



42A11NW0006 63.2038 PROSSER

010

Report on Airborne E. M. Suway

INTRODUCTION

An airborne E.M. survey was conducted over claims held by Texas Gulf Sulphur in Prosser Township, District of Cochrane, Porcupine Mining Division.

Because of sparse geologic information portions of the area were flown in two directions. The enclosed map covers claims held by T.G.S. and is part of a larger survey (400 square miles), in the immediate area.

The area was flown in January, 1965. Seven distinct conductive zones were located within the claim group and two other conductors were indicated along the outer boundary of the group.

A total of 14 miles of airborne survey line cover the claims. The data is shown on the enclosed map and applies to the claims numbered 55310 to 55321 inclusive.

TECHNICAL INFORMATION

Aircraft type: Hiller U12E helicopter

E.M. unit: T.G.S. - Varian E.M. ore detector
co-axial in-line coils
50' separation
400 cps.

Radio Alt. - APN-1

Camera - continuous recording, frame

Magnetometer - none

Mean terrain clearance - 100 feet

E.M. noise level - \pm 15 parts per million

ACQUISITION & REDUCTION OF DATA

Data acquisition and reduction was accomplished by the following personnel:

H. Clelland	(Texas Gulf Sulphur)	Helicopter maintenance
J. Gougeon	(McPhar)	Data reduction helper
A. Martin	(Canadian Aero Mineral Surveys)	Data reduction
L. Russill	(Texas Gulf Sulphur)	A.E.M. maintenance
D. Sarazin	(Canadian Aero Mineral Surveys)	Data reduction Navigation
J. Schultz	(Dominion Helicopters)	Flying
G. Podolsky	(Texas Gulf Sulphur)	Data reduction
P. White	(Texas Gulf Sulphur)	Navigation, Supervision

DISCUSSION OF RESULTSAnomaly #1

Consists of one intercept along the east boundary of claim 55311. Both the amplitude and ratio of In-Phase to Quadrative responses are low and with only one intercept, no estimate of length can be made. This would appear to be a weak conductor, probably less than 100 feet below surface. Anomaly 1 (a) is a questionable intercept about 500 feet north of Anomaly #1 along line 68S.

Anomaly #2

Consists of four or more intercepts trending in an east-west direction over a length of about three-eighths of a mile.

Anomaly #3

Consists of four intercepts over a length of about one-half mile, though not continuous, trending in east-west direction and curving to the northeast at its eastern end.

Anomaly #4

Consists of four (or more) intercepts over a length exceeding one-half mile trending in a north-northeasterly direction. May be bifurcated at its eastern end.

Anomalies 2, 3 and 4 appear to be parallel conductive zones associated with the same structural (and quite likely, lithologic) feature. Apparent conductivities range from weak to strong, the variation likely a reflection of depth of burial. Assuming a moderate depth of burial (say 70 to 100 feet) the average conductivity would be weak but increasing to the east.

Anomaly #5

Consists of five intercepts over a length of slightly more than one-half mile. The high amplitudes and good ratios indicate a strong, narrow conductor at or near surface. The alignment of the intercepts indicates that this is not structurally or lithologically associated with anomalies #2, 3 and 4.

Anomaly #6

Consists of five intercepts in a north-easterly direction

over a length of a half mile. Along with Anomaly #7 (and possibly #8) this anomaly appears to be similar to anomalies 2, 3 and 4 and the same general interpretation must therefore apply.

SUMMARY

At least seven conductors lie within this claim group. Except for #5, they all appear to be zones of moderate to low conductivity buried at a depth of around 70 feet. Their number and length indicate that they should be of secondary interest. Anomaly #5 is most likely to be similar to the others except for a higher concentration of sulphides and is therefore of primary interest.


G. Podolsky P. Geoph.

Dated: September 21, 1966.

