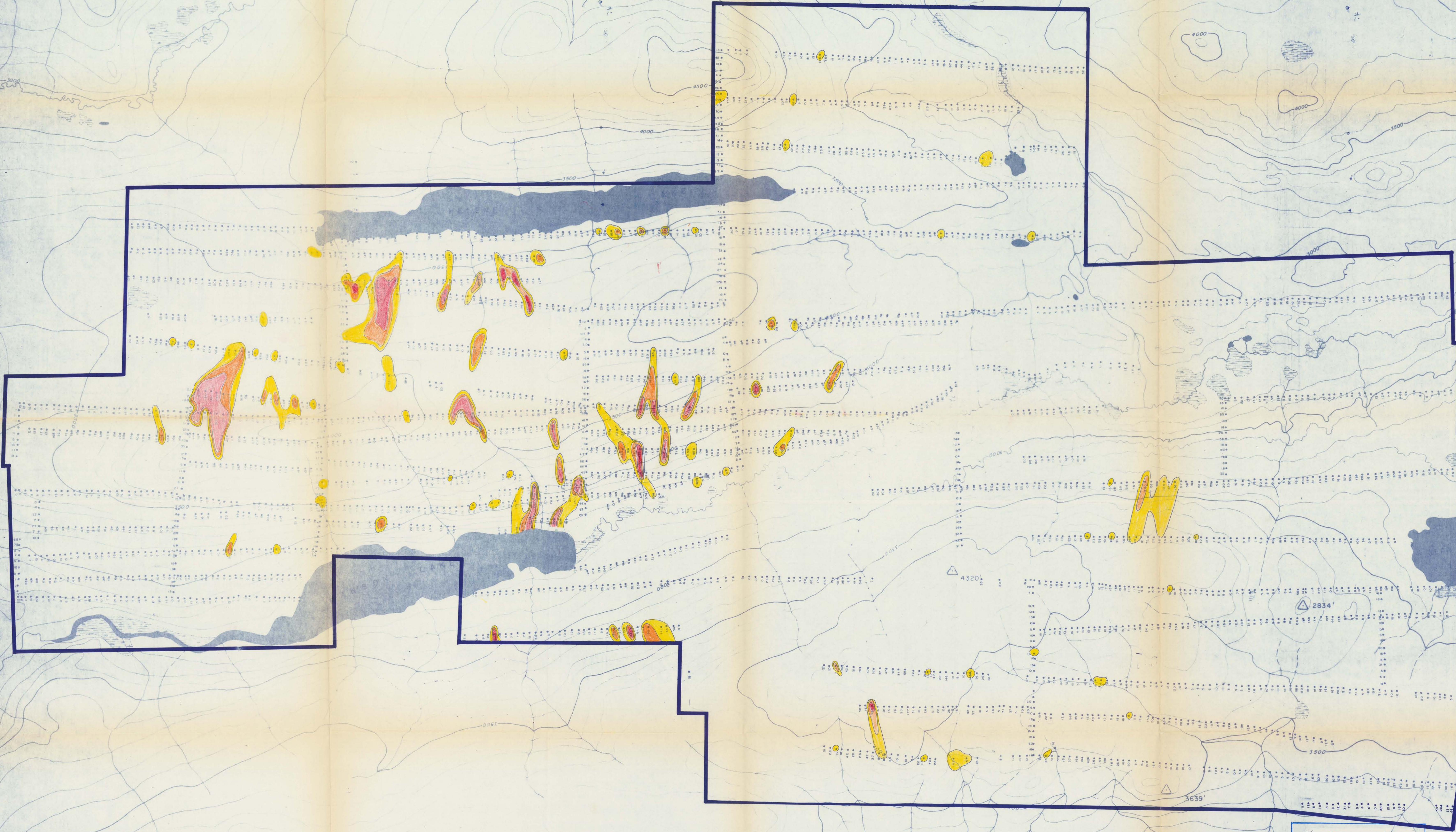
125°00'



125° 05'

125° 00'

124° 55'



Department of  
Mines and Petroleum Resources  
ASSESSMENT REPORT  
NO. 3645 MAP #6

COPPER CONCENTRATION  
 80-150 ppm.  
 151-300 ppm.  
 >300 ppm.

