

42A04NW0166 63.1707 KENOGAMING

010

File 63-1707

REPORT ON GEOPHYSICAL SURVEYS
CRAWFORD LAKE GROUP OF CLAIMS
KENOGAMING TOWNSHIP
SUDBURY MINING DIVISION
PROVINCE OF ONTARIO

by

F. J. Eveleigh.

Exploration Department,
Canadian Johns-Manville Co. Limited.

June 26th, 1965.
Matheson, Ontario.



I N D E X

Introduction	.....	Page 1
Property	.....	1
Location & Accessibility	.....	2
Topography	.....	2
Previous Work	.....	2, 3
Line Cutting & Chaining	.....	3, 4
General Geology	.....	4, 5
Magnetometer Survey	.....	5, 6
Electromagnetic Survey	.....	6, 7
Interpretation of Magnetometer Survey	.....	7, 8, 9
Interpretation of Electromagnetic Survey	.....	9, 10
Recommendations	.....	10

Assessment Report	A, B
-------------------	-------	------

List of Maps Accompanying Report:

Geo-Magnetic Contour Plans on a scale of 1" = 200'
Sheets K20, 25, 26 and 32.

Electromagnetic Profile Plans on a scale of 1" = 200'
Sheets K20, 25, 26 and 32.

Legend Sheet

REPORT ON GEOPHYSICAL SURVEYS
CRAWFORD LAKE GROUP OF CLAIMS
KENOGAMING TOWNSHIP
SUDBURY MINING DIVISION
PROVINCE OF ONTARIO.

Introduction:

The following report describes the geophysical surveys completed during March and April 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 foot 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 foot 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. Iinkar assisted during the course of this work. Readings were recorded at 100 foot 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-125760 - 77 inclusive.

These eighteen claims comprise approximately 720 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 low relief. This is especially prevalent in the south and southeast parts of the property along the shores of Crawford River and Crawford Lake. Here the topography is characterized by wet cedar, spruce and tamarack swamps where only minor bedrock exposures were noted. In the northern part of the claims, rock outcrops are relatively abundant as the area is higher and timbered with poplar, birch and scattered pine. Alders were noted in low lying locations. Several east - west trending outcrop ridges occur in this area. Parts of the northern section are covered by extensive gravel - boulder deposits.

Drainage is provided by the Crawford River which flows from Hanrahan Lake to the east through Crawford Lake and on northwards towards Highway #101. The southern part of this stream is extremely shallow and sluggish, however, farther north rapids occur and the river becomes rapid although still shallow. This stream is navigable by canoe or small boat 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 No. 33g, entitled "Groundhog River Area" on a scale of 1 inch equals 1½ miles. Further regional mapping was carried out by V. K. Priest (Geology of Keith-Muskego Area) and W. D. Harding (Geology of Horwood Lake Area) in 1949 and 1936 respectively for the Ontario Department

Previous Work: (cont'd)

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, Johnsmith 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 geological mapping and prospecting are currently in progress on the group.

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 boundaries of the claims. Pickets with numbered locations were established at 50 foot intervals along the offset lines by chaining. 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: (cont'd)

Line cutting and chaining were contracted to J. Alix Company Limited of Val d'Or, Quebec and were carried out during the latter part of November, 1964. A total of 19.0 miles of picket and base lines was cut and chained during the course of this work.

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 No. 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.

Precambrian

Proterozoic

Keweenawan

Alkaline syenite - carbonatite complex

Keweenawan and Matachewan

Diabase

Archean

Acid igneous rocks - granitoid rocks, mgaitites 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.

General Geology: (cont'd)

The geology of the claims immediately to the west and south of the Crawford Lake Group was mapped in detail by Company geologists during 1957 and same was compiled as a report on the South Hanrahan Lake Group of claims.

The Crawford Lake Group of claims is underlain by altered intermediate to basic volcanic rocks with narrow rhyolitic flows and interbedded 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 "Interpretation of Magnetometer Survey".

Magnetometer Survey:

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

This 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 " " "

" #3 - 100 " " "

The survey was tied into the base control station used during 1955 - 57 for the South Hanrahan Lake Group survey. Same was established using a Sharpes A-2 type magnetometer. In this respect a relative gamma value of 1220 corresponds closely with an absolute value of $57,599 \pm 15$ gammas.

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

Line 32+00East on the base line	-	1440	gammas
" 55+00East " " " "	-	1320	"
" 72+00East " " " "	-	1110	"

Magnetometer Survey: (cont'd)

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.

The locations of the base control listed above 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 2,266 stations was recorded on the East Mt 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. Lin'ar 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 1,017 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

Electromagnetic Survey: (cont'd)

- the conductor. The out of phase component remained within ± 5 of zero.
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.

The major portion of the surveyed area is underlain by altered (carbonatized and chloritized) intermediate to basic volcanic rocks. These formations strike in a general easterly direction across the claims and have steep dips. Magnetic readings over these andesites range in value from 1000 to 2,500 gammas, however, the majority fall within the range of 1,300 to 1,600 gammas. This is a normal background value for the area. Narrow rhyolitic flows occur in the area but none are shown on the accompanying plans as same cannot be distinguished on a magnetic basis.

Interpretation of Magnetometer Surveys (cont'd)

A marked magnetic zone of "lows" having a sharp linear trend has been delineated in the north-central part of the group. Magnetic readings over this assumed sedimentary band range in value from negatives to 1300 gammas. This zone strikes slightly north of east and extends beyond the east boundary of the immediate surveyed group. Detailed geological mapping, which is currently in progress in this area, failed to reveal any bedrock exposures in the zone of magnetic "lows".

A small gabbro intrusive has been mapped in the extreme east part of the claims. Magnetic readings over this basic intrusive range in value from 1300 to 2000 gammas. Same is indistinguishable from the volcanic rocks on the basis of the magnetic data.

Easterly trending sill-like bodies of ultrabasic rocks - assumed serpentized peridotite - extend throughout the central and southern portions of the surveyed area. In general the ultrabasic intrusives are relatively narrow, however, sizeable thicknesses occur in fault blocks on claims S-125763 and S-125773. Magnetic readings over these ultrabasic rocks range in value from 2500 to over 17,000 gammas. Values in the latter range indicate marked concentrations of secondary magnetite. In several instances, low readings (2500 to 3500 gammas) over the ultrabasics are due to moderate carbonate alteration.

Narrow dykes and small intrusive bodies of quartz-feldspar porphyry occur on the claims group but cannot be distinguished from the andesites on a magnetic basis. Same were noted during the mapping program currently in progress on the claims.

The banded iron formation which is typical of this area occurs in the extreme east and central parts of the group. Magnetic readings over the iron formation range in value from marked negatives to over 21,000 gammas. The iron formation has a general easterly strike but does not show magnetically in hematite-rich sections.

Interpretation of Magnetometer Survey: (cont'd)

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.

