

I Introduction

The small scale plat, made a part of this report, locates the seismic control as related to Trout Lake and also has outlined the involved leases and permits. Further detail has been included on a "Line Index" map, on the scale of one mile to the inch.

Your letter dated November 26, 1971 (File R-1799-514) from Mr. H. W. Woodward suggested grouping the two winters' shooting programs as one report and as a result this report summarizes both of these surveys. Reference to the 1970-71 control shall be designated as Phase I and the 1971-72 control as Phase II. A separate field operation report was submitted by Teledyne to cover the 1971-72 program and it has been made a part of this expanded geophysical summary.

II Results and Interpretation

Results of the Phase I and Phase II surveys are incorporated as one report and comprise the following maps:

1. Line Index map
2. Kotcho structure (Time)
3. Slave Point structure (Time)
4. Kotcho to Slave Point (Isotime)

The line index map has on it noted, as a part of the legend, the two programs referred to previously.

Reflections identified as the Top of Mississippian, Kotcho, Tetcho, Jean Marie and Slave Point were generally present over most of the surveyed area. Two sample sections AP-4 and K-70-8, are made a part of this report and have described in annotated form the processing routines applied, and identifications of the reflecting horizons. Identification was accomplished by correlating the field data to sonograms purchased for several wells in the area. A very reliable correlation appeared to exist and it is therefore felt that the enclosed maps precisely correlate to the geological markers described.

Structure sections were not prepared from the Phase I operation and consequently structure data has been confined to the Phase II program. The primary objective in the prospect area was to locate Middle Devonian carbonate porosity, a condition that is generally associated with a structurally high Slave Point or

in proximity to the shale-out position of the Slave Point carbonates. Conversely it is not always the case that the Slave Point is always porous in these environments.

To evaluate these conditions the above three listed maps were prepared with the most accurate and diagnostic considered to be the Tetcho to Slave Point. This map does not reflect some of the inaccuracies attributable to percentage error involved in computing structural times.

An anomaly, comprising in part the M-51 location, extends to the northeast but with perhaps less structural relief as it continues in that direction. This feature would appear to be associated with a high and perhaps thick Slave Point member. The western portions of profiles AP-9 and K-70-5 reveal another thin interval perhaps in this case associated with pre-Jean Marie faulting which in turn accounts for the eastward Kotcho to Slave Point thickening. Structure on the Slave Point and interval thinning are generally coincident. Over the area it has been noted that the Kotcho does exhibit drape over Slave Point changes and hence there is agreement between the Kotcho and Slave Point in structural detail.

