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FINAL REPORT ON TOP SOIL DRILLING AND SAMPLING PROGRAM

FORT VERMILION AREA
NORTHERN ALBERTA

TOWNSHIPS 104 to 110, RANGES 6 to 16 W5M

SULPHUR PERMITS NO. 50, 51, 53, 54

PLACID OIL COMPANY
CALGARY, ALBERTA

R. A. Buckley, B.Sc., M.Sc., P. Geol.

May 29, 1969

TABLE OF CONTENTS

LIST OF ENCLOSURES

(In Back Pocket)

Enclosure No. 1

Test Hole Location Map
Scale: 1" = 1 mile

Enclosure No. 2

Map showing Placid Oil et al Sulphur Permits
Scale: 1" = 16,000 ft.

Enclosure No. 3

Copy of Placid Laboratory Assay Sheets

LIST OF PLATES

Plate No. 1

Location of Sulphur Permits

Plate No. 2

Picture of Giddings Soil Sampler

Plate No. 3

Picture of Soil Sampler in Operation

Plate No. 4

Soil Coring Tubes and Soil Sampling Augers

Plate No. 5

Curtis Drilling & Research Model B-40 Mobile Drill

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INTRODUCTION

This report is the third and concluding report on the top soil drilling and sampling program carried out in Northern Alberta in the general area of Townships 104 to 110, Ranges 6 to 16, west of the 5th Meridian. More specifically, the top soil was sampled by means of continuous flight augers on Province of Alberta Sulphur Permits No. 50, 51, 52, 53, 54 and 57. The first report on this project was authored by the undersigned and dated June 4, 1968. The drilling technique, sampling method, assaying results and conclusions of Permits No. 52, 54 and 57 were covered in this report.

A similar report dated December 11, 1968, authored by the undersigned, was an interim report covering our activities on Permits No. 50, 51, 53 and 54, to December 1, 1968.

This present report summarizes the drilling, sampling technique, sample analyzing technique, assay results, expenditures, conclusions and recommendations for all permits. This work was done by Placid Oil Company, as operator, Hunt Oil Company and Canadian Delhi Oil Ltd.

Plate No. 1 shows the location of these permits, while Enclosure No. 1 gives the location of each test hole.

To date, 950 holes spaced 500 feet apart, have been drilled to a depth of 20 feet. Representation soil samples were taken from the auger over 2½-foot intervals, 8 samples being taken from each hole. Approximately 7,600 samples were collected during the project. The laboratory reports are contained in the back pocket of this report.

The field work is being carried out by Curtis Test Laboratories Ltd. of Calgary, under contract to Placid Oil Company.

