



42A05NE8447 2.3171 BRISTOL

010

MAGNETIC AND ELECTROMAGNETIC SURVEYS

Claims No. 495307, 495308, 495309 & 515901

North Part of the Croxall-Miller Property
Southwestern Part of Bristol Township
Porcupine Mining Division

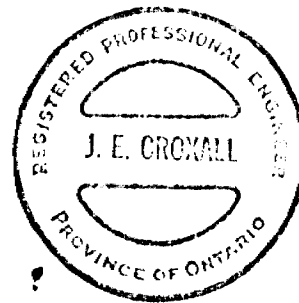
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DEC 20 1979

MINING LANDS SECTION

Submitted by:

J. E. CROXALL - P.Eng.



Written: November 13, 1979

Geophysical Surveys on Claims No. 495307, 495308, 495309 and 515901, North Part of the Croxall-Miller Bristol Township Property.

LOCATION AND ACCESS

The four claims surveyed are located approximately 16 road miles south-west from downtown Timmins. A gravel road leads south from Highway 101 at a point about 2000 feet east from the Thunder Creek crossing. An old bridge across the creek, about 1000 feet south of the highway (presumably built originally for access to the Holmer Mine Property, $\frac{1}{4}$ mile to the east) has been renovated to service current timbering operations in the area. A few hundred feet past the bridge, the road splits - the east branch leading to the Holmer Shaft area and the south branch leading about $\frac{1}{4}$ mile onto the north-east corner of the claim group. The north-west corner of the claim group is also accessible by a recently constructed timbering road which leads east from Highway 144 at a point approximately $\frac{1}{4}$ mile south of its junction with Highway 101.

The writer, J. Croxall of 376 Cherry Street, Timmins is the recorded holder of the property. D. Miller of 671 Emilie Street, Timmins is a partner in the property.

The survey results are submitted for Special Provisions Assessment Credits on the four claims.

GEOLOGY, MINERAL OCCURRENCES AND PREVIOUS EXPLORATION

Geology

Volume LXVI, Part 7, 1957 of the Sixty-Sixth Annual Report of the Ontario Department of Mines "Geology of Bristol Township" and accompanying Map No. 1957-7 by S. A. Ferguson, show the rocks underlying the claim group to be sediments to the south-east on claim number 495308 and massive and pillowed andesitic volcanics to the north-west on claims 495307, 515901 and 495309. A pyroxenite sill is shown to occupy part of the volcanics-sediments contact. A massive, monzonite stock is shown in the sediments, the main body of which lies south of the surveyed claim group. The northern tip of a second large pyroxenite body is shown to enter the western part of claim number 495309. Diabase dikes traverse the claims in a north to north-northwest direction. One crosses the eastern portion of claim number 495308. Another crosses the central portions of 515901 and 495309 and the third one parallels the western boundary of claim number 515901.

Mineral Occurrences and Previous Exploration

The earliest recorded exploration work consists of 18 diamond drill holes totalling 6500 feet by Rusk Porcupine Mines Limited in 1942. The drilling appears to have been the result of a December 1941 report by E. M. Flynn who refers to a 60 foot wide zone of alteration and mineralization from which he derived several grab samples averaging about 0.88 oz/ton gold. Reportedly, a 4' x 4' pit in this zone gave channel samples of 0.71 oz/T. over 48", 0.43 oz/T. over 30" and 0.24 oz/T. over 36" across the pit.

Mineral Occurrences & Previous Exploration (cont'd)

The results of this original drilling program are unknown. However, some of the core remaining in the old core shacks, appears to have been logged by Ferguson in the mid 1950's. The logs of six holes, numbered 10, 11, 13, 14, 16 and 18 were found on file in the Timmins office of the Ministry of Natural Resources. Considerable amounts of the core from each hole were noted as missing by Ferguson. Two drill casings, believed to be holes number 3 and 4, were located in the field. Hole 4 is shown at 12 + 00W on XL8 + 00N.

The "L" shaped pit in the extreme north-eastern corner of claim number 495309 was excavated by the author and his partner in an effort to expose the mineralization referred to by Flynn, the earlier workings having been obscured by the recent construction of timbering roads in this area.

Twelve of the eighteen Rusk holes were drilled over a 600 foot length south-west from this new pit, along the apparent strike of the alteration zone banding. Eight of these twelve holes were drilled in the first 250-300 feet of the 600 foot overall length.