Structurally, two cross faults have been shown offsetting the formations on claims S-125768 and S-125773 and movement is apparent along several of the diabase dykes shown on the accompanying plans. Folding, which is typical in the formations to the north of the surveyed area, no doubt occurs on these claims, however, same is not indicated by the magnetometer survey.

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 serpentized 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. One strong to intense conducting zone has been delineated over the iron formation on claim S-125762. A sharp "in phase" peak, crossover and weak paralleling by the "out of phase" component occur over the zone. This conductor is due to pyrite-pyrhotite mineralization in the banded iron formation.

A moderate conductor occurs in the southeast corner of claim S-125770 and is situated along the north side of the iron formation. A second moderate con-

Interpretation of Electromagnetic Survey: (cont'd)

ductor occurs along the contact of the diabase dyke in the north part of claim S-125775. A marked crossover occurs in this zone and same indicates the occurrence of a disseminated sulphide zone.

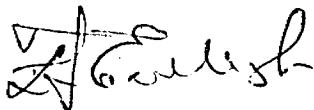
Numerous weak conductors occur on the claims group but are assumed to be of little interest. Some may be due to topographic effects and normal disseminated pyrite mineralization in the volcanic formations. Conducting zones on these plans which have been caused by topography are marked N. P. C. S.

In summary, no conducting zones of major importance have been delineated by the electromagnetic survey. The iron formation, by surface sampling, contains no sulphides of economic importance - this is typical of the banded iron formation in the Penhorwood - Kenogaming Townships area. The conductor along the diabase dyke in the north part of claim S-125775 appears of sufficient interest to warrant further work. Stripping may uncover bedrock in this area.

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 - no assessment work - only work completed on the claims discussed in this report have been used for assessment filing purposes. The additional data shown on the accompanying plans will be filed at a later date.

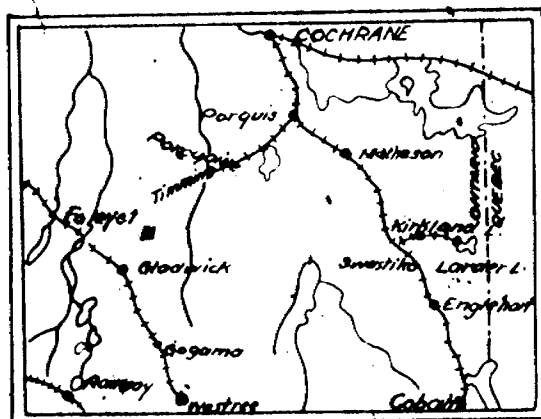


Submitted: June 26th, 1965.
by: F. J. Evesleigh,
Sr. Geologist.

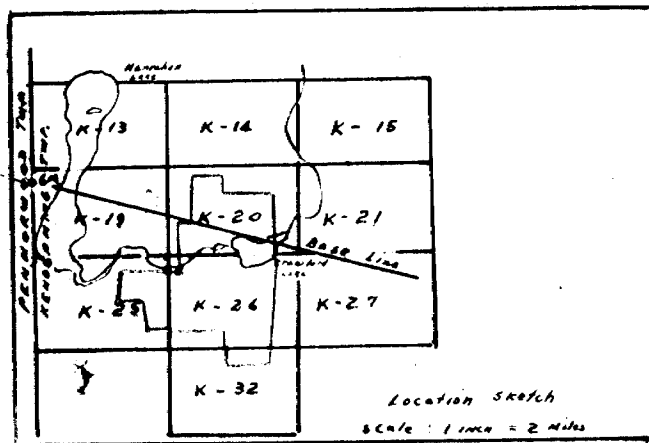
CANADIAN JOHNS-MANVILLE CO. LTD.
 MATHESON MUNRO MINE ONTARIO
 LEGEND SHEET
 KENOGAMING TOWNSHIP

SCALE 1" = 200' DATE JULY 24/65

DRAWN R.F.K.
 TRACED
 APPROVED F.J.E.



LOCATION SKETCH
 Scale 1" = 50 Miles



GEOL. LEGEND

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

TOPO-SYMBOLS

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

GEO-MAG SYMBOLS

- Contour Interval: 500 gammas
- Magnetic Base Control Station
- Geological Contact
- Fault Zone
 - S - Geologic
 - M - Magnetic
 - T - Topographic

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.G.S. - Not proper coil spacing

Magnetometer Survey by - R.F. HALEY

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

63-1707

R. Haley

63-1707

REPORT ON GEOPHYSICAL SURVEYS
CRAWFORD LAKE GROUP OF CLAIMS
KENOGAMING TOWNSHIP
SUDBURY MINING DIVISION
PROVINCE OF ONTARIO.

Introduction:

The following report describes the geophysical surveys completed during March and April 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 foot 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 foot 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 Renka Mark IV horizontal loop type unit. F. McChristie and M. Linkar assisted during the course of this work. Readings were recorded at 100 foot 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: -

8-125760 - 77 inclusive.

These eighteen claims comprise approximately 720 acres.

Location and Accessibility:

The Canadian Johns-Manville claims group is situated in the west-central part of Kenegaming 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 low relief. This is especially prevalent in the south and southeast parts of the property along the shores of Crawford River and Crawford Lake. Here the topography is characterized by wet cedar, spruce and tamarack swamps where only minor bedrock exposures were noted. In the northern part of the claims, rock outcrops are relatively abundant as the area is higher and timbered with poplar, birch and scattered pine. Alders were noted in low lying locations. Several east - west trending outcrop ridges occur in this area. Parts of the northern section are covered by extensive gravel - boulder deposits.

Drainage is provided by the Crawford River which flows from Hanrahan Lake to the east through Crawford Lake and on northwards towards Highway #101. The southern part of this stream is extremely shallow and sluggish, however, farther north rapids occur and the river becomes rapid although still shallow. This stream is navigable by canoe or small boat 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 No. 33g, entitled "Groundhog River Area" on a scale of 1 inch equals 1½ miles. Further regional mapping was carried out by V. K. Priest (Geology of Keith-Muskego Area) and W. D. Harding (Geology of Herwood Lake Area) in 1949 and 1936 respectively for the Ontario Department

Previous Work: (cont'd)

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 Elsieff holdings, Johnsmith 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 geological mapping and prospecting are currently in progress on the group.

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 $S79^{\circ}E$ 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 boundaries 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 (cont'd)

Line cutting and chaining were contracted to J. Alix Company Limited of Val d'Or, Quebec and were carried out during the latter part of November, 1964. A total of 19.0 miles of picket and base lines was cut and chained during the course of this work.

General Geology

The geology of Kenogaming Township and immediately adjacent areas was mapped by E. W. Todd for the Ontario Department of Mines in 1929. The results of this work are shown on Map No. 33g on a scale of 1 inch equals 1½ miles entitled "Grandhug River Area" which accompanies Ontario Department of Mines Report Vol. XXXIII Part 6, dated 1924. More recently (1965), the "Foley Sheet" of the Ontario Department of Mines geological compilation series compiled by H. D. Carsen shows the geology of adjacent Penherveed 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.