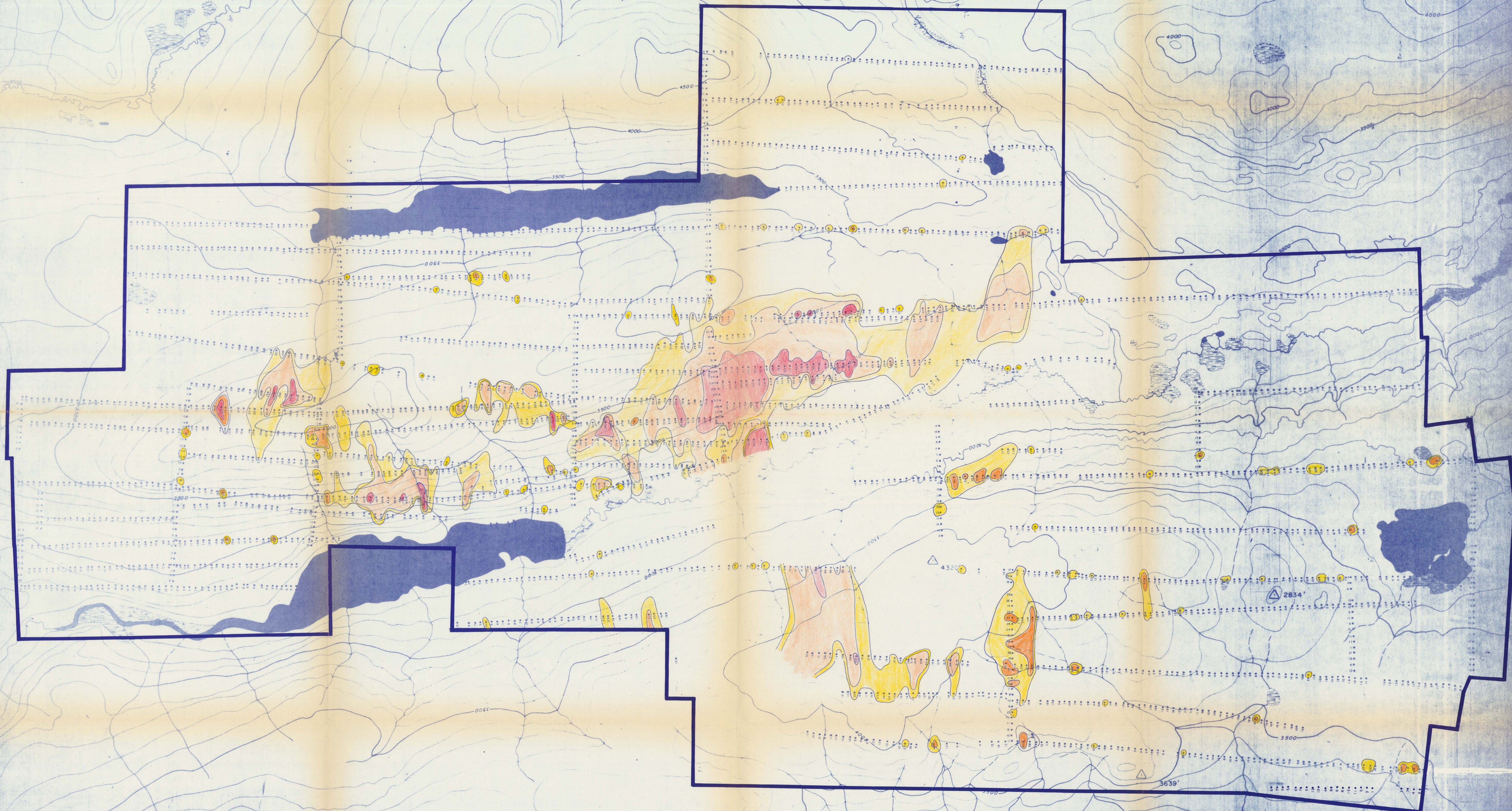
*Chamula May 12/71*



125°05'

125°00'

124°55'



Department of  
Mines and Petroleum Resources  
ASSESSMENT REPORT  
NO. 3645 MAP #7

