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GEOLOGICAL REPORT
 ON
 THE LUCKY LAKE GROUP OF CLAIMS
 MINISS RIVER PROJECT
 THE HANNA MINING COMPANY
 by
 Nelson Hogg
 District Geologist
 The Hanna Mining Company

MINISS RIVER PROJECT - Lucky Lake Claims

This report describes the geology of part of the Lucky Lake group of claims, which form part of The Hanna Mining Company's Miniss River Project. The entire claim group comprises 68 claims but geological mapping was not completed over the entire group in 1967. Assessment credit has been applied for in the case of 51 claims numbered as follows:

38455 - 38481	-	27
39297 - 39299	-	3
38483 - 38485	-	3
38502 - 38519	-	18

51

The claims were staked for The Hanna Mining Company, Room 805, 69 Yonge Street, Toronto 1, Ontario, which has outright ownership of them.

Mapping was started on May 15th, 1967 and was completed on October 7th. The project was under the direction of Nelson Hogg, District Geologist for The Hanna Mining Company, but field work was done by Donald W. Hattie and assistants. Three surveyed baselines were cut, with a total length of 5.9 miles, and picket lines with a total length of 58 miles were cut at 400 foot intervals.

LOCATION AND ACCESS

The claims straddle Provincial highway No. 599 about 30 miles north of Savant Lake, extending for one mile east of the road, and 2½ miles west of the road. They are located on plan No. M-2054, the Solitude Lake area of the Ontario Department of Mines.

The claim block extends from 90°35' to 90°41' West Longitude, and from 50°34' to 50°36' North Latitude, which is in area 52J10 of the National Topographic Series.

PREVIOUS WORK

The area was staked in 1956 by Northern Canada Mines Limited as part of the investigation of iron formation in the area. A reconnaissance magnetometer survey was run along the claim lines and a little prospecting was done at that time. A few shallow trenches on the property probably date back to that period of investigation.

The Hanna Mining Company staked the claims as part of a regional search for base metals in the area. In addition to the geological mapping, magnetometer and electromagnetic surveys were carried out during the 1967

field season. These were completed on the ice of the lakes during the winter of 1967 - 1968. One diamond drill hole was drilled in 1967, east of the highway at 120 feet east and 700 feet north. It was drilled to a depth of 403 feet at an inclination of 45° to the north, under an old trench in which massive pyrite and minor amounts of chalcopyrite are exposed.

GEOLOGY

The only published geological map covering this area is the Miniss Lake Sheet, Map No. P. 354 of the Ontario Department of Mines at a scale of 1 inch equals 2 miles. It is a compilation based largely on air photo interpretation and aeromagnetic surveys with very little field work. It shows the Lucky Lake area as part of a greenstone mass about 3 miles wide, intruded by granitic rocks and bounded to the north and west by granitic rocks. On the south side it is in contact with a band of sedimentary and acid volcanic rocks that extends in an easterly direction through Kashaweogama and Savant Lakes.

The greenstone mass is a complexly folded series of amphibolitized basic volcanic rocks, including massive flows and sills, pillow lavas, tuffs and banded iron formation, all of which are amphibolitized. Detailed mapping on the Lucky Lake claim group has traced a narrow band of sedimentary rocks along the north boundary of the volcanics. These sediments, which include impure quartzite, graywacke, argillite and chert, are generally somewhat gneissic and granitized, and biotitic. They occur along the boundary between granites to the north and volcanic rocks to the south. The volcanic rocks are intruded by massive amphibolite that is probably contemporaneous with the flows, and by a few small bodies of diorite, gabbro and peridotite. Exposures of diorite occur along highway No. 599 near the south claim boundary. The best exposure of gabbro crosses line 12+00 East at 600 to 700 feet north. Judging by the distribution of these rocks they may be only coarse grained flows or sills. Peridotite crops out on the shores of the small lake west of the north base line at Line 56 north and 1700 West. It was also found in reconnaissance mapping to the west of the lake.