EXPLORATION DIVISION
TEXAS GULF SULPHUR COMPANY



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020

~~Report on~~ Operation of
Texas Gulf Sulphur Company
Airborne electromagnetic system

A. EQUIPMENT

The Texas Gulf Sulphur Company airborne electromagnetic system consists of the following instruments:

- 1 - electromagnetic detector
- 1 - magnetometer
- 1 - radio altimeter
- 1 - positioning camera

The E.M. unit is a low frequency (400 c.p.s.) in-phase, out-of-phase system designed by Varian Associates. The transmitting and receiving coils are mounted coaxially with the axis parallel to the line of flight. The coils are mounted fifty feet apart on the ends of a very rigid boom. The boom is attached beneath the helicopter by means of a vibration isolating spring suspension system.

An electronic null device is adjusted so that in the absence of a conductor within the range of the system, no anomaly is recorded. Response is measured in parts per million of primary field. The noise level can generally be maintained at a level of 15 parts per million or less. The anomalous signal is divided into two components, the in-phase component having the same phase as the transmitted field and the quadrature or out-of-phase component being at right angles to it. These two measurements are recorded on two channels of the

four channel recorder.

Variations of the total magnetic field of the earth are measured by the flux-gate magnetometer mounted in the helicopter. The instrument was designed by McPhar Geophysics. Anomalies as small as 100 gammas can normally be distinguished. The magnetometer record is used primarily to check for possible relationships between E.M. anomalies and sharp magnetic features. The output of the magnetometer is presented on one channel of the four channel recorder.

The APN-1 radio altimeter provides a terrain clearance profile on one channel of the four channel recorder. Because E.M. response decays rapidly with increasing altitude this altitude information is important in the analysis of the E.M. data.

Each flight line is photographed by a vertically mounted Automax G-1 35 mm. camera operating at one exposure per second.

The four channel recorder was manufactured by Texas Gulf Sulphur Company using components from a Brush Mk. 2 curvilinear unit. It is operated at a chart speed of 5 mm. per second.

Synchronization between the camera and recorder is accomplished by means of an automatic fiducial numbering system which operates a marker pen on the left side of the recorder and an electromechanical counter indicating the number of

pictures taken. One fiducial mark is made for each picture taken. Provision is also made for the operator to manually mark topographic features on the right side marker pen on the recorder in conjunction with a mark on the appropriate film frame.

B. DESCRIPTION OF RECORDS

With the chart oriented so that the fiducial numbers increase from left to right, traces are from top to bottom of chart as follows:

1. Left marker pen: fiducial markers, one for each picture taken.
2. Recorder channel No. 1: magnetometer record, - positive deflection upwards. Scale is from 0 - 4000 gammas above normal magnetic reading. 1mm represents 100 gammas.
3. Recorder channel No. 2: E.M. in-phase record, - positive deflection upwards. Recorder sensitivities for full scale deflections of 400, 800, 1200 or 2400 parts per millions are obtainable. Most survey work is done with a sensitivity of 400 ppm. With this sensitivity 1mm represents 10 ppm. referred to the primary field at the receiver coil.
4. Recorder channel No. 3: E.M. out-of-phase record, - positive deflection upwards. Same scale as in-phase

record.

5. Recorder channel No. 4: radio altimeter record - increasing altitude downward. Centre line position approximately 150 feet. Scale below 150 feet approximately 5 feet per mm. Scale above 150 feet approximately 7 feet per mm.
6. Right marker pen: fiducials marked by operator to indicate topographical features noted while navigating along survey line. Mark also appears simultaneously on film.

C. SURVEY PROCEDURES

Flight lines were flown perpendicular to the generalized geologic strike. In some instances, an orthogonal set of lines was flown to check on possible minor variations in strike in regions of high anomalous activity. Line spacing was normally 1000 feet and mean terrain clearance was 150 feet.

Mosaics were either uncontrolled or semi-controlled photo laydowns, generally at a scale of 1" = 1000 feet.