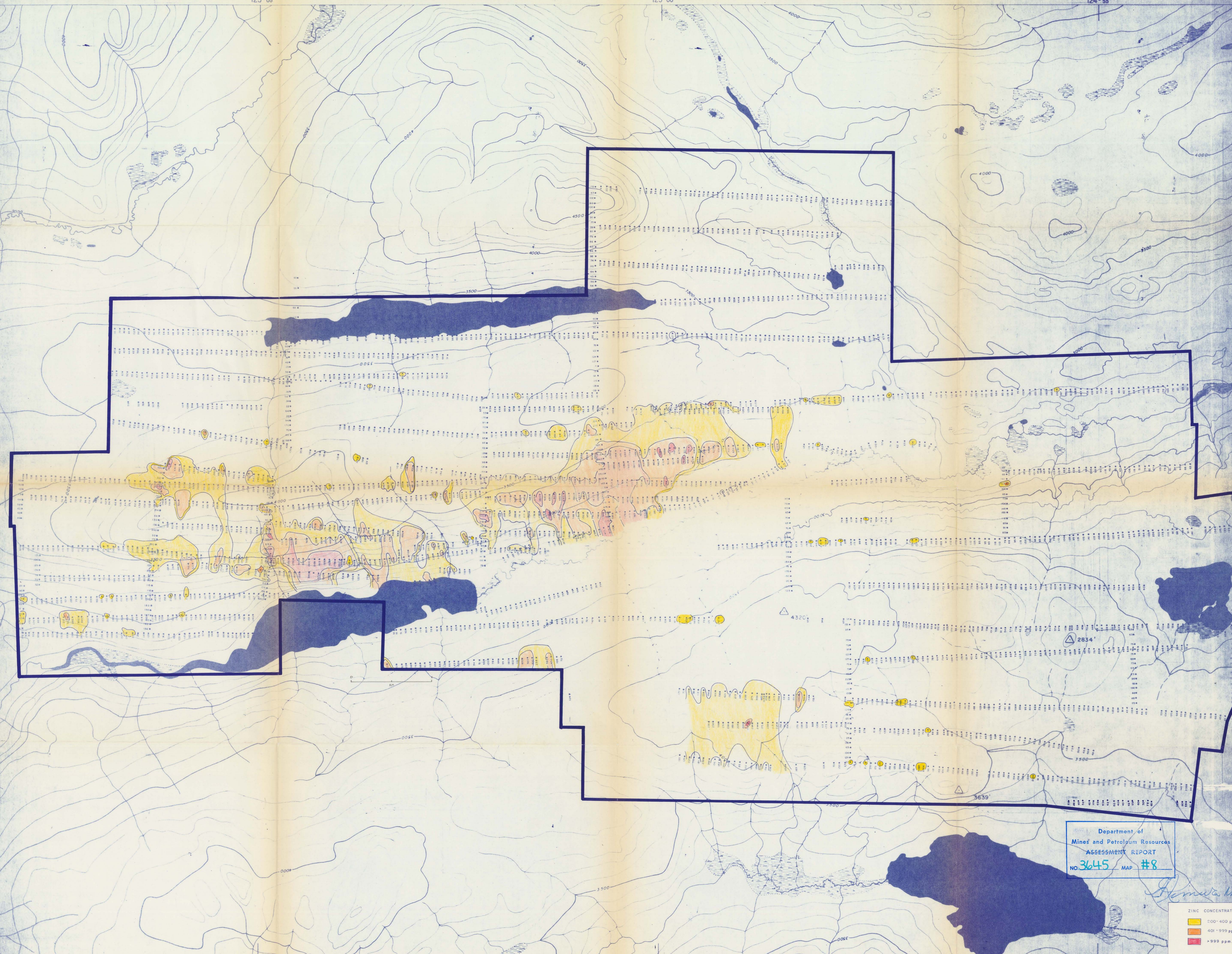
LEAD CONCENTRATION  
 20-30 ppm  
 31-100 ppm  
 >100 ppm



125°05'

125°00'

124°55'