Precambrian

Proterozoic

Keweenaw

Alkaline syenite - carbonatite complex

Keweenaw and Matachewan

Diabase

Archean

Acid igneous rocks - granitoid rocks, magnetites 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.

General Geology: (cont'd)

The geology of the claims immediately to the west and south of the Crawford Lake Group was mapped in detail by Company geologists during 1957 and same was compiled as a report on the South Hanrahan Lake Group of claims.

The Crawford Lake Group of claims is underlain by altered intermediate to basic volcanic rocks with narrow rhyolitic flows and interbedded 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 "Interpretation of Magnetometer Survey".

Magnetometer Survey:

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

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

Scale #1 - 10 gammas per division
" #2 - 30 " " "
" #3 - 100 " " "

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 Sharpes A-2 type magnetometer. In this respect a relative gamma value of 1220 corresponds closely with an absolute value of 57,599 \pm 15 gammas.

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

Line 32+00 East on the base line - 1440 gammas
" 56+00 East " " " " - 1320 "
" 72+00 East " " " " - 1110 "

Magnetometer Survey: (cont'd)

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.

The locations of the base control listed above 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 2,266 stations was recorded on the East Nat 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. Linker 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 Renka Mark IV Horizontal Loop type unit with coil spacing fixed at 200 feet. This unit had been tested, previous to this survey, over the ultrabasic sill at the Beatty Mine of Canadian Johns-Manville Company Limited in Beatty Township.

A total of 1,017 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

Electromagnetic Survey: (cont'd)

- the conductor. The out of phase component remained within ± 5 of zero.
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.

The major portion of the surveyed area is underlain by altered (carbonatized and chloritized) intermediate to basic volcanic rocks. These formations strike in a general easterly direction across the claims and have steep dips. Magnetic readings over these andesites range in value from 1000 to 2,500 gammas, however, the majority fall within the range of 1,300 to 1,800 gammas. This is a normal background value for the area. Narrow rhyolitic flows occur in the area but none are shown on the accompanying plans as same cannot be distinguished on a magnetic basis.

Interpretation of Magnetometer Survey (cont'd)

A marked magnetic zone of "lows" having a sharp linear trend has been delineated in the north-central part of the group. Magnetic readings over this assumed sedimentary band range in value from negatives to 1300 gammas. This zone strikes slightly north of east and extends beyond the east boundary of the immediate surveyed group. Detailed geological mapping, which is currently in progress in this area, failed to reveal any bedrock exposures in the zone of magnetic "lows".

A small gabbro intrusive has been mapped in the extreme east part of the claims. Magnetic readings over this basic intrusive range in value from 1300 to 2000 gammas. Same is indistinguishable from the volcanic rocks on the basis of the magnetic data.

Easterly trending sill-like bodies of ultrabasic rocks - assumed serpentized peridotite - extend throughout the central and southern portions of the surveyed area. In general the ultrabasic intrusives are relatively narrow, however, sizeable thicknesses occur in fault blocks on claims S-125768 and S-125773. Magnetic readings over these ultrabasic rocks range in value from 2500 to over 17,000 gammas. Values in the latter range indicate marked concentrations of secondary magnetite. In several instances, low readings (2500 to 3500 gammas) over the ultrabasics are due to moderate carbonate alteration.

Narrow dykes and small intrusive bodies of quartz-feldspar porphyry occur on the claims group but cannot be distinguished from the andesites on a magnetic basis. Same were noted during the mapping program currently in progress on the claims.

The banded iron formation which is typical of this area occurs in the extreme east and central parts of the group. Magnetic readings over the iron formation range in value from marked negatives to over 21,000 gammas. The iron formation has a general easterly strike but does not show magnetically in hematite-rich sections.

Interpretation of Magnetometer Survey: (cont'd)

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.

Structurally, two cross faults have been shown offsetting the formations on claims S-125768 and S-125773 and movement is apparent along several of the diabase dykes shown on the accompanying plans. Folding, which is typical in the formations to the north of the surveyed area, no doubt occurs on these claims, however, same is not indicated by the magnetometer survey.

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 serpentized 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. One strong to intense conducting zone has been delineated over the iron formation on claim S-125762. A sharp "in phase" peak, crossover and weak paralleling by the "out of phase" component occur over the zone. This conductor is due to pyrite-pyrrhotite mineralization in the banded iron formation.

A moderate conductor occurs in the southeast corner of claim S-125770 and is situated along the north side of the iron formation. A second moderate con-

Interpretation of Electromagnetic Survey (cont'd)

ductor occurs along the contact of the diabase dyke in the north part of claim S-125775. A marked crossover occurs in this zone and same indicates the occurrence of a disseminated sulphide zone.

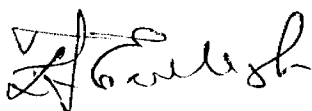
Numerous weak conductors occur on the claims group but are assumed to be of little interest. Some may be due to topographic effects and normal disseminated pyrite mineralization in the volcanic formations. Conducting zones on these plans which have been caused by topography are marked N. P. C. S.

In summary, no conducting zones of major importance have been delineated by the electromagnetic survey. The iron formation, by surface sampling, contains no sulphides of economic importance - this is typical of the banded iron formation in the Penhorwood - Kenogaming Townships area. The conductor along the diabase dyke in the north part of claim S-125775 appears of sufficient interest to warrant further work. Stripping may uncover bedrock in this area.

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 have been used for assessment filing purposes. The additional data shown on the accompanying plans will be filed at a later date.



