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REPORT ON TOP SOIL SAMPLING PROGRAM

Fort Vermillion Area

Northern Alberta

Sulphur Permit Nos. 52, 54, 57

PLACID OIL COMPANY

Calgary, Alberta

R. A. Buckley, P. Geol.

June 4, 1968

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REPORT ON TOP SOIL SAMPLING PROGRAM

FORT VERMILLION AREA

NORTHERN ALBERTA

Sulphur Permit Nos. 52, 54, 57

INTRODUCTION

During the period February 12 - March 12, Placid Oil Company operated a soil sample collecting program on Province of Alberta Sulphur Permit Numbers 52, 54, 57, located in the general Fort Vermillion area of Northern Alberta. Plate No. 1 shows the location of Placid operated permits and the permits specifically covered in this report.

Soil samples were collected during shot hole drilling operations associated with a seismic exploration program operated by Placid Oil Company. Ninety-two miles of seismic lines were cut on permits 52, 54, 57. On an average, twelve shot holes were drilled per mile, using a 3-inch continuous flight auger mounted on a Foremost track vehicle. Auger cuttings were taken when possible at 5-foot intervals to a depth of 20 feet, then at 10-foot intervals to the total depth of the shot hole, usually around 50 feet. In total, 797 shot holes were sampled with 1,681 samples being collected and assayed.

Generally the soil and clay became too diluted with drilling water at a hole depth of over 20 feet giving a

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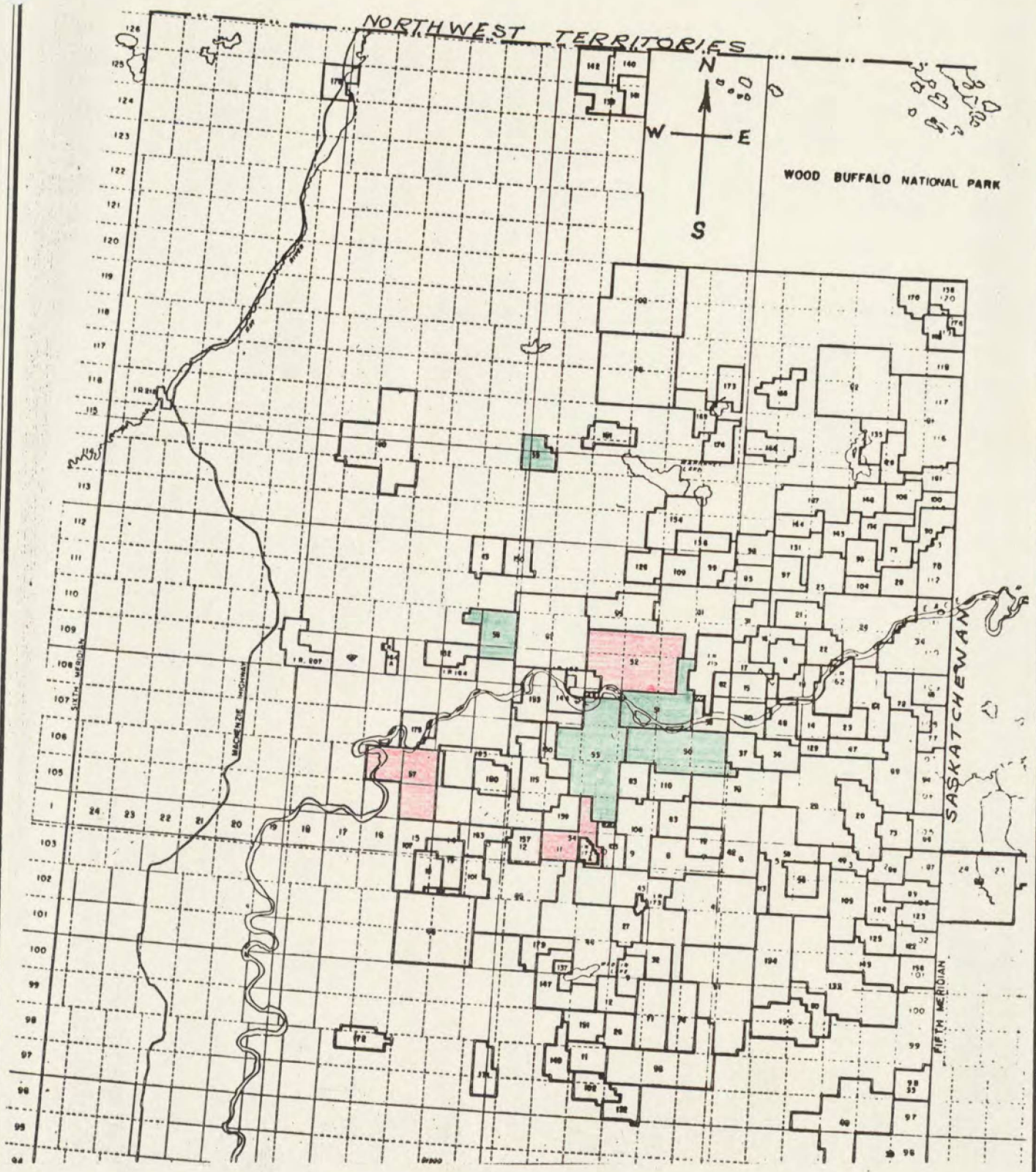


