REPORT ON GEOI
CRAWFORD RIVER GROUP OF CLAIMS
KENOGAMING TOWNSHIP
SUDBURY MINING DIVISION
PROVINCE OF ONTARIO.

Introduction:

The following report describes the geophysical surveys completed during April and May of 1965 on Canadian Johns-Manville Company Limited claims located in Kenogaming Township, Sudbury Mining Division, Province of Ontario.

Cutting and chaining of picket lines was contracted to J. Alix Company Limited of Val d'Or, Quebec. Picket lines were cut at right angles to base lines striking S79°E and were established at 400 feet intervals. Pickets were fixed every 50 feet along these offset lines by chainage.

Magnetometer surveying was conducted by R. F. Haley, geophysical operator with Canadian Johns-Manville Company Limited, using a Jalander type instrument. R. McBride assisted during the course of this work. Readings were recorded at 25 or 50 feet intervals along the offset lines - spacing was dependent upon the amount of detail required over the magnetic anomalies.

Electromagnetic surveying was carried out by R. A. Haley, geophysical operator with this Company, using a Ronka Mark IV horizontal loop type unit. T. McChristie and M. Linkar assisted during the course of this work. Readings were recorded at 100 feet intervals along the offset lines.

Supervision and interpretation of this work was the responsibility of the writer, Senior Geologist with Canadian Johns-Manville Company Limited.

Property:

The claims surveyed are located in the west-central part of Kenogaming Township and are numbered as follows:-

S-127251 - 56 inclusive and 127258 - 79 inclusive.

These twenty-eight claims comprise approximately 1,120 acres.

Location and Accessibility:

The Canadian Johns-Manville claims group is situated in the west-central part of Kenogaming Township, Sudbury Mining Division, Province of Ontario.

Ready access by car or truck is provided by Highway #101 - Timmins to Chapleau - to a point approximately 43 miles southwest of Timmins. A bush road, passable by truck or four-wheeled drive vehicle, has been cleared by this Company from Highway #101 to the north end of Hanrahan Lake. Access to this group is then provided by tractor road built by this Company or by canoe utilizing Hanrahan Lake and the Crawford River.

Topography:

The claims group is one of relatively moderate relief as pronounced outcrop ridges occur across the entire northern part of the map area. In this section bedrock exposures are abundant. Timber in this area consists of poplar, birch, spruce and scattered pine. The borders of the Crawford River, streams and ponds are in general thickly grown with alders, however, open patches of grass and spruce muskeg were noted. In the southeastern part of the group spruce muskeg with patches of cedar swamp were encountered during the survey work.

The drainage of the central and western part of the map area is provided by the Crawford River which flows from Hanrahan Lake to the east through Crawford Lake and on northwards towards Highway #101. The extreme northeast and southeast sections of the claims group are drained by small streams which flow to the east and empty into Akweskwa Lake. Several small ponds have been formed along these streams. The Crawford River and sections of the small streams are navigable by canoe during the high water seasons.

Previous Work:

The general area was mapped by E. W. Todd for the Ontario Department of Mines in 1923 and the results of this work are shown on Map 33g, entitled "Groundhog River Area" on a scale of 1 inch equals 1½ miles. Further regional

Previous Work: (cont'd)

mapping was carried out by V. K. Priest (Geology of Keith-Muskego Area)by W. D. Harding (Geology of Herwood Lake Area) in 1949 and 1936 respectively for the Ontario Department of Mines.

Considerable geological and geophysical surveying followed in several instances by diamond drilling were carried out on claims groups in the central part of Kenogaming Township during the late 1940's and mid 1950's. The main Companies involved appear to have been Dunvegan Mines, Falconbridge Mines, Nick Eleiff holdings, Jonsmith and Johns-Manville. Minor zinc, gold and nickel were reported on the claims of Dunvegan and Falconbridge Mines. Then activity in the area lapsed but with the Texas Gulf discovery Dunvegan and Falconbridge resumed exploration activity on their holdings.