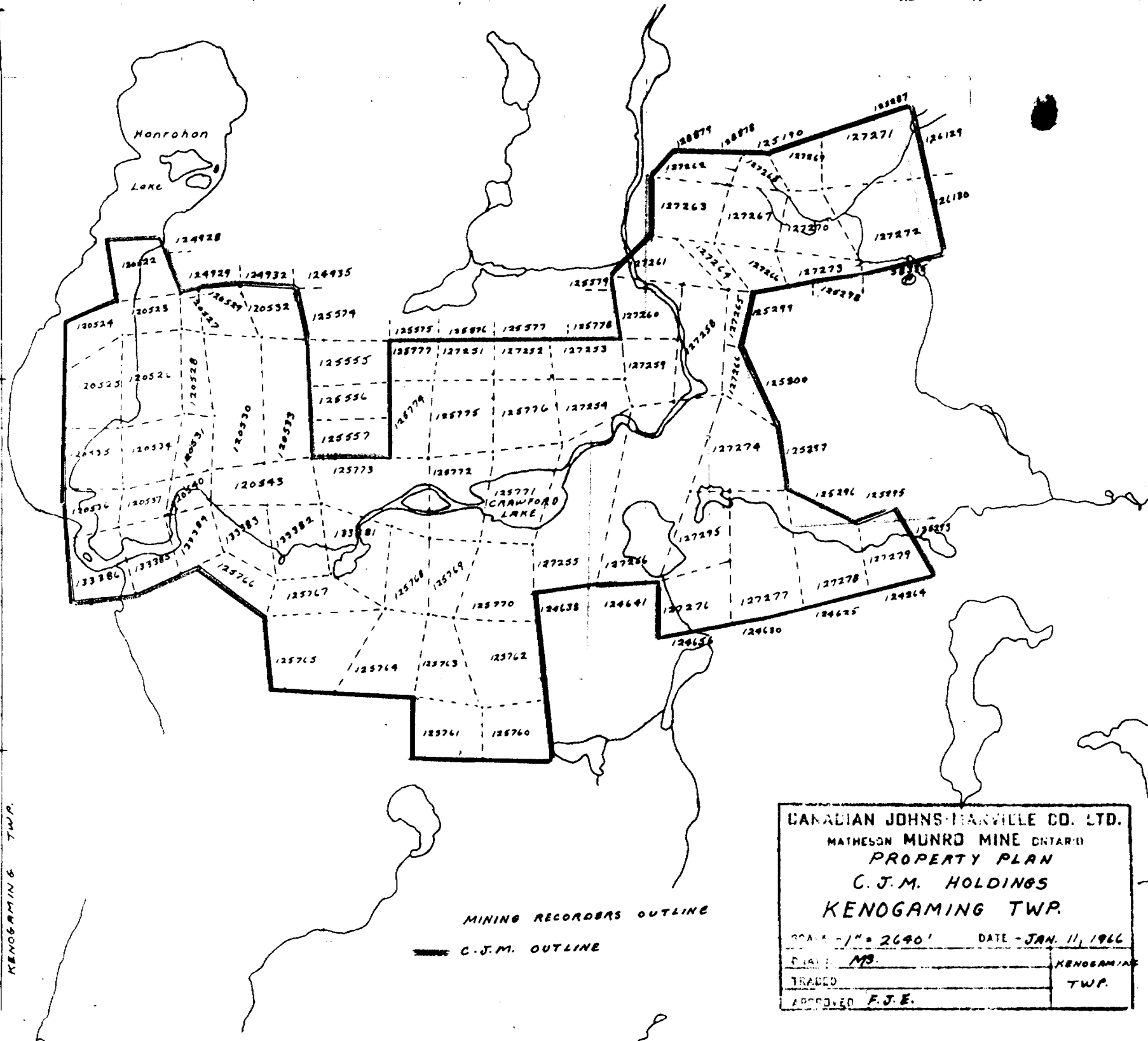
Submitted: June 26th, 1965.
by: F. J. Evelagh,
Sr. Geologist.

7 1/2 M

6 M

4 1/2 M

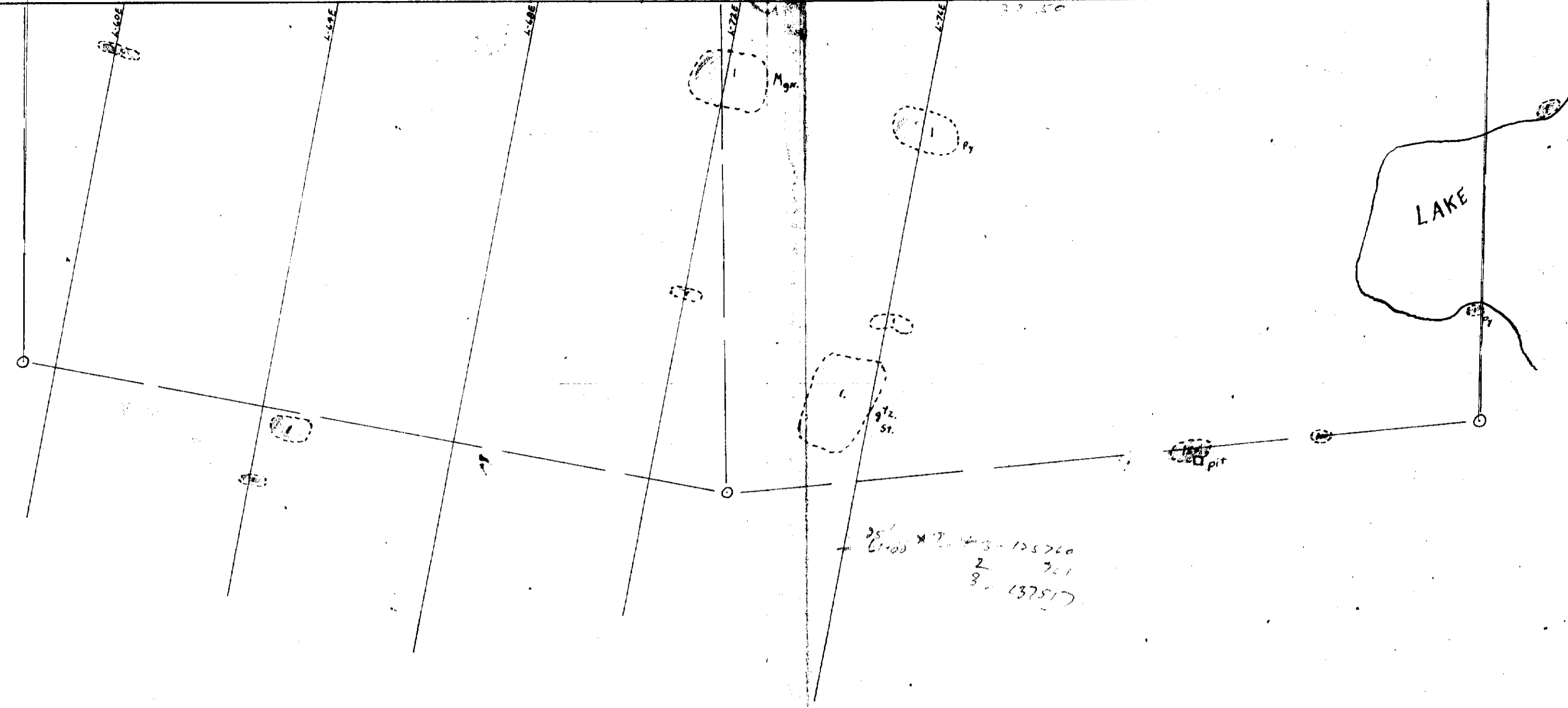
PENHORWOOD TWP.
KENOGAMING TWP.



MINING RECORDERS OUTLINE

C. J. M. OUTLINE

CANADIAN JOHNS-HARVILLE CO. LTD.	
MATHESON MUNRO MINE ONTARIO	
PROPERTY PLAN	
C. J. M. HOLDINGS	
KENOGAMING TWP.	
SCALE - 1" = 2640'	DATE - JAN. 11, 1966
PLAN: MB	KENOGAMING TWP.
TRADED	
APPROVED F. J. E.	



Handwritten scribbles or initials.