Granite is exposed on the north shore of Lucky Lake, and in small bodies distributed throughout the claim group. Pegmatitic facies of the granite form dikes up to 100 feet wide in the area from line 48 North to line 60 North.

TABLE OF FORMATIONS

Cenozoic

Pleistocene - Sand, gravel, till

Precambrian

Archean

Acid Igneous Rocks - granite, granodiorite, aplite, pegmatite

Basic and Ultrabasic Igneous Rocks - diorite, gabbro, peridotite

Iron Formation

Metavolcanic Rocks - amphibolite, pillow lava, basic tuff, iron formation

Metasedimentary Rocks - quartzite, graywacke, argillite, chert and sedimentary gneiss

No microscopic work was done to identify the rock types, so the names given to them are field names that may not be technically correct.

METASEDIMENTARY ROCKS

The sedimentary rocks include impure quartzite and greywacke, argillite, chert and quartz-feldspar-biotite gneiss. Most of the sedimentary rocks are somewhat gneissic and altered to a granulitic texture with grains of quartz, feldspar, green amphibole and biotite. The argillites are finer textured and more biotitic than those rocks classified as quartzite and graywacke. Bedding can be recognized in most cases, but no evidence was found to indicate the tops of the beds. Garnets are common in some of the sedimentary beds.

Some of the fine quartzite is probably a recrystallized chert, which occurs as narrow bands in the sedimentary rocks, and also in association with iron formation in the volcanic rocks. It is accompanied by iron silicate minerals of the grunerite-cummingtonite family, and by seams of pyrite and pyrrhotite, which cause the rock to oxidize at surface.

The best exposures of sedimentary rocks are north of line 64 North in the area east of the base line.

METAVOLCANIC ROCKS

Volcanic rocks are probably andesitic to basaltic in composition, and are metamorphosed in the amphibolite facies. They include massive, medium to coarse textured flows and sills, pillow lavas, fine textured schistose lavas and tuffs. The coarse varieties are sometimes dioritic and gabbroic in appearance, and it is quite probable that some of the rocks mapped as basic intrusive are actually coarse-grained volcanics. In the coarser varieties, altered feldspar generally makes up 20 to 30%, the balance being green hornblende and/or tremolite. In the finer-textured varieties, feldspar can not be identified in hand specimens, which have a dark green appearance due to the large percentage of fine amphibole. The tuffs are also mainly fine amphibole, but they contain fine sugary quartz and occasional garnet bands. The latter are more prominent near the contacts with iron formation. Good exposures of pillow lava are uncommon, but much of the fine textured lava has crude ellipsoidal structures and fragmentary pillows.

IRON FORMATION

Iron formation is interbedded with the basic volcanic rocks. It occurs in lenticular discontinuous bands that are never more than 70 feet wide, and seldom more than one-half mile long. It is made up of alternating bands of magnetite, fine sugary quartz and iron silicate minerals, varying in composition

from a ferruginous chert with less than 5% iron to a banded magnetic iron formation with 25% iron. The lean, cherty varieties often carry pyrite and pyrrhotite in seams and disseminated grains. Chalcopyrite has been identified with the other sulphides, but is very rare. The iron silicate minerals are pale gray, yellow or green varieties of grunerite and cummingtonite. They oxidize readily, and in combination with the sulphides they produce a brown, weathered surface on the lean iron formation. In the normal iron formation the bands of cherty quartz, silicates, and magnetite are seldom more than 1 inch thick. Magnetite occurs in the siliceous bands, and fine quartz makes up a fraction of the magnetite bands. These chemical sediments were apparently deposited in local basins during vulcanism, and were accompanied by enough limey material to develop into pink garnets along the margins of the iron formation bands.

