

REPORT ON GEOPHYSICAL EXPLORATION

DEPARTMENT OF NATURAL RESOURCES & NORTHERN AFFAIRS
PETROLEUM & NATURAL GAS

PERMIT NO. 226

for the period

AUGUST 9, 1956 to AUGUST 8, 1957

CALGARY, ALBERTA
OCTOBER 25, 1957

by: W.L. Irwin
Superintendent, N.F.A.

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INTRODUCTION

This report is submitted in support of an application for credit on those crown lands granted to and held jointly by the Northern Foothills Agreement group, which includes Texaco Exploration Company (Operator of N.F.A.), Shell Oil Company, Mobil Oil of Canada, Limited and the British American Oil Company, Limited.

The subject permit is in the Northwest Territories approximately twelve miles east of Fort Liard, N.W.T. and extends in a north-south direction from $60^{\circ}10'$ north latitude to $60^{\circ}20'$ north latitude and in an east-west direction from $122^{\circ}58'$ to $123^{\circ}11'$ west longitude.

ENCLOSURES:

- (1) A complete Mississippian time map of Crown Permit No. 226.
- (2) A complete topographic map of Crown Permit No. 226.
- (3) A tabulation of all shot holes drilled in the area during the period under report listing the shot hole number, the total depth and the drill log.

GENERAL DISCUSSION OF OPERATIONS:

The Bovie Lake North Project (Permit No. 226) is in an area of generally flat, featureless terrain, however, this permit encompasses one major topographical feature. This is a high ridge

which extends in a north-south direction from the middle of the southern boundary of the permit to a point midway between the north and south borders of the permit.

Universal Seismic Surveys, Limited began operations in the area on August 13, 1956 and continued until August 31, 1956. The purpose of the survey was to attempt to establish the attitudes of the subsurface strata in the vicinity of the surface ridge by both the reflection method and the refraction method of seismic exploration.

All vehicles used in the survey were bombardier tractor types and they included the following units: a recording unit, a personnel carrier, a survey unit, a drill unit and a water carrier for the drill.

One drill was used for the entire operation. This was a Failing CFD-2 type of drill and no difficulties were encountered in drilling holes to the required depth. The average depth of shot holes was about forty five feet.

Universal Seismic Surveys Ltd., were equipped with Southwestern Industrial Electronic Company recording equipment throughout. Amplifiers used were S.I.E. GA-7-H's utilizing a 20% bilateral mix, a filter setting of 1-28-62 for reflection records and 1-out-37 for refraction records. Geophones used were S-16's peaked at 28 c.p.s for reflection work and S.I.E.'s eight cycle S-19 model for refraction work.

The reflection seismograph work was done by the split spread method of continuous profiling. Shot holes were spaced at 1320 feet intervals and the standard set up had twenty-four groups with four geophones per group. There were twelve groups

on each side of the hole stretching to the next shothole and to the previous shot point. Results obtained with this method were generally good, however, in some cases a shorter spread length would have improved results. The average explosive charge used was five pounds.

A spread length of 6900 feet was used for the refraction work, with one geophone per group spaced at 300 foot intervals. The maximum range for the work done was 30,000 feet and the average explosive charge was ten pounds.

The geophone cables used were the portable type which were laid out and picked up by hand.

Surveying was done with a transit and elevations were obtained at all shot points and most geophone stations. Vertical control was tied to control points on the British Columbia-Northwest Territories boundary and is believed to be accurate within three feet. Shot points and spreads were laid out by means of a surveyors chain.

WEATHERING CONDITIONS:

Raw seismic times were reduced to a datum plane of 1200 feet above sea level by means of a rectilinear type correction. The entire permit area is overlain with a thick mantle of unconsolidated glacial drift which varied in thickness from 300 feet to 1000 feet and after some experimenting it was found that the rectilinear method of correction was most accurate for this area.

SEISMIC RESULTS:

Record quality varied from fair to good with only a very few very poor records obtained. The records, however, are a little difficult to correlate because of a lack of continuity from record to record. Near the crest of the feature the reflection records

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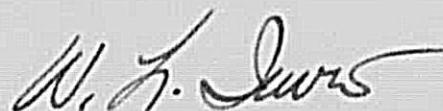
were extremely poor and the refraction work was used to establish the control in this area. In general the refraction work was of a fair quality with some of the long range shots being unuseable. The scarcity of well information in the area makes it difficult to identify any reflecting event accurately. However, the major reflecting event present on most records have been tentatively identified as Mississippian Limestone.

STRUCTURAL RESULTS:

The control established to date has served only to reveal a subsurface east-west reversal of considerable magnitude which is coincident with the surface ridge. There is some evidence that this reversal is broken by a high angle reverse fault but additional detail control will be necessary before this is definitely established.

Additional work is planned in this area as soon as possible.