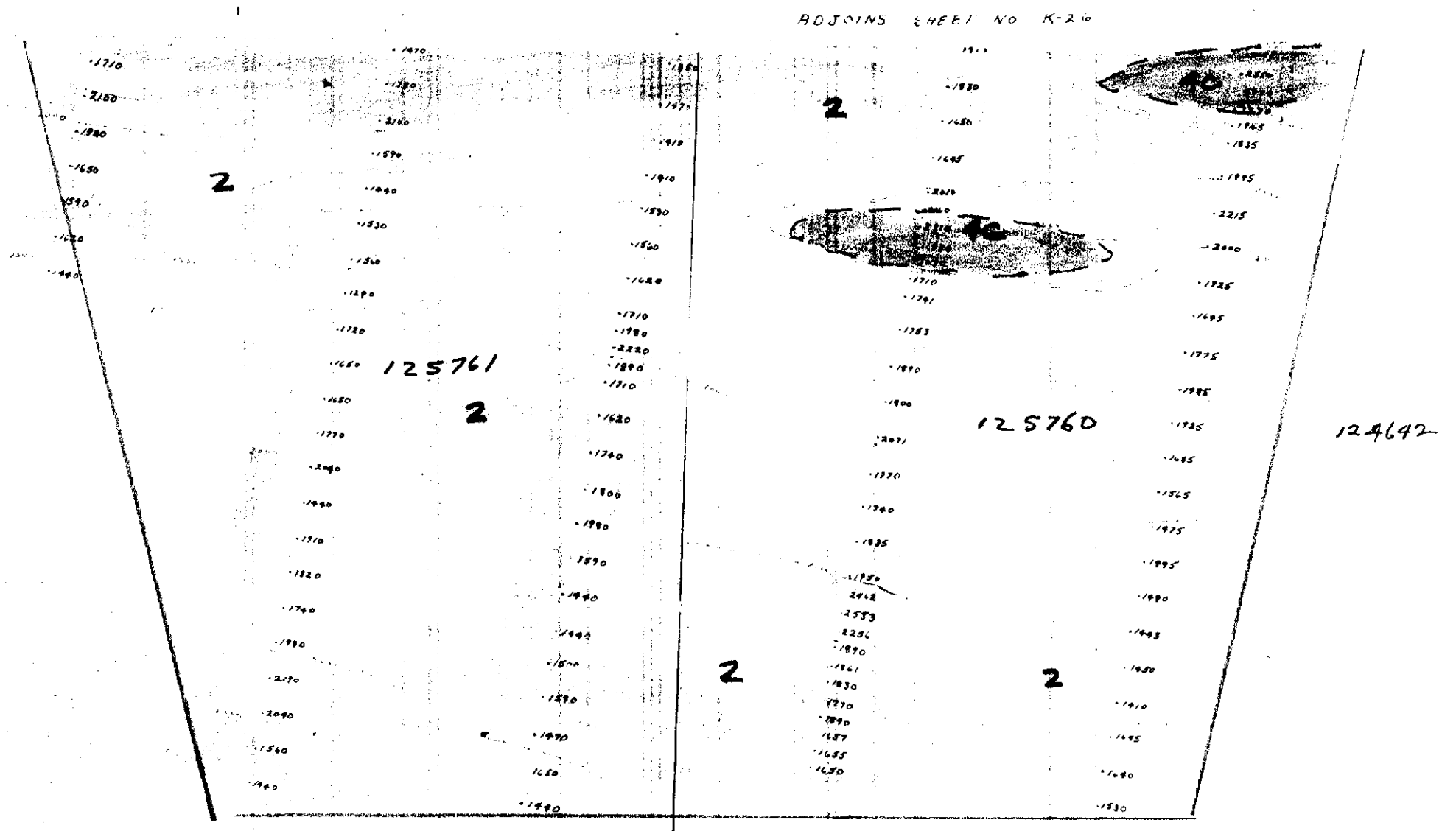
K 32



PENHORWOOD TWA
KENGAMING TWA

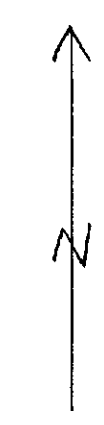


210



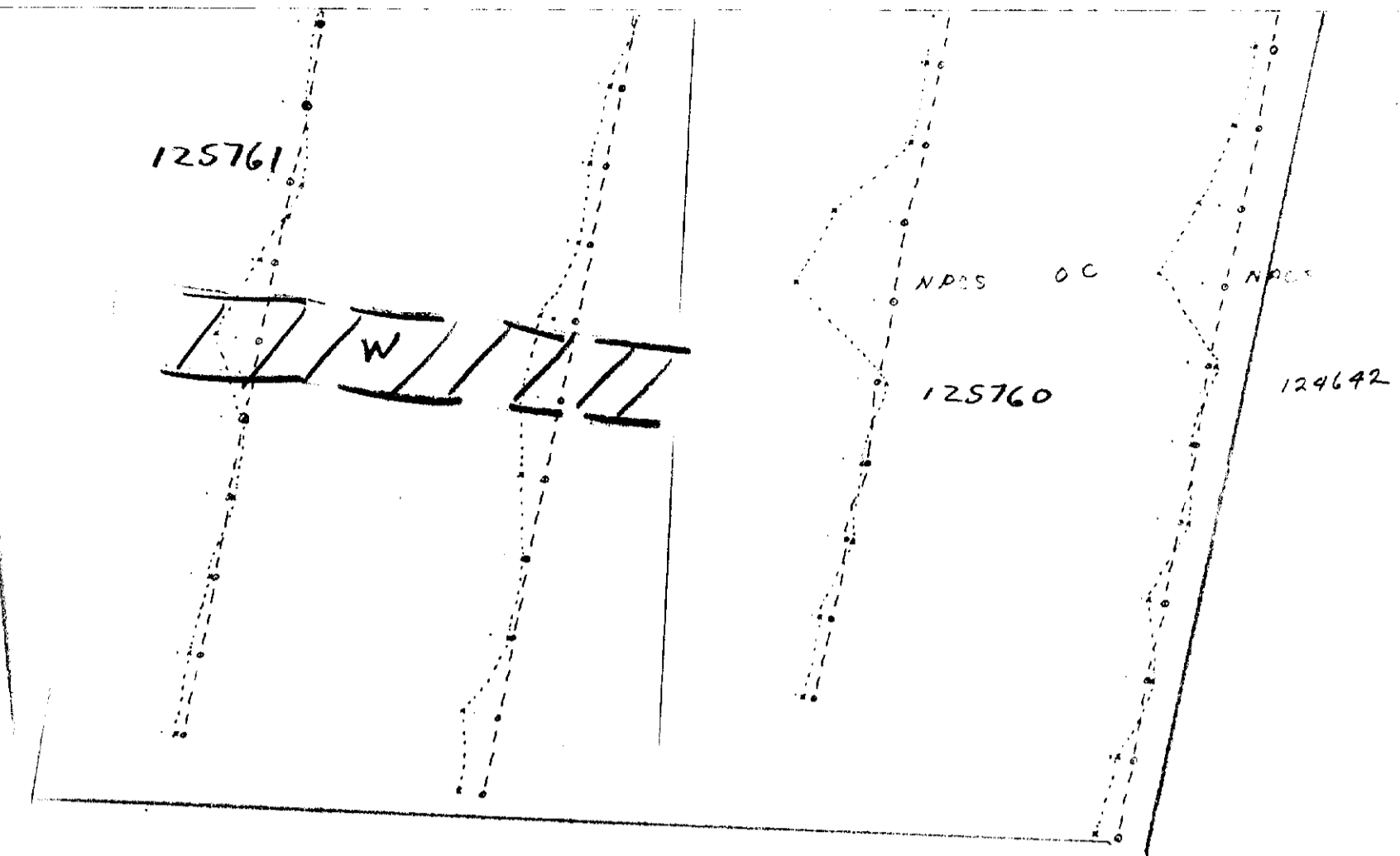
4248488166 63.1707 KENDSAMING