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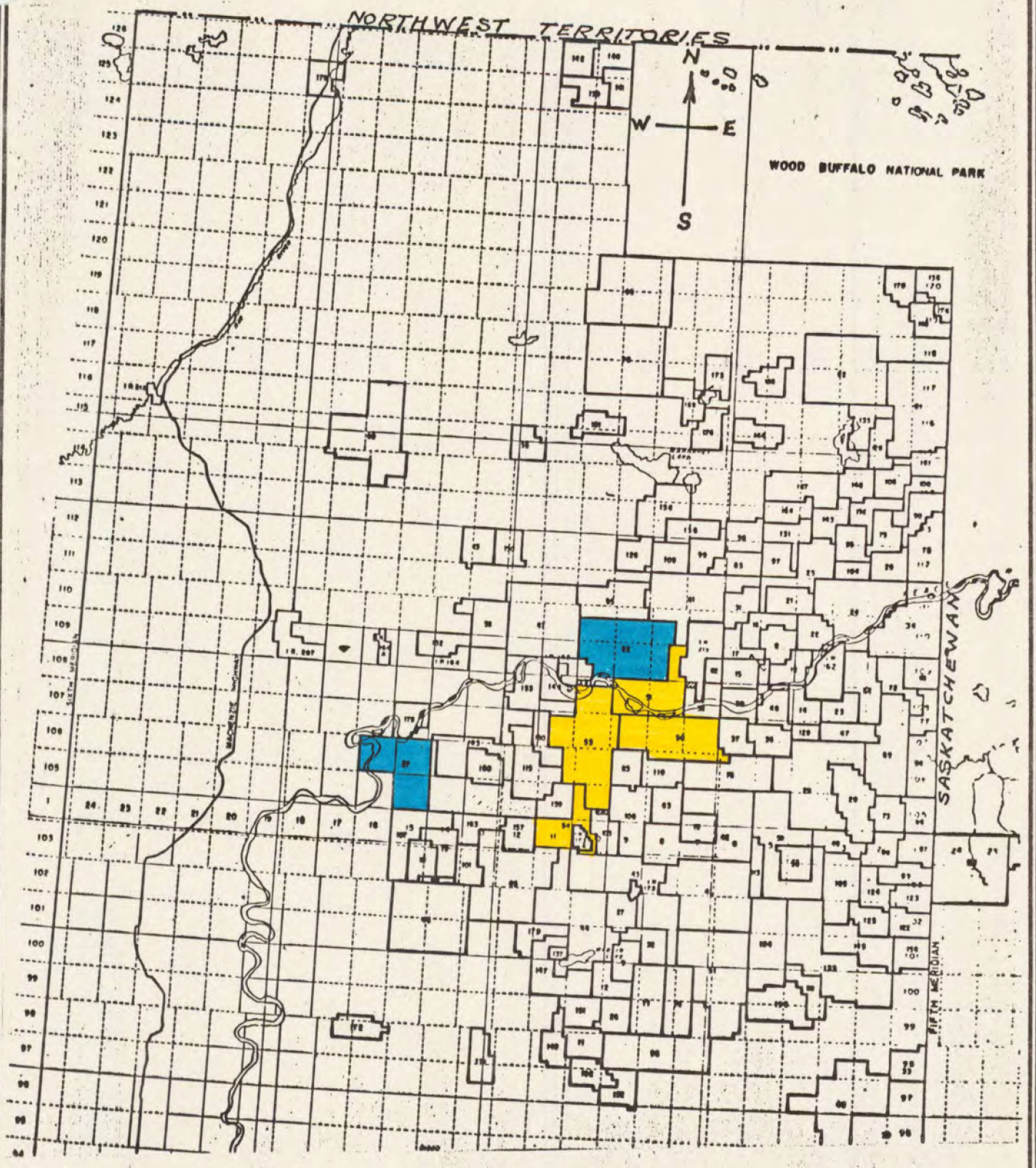


INDEX MAP

PERMIT Nº 52, 54, 57

PERMIT Nº 50, 51, 53 & 54

SCALE: 1 INCH = 24 MILES

PLATE Nº 1

SAMPLE PREPARATION

The samples, when received from the field, vary from a very viscous mud to stiff plastic clay. These are first dried in a warm, moving air drier, then ground, crushed, and rebagged in preparation for analysis. The unused portion of the samples have been retained in Placid's storage facilities.

Several qualitative methods to detect the presence of sulphur in the sample were devised by Placid personnel. The best method, and the method by which the majority of the samples were 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 present, it remained as a yellow deposit in the evaporating dishes. Control samples indicate that sulphur content in the soil, as low as 1%, could be detected using the Placid Qualitative Extraction method.