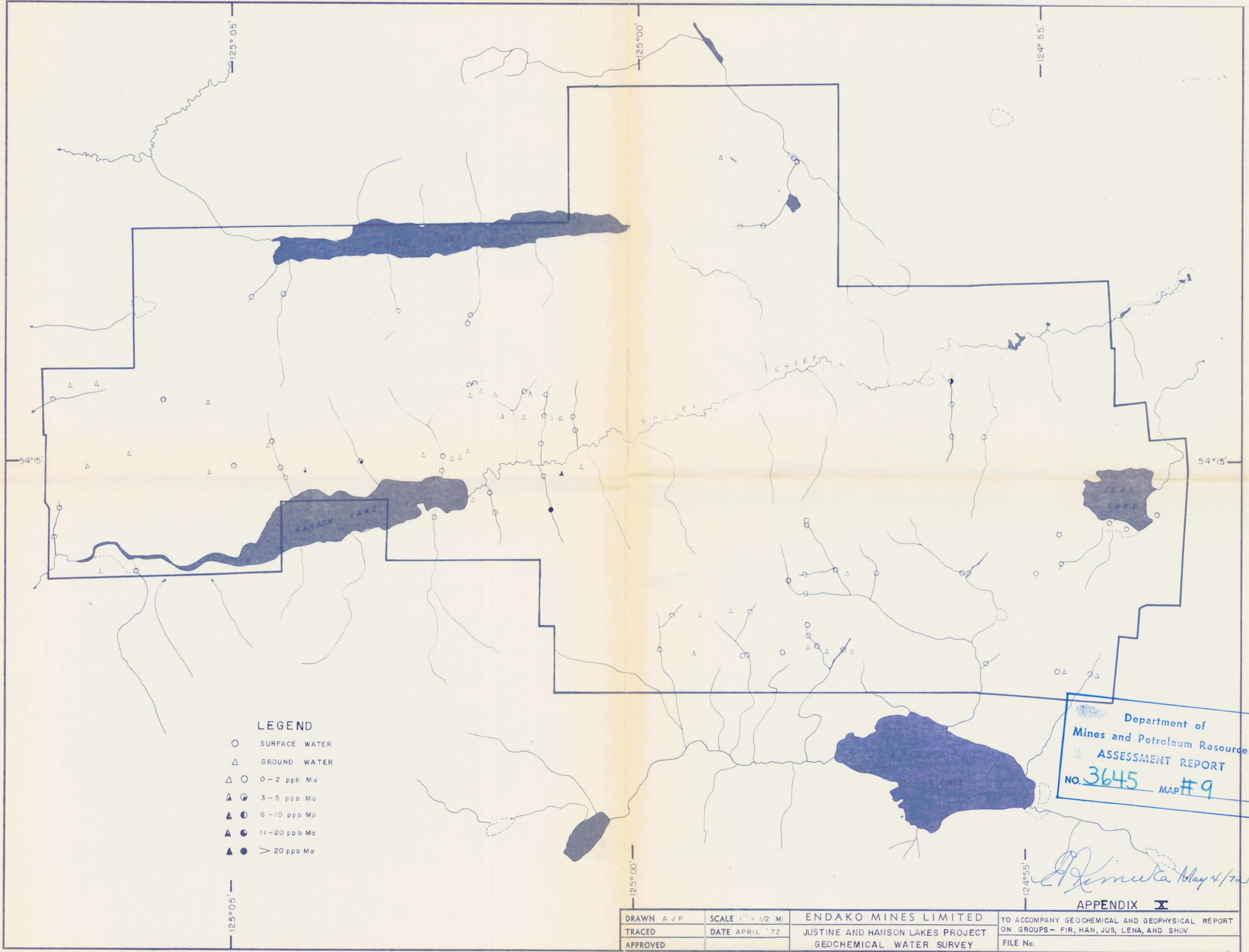


Department of  
Mines and Petroleum Resources  
ASSESSMENT REPORT  
NO. 3645 MAP #8

*Hermes May 4/71*

ZINC CONCENTRATION	
<span style="background-color: yellow; border: 1px solid black; display: inline-block; width: 10px; height: 10px;"></span>	000-400 ppm.
<span style="background-color: orange; border: 1px solid black; display: inline-block; width: 10px; height: 10px;"></span>	401-999 ppm.
<span style="background-color: red; border: 1px solid black; display: inline-block; width: 10px; height: 10px;"></span>	>999 ppm.





**LEGEND**

- SURFACE WATER
- △ GROUND WATER
- △ ○ 0-2 ppb Mo
- △ ● 3-5 ppb Mo
- ▲ ● 6-10 ppb Mo
- ▲ ● 11-20 ppb Mo
- ▲ ● > 20 ppb Mo

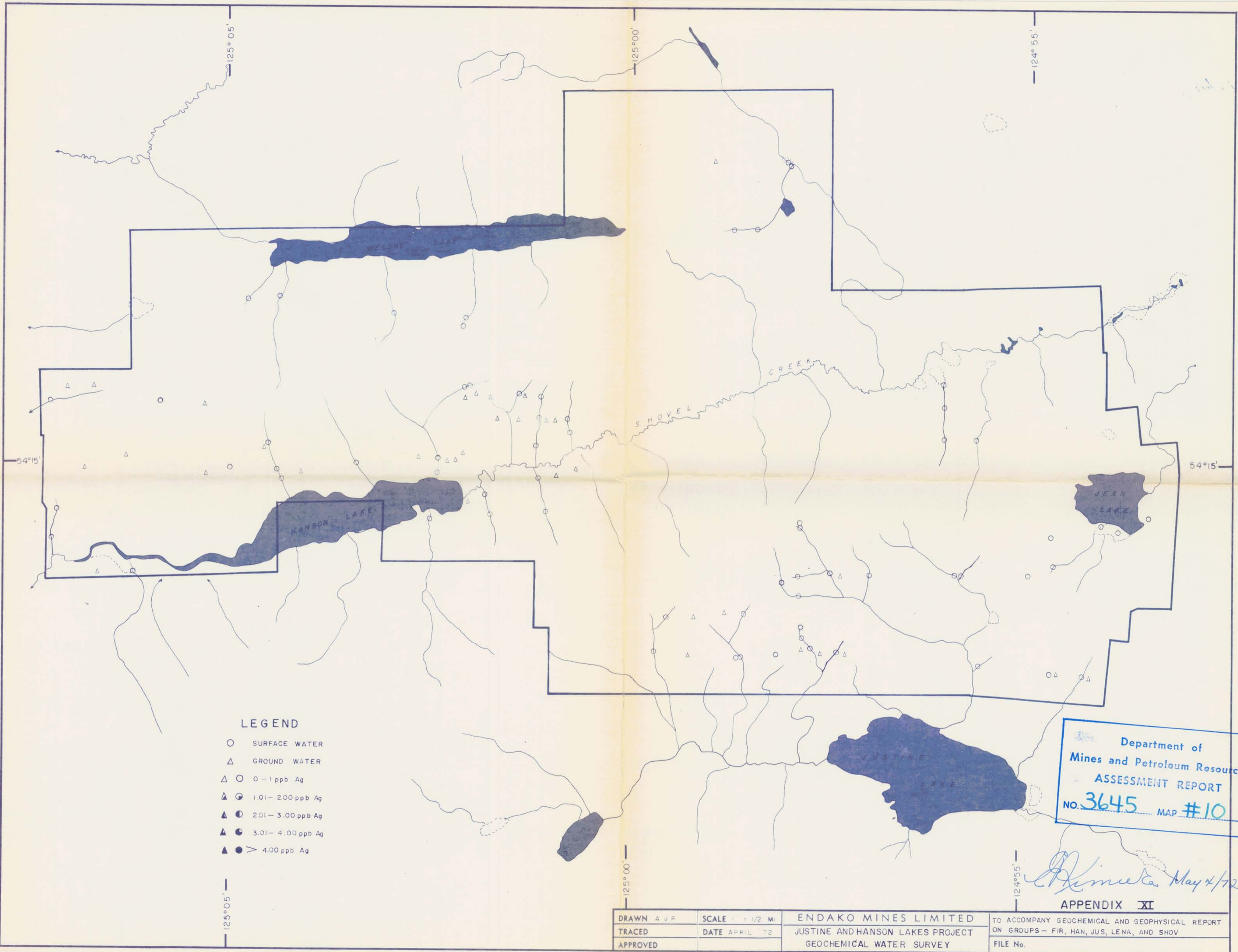
Department of  
Mines and Petroleum Resources  
ASSESSMENT REPORT  
NO. 3645 MAP #9