Pyrite mineralization occurs in both salmon-reddish and dark greenish-black alteration bands, two to twelve inches wide in volcanic rocks. This banding strikes east to north-east, roughly perpendicular to the west contact of the pyroxenite in this area. While the alternating banding has been exposed over a width of about 40 feet, grab samples of the more heavily pyritized rock from the northern edge of this zone, in the L-shaped pit only, have yielded significant values in gold, ranging from 0.12 oz/T. to 1.49 oz/T. The pyrite in the darker material tends to contain two to three times as much gold as the reddish pyritic material. Bedrock chip sampling in this northern section of the exposure fails to verify the grab sample values.

Mineral Occurrences and Previous Exploration (cont'd)

Other pit excavations by the author and his partner about 250 feet south of this pit, have yielded low gold values in grab samples from a narrow, quartz-carbonate filled, sparsely pyritized, brecciated fault zone in andesitic rocks containing minor blebs of chalcopyrite adjacent to the west pyroxenite contact.

One other small pit sunk about 125 feet north east of the L-shaped pit, but in the pyroxenite, contains some disseminated chalcopyrite mineralization.

A considerable amount of early pit work can be seen along the east contact of the pyroxenite with the sediments in the vicinity of the pit shown at 7 + 00W on XL 8 + 00N. This work corresponds to the carbonatized contact area referred to by Ferguson. An old shaft about 10 feet deep in this pit, exposes a well banded, south west striking structure. The one-quarter inch to one inch wide alternating red, grey and dark bands, contain fair pyrite and visible but minor chalcopyrite mineralization. Grab samples from this material yielded copper values, ranging from 0.02% to 0.08% with lead and zinc at 0.007% and 0.06% respectively. Gold assays ran trace and 0.01 oz/T.

In the late 1950's, present claims 495308, 495309 and the western part of 515901 were the extreme north-eastern claims (44652, 44662 and 44932 respectively) of a very large group of claims held by Hollinger Consolidated Gold Mines Ltd. This group of over 75 claims stretched to the south west into Thorneloe and Denton Townships. Compilation of filed Hollinger assessment data indicates that their grid and geophysical surveys covered only claim 495309 (44662) with cross lines running east-west. No work record was found for claim 515901.

Mineral Occurrences & Previous Exploration (cont'd)

Three diamond drill holes were recorded on claim 495308 (44652). These are numbered BT-1, 2 and 3 and all were 400 foot, south-east dipping holes, apparently designed to test the banded shaft occurrence at approximately 400 foot spacing along its strike.

One other Hollinger hole, BT-4 appears to have been collared near 15 + 00W on XL 0 + 00 and was drilled for 1000 feet to the south-east. The purpose of this hole is not readily apparent from the data, but all four holes seem to cut recently outlined radem conductor B. By compilation, the other Hollinger holes BT-5, 6 and 7 were collared about 1200 to 1400 feet south-west of BT-4 and lie south of the current surveyed group.

Evidence of old north-south picket lines were found on claims 515901, 495307 and 495308. These were probably lines run from an east-west baseline north of the current surveyed group on the Holmer and former Shield properties.

GEOPHYSICAL SURVEYS

Survey Grid

A baseline was installed diagonally across claim number 495308 on a bearing of north 30° east. Crosslines were established at 400 foot intervals and cut both east and west to the claim group boundaries. The number one post of claim 495308 was called 20 + 00N on the baseline. The baseline was offset at XL 16 + 00N and cut at $N30^{\circ}E$ from 20 + 00W on XL 16 + 00N to 28 + 00N. It was also offset on XL 0 + 00 at 11 + 00W and extended south-westward for 400 feet to allow the installation of XL 4 + 00S to cover the southwest corner of claim number 495309.

Survey Grid (cont'd)

In all, 29,000 feet of grid lines were cut, chained and picketed at 100 foot intervals. This consists of 3700 feet of baseline and 25,300 feet of crosslines.

A total of 568 geophysical measurements were taken. All 290, hundred-foot picket stations were read with the magnetometer with 13 additional readings being taken at 50 foot intervals for a total of 303 magnetometer readings. Only picket stations on crosslines were read with the radem unit (incl. XL-BL intercepts) for a total of 265 electromagnetic measurements.