SAMPLING TECHNIQUE

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

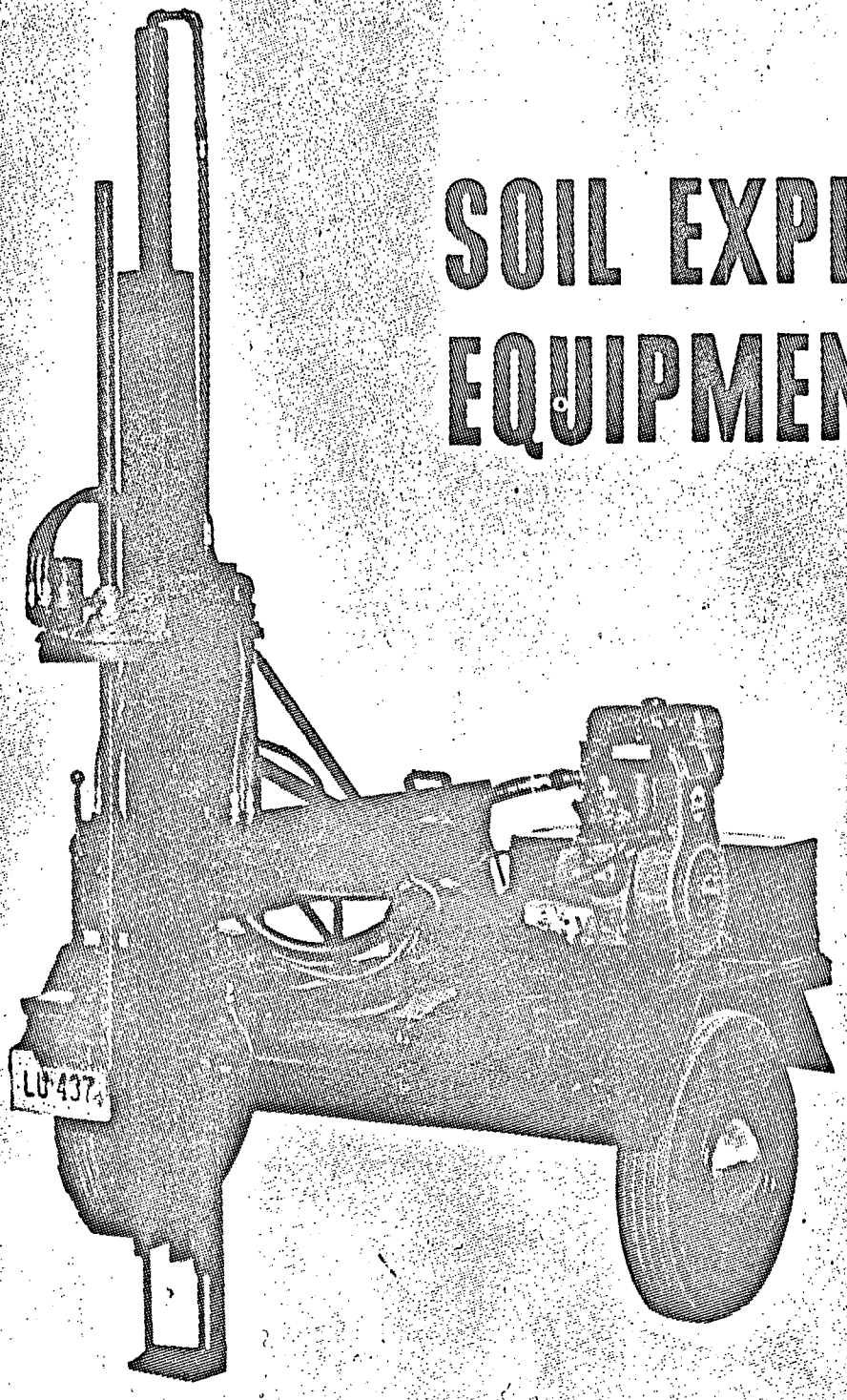
The top soil is being sampled by means of a 6-inch auger, powered by a B-40 Mobile drill. Drilling of the test holes has been conducted as shown on Enclosure No. 1 and numbered consecutively. A spacing of 500 feet is being measured between test holes with individual samples being taken at each 2½ feet of depth to a depth of not less than 20 feet; e.g., 8 samples per test hole. Samples are being placed in plastic, then in cloth bags, numbered, and shipped to Placid's laboratory in Calgary.

A 4-mil plastic bag 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 bag was placed in a standard, 4 x 6-inch, oil well sample bag and labeled. A 3 to 4-inch diameter post is being driven into each test hole and a seismic tag placed on each post. In addition, a seismic tag is placed on a tree adjacent to the test hole location to comply with the Department of Lands & Forests. Test hole locations have been forwarded to the Department of Lands & Forests as required by Geophysical Regulations.

GIDDINGS

SOIL EXPLORATION EQUIPMENT.....

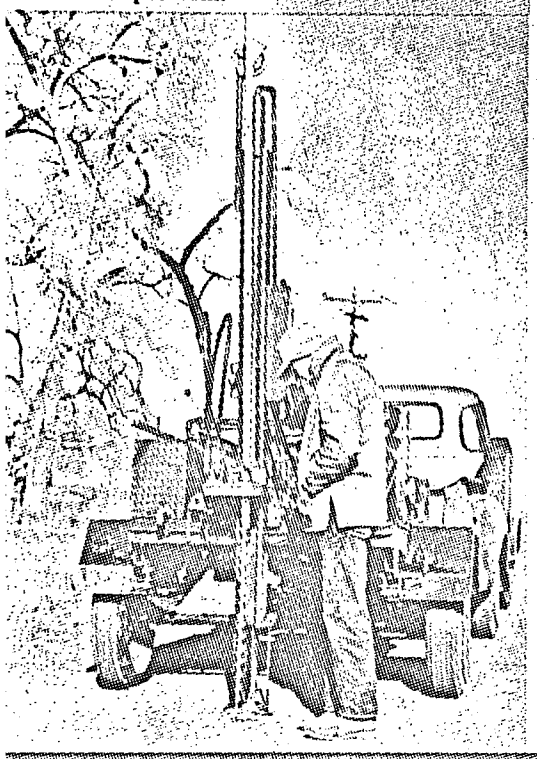


NEW Trailer-Mounted and Power - Equipped Giddings Soil Sampling Machine, Model GSRT