*A. K. Mulla May 14/72*

**APPENDIX X**

DRAWN A J P	SCALE 1" = 1/2 MI.	ENDAKO MINES LIMITED	TO ACCOMPANY GEOCHEMICAL AND GEOPHYSICAL REPORT ON GROUPS - FIR, HAN, JUS, LENA, AND SHOV FILE No.
TRACED	DATE APRIL '72	JUSTINE AND HANSON LAKES PROJECT	
APPROVED		GEOCHEMICAL WATER SURVEY	





**LEGEND**

- SURFACE WATER
- △ GROUND WATER
- △ ○ 0 - 1 ppb Ag
- △ ● 1.01 - 2.00 ppb Ag
- ▲ ● 2.01 - 3.00 ppb Ag
- ▲ ● 3.01 - 4.00 ppb Ag
- ▲ ● > 4.00 ppb Ag

Department of  
Mines and Petroleum Resources  
ASSESSMENT REPORT  
NO. 3645 MAP #10

*Permuta May 4/72*

**APPENDIX XI**

DRAWN AJP	SCALE 1" = 1/2 MI.	ENDAKO MINES LIMITED	TO ACCOMPANY GEOCHEMICAL AND GEOPHYSICAL REPORT ON GROUPS - FIR, HAN, JUS, LENA, AND SHOVL
TRACED	DATE APRIL 72	JUSTINE AND HANSON LAKES PROJECT	
APPROVED		GEOCHEMICAL WATER SURVEY	
			FILE No.





**LEGEND**

- SURFACE WATER
- △ GROUND WATER
- △ ○ 0-5 ppb Cu
- △ ● 6-10 ppb Cu
- ▲ ● 11-20 ppb Cu
- ▲ ● 21-30 ppb Cu
- ▲ ● > 30 ppb Cu