Canadian Johns-Manville carried out geological and geophysical work on a block of claims covering an ultrabasic intrusive at the southeast end of Hanrahan Lake. However, due to negative results the claims were allowed to lapse. Due to a renewed interest in the ultrabasic intrusives in the Reeves Area, extensive holdings, of which the Crawford Lake Group of claims forms a part, were staked during 1963 and 1964. Exploration work, as outlined in this report, was carried out during the winter of 1964 - 65 and considerable geological mapping and prospecting were completed during the 1965 field season. This program will be resumed in 1966.

Line Cutting and Chaining:

A base line was started from the mid point on the east shore of a prominent bay on Hanrahan Lake using a compass and was cut on a bearing S79°E to the east limit of Company holdings in this Township. Note that the Crawford Lake claims form the central group of holdings in this area. Parallel offset base lines were cut where required to avoid small lakes. Right-angled offset lines were established at 400 foot intervals along the base lines and were cut to the outside

boundaires of the claims. Pickets with numbered locations were established at 50 foot intervals along the offset lines by chainage. All offset lines were tied in along the north and south claim boundaries by chainage to increase the accuracy of the plans.

Line cutting and chaining were contracted to J. Alix Company Limited of Val d'Or, Quebec and were carried out during the late winter of 1964 and early winter of 1965. A total of 31.3 miles of picket and base lines was cut and chained during the course of this work. Note that the number of man days spent cutting and chaining lines outside the limits of the twenty-eight claims covered in this report have been deleted from the total for assessment purposes.

General Geology:

The geology of Kenogaming Township and immediately adjacent areas was mapped by E. W. Todd for the Ontario Department of Mines in 1923. The results of this work are shown on Map 33g on a scale of 1 inch equals 1½ miles entitled "Groundhog River Area" which accompanies Ontario Department of Mines Report Vol. XXXIII, Part 6, dated 1924. More recently (1965) the "Foleyet Sheet" of the Ontario Department of Mines geological compilation series compiled by H. D. Carson shows the geology of adjacent Penhorwood Township and part of same extending eastwards into Kenogaming Township.

The following "Table of Formations" has been taken from the legend portion of this map.

General Geology: (cont'd)

Table of Formations

Precambrian

Proterozoic

Keweenawan
Alkaline syenite - carbonatite complex

Keweenawan and Matachewan
Diabase

Archean

Acid igneous rocks - granitoid rocks, magmatites and hybrid granitoid rocks.
Basic and ultrabasic intrusives rocks - gabbro, diorite, peridotite and pyroxenite.
Sedimentary and metasedimentary rocks - conglomerate, greywacke, slate, etc., gneisses, granulites and amphibolites.

Iron formation

Basic and Intermediate volcanic rocks - andesite, basalt, etc.

Iron formation

Acid volcanic rocks - rhyolite, dacite, etc.

Iron Formation

The geology of the claims to the west of the map area (Crawford Lake Group) were mapped and prospected during the field season of 1965 by Company geologists. This work was extended to the east and a good part of the Crawford River Group was covered geologically by R. Seavey and assistants. Seavey is currently preparing a detailed report on the geology of all Company holdings in this Township.

The Crawford River Group of claims is underlain by altered intermediate to basic volcanic rocks with narrow rhyolitic flows and interbanded sediments. These formations have been intruded by basic and ultrabasic rocks, quartz feldspar porphyry dykes and diabase dykes. Bands of iron formation occur in the south part of the claims. Further details will be discussed under the heading

General Geology: (cont'd)

"Interpretation of Magnetometer Survey."

Magnetometer Survey:

A magnetometer survey was conducted over the Crawford River Group of claims by R. F. Haley, geophysical operater with Canadian Johns-Manville Company Limited. R. McBride assisted during the course of this work.

The survey was carried out using a Jalander type instrument having sensitivities or scale constants as shown below: -

Scale #1 - 10 gammas per division

" #2 - 30 gammas per division

" #3 - 100 gammas per division

The survey was tied into the base control station used during 1956-57 for the South Hanrahan Lake Group survey. Same was established using a Sharpe's A-2 type magnetometer. In this respect a relative gamma value of 1220 corresponds closely with an absolute value of 57,599 ± 15 gammas.