D. COMPILATION

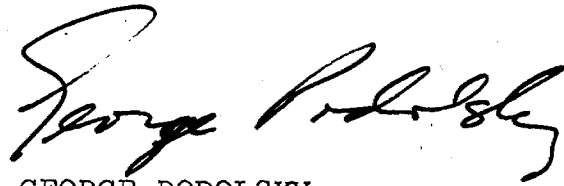
Flight path of the survey aircraft was recovered through an image matching of identifiable features on both the 35 mm film strip and photo mosaic. These "picked points" or fiducials were then numbered according to their film frame number. The flight lines and fiducials were then drafted onto a transparent sepia copy of the photo mosaic to produce the airborne survey map.

E. DATA PRESENTATION

The airborne geophysical data was analyzed by the geophysicist who selected and evaluated all the anomalies of significance. The E.M. anomalies were then plotted according to their position along the flight lines. The anomaly symbol indicates the half-peak width (where significant), the anomaly peak, and the amplitude in parts per million of the In-Phase and Quadrature response. Magnetic response, where the mag. anomalies were correlative directly with E.M. anomalies, was indicated in gammas.

The alignment of the conductors, where shown, was established from geophysical (magnetic) and geologic data.

The foregoing description has been prepared from technical and descriptive data pertaining to the Texas Gulf Sulphur Company airborne system by members of the geophysical department of Texas Gulf Sulphur Company.



GEORGE PODOLSKY,
SENIOR GEOPHYSICIST,
TEXAS GULF SULPHUR COMPANY.

January 23, 1967.