INSTRUMENTATION & METHOD

Magnetometer Survey

The instrument used was a PMF-3 magnetometer, manufactured by McPhar Geophysics Ltd. It measures the strength of the vertical component of the total magnetic field in units of gammas.

This field, at a given station, consists of the vectorial sum of the earth's magnetic field and that of any anomalous body. The latter is caused by mineralization that is either naturally magnetic or is capable of possessing a secondary field which is induced by the earth's primary field.

Immediately prior to the survey, the instrument was set to read zero over the Ministry of Natural Resources' Base Station No. M-71-34 (on the Bristol-Odgen Township Boundary, a few feet north of Highway 101), whose most recent true reading is recorded as 59,800 gammas. Twenty minutes later, a reading was taken on the property magnetic base station - a 12"Ø stump located 40 feet north from 12 + 50W on XL 24N. The reading here was 900 gammas higher than at the M.N.R. base.

Magnetometer Survey (cont'd)

All subsequent readings on the claims were taken relative to the property base station. Diurnal drift corrections were made to property readings based on three to four hour check-in periods on the property base. After correction for drift, all readings were increased by 900 gammas to relate them to the M.N.R. base station. These corrected readings were then plotted on the map and contoured.

In general, a 1000 gamma contour interval was used. These contours are shown as solid lines on the map. Since the magnetic relief on the claims is in the order of eleven thousand gammas (60,000 - 71,000 gammas) a smaller contouring interval was used to pinpoint areas where relief is smaller but possibly significant. These contours are shown as dashed lines on the map.

Electromagnetic Survey

The survey was carried out with a Crone Radem V.L.F. unit, using Seattle, Washington as the transmitter station (18.6 KHz). The receiver measures the dip angle of the direction of the resultant V.L.F. field in degrees from the horizontal.

To measure the dip angle, the unit was first held with the instrument face horizontal and rotated until a "null" is obtained (visual minimum on the field strength meter and audio null). The Radem was then held vertically and tilted from right to left until another null was obtained. In this position the dip angle magnitude is read from the inclinometer. The direction to which the stationary Crone arrow points was recorded along with the dip reading.

An anomaly is represented as a "cross-over" when north dips changed to south dips between two successive readings.

Electromagnetic Survey (cont'd)

The Fraser filtering method was applied to the dip angle readings to provide contourable data. A 10 degree contour interval was used on the map. The profiles were plotted on the same map at a scale of one inch to 20 degrees of dip.

INTERPRETATION OF RESULTS

Magnetic Survey

The magnetometer survey serves to locate two main areas of very high relief associated with intrusive basic rocks, and also several diabase dikes. The first area of high relief is designated R and corresponds to Ferguson's pyroxenite sill lying between sediments to the east and volcanics to the west. Relief over the pyroxenite is in the order of 6000 gammas and ranges from 61,000 to 67,000 gammas. The contours suggest the sill dips west. The second area of high relief is designated as S. Relief in this area is in the order of 9000 gammas and ranges from 62,000 to 71,000 gammas. This area corresponds to a basic intrusive rock outlined by previous Hollinger magnetic surveys as stretching south-westward to the Thorneloe Township boundary about 800 to 1000 feet east of the five mile post. The contours in this area suggest an eastward dipping intrusive.

The 61,500 gamma contour encloses an area designated U along strike from the structure designated S. It further serves to link up the areas S and U with area R. The horse-shoe shape of the linked areas, along with the converging dips, suggests a possible north-plunging synclinal structure whose axis strikes about north 30^o east across the claim group.

Magnetic Survey (cont'd)

Area V correlates with a north-south diabase dike cutting the sediments in claim 495308. Areas T and W correlate with north-south striking diabase dikes cutting the volcanics in claims 515901 and 495309. These dikes have been located on Map No. 1957-7.

Area X is a comparatively low relief anomaly and is outlined only by intermediate contouring. Background in the areas underlain by sediments, ranges from 60,100 to 60,300. In area X the relief rises to about 60,500 gammas locally. The anomaly lies mainly west of the diabase dike V and centers on the 0 + 00 baseline at the junction of XL 4 + 00N. The anomalous zone strikes N60°E and is 800 to 1000 feet long.

Background in areas underlain by volcanics in the north-western part of the claim group is 60,500 to 61,000 gammas.

Electromagnetic Survey

Eight conductors are interpreted to exist on the claim group. Five of the eight conductors (designated A through E) consist of more than single line cross-overs. Weak, single line cross-overs near the lake to the north-west are deemed to be related to diabase dikes. A precise interpretation would require more data in the vicinity of the lake.