Base control stations were established on the claims group and were given fixed values as shown below:

B. C. S. #5 - on line 92+00East at the base line - value - 1668 gammas

B. C. S. #6 - on line 104+00East at the base line offset - value - 1500 gammas.

B. C. S. #7 - on line 128+00East at the main base line - value - 1920 gammas

B. C. S. #8 - on line 4+00East at the base line offset - 2260 gammas

B. C. S. #9 - on line 28+00East at the base line offset - value - 1530 gammas

B. C. S. #10- on line 48+00East at the north base line offset - value - 2108 gamm

Note that the main base station is located to the south of the camps on the shore of Hanrahan Lake and is therefore not shown on the accompanying plans.

Magnetometer Survey: (cont'd)

The locations of the base control stations listed on Page 6 are shown on the accompanying "Geo-Magnetic Contour Plans". Readings were recorded on the base control stations at least four times per day as a check on the working condition of the instrument and to determine the daily diurnal variation.

Stations were spaced at 25 or 50 foot intervals along the offset lines-spacing was dependent upon the magnetic intensity of the underlying formations. A total of 3,872 stations was recorded on the Crawford River Group of claims during the course of the magnetometer survey.

Electromagnetic Survey:

An electromagnetic survey was conducted over the claims group by R. A. Haley, geophysical operator with this Company. T. McChristie and M. Linkar assisted during the course of the work. Three men were used throughout this survey in an attempt to cut down lost time due to cable breaks.

Readings were recorded using a Ronka Mark IV Horizontal Loop type unit with coil spacing fixed at 200 feet. This unit had been zeroed, previous to this survey, over the ultrabasic sill at the Beatty Mine of Canadian Johns-Manville Company Limited in Beatty Township.

A total of 1,471 stations, spaced at 100 foot intervals, was recorded during the course of this survey.

Test surveys have been completed with this unit over a graphitic zone, a massive sulphide zone and a disseminated sulphide zone as aids in interpreting the results obtained on unexplored claims groups. The following results were obtained during these tests:-

1. Massive sulphide zone—a strong positive rise on the in phase followed by an intense negative with a resumption to zero or near zero when the station was off the conductor. The out of phase component remained within $\pm$5 of zero.

Electromagnetic Survey: (cont'd)

2. Disseminated sulphide zone -- similar to No. 1 but with lower in phase peaks.

3. Graphitic zone — both the in phase and out of phase components paralleled one another and followed the pattern of No. 1.

It should also be noted that coil spacing (should be exactly 200 feet) and the angle of the coils to the horizontal (each coil should be horizontal) play a large part in this work. Errors in one or both of the above may cause anomalies of sufficient magnitude to indicate the presence of a disseminated sulphide zone. Consequently topography is an important factor in this type of survey.

The results of the electromagnetic survey are shown on the accompanying electromagnetic profile plans on a scale of one inch equals 200 feet.

Interpretation of Magnetometer Survey:

The results of the magnetometer survey are depicted on the accompanying "Geo-Magnetic Contour Plans" on a scale of one inch equals 200 feet. Contour lines of equal magnetic intensity have been drawn at 500 gamma intervals from 0 to 6,000 with the interval at 1000 gammas for readings exceeding 6,000 in value, to emphasize anomalous zones. Interpretation has been based upon a study of the contoured magnetometer plans, geophysical, geological and diamond drill data previously completed by other interests in the area and aerial photographs.

Intermediate to basic volcanic rocks, generally altered by carbonatization and chloritization, underlie the major portion of the map area. These formations strike in an easterly direction across the claims and have steep dips. Magnetic readings over the andesitic volcanics range in intensity from 1200 to 2200 gammas, however, the majority fall within the range of 1400 to 1800 gammas. This is a normal background for intermediate volcanics in the area. A band of acid volcanics has been outlined on map sheets K-15 and K-21, having a maximum thickness of approximately 750 feet and striking conformably with the other

formations. Magnetic readings over the rhyolite range in value from 1300 to 1900 gammas. Note that the rhyolite has been delineated primarily on the basis of geological information as same cannot be distinguished by the results of the magnetic survey.