INDEX MAP

PERMIT Nº 52, 54, 57

PLACID OPERATED PERMITS

SCALE : 1 INCH = 24 MILES

PLATE Nº 1

return to surface of only muddy water, instead of solid samples. Most holes have therefore been sampled at the 5, 10 and 15-foot depth only. Near the end of the sampling period, in March, when the weather became unusually warm, the muskeg areas were covered with up to 1 foot of water. It was not possible to recover soil samples in these areas.

Assaying of the samples was carried out at Placid's laboratory facilities in Calgary with selected control samples being assayed commercially at Chemical and Geological Laboratories, Calgary.

The Field work was undertaken by Mr. James Woodward, Field Geological Technician under the supervision of R. A. Buckley, P. Geol.

SAMPLING TECHNIQUE

The top soil of the area prospected by Placid Oil Company consisted of glacial clays and interbedded layers of silt. The most common top soil being a sticky, slippery clay, laid down on the bottom of shallow glacial lakes formed from the melt waters of the Wisconsin Age Glaciers, approximately 31,000 years ago.

Sampling technique was quite simple using the Mayhew seismic shot hole auger. The clay augered out of the hole is drilled using 10-foot lengths of auger. The only sampling problem encountered was that at a depth greater than 20 feet, the auger returns were thoroughly mixed with drilling water with the result that the auger returns consisted entirely of muddy water. For this reason, practically no sampling was carried out below a depth of 20 feet.

Approximately 2 cups of soil was collected for each sample. This was bagged in a 4-mil plastic sack and labelled. The plastic sack was found to be necessary, due to the corrosive nature of sulphur. In addition, the plastic bag preserved the moisture and chemical make-up of the samples. To eliminate the risk of puncture, the plastic sack was placed in a standard 4 x 6 oil well sample bag and labelled.

DISCUSSION OF RESULTS

All shot hole samples were analysed for sulphur in Placid's Laboratory in Calgary. The result of these analyses is contained in the back pocket of this report.

Several qualitative methods to detect the presence of sulphur in the samples were devised by Placid personnel. The best method, and the method by which the majority of the samples was processed, was using a carbon disulphide extraction method. The procedure was to shake in a test tube 10 grams of soil with 10 cubic centimeters of carbon disulphide. The carbon disulphide was then decanted into evaporating dishes and allowed to evaporate under fume hoods. If elemental sulphur was extracted, it remained as a yellow deposit in the evaporating dishes. Control samples were analysed at Chemical & Geological Laboratories in Calgary. It was found that sulphur content as low as 1% could be detected using the Placid Qualitative Extraction Method.