220

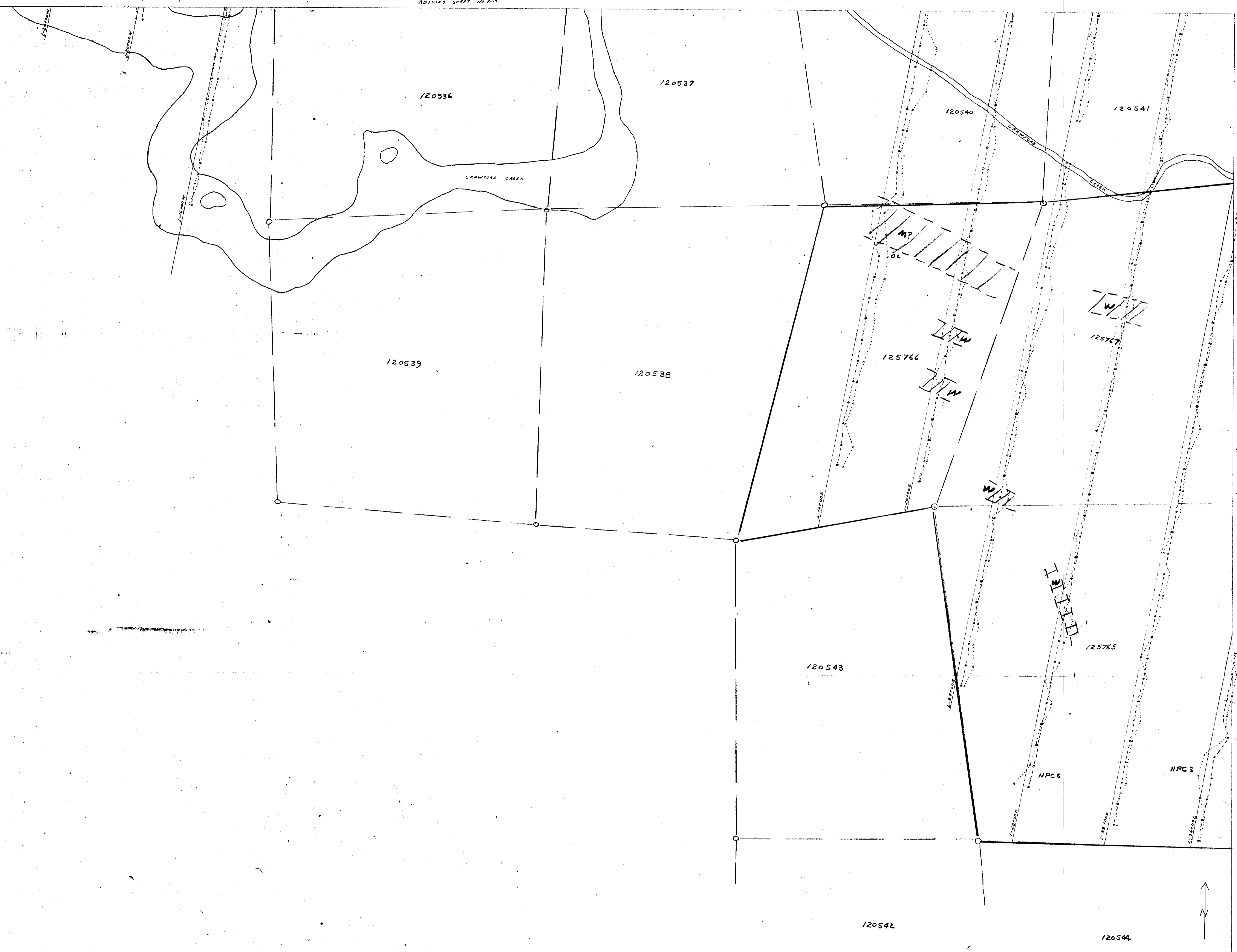


63.1707

SHEET NO. K-32
KENDSAMING TWA
GEO-MAGNETIC CONTOUR PLAN

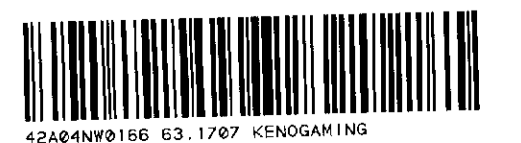
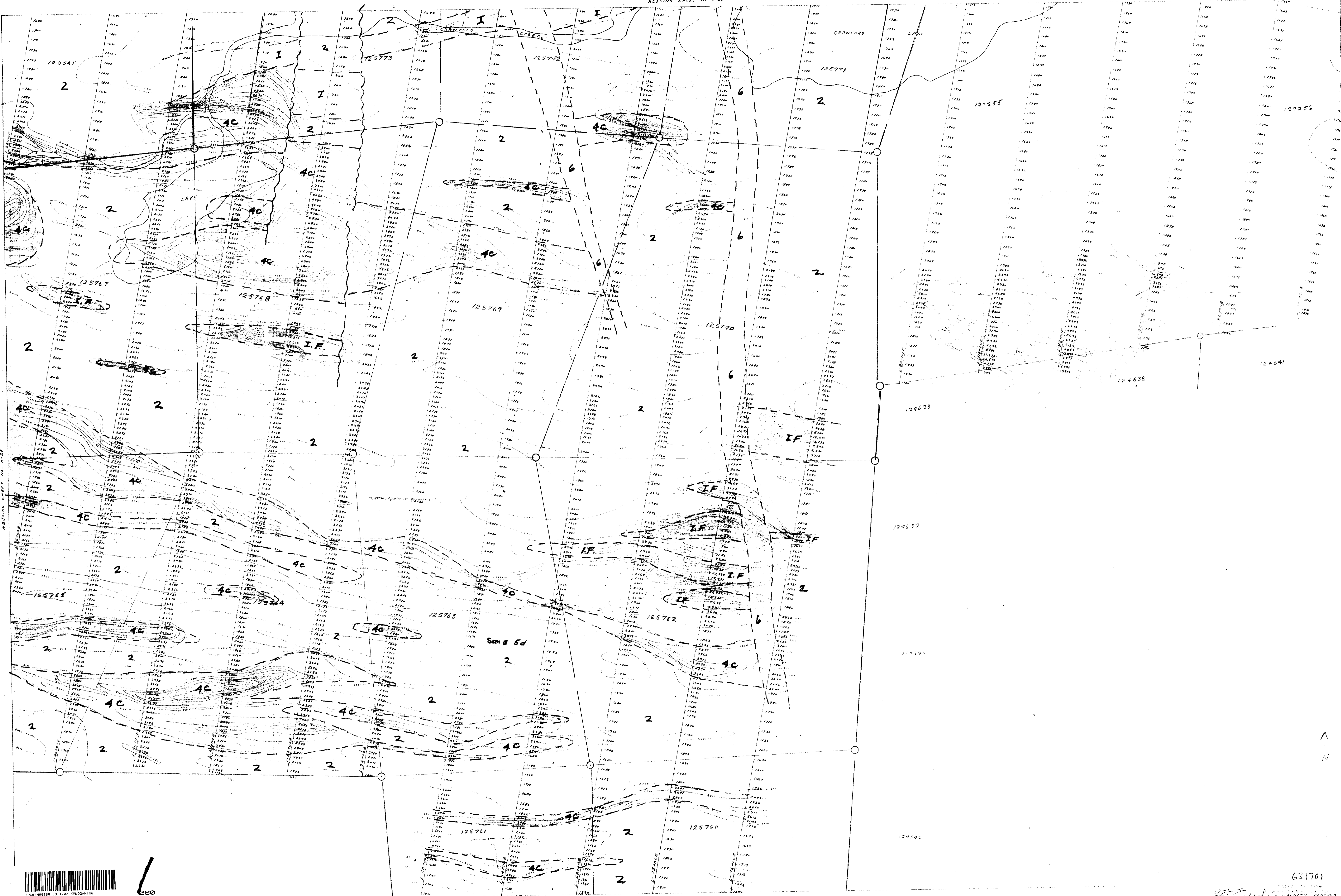