BASIC AND ULTRABASIC IGNEOUS

As stated in the description of the metavolcanic rocks, much of the rock mapped as basic intrusive is probably a coarse phase of the volcanic flows and sills. The distinction has been made in the field on the basis of texture and the abundance of feldspar.

Peridotite accompanied by gabbro is exposed on the west edge of the small lake west of the base line at lines 56 to 68 North. The peridotite is somewhat sheared with talcose bands, and it weathers to a smooth, grayish surface. Its greatest observed width is 400 feet, but it may be wider under the small lake. Only a few outcrops of the peridotite are exposed, and its relationship to the adjacent rocks is not known. The fact that it is sheared suggests a chosen relationship to the volcanic rocks than to the acid intrusives.

ACID IGNEOUS ROCKS

Although granitic rocks are the most abundant in the general area, they constitute a minority on the claim group. Massive biotite granite crops out on the north shore of Lucky Lake and also to the south of the claim group, but there are only a few outcrops of granite on the property, and these generally have a gneissic structure.

Most of the granitic rocks exposed on the property are apophyses of the main granitic mass in the form of pegmatite and aplite dikes. Both have simple mineralogy consisting of quartz and pink feldspar with minor amounts of mica. Pegmatite dikes are common throughout the claim group, and reach widths of 200 feet in the northwest portion of the property.

PLEISTOCENE

Most of the property is covered with a thin ground moraine containing large boulders in a sandy matrix. A prominent esker crosses highway No. 599 just east of Lucky Lake. It can be traced for about 8 miles to southwest to the property of Northern Canada Mines Limited, and would make an excellent access road into that area.

STRUCTURE

The Lucky Lake claim group covers most of a narrow belt of greenstones bounded by granitic rocks on the north, south and west. At its west end, the greenstone divides into two branches, one of which extends northwesterly to the property boundary, the other southwesterly to the property boundary. The three base lines, trending N80°E, N35°W and S25°W reflect the general trends of the greenstones. These trends are also indicated by the lenticular beds of iron formation within the volcanics. The general configuration suggests a synclinal structure plunging to the east, but detailed evidence in the field does not support this interpretation. Sedimentary rocks are confined to the north edge of the greenstone belt and are not repeated on the south unless they have been completely granitized. Where evidence of tops of flows is found in pillow structures they consistently face to the south or southeast. Most of the rocks are moderately sheared, and shearing trends parallel to the general trend of the volcanic formations. Along the main east-west base line the rocks dip to the south at angles of 40 to 70 degrees. Where the formations swing northwesterly along the north base line the dips are to the southwest and they are generally steeper, at angles of 65 - 85 degrees. The southwesterly extension of the volcanics was not mapped in detail but reconnaissance along the claim lines indicates that the volcanics face east and dip steeply to the east.

No evidence was seen of major faulting, but there may be strike faulting along some of the sheared zones in the volcanics and there may be faulting on the contact between the metasediments and the main granite mass to the north.

ECONOMIC GEOLOGY

Rusty pyritic zones accompany the lean iron formation and chert bands and a few specks of chalcopyrite have been observed. None of the rusty zones examined to date have been no wider than 6 feet. However, the investigation is based mainly on electromagnetic work, and several anomalous zones remain to be investigated.