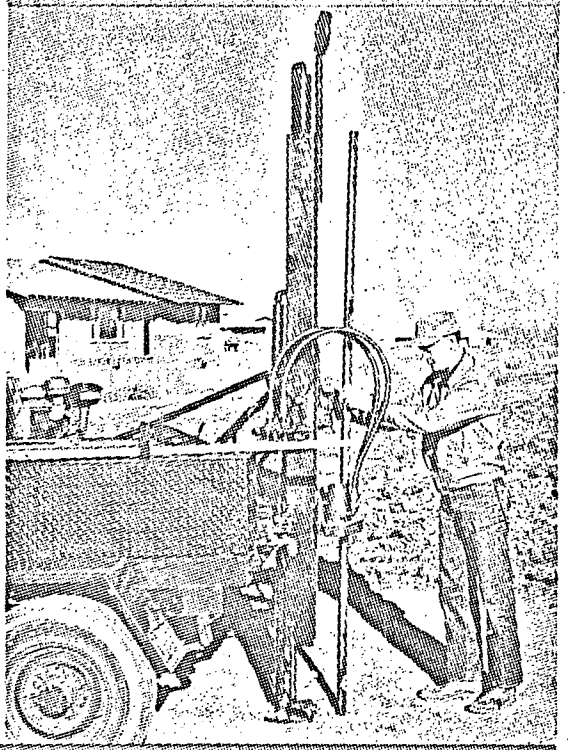
PLATE NO. 2

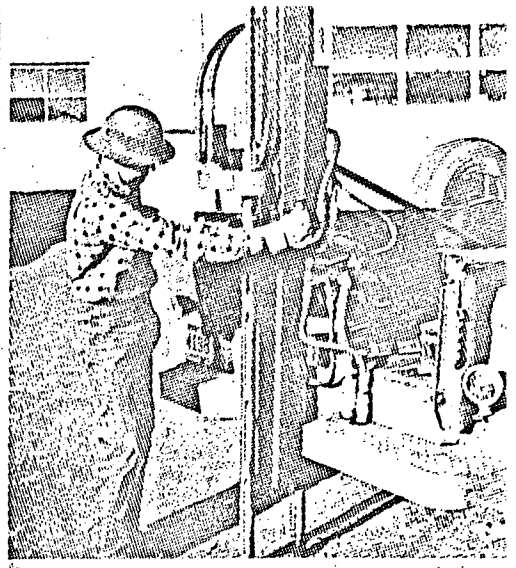
For Use by: Soil Conservation Agencies — Federal and State Highway Departments — Municipalities — Public Utilities — Highway Contractors — General Contractors — Private Geological Service Organizations

Frost Penetration Many public utility companies and municipally-owned utilities will find Giddings Machines profitable equipment for cutting through frozen soils to locate leaks in water and gas lines. Recently a Giddings Machine penetrated 54" of frost to locate a break in a water line. Using a 2" auger, back fill was no problem.



Test Back Fill Before Black Topping or Paving A wise precaution that puts longer life into highway, street and road construction is to use a Giddings Machine to check back fill and recover unconfined lab samples for compactness tests before paving. It gets more mileage from highway funds.



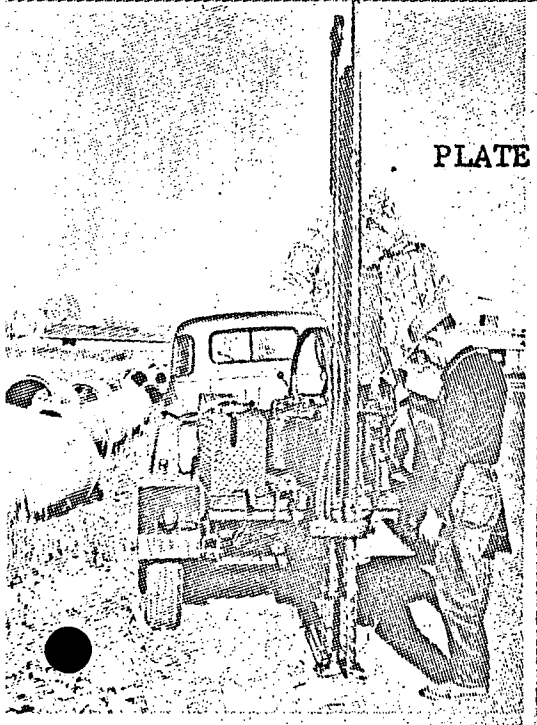


Avoiding Drainage Problems

On farms and ranches—on suburban and rural home and commercial building—a Giddings Soil Sampler can help to eliminate problems on drainage, irrigation, leaching fields and similar projects.