SULPHUR SHOWS

Chemical analyses showed the following seismic lines and shot points to have encountered sulphur. The portion of the seismic lines containing sulphur are outlined in red on the accompanying map sheets.

Seismic Line	Shot Point
31	5
"	6
"	8
"	9
"	10
"	15
"	16
"	27
"	29
"	30
"	31
"	32
"	35
"	36
"	37
"	38
"	39
"	42
"	57
"	59
29	101
33	62
21	2
32	32
22	35
"	5
"	20
"	36
30	46

CONCLUSION AND RECOMMENDATIONS

Positive sulphur tests on soil samples taken during a seismic shot hole drilling program indicates the presence of sulphur in the top soil on Placid Operated permits. A more quantitative analysis is not warranted at this point on the present suite of samples. The auger used in this shot hole drilling program is essentially a hole-making device, rather than a soil-retrieving tool. The action of the auger drilling string tends to smear or pack the hole walls, resulting in poor representative samples of the formation penetrated by the drill.

It is recommended that a new program be initiated, using a deep flight continuous auger or a coring tube. This would provide more representative samples of the formation being penetrated as well as allowing the samples to be both qualitatively and quantitatively analysed.

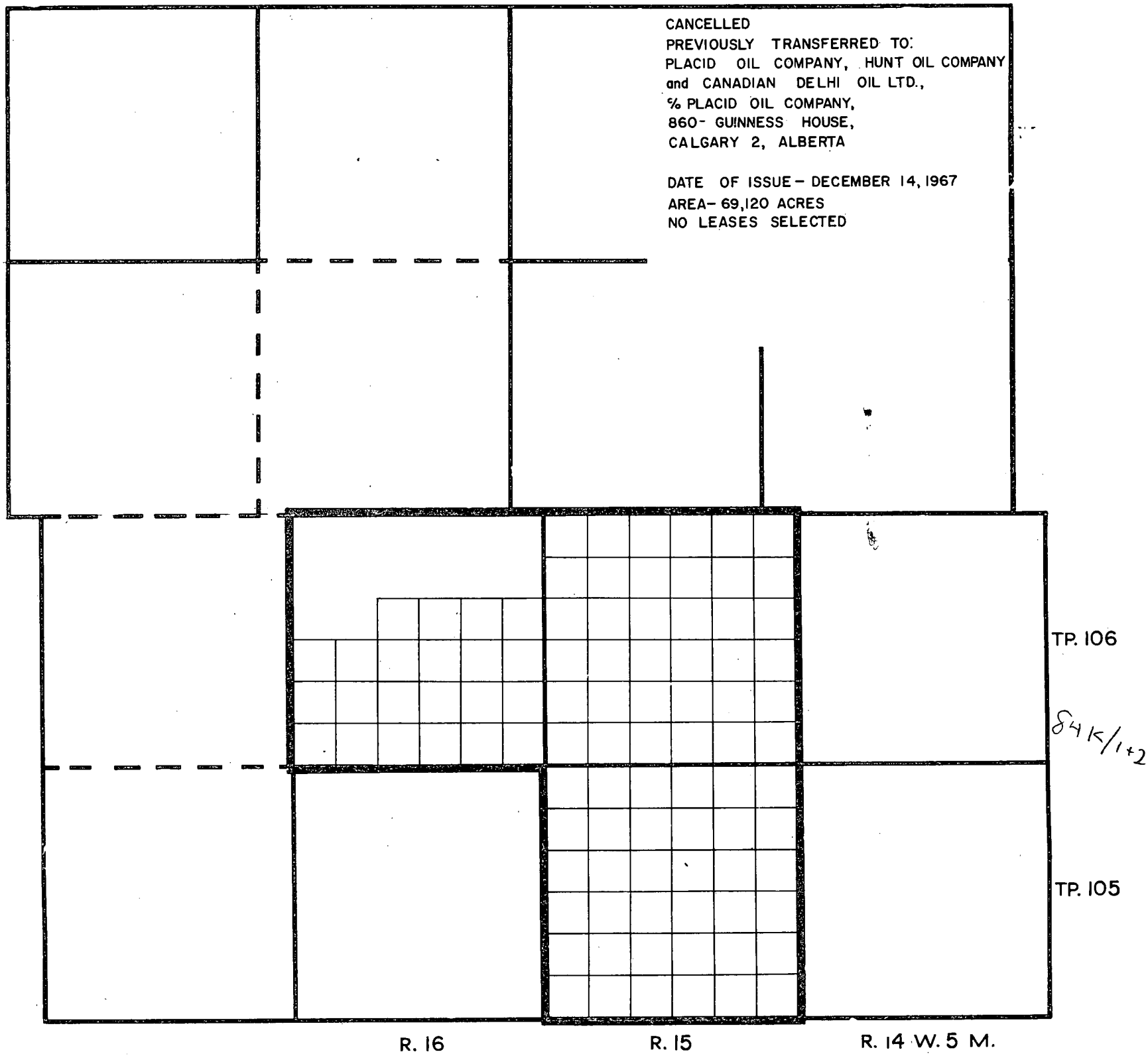
Respectfully submitted,

[redacted]