A marked magnetic zone of "lows" previously delineated on the Crawford Lake Group of claims has now been traced across the Crawford River block. Magnetic readings over this assumed sedimentary band range in value from 100 to 1000 gammas. Detailed geological mapping has failed to reveal any bedrock exposures in this zone of magnetic "lows". Several pronounced zones of low (negatives to 1000 gammas) magnetic intensity have been delineated on Sheet K-27 and have been interpreted as occurring over sedimentary formations. On map Sheet K-15 a band of altered sedimentary rocks have been mapped geologically by R. Seavoy. Magnetic readings over these altered greywackes range in intensity from 1500 - 2500 gammas - indistinguishable from the intermediate volcanics on a magnetic basis.

A small dioritic or gabbroic intrusive containing an unusually high percentage of magnetite occurs on map Sheets K-15 and K-21. Magnetic readings over this basic intrusive which has been mapped geologically, range in value from 2000 to 6000 gammas. Without the geological information this magnetic "high" would have been interpreted as an ultrabasic intrusive. Another narrow basic intrusive occurs on Map Sheet K-20.

Narrow dikes and small intrusive bodies of quartz-feldspar porphyry have been mapped on Sheet K-20 by R. Seavoy. Same cannot be distinguished from the andesites on a magnetic basis.

Easterly to southeasterly striking sill-like bodies of ultrabasic rocks occur in some profusion throughout the map area. The detailed geological mapping completed during the past field season shows these ultrabasic intrusives to be mainly highly serpentinized peridotites. In general these intrusives are

Interpretation of Magnetometer Survey: (cont'd)

relatively narrow, however, on Map Sheet K-21 the serpentinized peridotite attains a maximum thickness of 1250 feet. Magnetic readings over the ultrabasic intrusives range in intensity from 2000 to over 13,000 gammas, the latter indicating zones extremely rich in secondary magnetite. Several pronounced "dipoles" occur in these zones of extreme magnetic "highs". In several instances low readings (2000 to 3500 gammas) over the ultrabasics are due to moderate talc-carbonate alteration.

A series of northerly to northwesterly trending diabase dykes intrude the formations on the property. In general, these dykes have been sharply defined by geological mapping. However, many of the dykes show a magnetite content which is higher than the volcanic rock background. Consequently, magnetic values over these dykes range in value from normal background (2000 - 2500 gammas) up to 3500 gammas.

One diabase dyke has been delineated by a combination of the geological mapping and the magnetometer survey, and occurs across Map Sheets K-15, K-21 and K-27 a distance of approximately 9,000 feet.

Structurally no major cross faults have been outlined by either the recent geological mapping or the magnetometer survey. However, folding is indicated by the attitude of the ultrabasic intrusives in the northeast corner of the map area - Sheet K-15. It is planned to carry out further detailed geological mapping in this area during the 1966 field season to more clearly define the major structural features in central Kenogaming Township.

The results of the magnetometer survey indicate the occurrence of a series of easterly-striking sills of ultrabasic rocks extending across the central and southern parts of the property. These zones of assumed serpentinized peridotite are of sufficient size and magnetic intensity to warrant further exploration work.

Interpretation of Electromagnetic Survey:

The interpretation has been based upon a study of the results of the horizontal-loop type survey and all available geological and geophysical data. Results of the survey are shown on the accompanying "Electromagnetic Profile Plans" on a scale of one inch equals 200 feet.

Electromagnetic surveying was carried out on this claims group to check the formations for sulphide mineralization with special emphasis on the contacts of the ultrabasic intrusives. No conducting zones of any economic importance have been delineated by the horizontal loop electromagnetic survey. Weak conductors having low "in phase" peaks and in places minor "crossovers" of the in phase component, occur on the map area. Same are probably due to topographic effects and/or normal disseminated pyrite mineralization in the volcanic formations. Conducting zones on the accompanying plans which have been caused by major topographic features are marked N. P. C. S.

In summary, no conducting zones of importance have been indicated by the electromagnetic survey.