Conductors D & E, in a general sense, flank the north-east trending magnetic high over the basic intrusive to the west, designated S. Conductor D, bordering the intrusive on the west, consists of two cross-overs; one each on lines 0 + 00 and 8 + 00N at 22 + 50W and 23 + 50W respectively. The contoured, filtered data suggests that these cross-overs are linked by a zone of positive values centering on XL 4 + 00N near 22 + 50W.

Electromagnetic Survey (cont'd)

The stronger southern cross-over on XL 0 + 00 centers on a low spruce and cedar swamp. Conductor E, a very weak conductor, parallels conductor D, 500 feet to the east. Two true cross-overs make up this conductor.

Conductors A & B, also in a general sense, flank the pyroxenite sill. Conductor B very closely correlates with the eastern pyroxenite-sediments contact and the mineralized, banded alteration zone in the contact. It consists of progressively stronger true cross-overs southward across the group. Conductor A consists of three true cross-overs on XL's 20 + 00N, 16 + 00N and 12 + 00N. By virtue of the positive contour zone west of the road on XL 8 + 00N, it has been interpreted to extend through to and adjoin conductor B on XL 4 + 00N at 9 + 00W.

Correlation with the west pyroxenite contact is not as good as with Conductor B. It may in fact represent a water-filled zone of shearing along the postulated fold axis. While the cross-over on XL 20 + 00N is weak, it does occur on somewhat higher ground than the stronger cross-over on XL 16 + 00N in the creek. While the creek and its mud flats are felt to influence the location and magnitude of conductors, there is a loss of correlation in the vicinity of the old core shacks.

Conductor C parallels Conductor B about 700 feet to the south-east and consists of two true crossovers on XL's 12 + 00N and 8 + 00N east of 0 + 00 baseline and a third true cross-over west of the baseline on XL 4 + 00N. The two southern cross-overs lie in a low, wet cedar swamp which crosses the baseline. The northern cross-over on XL 12 + 00N occurs at a point where the topography changes rapidly from a high ridge in the east to a low and flat but drier area to the west. The conductor is shown to cross the diabase dike at about its midpoint in claim 495308. This conductor correlates well with the magnetic anomaly X centering on the baseline at the south edge of the swampy ground.

CONCLUSION

Much of the early work on the claim group, including diamond drilling and trenching, has been centered on the east pyroxenite contact. Drill holes on the group and to the south by Hollinger, seem to penetrate parts of Conductor B and its projected south-westward extension. This work was presumably in search of a gold deposit in the carbonatized contact, similar to the Holmer deposit to the north.

Conductor A along the west pyroxenite contact could represent a geologically similar, mineralized zone. The strike of the alteration zone drilled by Rusk appears to cross the inferred extension of Conductor A. The occurrence of gold values in this area however, may tie-in with the conductor.

Conductor C, with its coincident magnetic anomaly X could represent a mineralized shear zone in the sediments or a fault zone injected with magnetic rocks at the time of formation of the diabase dike. No previous work is known to have been done in this area.

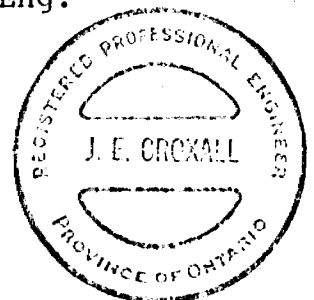
The cause or implications of Conductors D & E are unknown at the moment. No previous work is known to have been done on them.

A more selective electromagnetic survey is required to attempt to isolate the effects on the conductors of low, wet ground, particularly in the case of Conductors A & C and the south end of D.

J. E. Croxall

J. E. Croxall, P.Eng.

November 13, 1979





Ministry of Natural Resources

GEOPHYSICAL - GEOLOGICAL TECHNICAL DATA



42A05NE8447 2.3171 BRISTOL

900

TO BE ATTACHED AS AN APPENDIX TO TECHNICAL REPORT
FACTS SHOWN HERE NEED NOT BE REPEATED IN REPORT
TECHNICAL REPORT MUST CONTAIN INTERPRETATION, CONCLUSIONS ETC.