R. A. Buckley, P. Geol.

June 4, 1968

SULPHUR PROSPECTING PERMIT NO. 57



T. 107 R.16 W5M.

T. 107 R.15 W.5M.

T. 107 R.14 W.5M.

T. 106 R.17 W.5M.

T. 106 R.16 W.5M.

T. 106 R.15 W.5M.

T. 106 R.14 W.5M.

T. 105 R.17 W.5M.

T. 105 R.16 W.5M.

T. 105 R.15 W.5M.

T. 105 R.14 W.5M.

T. 104 R.17 W.5M.

T. 104 R.16 W.5M.

T. 104 R.15 W.5M.

PROJECT NO.- | DATE-

PLACID OIL COMPANY

EVALUATION OF THE

FT. VERMILION

GROUP 1

FROM SEISMOGRAPH DATA

SULPHUR PERMIT NO. 57

O SHOT HOLE WITH SULPHUR SHOW

DATUM ELEVATION- | DATUM VELOCITY- FT/S

CONTOUR INTERVAL- | SCALE- 2 INCHES TO 1 MILE 1980055

Interpretation By- R.C.J. Buckley | MAP NO. Enclosure No. 3

T. 106 R. 12 W. 5M.

T. 106 R. 11 W. 5M.

T. 106 R. 10 W. 5M.

T. 106 R. 9 W. 5M.

T. 105 R. 12 W. 5M.

T. 105 R. 11 W. 5M.