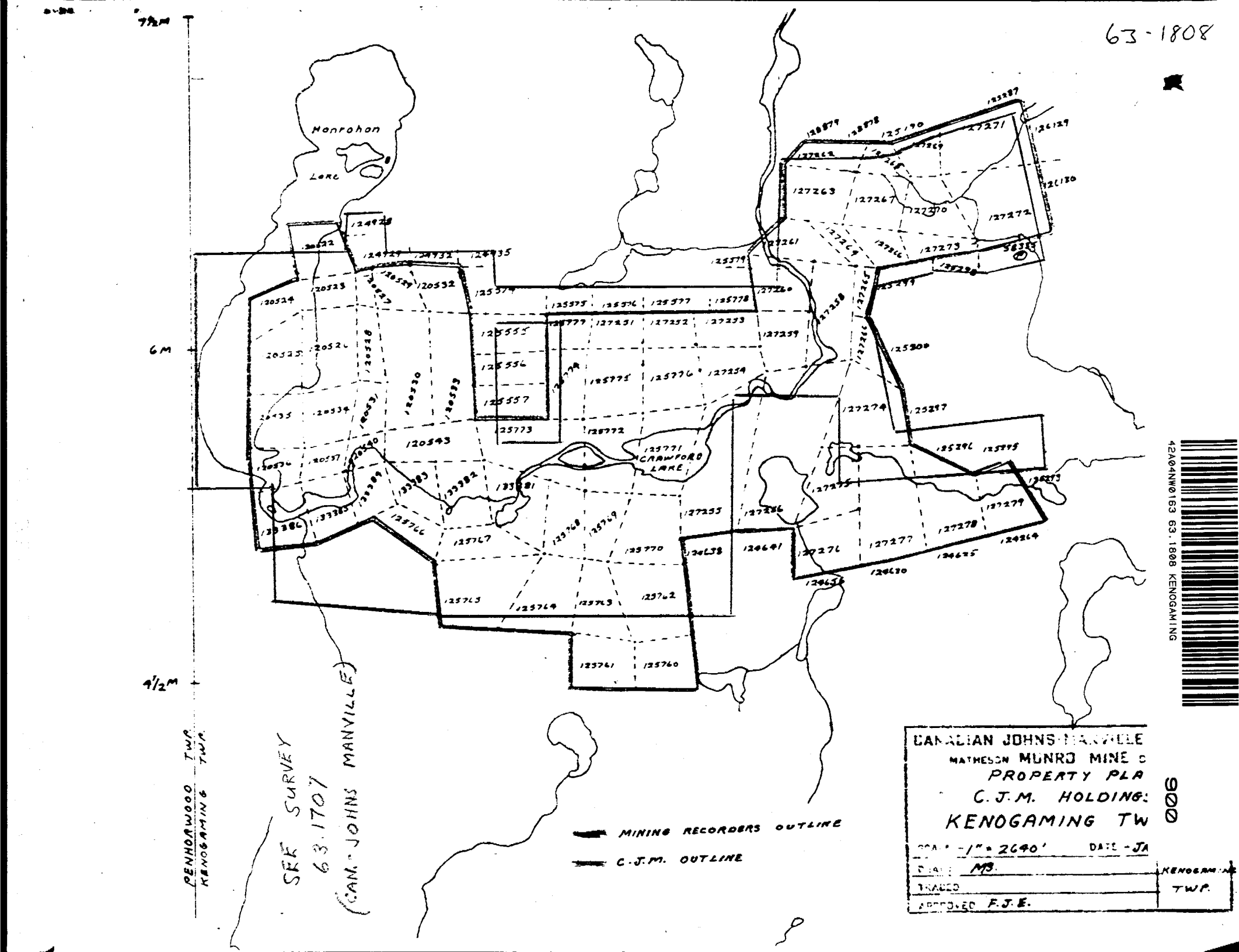
Recommendations:

Complete the detailed geological mapping and prospecting program currently in progress on the claims group. Upon completion of this work, arrive at a decision for the 1966 program.

Note - re assessment work - only work completed on the claims discussed in this report has been used for assessment filing purposes.