Type of Survey(s) MAGNETIC & ELECTROMAGNETIC
Township or Area BRISTOL TWP., PORCUPINE M.D.
Claim Holder(s) J.E. CROXALL
376 CHERRY ST., TIMMINS, ONTARIO
Survey Company N/A
Author of Report J.E. CROXALL
Address of Author 376 CHERRY ST., TIMMINS, ONTARIO
Covering Dates of Survey OCT. 13 TO NOV. 19, 1979
Total Miles of Line Cut 5.5

MINING CLAIMS TRAVERSED
List numerically

Table with columns for prefix and number, containing entries: 495307, 495308, 495309, 515901

SPECIAL PROVISIONS
CREDITS REQUESTED

DAYS per claim

ENTER 40 days (includes line cutting) for first survey.

ENTER 20 days for each additional survey using same grid.

- Geophysical
--Electromagnetic 40
--Magnetometer 20
--Radiometric
--Other
Geological
Geochemical

AIRBORNE CREDITS (Special provision credits do not apply to airborne surveys)

Magnetometer Electromagnetic Radiometric
(enter days per claim)

DATE: NOV. 19/79 SIGNATURE: J.E. Croxall
Author of Report or Agent

Res. Geol. L.D. Qualifications 2.2164

Previous Surveys

Table with columns: File No., Type, Date, Claim Holder

TOTAL CLAIMS FOUR (4)

If space insufficient, attach list

OFFICE USE ONLY

GEOPHYSICAL TECHNICAL DATA

GROUND SURVEYS - If more than one survey, specify data for each type of survey



Number of Stations 290 Number of Readings 303 MAG; 265 RADEM
Station interval 100 FEET Line spacing 400 FEET
Profile scale ONE INCH = 20 DEGREES (RADEM)
Contour interval 1000 GAMMAS (MAG.); 10 DEGREES (RADEM)

MAGNETIC

Instrument PMF-3 BY MCPHAR
Accuracy - Scale constant 25 GAMMAS
Diurnal correction method CHANGE IN BASE STA. RDG. BETWEEN CHECK-INS, DISTRIBUTED OVER CHECK-IN INTERVAL ACCORDING TO TIME FROM INITIAL RDG.
Base Station check-in interval (hours) 4 HOURS
Base Station location and value 12" Ø STUMP LOCATED 40 FT. NORTH FROM 12+50W ON XL 24N BASE RDG. = 60,700 GAMMAS

ELECTROMAGNETIC

Instrument CRONE RADEM
Coil configuration VERTICAL LOOP
Coil separation 600 MILES OR INFINITY
Accuracy ± 1/2 DEGREE
Method: Fixed transmitter Shoot back In line Parallel line
Frequency SEATTLE, WASHINGTON 18.6 KHz
(specify V.L.F. station)
Parameters measured DIP ANGLE IN DEGREES OF RESULTANT V.L.F. - E.M. FIELD

GRAVITY

Instrument _____
Scale constant _____
Corrections made _____
Base station value and location _____
Elevation accuracy _____

INDUCED POLARIZATION RESISTIVITY

Instrument _____
Method Time Domain Frequency Domain
Parameters - On time _____ Frequency _____
- Off time _____ Range _____
- Delay time _____
- Integration time _____
Power _____
Electrode array _____
Electrode spacing _____
Type of electrode _____

Godfrey Twp. - M.284

THE TOWNSHIP OF
OF
2.3171
BRISTOL

DISTRICT OF
COCHRANE

PORCUPINE
MINING DIVISION

SCALE: 1-INCH = 40 CHAINS

DISPOSITION OF CROWN LANDS

- PATENT, SURFACE AND MINING RIGHTS ●
- " , SURFACE RIGHTS ONLY ○
- " , MINING RIGHTS ONLY ◐
- LEASE, SURFACE AND MINING RIGHTS ■
- " , SURFACE RIGHTS ONLY □
- " , MINING RIGHTS ONLY ◑
- LICENCE OF OCCUPATION ▼

- ROADS
- IMPROVED ROADS
- KING'S HIGHWAYS
- RAILWAYS
- POWER LINES
- MARSH OR MUSKEG
- MINES
- CANCELLED

NOTES

400' Surface Rights Reservation along the shores of all lakes & rivers

Areas withdrawn from staking under Section 43 of the Mining Act (R.S.O. 1970).

Order No.	File	Date	Disposition
①	164584		Surface Rights Only.