PENHORWOOD TWA
KENOGAMING TWA



PENHORWOOD TWA
KENDRICK TWA



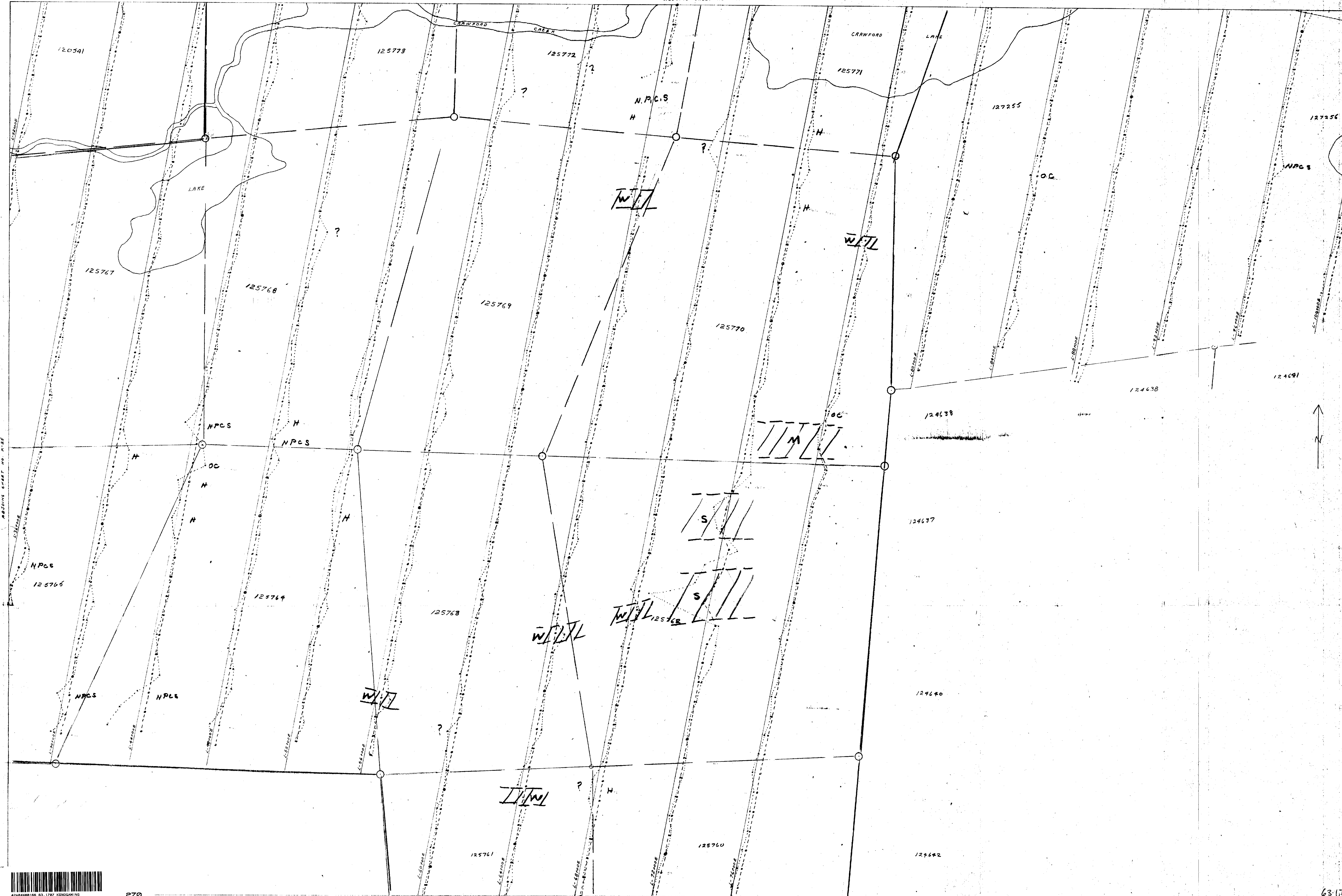


4248491166 63.1767 KENDAMING

260

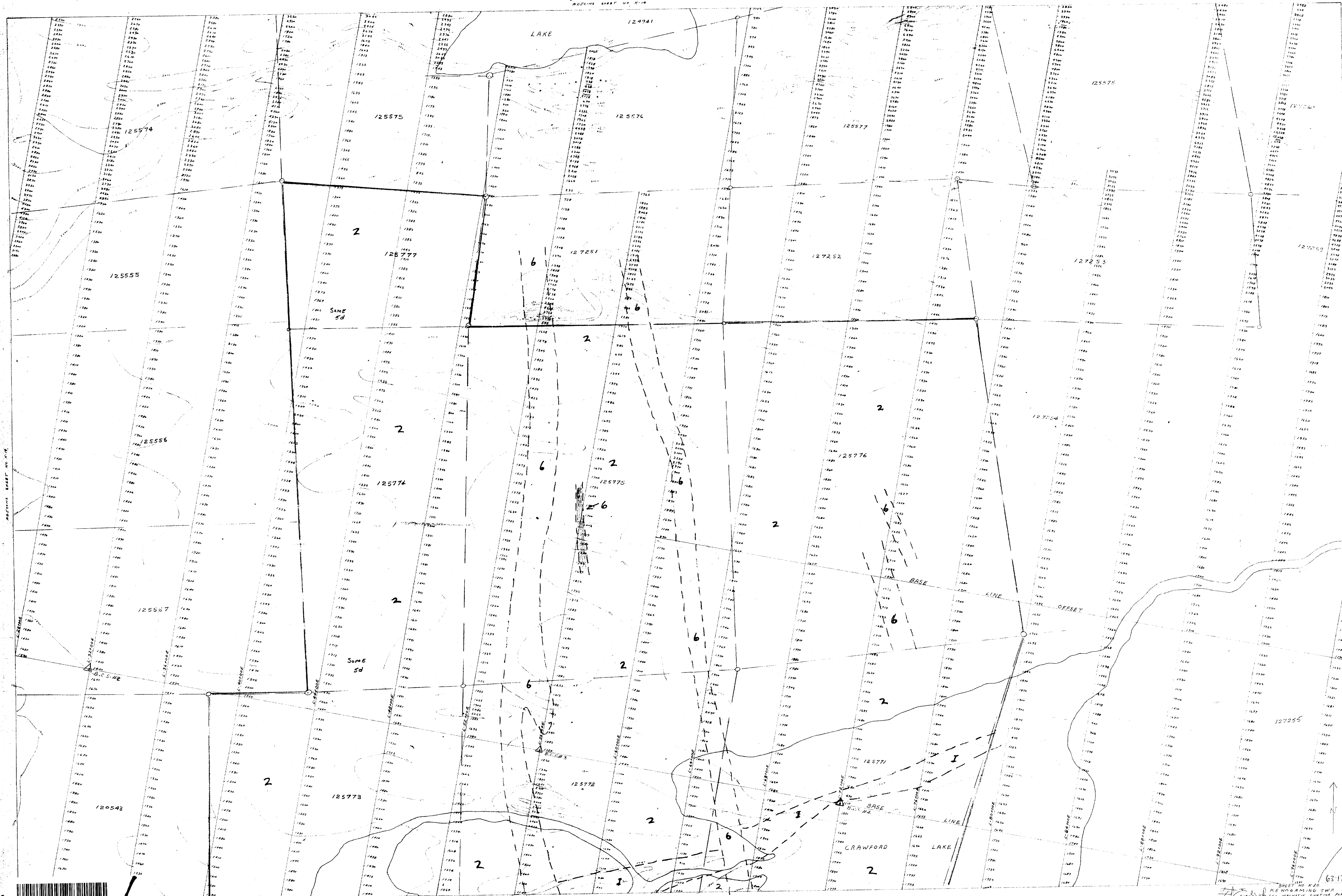
631707

GEOMAGNETIC CONTOUR MAP



ADJOINS SHEET NO. K-21





LAKE

124991

125574
NOT
C.J.M.

125575
NOT C.J.M.

125576
NOT C.J.M.

125577
NOT C.J.M.

125578
NOT C.J.M.

125555
NOT
C.J.M.