F. J. Evelegh

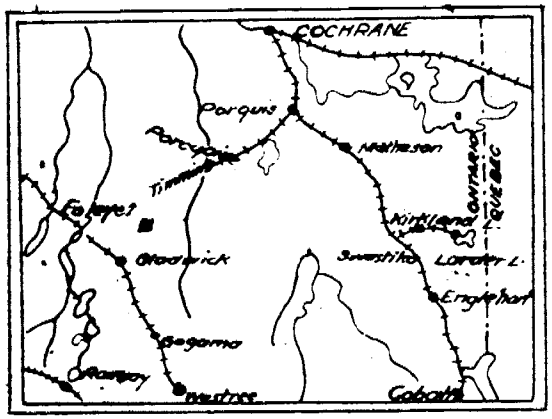
Submitted: October 7th, 1965
by: F. J. Evelegh,
Sr. Geologist.


63-1808
7½M
6M
4½M
Monrohon Lake
CRAWFORD LAKE
PENHORWOOD TWP.
KENOGAMING TWP.
SEE SURVEY 63.1707 (CAN. JOHNS MANVILLE)
MINING RECORDERS OUTLINE
C.J.M. OUTLINE
CANADIAN JOHNS-MANVILLE
MATHESON MUNRO MINE
PROPERTY PLA
C.J.M. HOLDINGS
KENOGAMING TW
SCALE - 1" = 2640'
DATE - JA
DRAWN MB.
TRACED
APPROVED F.J.E.
KENOGAMING TWP.
900
42A04NW0163 63.1808 KENOGAMING

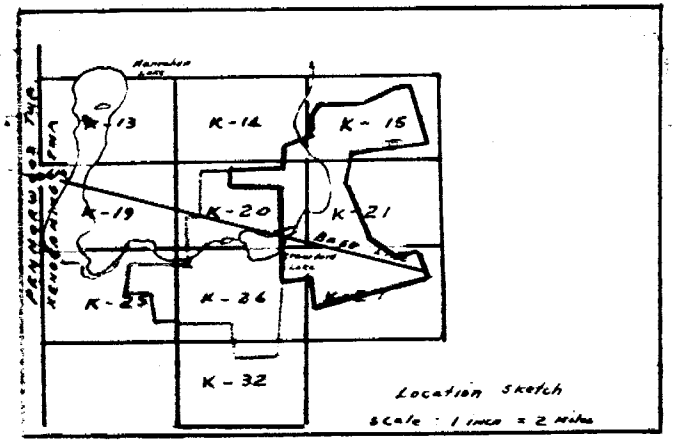
63.1809

CANADIAN JOHNS-MANVILLE CO. LTD.
MATHESON MUNRO MINE ONTARIO
LEGEND SHEET
KENOGAMING TOWNSHIP

SCALE 1"=200' DATE JULY 26/63
DRAWN R.F.K.
TRACED
APPROVED F.J.E.



LOCATION SKETCH
Scale 1" = 50 Miles.



GEOL. LEGEND

- DIABASE
- 5 — GRANITE SYENITE
- SERP. PERIDOTITE
- GABBRO - DIORITE
- 3 — ACID VOLCANIC
- INTERMEDIATE TO BASIC VOLCANICS CARB. VOLCANICS
- QUARTZITE, GRAYWACKE IMPURE SEDIMENTS
- IF — IRON FORMATION

GEO-MAG SYMBOLS

- Contour Interval: 500 gammas
- BC-361 — Magnetic Base Control Station
- Geological Contact
- Fault Zone {G-Geologic, M-Magnetic, T-Topographic}

TOPO-SYMBOLS

- Outcrop
- Higher Ground
- Scarp
- Muskeg or Swamp
- Creek
- Drill Hole
- Bush Road

ELECTRO-MAG SYMBOLS

- In phase Curve
- Out phase Curve
- Conducting Zone {S-strong, M-Medium, W-Weak}

Scale 40 Units = 1 inch
East is positive
West is negative

N.P.C.S. - Not proper coil spacing

63.1809

Magnetometer Survey by - R.F. HALEY
E.M. Survey by - R.A. HALEY

CANADIAN JOHNS-MANVILLE CO. LTD.
HUNAR MINE ONTARIO
PROPERTY PLAN
KENOGAMING TWP.
SCALE 1" = 1320'   DATE SEPT. 1966
TRACED I.G.W.
APPROVED