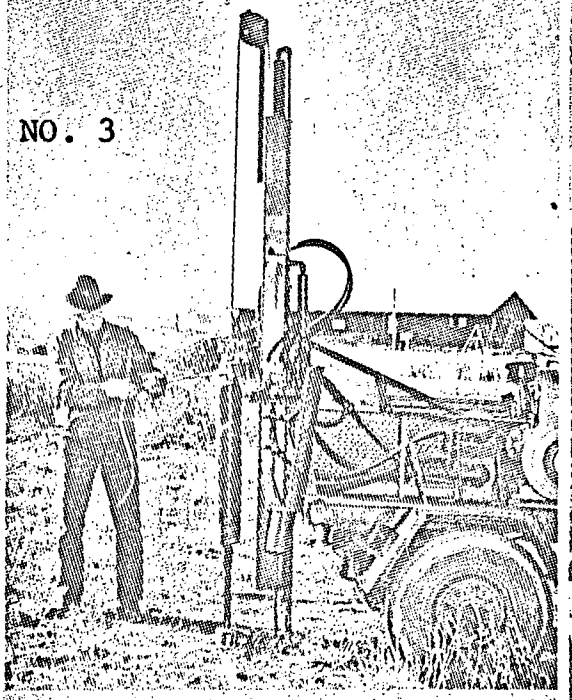
Their Many Valuable Uses make Giddings Machines A PAYING INVESTMENT!

PLATE NO. 3



Pre-Testing Before Trenching

Giddings Machines can pay off when ditching for water and gas lines — to make sure rock shelves, alkaline soil structure, water pockets and other troublesome soil conditions won't cause



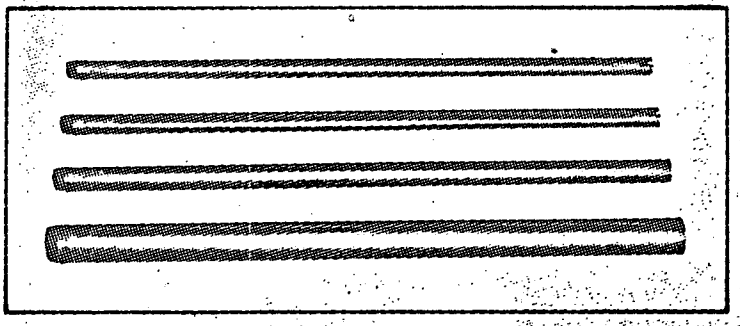
Foundation Testing In constructing small commercial buildings and in planning new residential developments, a Giddings Machine with a Drop Hammer attachment can easily and quickly make Penetration Tests that may elimi-

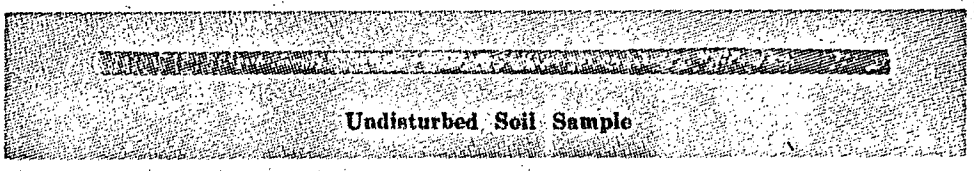
Pre-Bid Testing Before bidding on many construction jobs — from laying water and sewer lines, to building roads and airports — it will pay contractors to know in advance the soil structure to be encountered. Pre-testing often means better jobs and full profit on contracts.

Agricultural Soil Testing Top soil surveys, land leveling operations, irrigation planning and other projects, such as performed by the Soil Conservation Service, can be done easier and more reli-

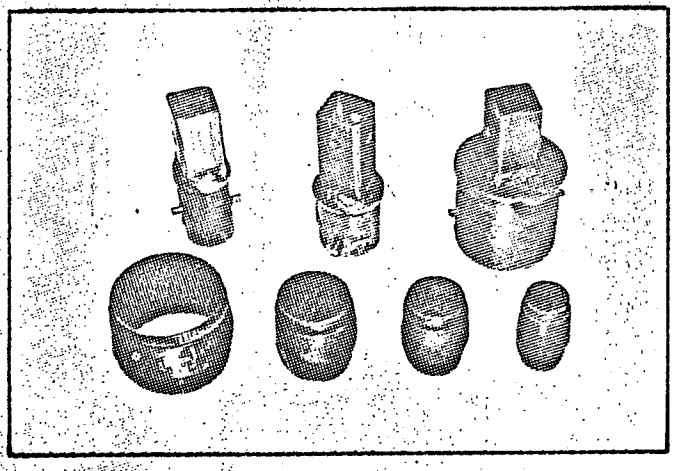
CORING TUBES

Take undisturbed samples as shown below. .A5/8" slot extending the full length of the tube permits observation of the sample. Top of tube is open to permit easy removal of sample. Tubes are made from tough molychrome steel. Tubes are available in 48" and 60" lengths with diameters from 1 1/4" to 4 1/2".