DATE OF ISSUE
MAR 21 1980
SURVEYS AND MAPPING
BRANCH

This township lies within the Municipality of the CITY of TIMMINS.

PLAN NO. **M-264**

ONTARIO
MINISTRY OF NATURAL RESOURCES
SURVEYS AND MAPPING BRANCH

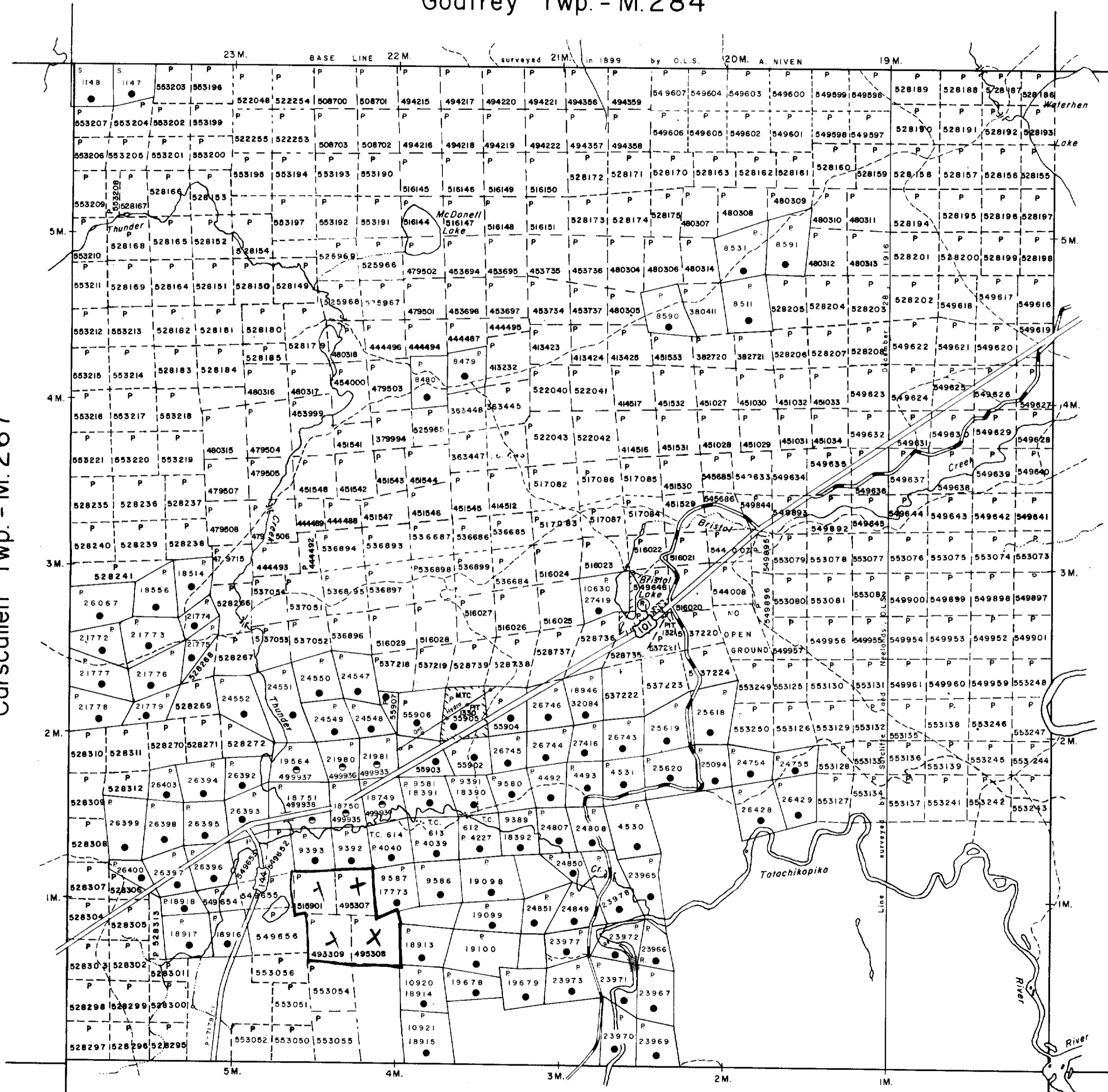
Carscallen Twp. - M. 267

Ogden Twp. - M. 305

Thorneloe Twp. - M. 313



42A05NE447 2.3171 BRISTOL





MAGNETOMETER SURVEY
CONTOUR PLAN
CROXALL-MILLER PROP.
BRISTOL TWP.