DATE OF ISSUE

DEC. 8, 1966

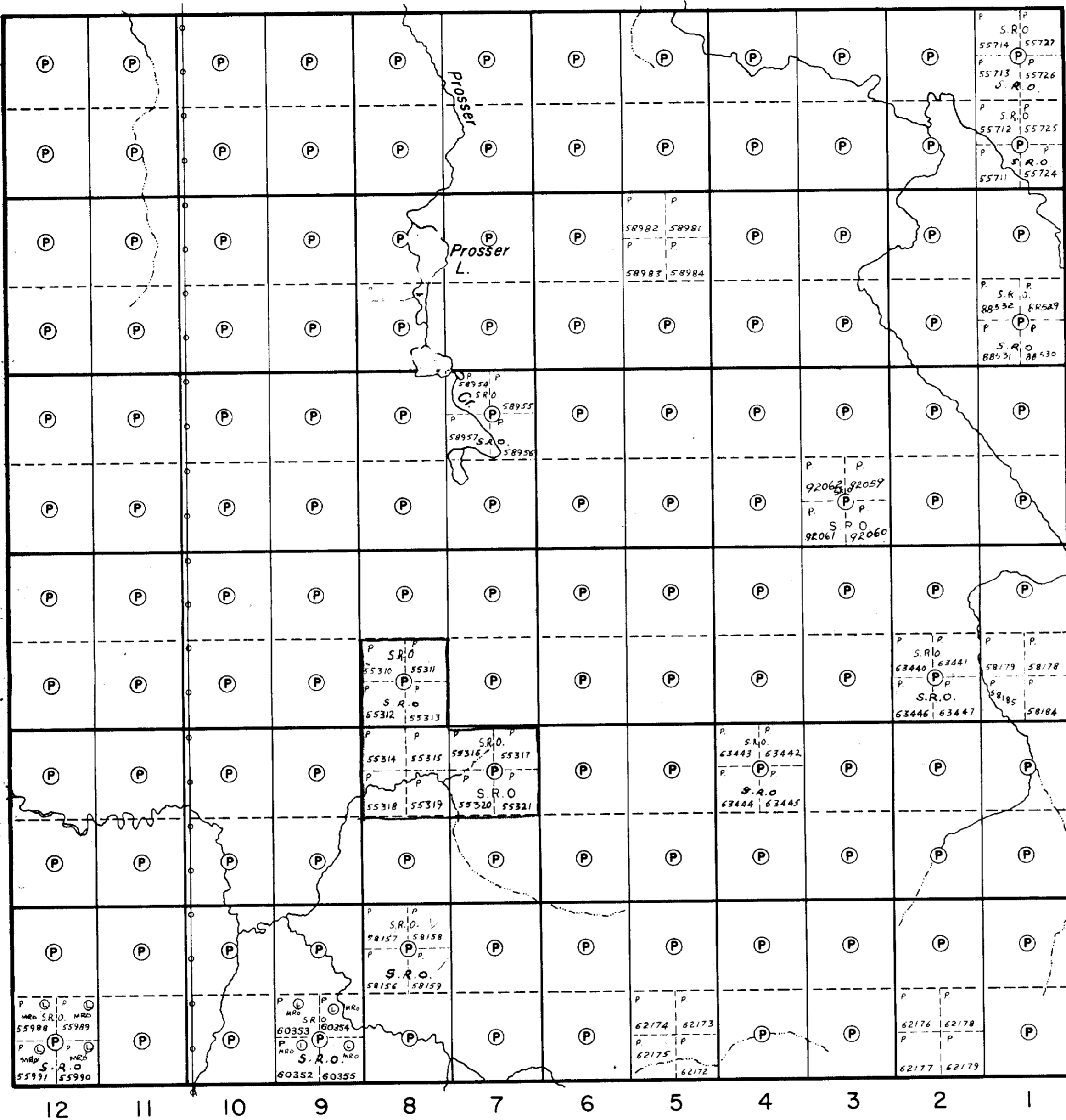
ONTARIO DEPT. OF MINES

DEPT. OF MINES
TWO LANDS BR.

MAP FOR CHECKING
COPIES ONLY - MUST
BE SOLD

Carnegie Twp.

Lucas Twp.



Wark Twp.

VI

V

IV

III

II

I

Tully Twp.

THE TOWNSHIP
OF

PROSSER

DISTRICT OF
COCHRANE

PORCUPINE
MINING DIVISION

SCALE: 1-INCH = 40 CHAINS

LEGEND

PATENTED LAND	(P)
CROWN LAND SALE	C.S.
LEASES	(L)
LOCATED LAND	Loc.
LICENSE OF OCCUPATION	L.O.
ROADS	—
IMPROVED ROADS	—
RAILWAYS	—
POWER LINES	—
MARSH OR MUSKEG	—