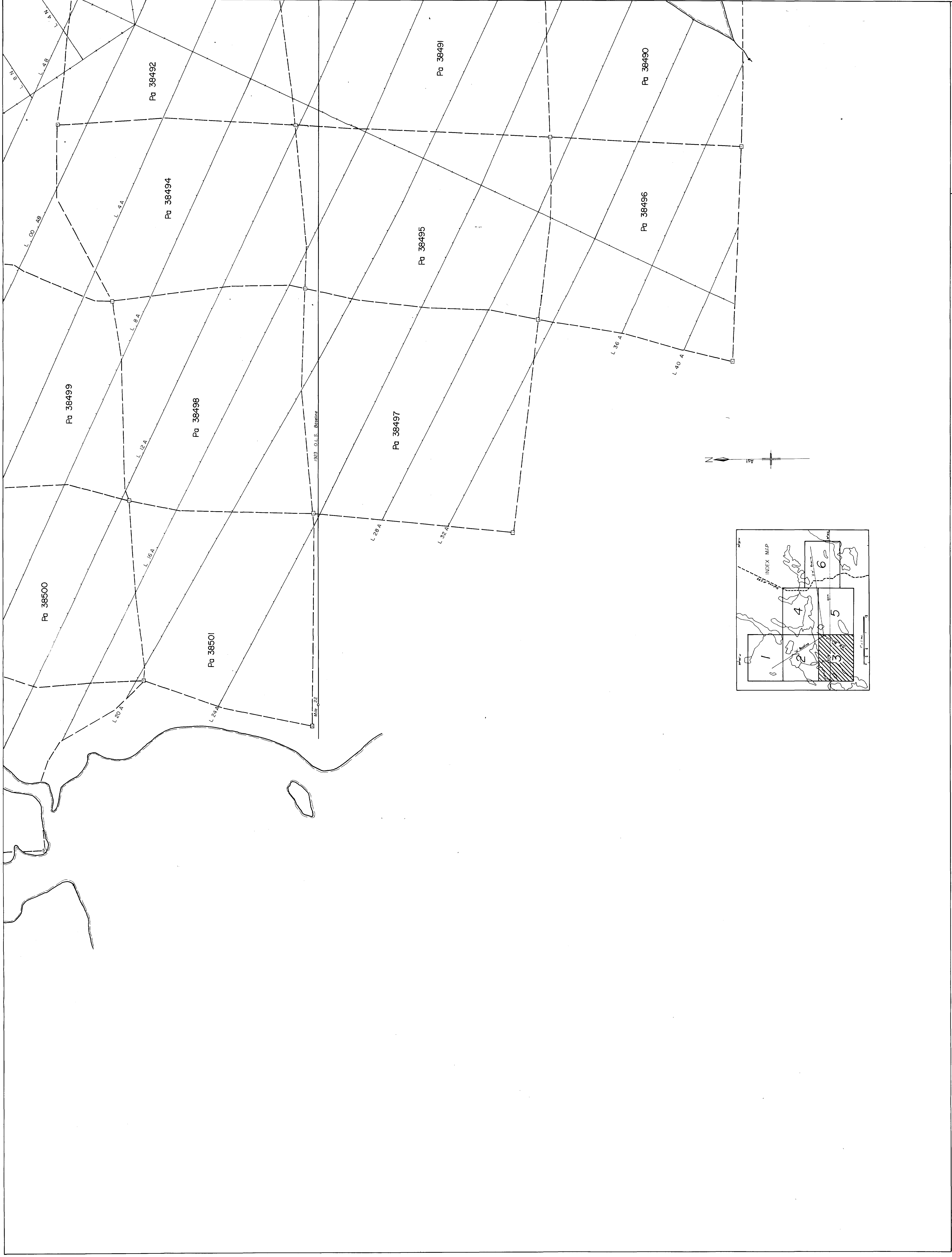
REFERENCES

1. Ontario Department of Mines Map P. 354, Miniss Lake Sheet - 1" = 2 miles
2. G.S.C. Map 910G - De Lesseps Lake - 1" = 1 mile - Aeromagnetic Series

Nelson Hogg

Nelson Hogg, P. Eng.