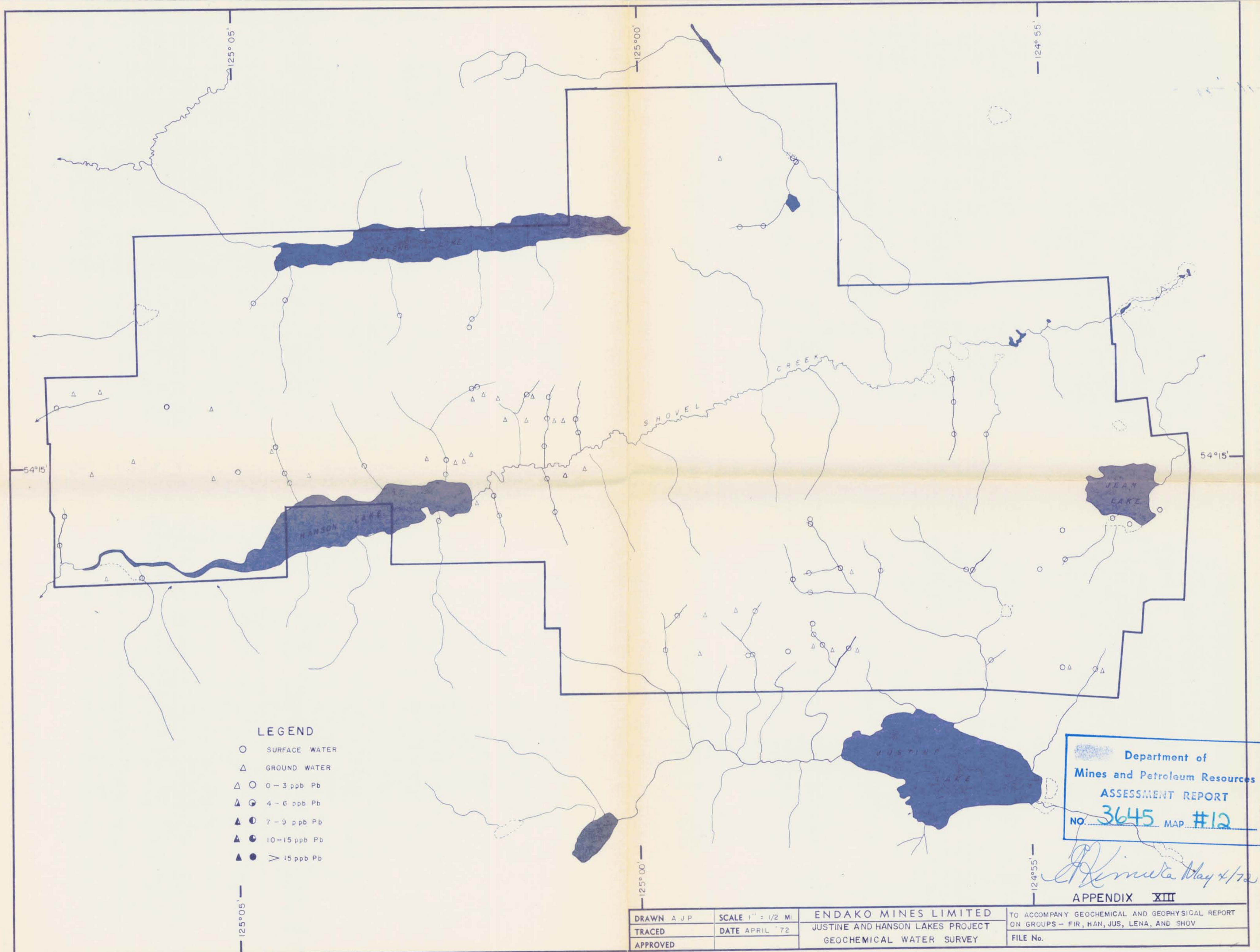
Department of  
Mines and Petroleum Resources  
ASSESSMENT REPORT  
NO. 3645 MAP #11

*R. M. ... May 4/72*

**APPENDIX XII**

DRAWN AJP	SCALE 1" = 1/2 M.	ENDAKO MINES LIMITED	TO ACCOMPANY GEOCHEMICAL AND GEOPHYSICAL REPORT ON GROUPS - FIR, HAN, JUS, LENA, AND SHO
TRACED	DATE APRIL 72	JUSTINE AND HANSON LAKES PROJECT	
APPROVED		GEOCHEMICAL WATER SURVEY	
			FILE No.





**LEGEND**

- SURFACE WATER
- △ GROUND WATER
- △ ○ 0-3 ppb Pb
- △ ● 4-6 ppb Pb
- △ ● 7-9 ppb Pb
- △ ● 10-15 ppb Pb
- △ ● > 15 ppb Pb