NOTES

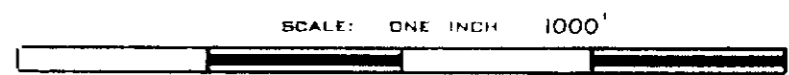
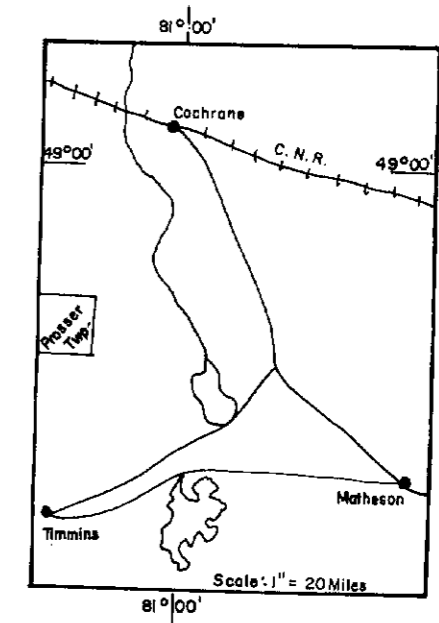
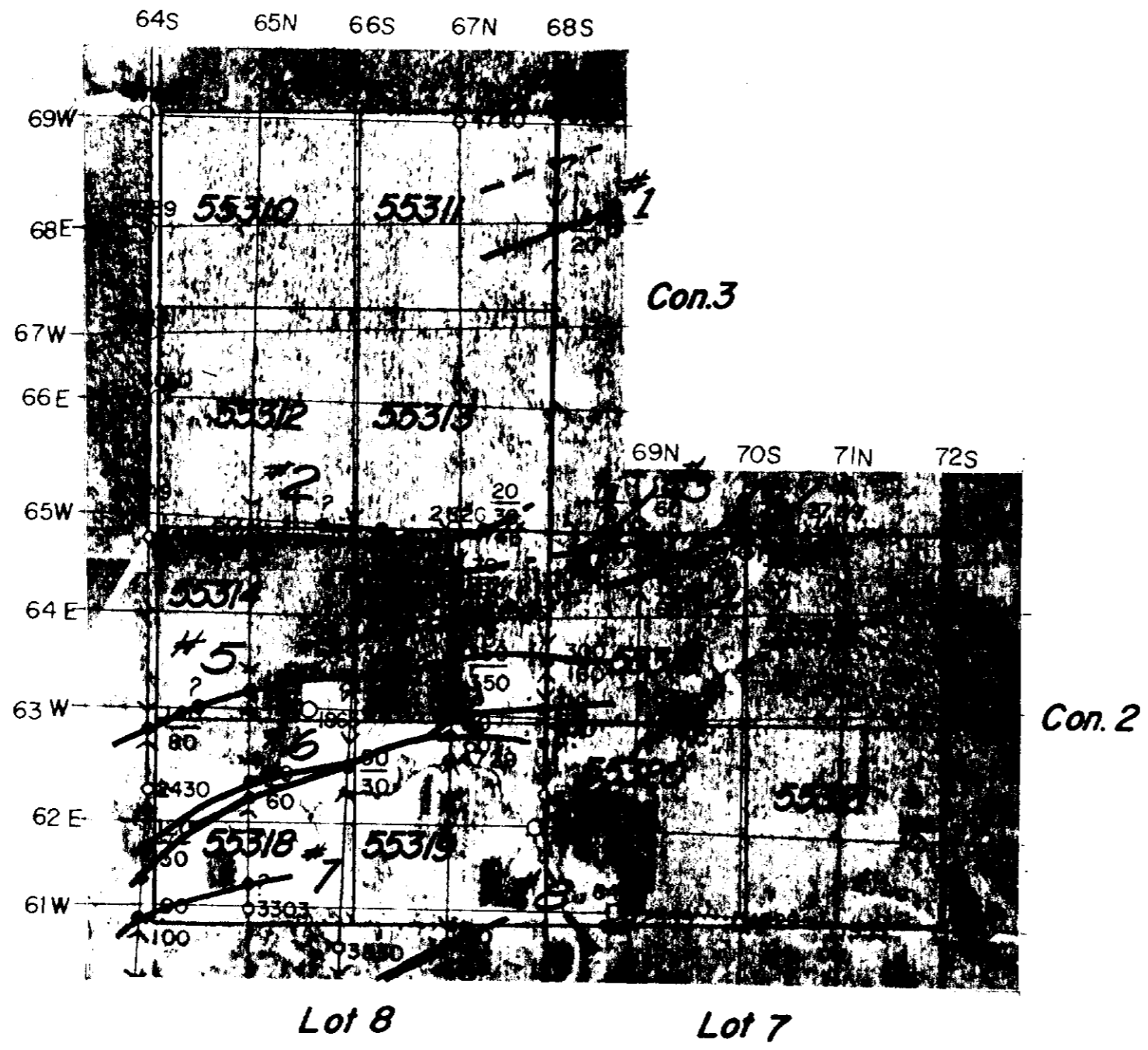
400' Surface Rights Reservation around
all Lakes and Rivers.

PLAN NO. — M.571

DEPARTMENT OF MINES
—ONTARIO—

G.E.M.





LEGEND

$\frac{200}{150}$



IN PHASE IN P.P.M.
OUT OF PHASE IN P.P.M.

E.M. ANOMALY SHOWING
PEAK AND 1/2 WIDTH

AND FLIGHT LINE
CE 100-150 FEET

Handwritten notes:
1. 11/20/66
2. 11/20/66
3. 11/20/66

TEXAS GULF SULPHUR CO.		
A. E. M. SURVEY PROSSER TWP. ONTARIO		
WORK BY	DRAWN BY	DATE
	J. P.	Sep. 1966