200


ADJOINS SHEET No. K-14
LAKE
QTZ STRKWK
Porph dike QTZ STRKWK
125574
125575
125576
125577
125555
125556
125557
125777
127251
127252
127253
127254
127255
127256
127259
127260
125773
125772
125771
125776
42-25
42-31
42-32
42-24
42-26
37-1
37-2
Kg-36-2
Kg-36-11
Kg-36-12
Kg-36-13
Kg-36-10
Kg-33-3
Kg-34-13
Kg-34-14
Kg-34-18
Talc-carb Vein 3ft
differentiated olivine gabbro top of U.B.
OPEN SPRUCE
High Sand-Clay Flats draining to the East
Bedd tuff
STEEP SCARP
Pond
POND
VERY DENSE CEDAR SWAMP (VALLEY)
Ridge along strike of dike
TRACTOR ROAD
L-28+00E
L-32+00E
L-36+00E
L-40+00E
L-44+00E
L-48+00E
L-52+00E
L-56+00E
L-60+00E
L-68+00E
L-72+00E
L-76+00E
L-80+00E
L-84+00E
L-88+00E
L-92+00E
L-96+00E
Kg-15-4
Kg-15-5
Kg-15-6
Kg-15-8
Kg-15-9
Kg-15-10
Kg-15-13
Kg-15-15
Kg-15-16
Kg-15-17
Kg-15-18
Kg-15-19
1% diss po in rock fabric
RAPIDS
PORTAGE
Canoe
OPEN BOG
BASE LINE
BASE LINE OFFSET
CRAWFORD LAKE
BEAVER DAM
High hill
QTZ STKWKS
OCA
42A04NW0163 63.1808 KENOGAMING
220
ADJOINS SHEET No. K-
CANADIAN JOHNS MANVILLE CO. LTD
GEOLOGICAL AND TOPOGRAPHIC PLAN
1" = 200'

CANADIAN JOHNS MANVILLE CO. LTD.
GEOLOGICAL AND TOPOGRAPHIC PLAN
1" = 200'

CANADIAN JOHNS MANVILLE CO. LTD.
GEOLOGICAL AND TOPOGRAPHIC PLAN
KENOGAMING TOWNSHIP
1" = 200'
MAR. 1966
No. K-27

42A04NW0153 63.1888 KENOGAMING

240

63.1808

250

SHEET NO. K-14
KENOGAMING TWP.
ELECTRO-MAGNETIC PROFILE

SHEET NO K-15
KENOGAMING TWP.
ELECTRO-MAGNETIC PROFILE
1" = 200'

ADJOINS SHEET NO. K-19

LAKE

124941

125574

125575

125576

125577

125578

127260

NOT CTM

125555

125777

127251

127252

127253

127259

125556

125774

125775

125776

127254

125557

NPCS

127255

127256

125773

125772

125771

BASE LINE OFFSET

BASE LINE

LAKE

CRAWFORD

120545

270

ADJOINS SHEET No. K-24

SHEET NO. K-20
KENOGAMING TWP.
ELECTRO-MAGNETIC PROFILE
1" = 200'

63-1808

W

W

W

127260

127265

125299

NPCS

RIVER

CRAWFORD

127258

127259

?

W W

125297

?

127274

?

125300

127256

BASE LINE OFFSET

127275

127277

127278

63-1808

SHEET NO K-27
KENOGAMING TWP.
ELECTRO-MAGNETIC PROFILE
1" = 200'

63.1808

SHEET NO. K-26
KENOGAMING TWP.
ELECTRO-MAGNETIC PROFILE
1" = 200'

290

300

63·1808
K-27
ELECTRO-MAGNETIC PROFILE
1" = 200'

63.1808

SHEET No. 5-15
KENOGAMING TWP
GEO-MAGNETIC CONTOUR PLAN
1" = 200'