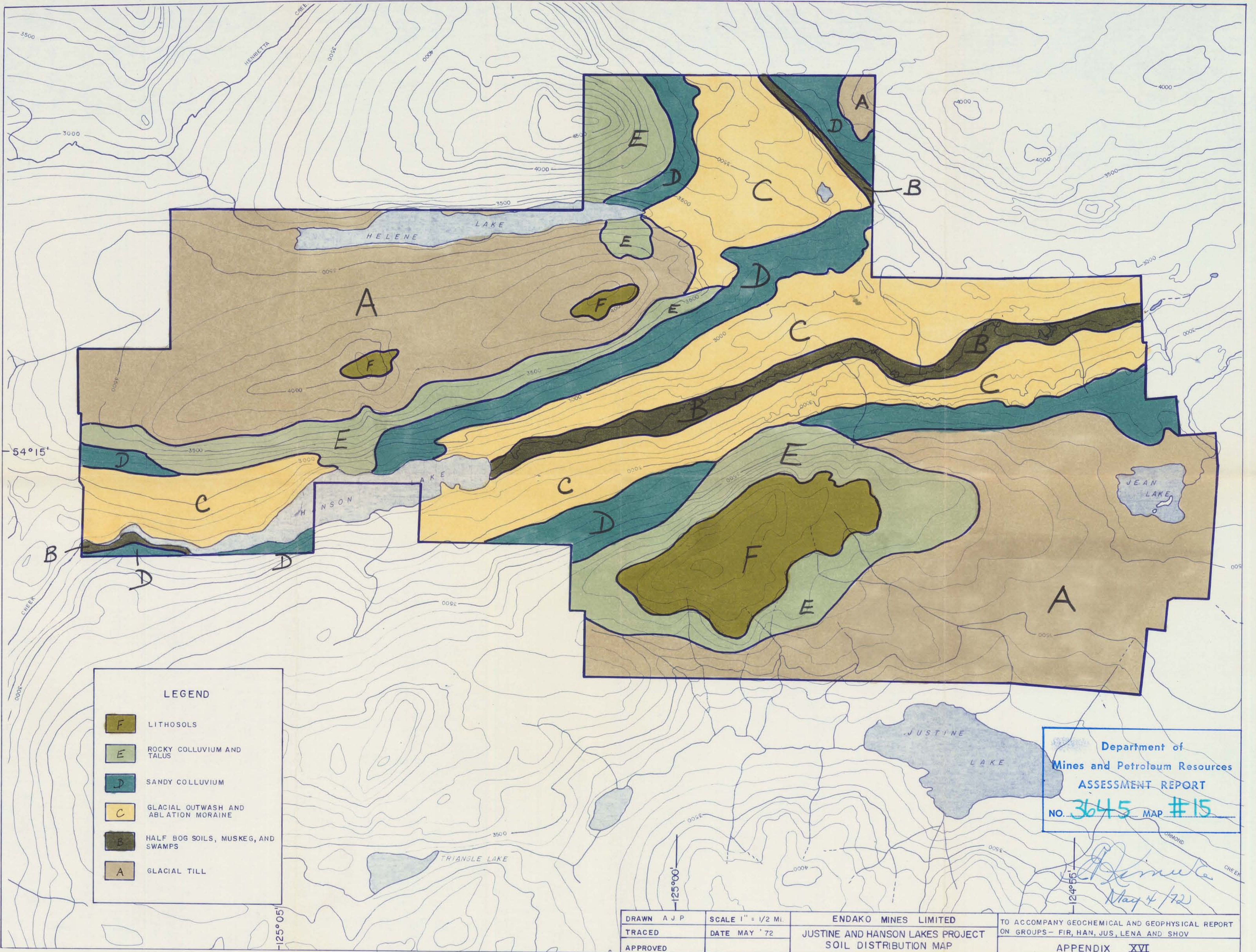
Department of  
**Mines and Petroleum Resources**  
**ASSESSMENT REPORT**  
 NO. **3645** MAP #12

*R. Simola May 4/72*

APPENDIX XIII

DRAWN AJP	SCALE 1" = 1/2 MI	ENDAKO MINES LIMITED	TO ACCOMPANY GEOCHEMICAL AND GEOPHYSICAL REPORT ON GROUPS - FIR, HAN, JUS, LENA, AND SHO
TRACED	DATE APRIL '72	JUSTINE AND HANSON LAKES PROJECT	
APPROVED		GEOCHEMICAL WATER SURVEY	
			FILE No.