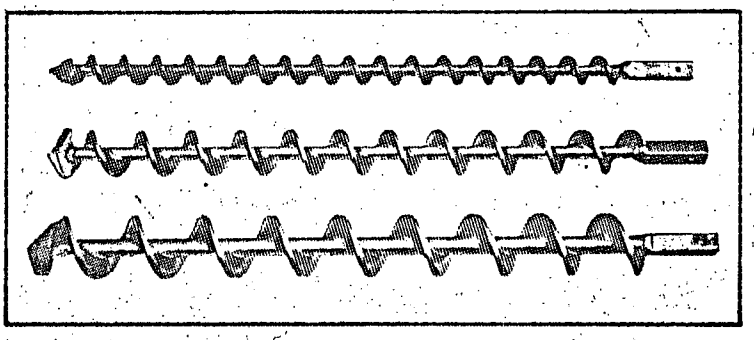
Undisturbed Soil Sample



TUBE BITS AND ADAPTERS

Bits have a standard thread for solid attachment and quick changing. Also designed with an I.D. and O.D. taper to hold the soil sample in the tube and to provide easier probing in the soil. The quick relief bit is designed for heavy expanding soils. The adapter connects to the Kelley bar and tub attaches to the adapter. Sizes up to 2 inch connect with a 1/8" turn; larger sizes with a bolt.

AUGER TOOLS



2" — 3" — 4" diameters

PLATE NO. 4

CURTIS DRILLING & RESEARCH

MODEL B-40 MOBILE DRILL

ROTARY DRILLS TO 300'

DRY AUGERS TO 100'

BORES HOLES TO 24" DIA.