Respectfully submitted,



W. L. Irwin, Superintendent,
NORTHERN FOOTHILLS AGREEMENT

CALGARY, Alberta
October 25, 1957

BOVIE LAKE NORTH

RESERVATION NO. 226SHOT HOLE DRILLING LOG

<u>Shot Hole No.</u>	<u>Formation Log</u>	<u>Total Depth</u>
S. P. 1	0-13 Mus. 13-40 Hd. Sdy. Cl. & Blds.	40
S. P. 2	0-40 Cl., Gr. & Blds.	40
S. P. 3	0-4 Mus. 4-15 Cl. 15-35 Sd. & Gr. 35-40 Cl.	40
S. P. 4	0-40 Cl., Gr. & Blds.	40
S. P. 5	0-40 Cl., Gr. & Blds.	40
S. P. 6	0-40 Cl., Gr. & Blds.	40
S. P. 7	0-40 Cl. & Gr.	40
S. P. 8	0-20 Br. Cl. & Blds. 20-25 Sd. & Gr. 25-40 Cl. & Gr.	40
S. P. 9	0-20 Cl. & Gr. 20-40 Sh. with scattered S. S. streaks	40
S. P. 10	0-15 Br. Cl. & Gr. 15-40 Sh.	40
S. P. 11	0-20 Sd., Cl., Gr. & Blds. 20-25 S. S. 25-40 Hd. Sh.	40
S. P. 12	0-6 Cl. & Gr. 6-20 Sh. 20-40 S. S.	40
S. P. 13	0-15 Sdy. Cl. & Gr. 15-40 Hd. Sh.	40
S. P. 14	0-10 Cl. & Blds. 10-40 Sh.	40
S. P. 15	0-30 Sd. & Gr. 30-40 Hd. Sh.	40
S. P. 16	0-25 Sdy. Cl., Blds., & Gr. 25-40 Sh.	40
S. P. 17	0-40 Cl. & Blds.	40
S. P. 18	0-3 Mus. 3-13 Cl. 13-17 S. S.	17
Skid	0-14 Cl. 14-18 S. S.	18
S. P. 19	0-5 Mus. 5-25 Sd. & Gr. 25-40 Cl.	40
S. P. 20	0-3 Mus. 3-15 Sd. & Gr. 15-40 Sdy. Cl.	40
S. P. 21	0-3 Mus. 3-20 Sd. & Gr. 20-30 Cl. 30-40 Sd., Gr. & Blds.	40
S. P. 22	0-2 Mus. 2-40 Sdy. Cl., Gr. & Blds.	40
S. P. 23	0-40 Sdy. Cl. & Gr.	40
R 23A	0-18 Mus. 18-40 Bl. Cl. & Blds.	40
R 23B	0-18 Mus. 18-40 Bl. Cl. & Blds.	40
S. P. 24	0-40 Cl. & Blds.	40
R 24A	0-40 Bl. Cl., Gr. & Blds.	40
R 24B	0-40 Bl. Cl., Gr. & Blds.	40
S. P. 25	0-3 Mus. 3-40 Sdy. Cl., Gr. & Blds.	40

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<u>Shot Hole No.</u>	<u>Formation Log</u>		<u>Total Depth</u>	
R 25A	0-25 Bl. Cl. & Blds.	25-40 Sh.	40	
R 25B	0-25 Bl. Cl. & Blds.	25-40 Sh.	40	
R 250	0-25 Bl. Cl. & Blds.	25-40 Sh.	40	
S. P. 26	0-2 Mus. 2-20 Sdy. Cl. & Gr.	20-40 Cl. & Blds.	40	
R 26A	0-32 Sd., Gr. & Cl.	32-40 Hd. Bl. Cl.	40	
R 26B	0-10 Br. Cl.	10-30 Sd. & Gr.	30-40 Hd. Bl. Cl.	40
R 26C	0-15 Br. Cl.	15-40 Bl. Cl. & Gr.	40	
	S. S. layer at 25'		40	
S. P. 27	0-4 Mus.	4-25 Cl., Gr. & Blds.	25	
Skid	0-4 Mus.	4-40 Cl., Gr. & Blds.	40	
R 27A	0-8 Mus.	8-40 Cl., Blds. & Gr.	40	
R 27B	0-8 Mus.	8-40 Cl., Gr. & Blds.	40	
R 27C	0-8 Mus.	8-40 Cl., Gr. & Blds.	40	
R 27D	0-40 Cl. & Blds.		40	
R 27E	0-40 Cl. & Blds.		40	
S. P. 28	0-40 Sdy. Cl.		40	
R 28A	0-40 Cl. & Blds.		40	
R 28B	0-40 Cl., Gr. & Blds.		40	
R 28C	0-30 Cl., Blds. & Gr.		30	
Skid	0-30 Cl., Blds. & Gr.	30-40 Hd. Bl. Cl.	40	
R 28E	0-40 Cl., Blds. & Gr.		40	
S. P. 29	0-40 Cl., Blds. & Gr.		40	
R 29A	0-40 Cl.		40	
R 29B	0-40 Cl. & Blds.		40	
R 29C	0-15 Sd. & Blds.	15-30 Cl. & Blds.	40	
	30-35 S. S. 35-40 Sd.		40	
R 29D	0-35 Sd. & Blds.		35	
S. P. 30	0-15 Cl. & Blds.		15	
Skid	0-40 Cl. & Blds.		40	

Note: Blds. - Boulders
 Bl. - Blue
 Br. - Brown
 Cl. - Clay
 Gr. - Gravel
 Hd. - Hard
 Mus. - Muskeg
 Sd. - Sand
 Sdy. - Sandy
 Sh. - Shale
 S. S. - Sandstone

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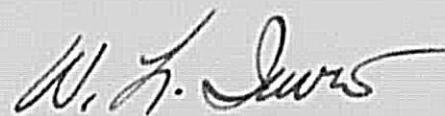
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