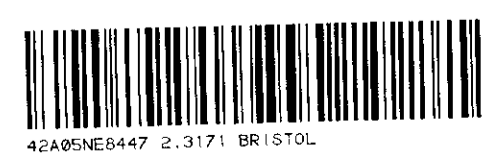
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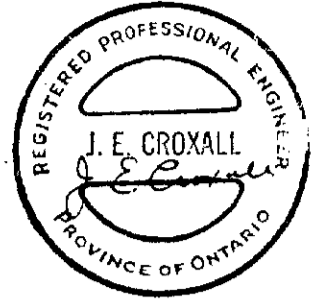
GRID SCALE 1"=200' SURVEY DATE 06/13-NOV/19 BY J. Croxall

LEGEND	
	ROADS
	CLAIM POSTS LOCATED APPROXIMATE
	TIMBERED CLEARING BOUNDARIES
	WET SWAMPY AREA, LERR
	GRID LINES SOUTHMAN 1987 PLAN
	OLD DIAMOND LAND
	PITS AND TRENCHES

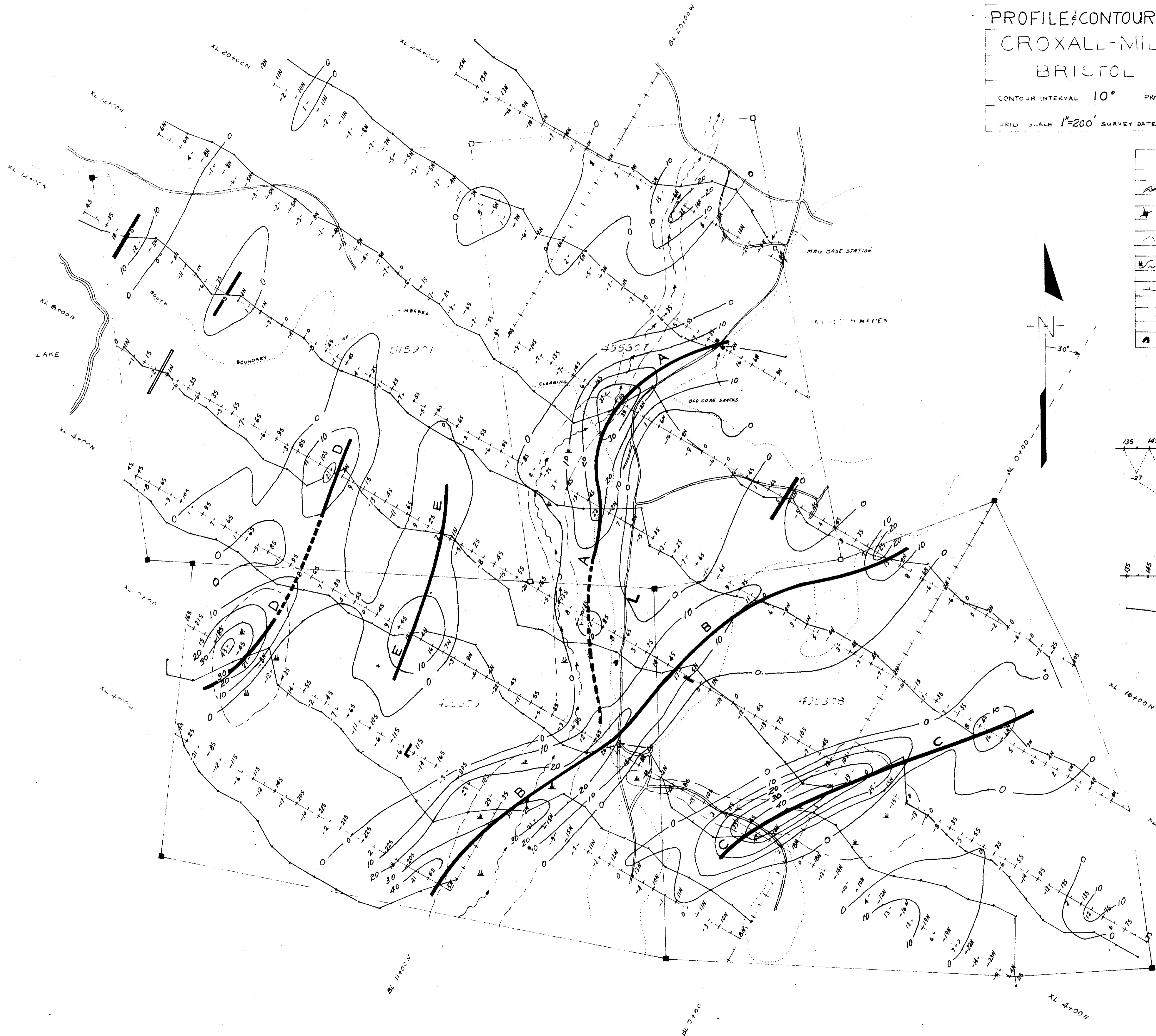