T. 105 R. 10 W. 5M.

T. 105 R. 9 W. 5M.

T. 104 R. 12 W. 5M.

T. 104 R. 11 W. 5M.

T. 104 R. 10 W. 5M.

T. 104 R. 9 W. 5M.

T. 103 R. 12 W. 5M.

T. 103 R. 11 W. 5M.

T. 103 R. 10 W. 5M.

Line 32

Line 30

Line 31

Line 33

I.R. 173A

PROJECT NO. | DATE

PLACID OIL COMPANY

EVALUATION OF THE

FT. VERMILION

GROUP 4

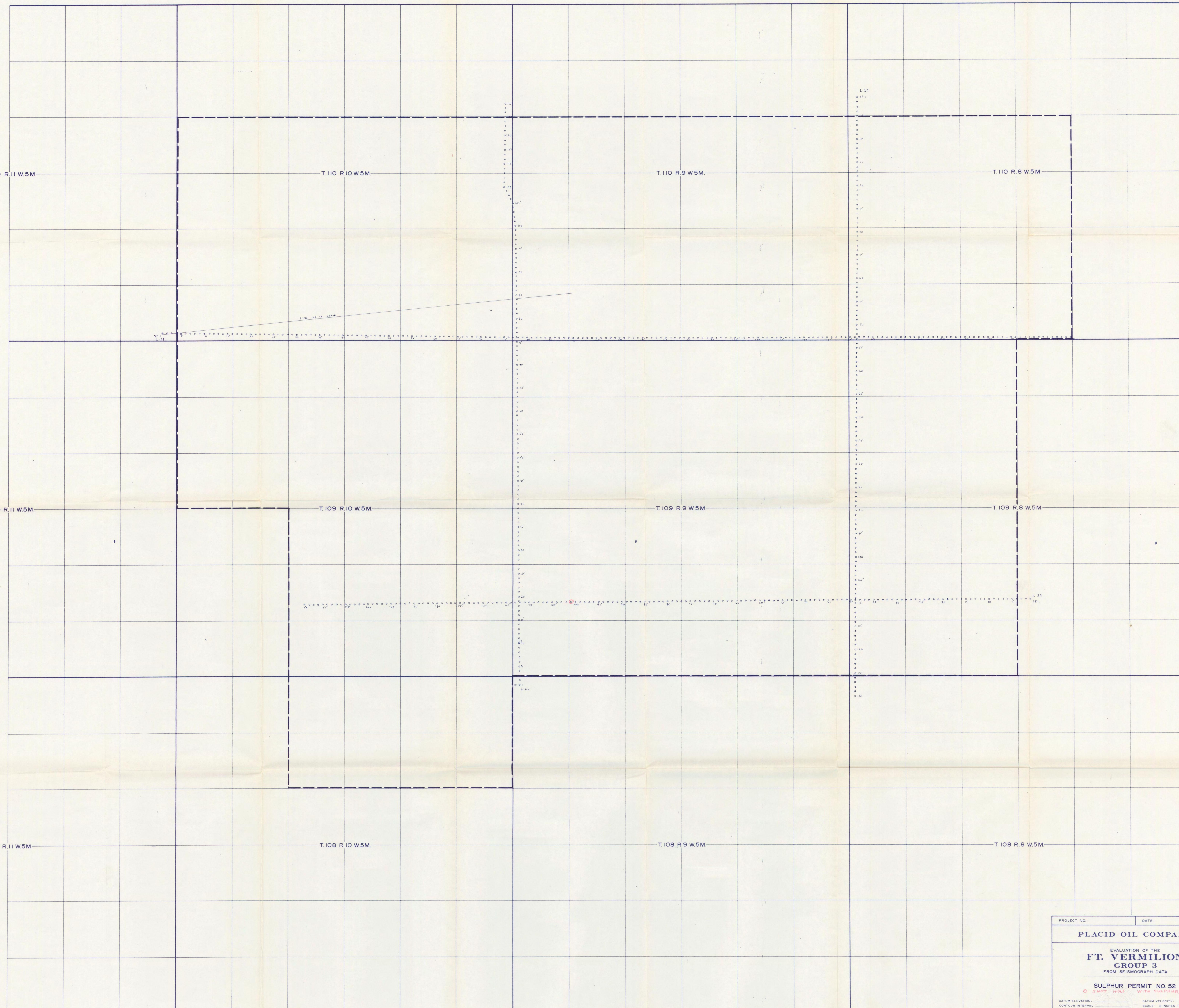
FROM SEISMOGRAPH DATA

SULPHUR PERMIT NO. 54

O SHOT HOLE WITH SULPHUR SHOW

R. A. Buckley

MAP NO. Enclosure No. 2



PROJECT NO.- | DATE-

PLACID OIL COMPANY

EVALUATION OF THE

FT. VERMILION
GROUP 3

FROM SEISMOGRAPH DATA

SULPHUR PERMIT NO. 52

O SHOT HOLE WITH SULPHUR SHOW

DATUM ELEVATION- | DATUM VELOCITY- FT/S.

CONTOUR INTERVAL- | SCALE- 2 INCHES TO 1 MILE 19860055

Interpretation by- R. A. Buckley

MAP NO. Enclosure No. 1