310

42A04NW0153 63.1808 KENOGAMING

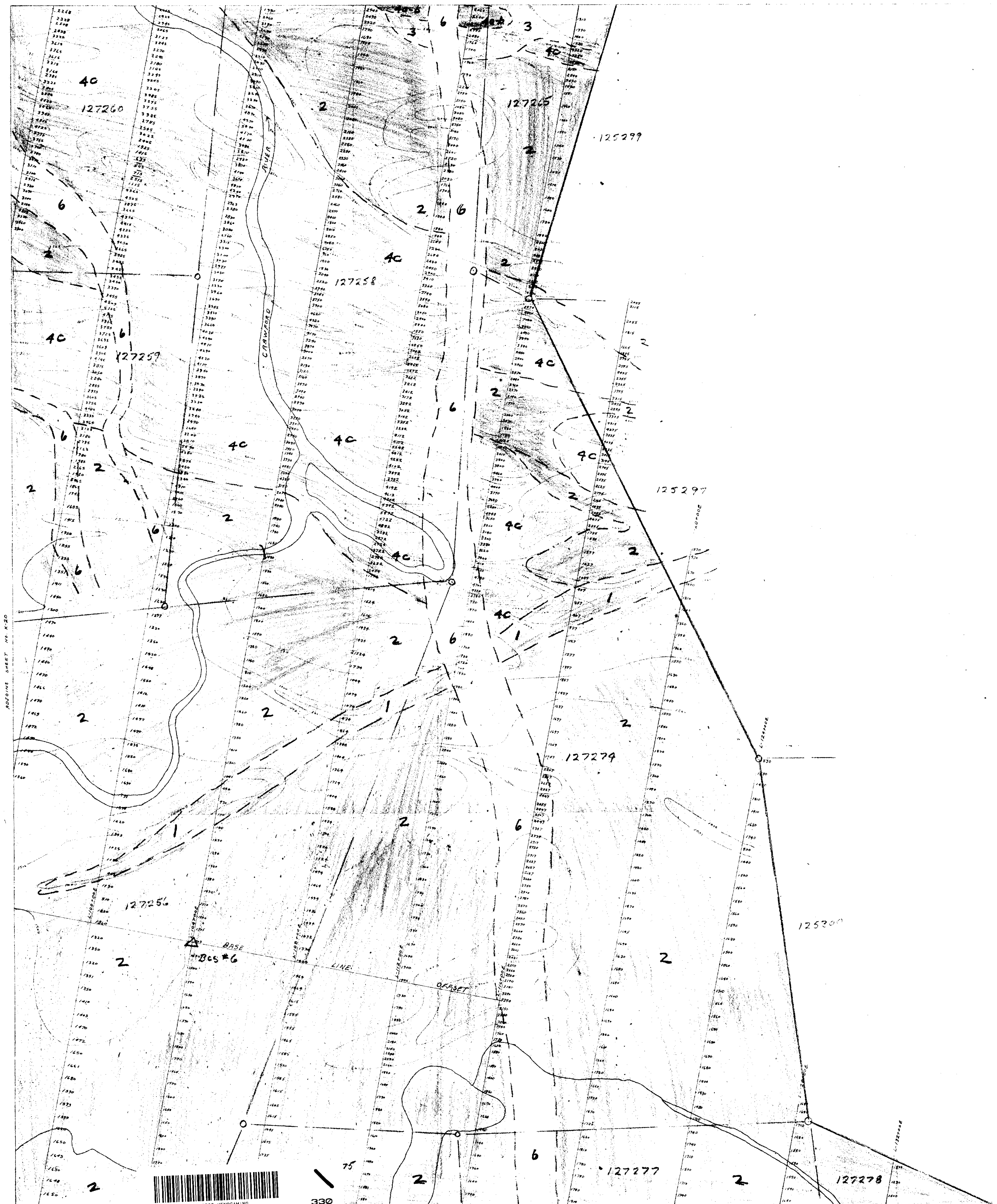
1

320

63.1808

SHEET NO. K-20
KENOGAMING TWP.
GEO-MAGNETIC CONTOUR PLAN
1" = 200'

ADJOINS SHEET NO K-15



ADJOINS SHEET NO K-27

631808

SHEET NO. K-21
KENOGAMING TWP.
GEOMAGNETIC CONTOUR PLAN
1" = 200'

340

63.1808

42A04NW0163 63.1808 KENOGAMING

350

63·1808
K-27

GEO-MAGNETIC CONTOUR PLAN
1" = 200'