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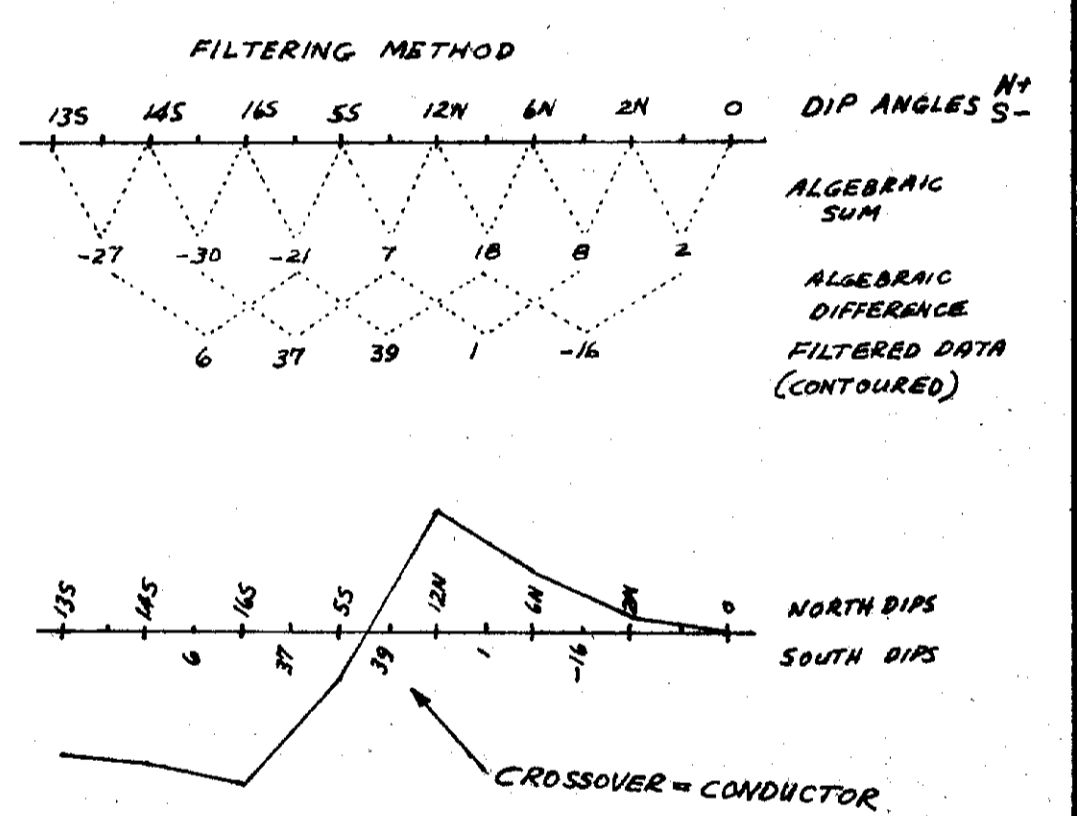




CRONE RADEM SURVEY
PROFILE & CONTOUR PLAN
CROXALL-MILLER PROP.
BRISTOL TWP.
CONTOUR INTERVAL 10' PROFILE SCALE 1"=20'
GRID SCALE 1"=200' SURVEY DATE OCT. 13-NOV. 19/1964 J.E. Croxall



LEGEND	
	ROADS
	CLAIM POSTS LOCATED - APPROXIMATE
	TIMBERED CLEARING BOUNDARIES
	WET SWAMPY AREA, CREEK
	GRID LINES SOUTH MANA 100 FT. PILEAT
	OLD DIAMOND DATA LAND
	PITS AND TRENCHES



2-3171