COMPLETE SOIL SAMPLING

INSITU PENETRATION TESTS

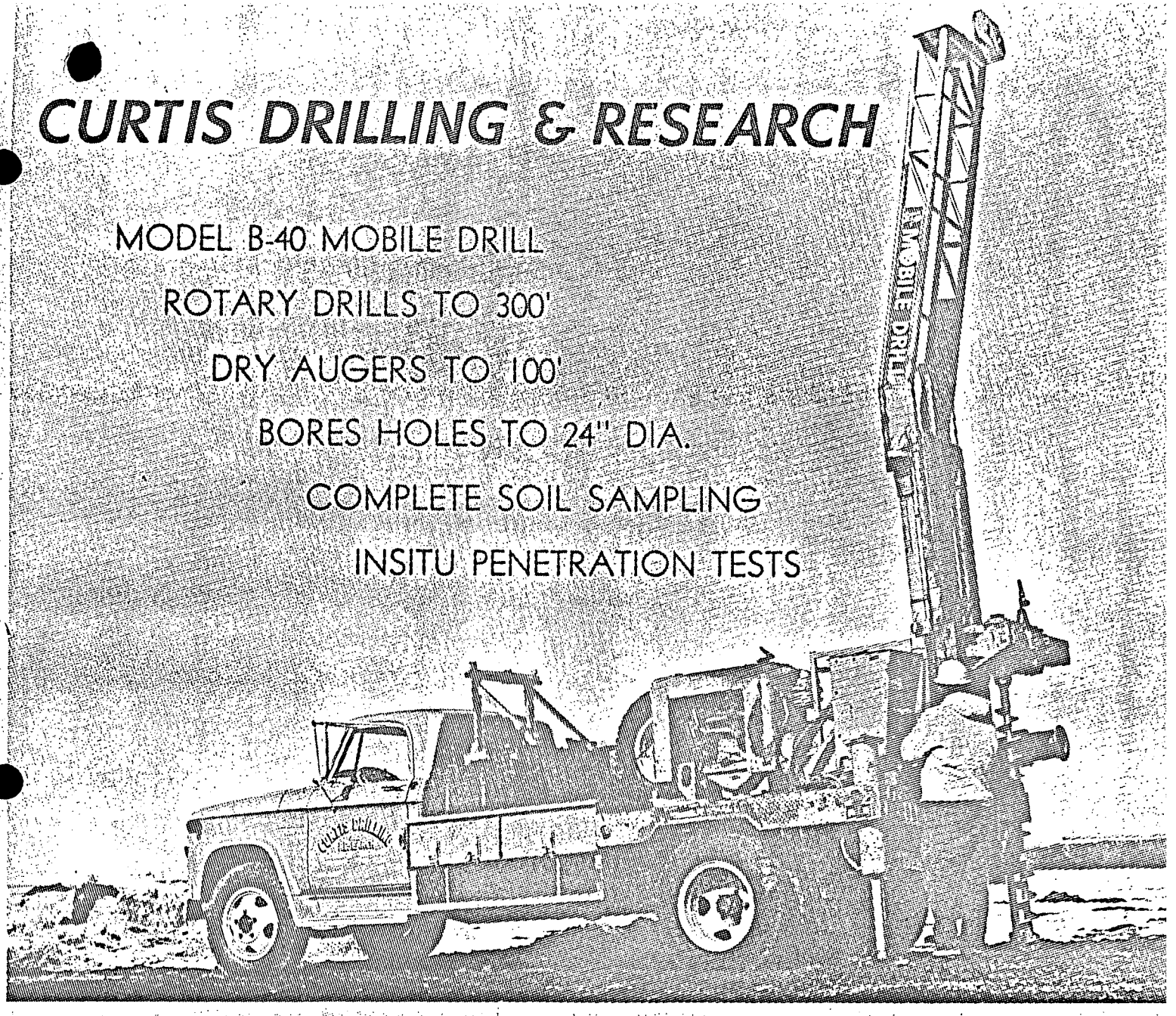


PLATE NO. 5

SUMMARY OF PROGRAM

On September 11, 1968, 2 Giddings soil samplers were delivered from the factory in Fort Worth, Colorado. These soil samplers consist of a soil sampling tube that is forced in to the soil by hydraulic cylinders, (See Plates No. 2, 3 & 4). The machine is anchored by means of 3-inch diameter, 5-foot long continuous flight augers. Excellent undisturbed soil samples can be recovered using this type of machine.

Immediately upon arrival, one of these units was adapted to a 3/4 ton, 4-wheel drive vehicle and dispatched to the Fort Vermilion area. The presence of 10 feet of muskeg would not provide suitable ground anchor material to hold the drill during coring operations. At a depth of 10 feet, very plastic clays were encountered, which were virtually impossible to core. These facts, along with the uncommonly wet, rainy summer, made the trails and roads impassable. It was decided to mount a larger auger-type drill on a track vehicle to complete the exploration program.

On October 1, 1968, a B-40 continuous auger Mobile Drill was mounted on a tracked carrier - a Foremost, Model S-200, field tested, and trucked to the Fort Vermilion project, (Plate No. 5 shows the Model B-40 Mobile Drill mounted on a truck). A track mounted, 3-man camper unit was included as auxiliary equipment for personnel accommodation.

Sampling was completed during the first week of April. Assaying of the samples was completed on April 30, 1969.

DISCUSSION OF RESULTS

All samples collected during the sampling program were assayed at Placid's laboratory facilities in Calgary. In total, 7,600 samples were processed. Laboratory reports show that none of the samples contain sulphur.

CONCLUSIONS & RECOMMENDATIONS

Since all soil samples collected on this program gave negative sulphur values, it is recommended that no additional work be undertaken on these permits and that the permits be surrendered to the crown.

Respectfully submitted,

[redacted]