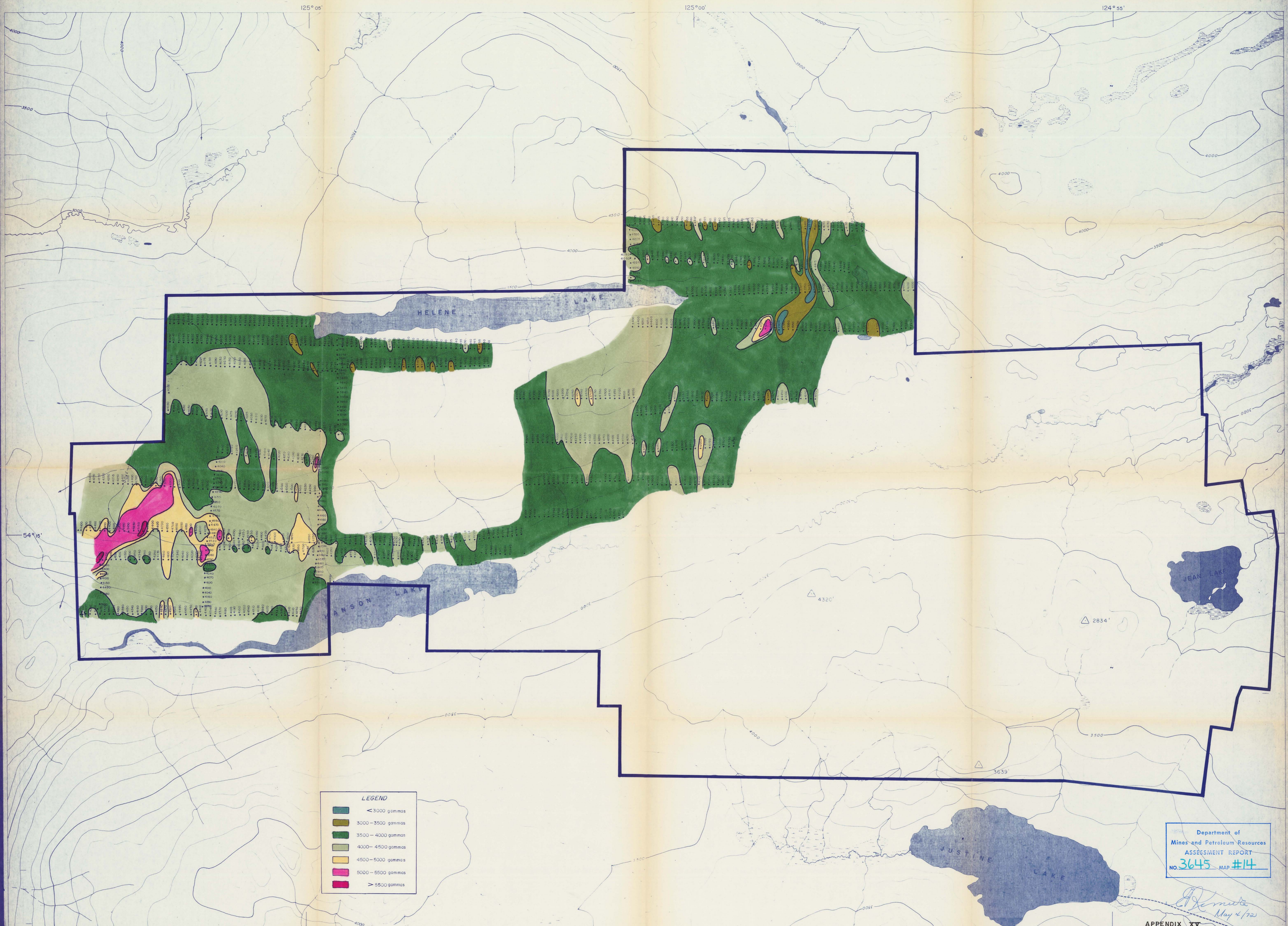
LEGEND	
<span style="background-color: #808000; border: 1px solid black; display: inline-block; width: 15px; height: 15px;"></span> F	LITHOLSOLS
<span style="background-color: #90EE90; border: 1px solid black; display: inline-block; width: 15px; height: 15px;"></span> E	ROCKY COLLUVIUM AND TALUS
<span style="background-color: #008080; border: 1px solid black; display: inline-block; width: 15px; height: 15px;"></span> D	SANDY COLLUVIUM
<span style="background-color: #FFD700; border: 1px solid black; display: inline-block; width: 15px; height: 15px;"></span> C	GLACIAL OUTWASH AND ABLATION MORAINE
<span style="background-color: #654321; border: 1px solid black; display: inline-block; width: 15px; height: 15px;"></span> B	HALF BOG SOILS, MUSKEG, AND SWAMPS
<span style="background-color: #A08060; border: 1px solid black; display: inline-block; width: 15px; height: 15px;"></span> A	GLACIAL TILL

Department of  
 Mines and Petroleum Resources  
 ASSESSMENT REPORT  
 NO. 3645 MAP #15

*A. J. P.*  
 May 4 / 72

DRAWN A J P	SCALE 1" = 1/2 MI.	ENDAKO MINES LIMITED	TO ACCOMPANY GEOCHEMICAL AND GEOPHYSICAL REPORT ON GROUPS - FIR, HAN, JUS, LENA AND SHO V
TRACED	DATE MAY '72	JUSTINE AND HANSON LAKES PROJECT	
APPROVED		SOIL DISTRIBUTION MAP	
			APPENDIX XVI





**LEGEND**

<span style="color: green;">■</span>	< 3000 gammas
<span style="color: yellow;">■</span>	3000 - 3500 gammas
<span style="color: orange;">■</span>	3500 - 4000 gammas
<span style="color: red;">■</span>	4000 - 4500 gammas
<span style="color: purple;">■</span>	4500 - 5000 gammas
<span style="color: blue;">■</span>	5000 - 5500 gammas
<span style="color: magenta;">■</span>	> 5500 gammas

Department of  
Mines and Petroleum Resources  
ASSESSMENT REPORT  
NO. 3645 MAP #14

*J. DeMott*  
May 4/72

**APPENDIX XV**