SHEET 3

THE HANNA MINING COMPANY
 MINISS RIVER PROJECT
 LUCKY LAKE CLAIMS
 PATRICIA MINING DIVISION, ONTARIO

GEOLOGICAL PLAN

Scale: 1 in. to 200 ft.
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 Field work by: D. Wolfe
 Date: Aug. 1957
 Reviser: [blank]
 Interpreter: [blank]
 Date: [blank]
 N.C.O. Ref. 85-1-0



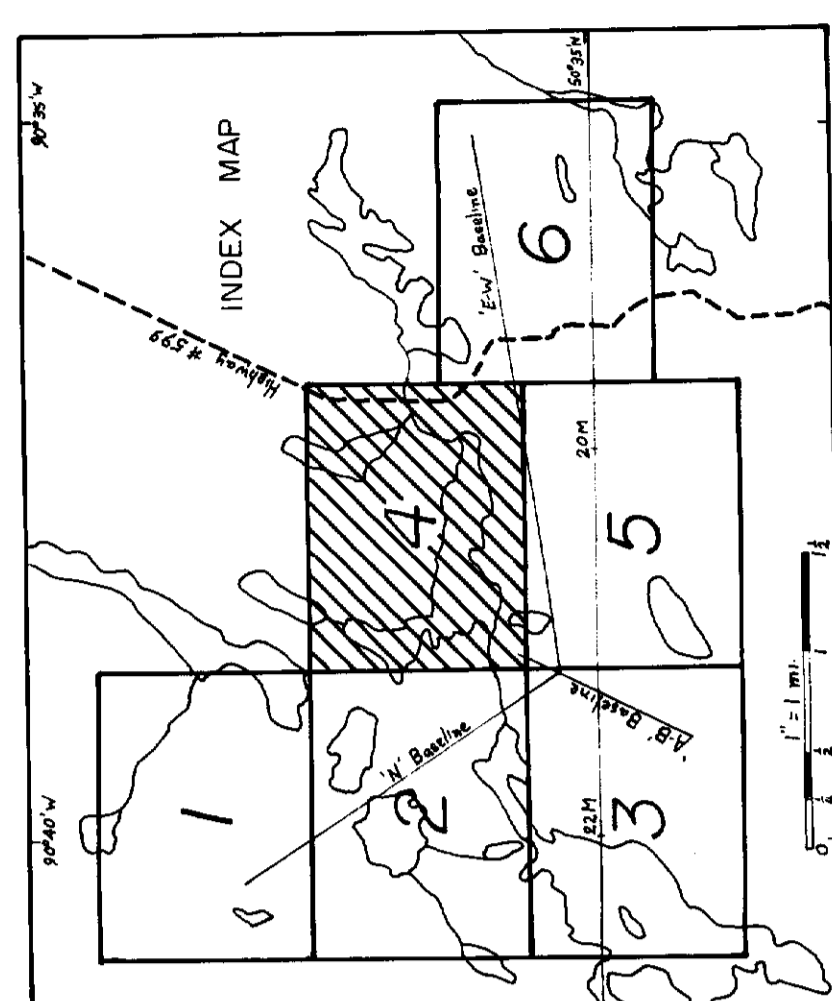
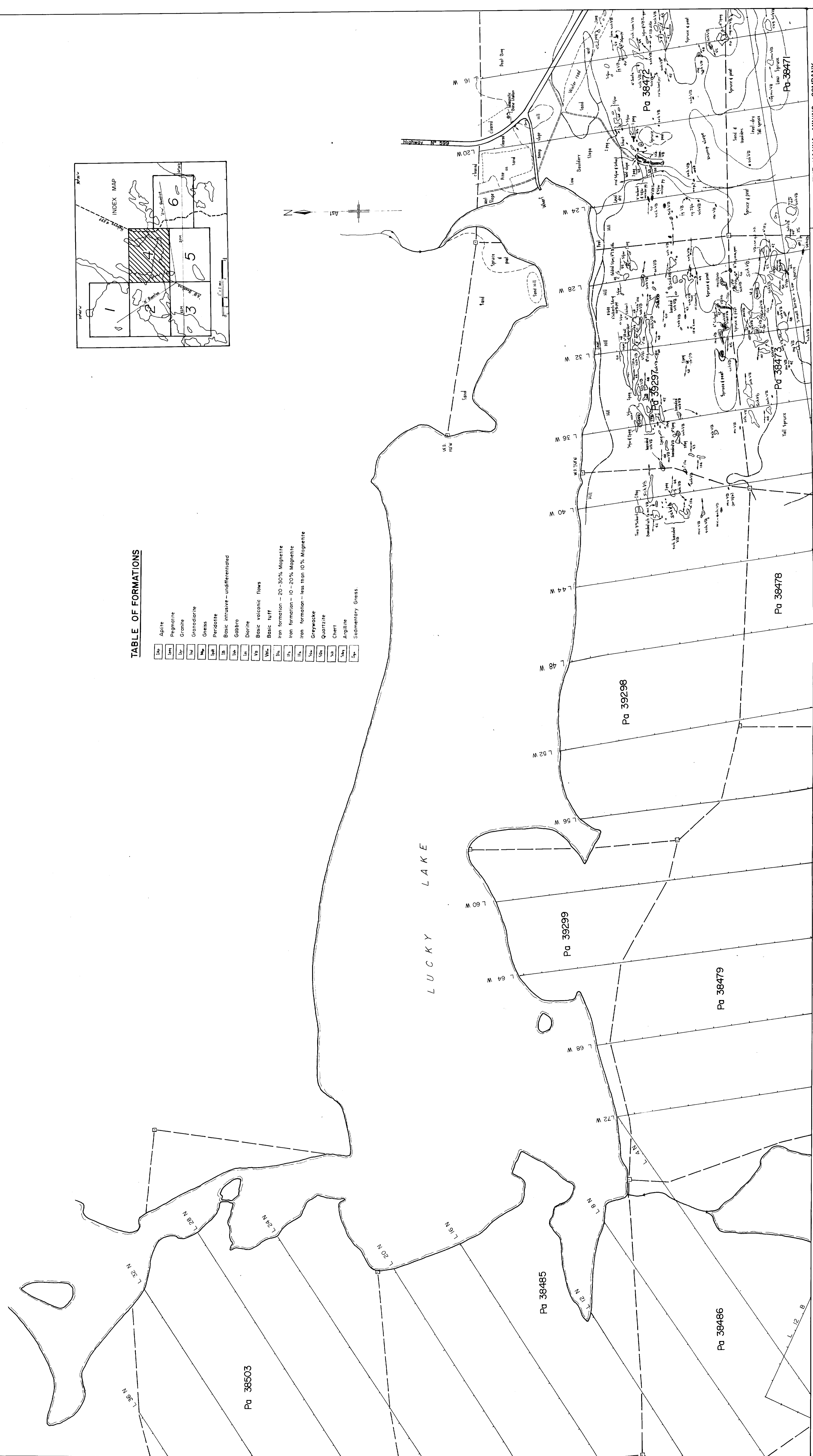


TABLE OF FORMATIONS

L1	Apatite
L2	Pegmatite
L3	Granite
L4	Gneiss
L5	Quartzite
L6	Schist
L7	Amphibolite
L8	Basic igneous - undifferentiated
L9	Gabbro
L10	Diorite
L11	Basic volcanic flows
L12	Basic tuff
L13	Iron formation - 20-30% Magnetite
L14	Iron formation - 10-20% Magnetite
L15	Iron formation - less than 10% Magnetite
L16	Greywacke
L17	Quartzite
L18	Chert
L19	Argillite
L20	Sedimentary Gneiss



SHEET 4

THE HANNA MINING COMPANY
 MINISS RIVER PROJECT
 LUCKY LAKE CLAIMS
 BRANCH MINING DIVISION, ONTARIO
GEOLOGICAL PLAN

Scale: 1 in. to 200 ft.
 0 200 400

Field work by: D. Harte
 Interpretation by: [Signature]
 Date: Aug. 1957

Revised: [Signature]
 Date: [Signature]

NTS Ref. 52-J-10