125777

127251

127252

127253

127259

125586
NOT
C.J.M.

125774

125775

125776

127254

125587
NOT
C.J.M.

W/I

W/I

125543

125773

125772

125771

127255

NPCS

W/I

BASE

LAKE

CRAWFORD

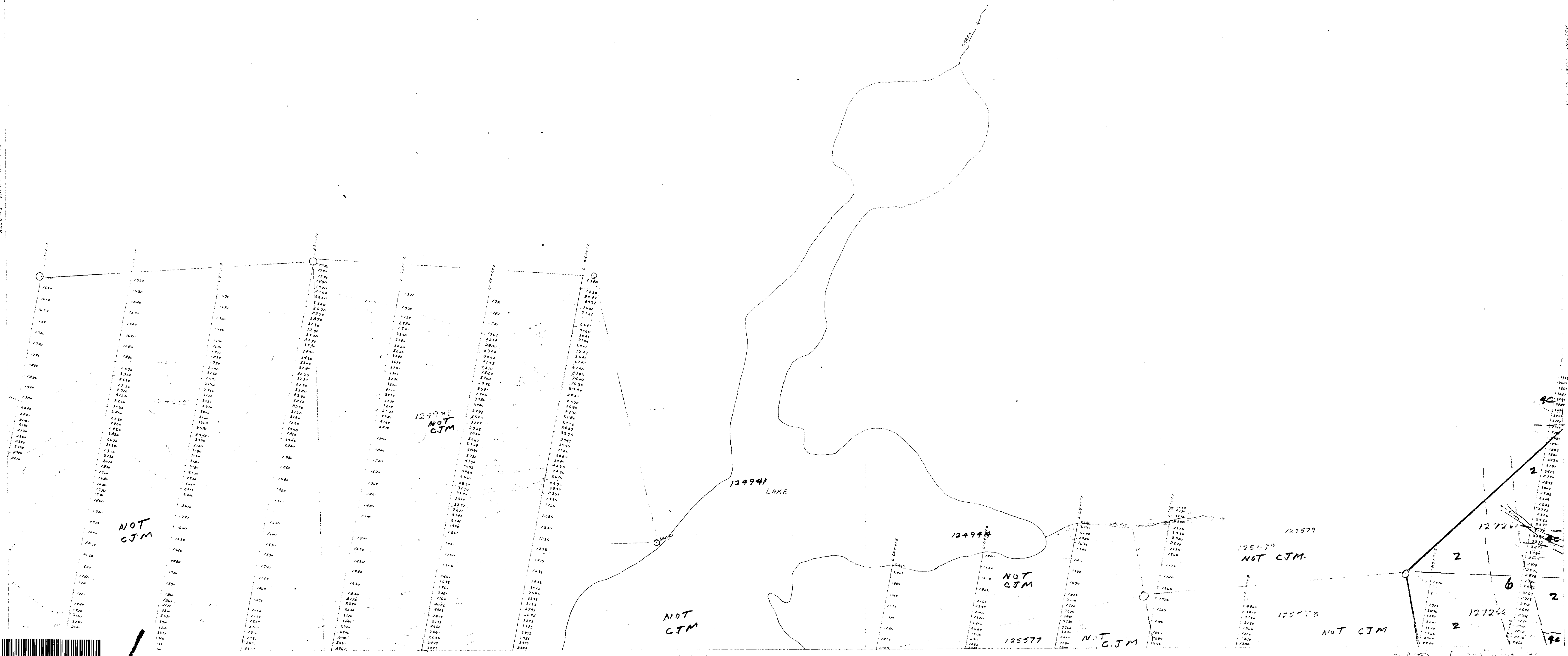
OFFSET

LINE

LINE



ADJOINS SHEET NO. 17.3



300

ADJOINS SHEET NO. 17.2

63-1707

H. J. GARDNER
 600 - MAGNETIC CONTOUR PLAN
 1:20,000