R. A. Buckley, B.Sc., M.Sc.,
P. Geol.

May 29, 1969

T110 R11 | T110 R10 | T110 R9 | T110 R8 | T110 R7 | T110 R6

T109 R11 | T109 R10 | T109 R9 | T109 R8 | T109 R7 | T109 R6

52

I.R. 215

PEACE RIVER

51

T108 R11 | T108 R10 | T108 R9 | T108 R8 | T108 R7 | T108 R6

PEACE RIVER

T107 R11 | T107 R10 | T107 R9 | T107 R8 | T107 R7 | T107 R6

53

50

T106 R12 | T106 R11 | T106 R10 | T106 R9 | T106 R8 | T106 R7

REQUIRE DOZER

REQUIRE DOZER

T105 R12 | T105 R11 | T105 R10 | T105 R9 | T105 R8 | T105 R7

EXTREMELY WET AREA

54

T104 R12 | T104 R11 | I.R. 173A | T104 R10 | T104 R9 | T104 R8 | T104 R7

PROJECT No. | DATE: DEC. 11/1968

PLACID OIL COMPANY

FORT VERMILION

SULPHUR PERMITS 50 TO 54

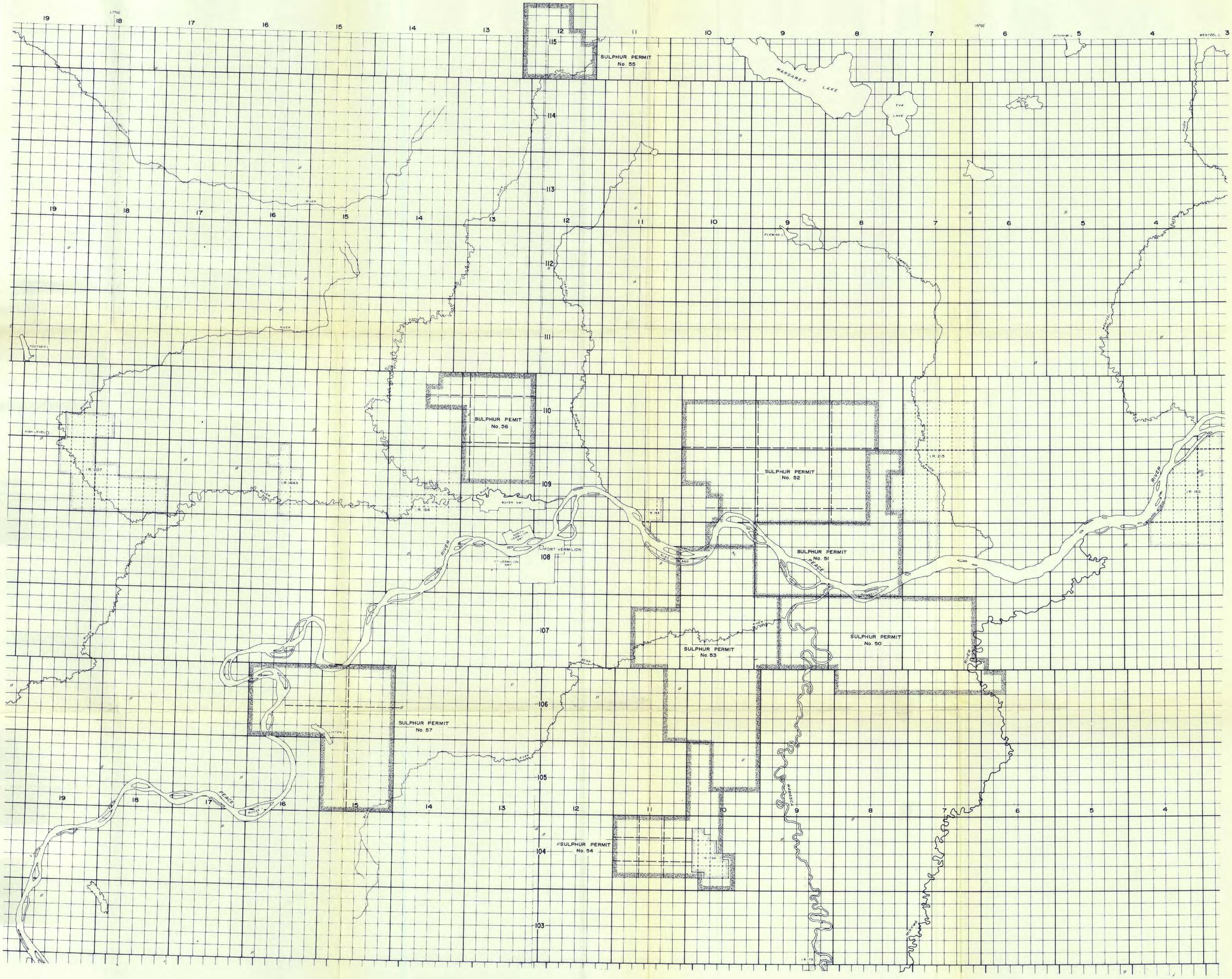
REMAINDER OF 1968 PROGRAM

TEST HOLE LOCATIONS

MAP NO. 1

D.G. Buckley

19690052 Enclosure No. 1



SULPHUR PERMITS 50 to 57

FORT VERMILION

SCALE - 1 INCH TO 15,000 FEET

PLACID OIL COMPANY
CALGARY ALBERTA

R.A. BUCKLEY DEC 12, 1968

R A Buckley

19690052
Enclosure No. 2