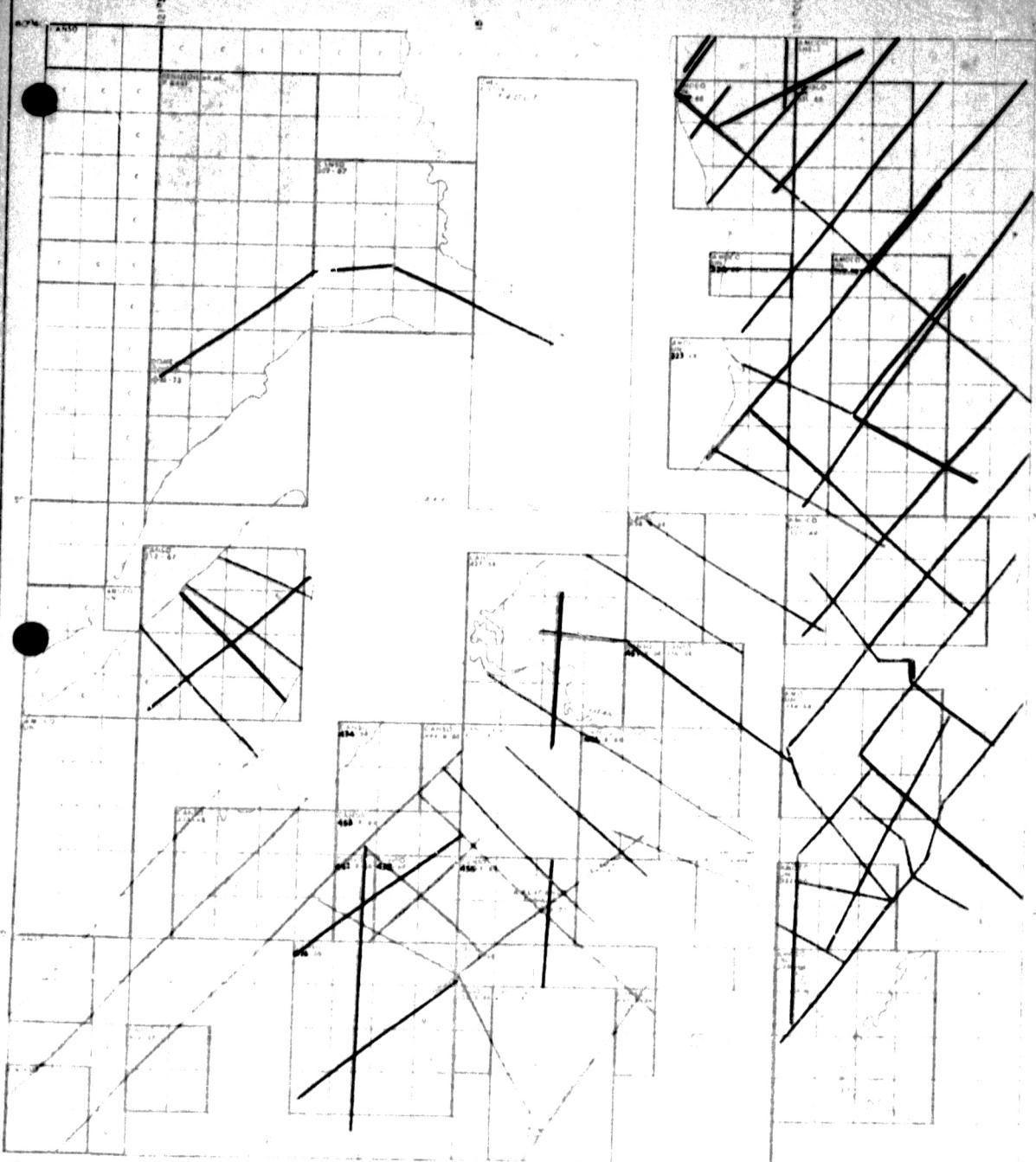
III Summary and Conclusions

Quality of the seismic data is in most cases sufficiently good to map changes in the Slave Point. Further drilling will be required to locate the optimum areas for Slave Point gas production.

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OPERATION REPORT
on the
SEISMIC SURVEY
of the
TROUT LAKE PROJECT
in the
NORTHWEST TERRITORIES, CANADA

Submitted to
ATKINSON PETROLEUM LTD.
by
TELEDYNE EXPLORATION LTD.
PARTY NO. 620

I. INTRODUCTION

This report primarily concerns the field operations performed by Teledyne Exploration Limited, Party No. 620 in the seismic survey of the Trout Lake Project in the Northwest Territories, Canada.

The assigned program in the Trout Lake Project was located between latitudes 60° 20' and 60° 36' North and longitudes 120° 55' and 121° 30', near the shores of Trout Lake.

Work was conducted in three separate areas in the project. Line numbers AP-1 through AP-8 inclusive are located on lands near the southeast shore of the lake and line numbers AP-9 through AP-11 inclusive are located on the peninsula in the southwest end of the lake, and line numbers AP-12 and AP-13 are located near the shore on the southwest side of the lake, and line number AP-14 is located on the peninsula extending into the lake from the west.

The crew was quartered in a portable camp, which was situated in two different locations during the course of operations. The office staff was located in Calgary, Alberta.

Field operations commenced on December 8, 1971 and ceased on January 26, 1972.

The survey was conducted with a 24 trace SDS 1010 Binary Gain Digital Recording System for Atkinson Petroleum Ltd.,

by Teledyne Exploration Ltd., Party No. 620. Mr. J. Duggan was the Party Chief and Mr. J. H. Jackson the Supervisor.

A total of 62.13 miles of line was recorded during the course of operations. This control was primarily additional detail of previous work in the area.

The primary purpose of the assignment was to delineate more precisely anomalous conditions known or suspected to exist in the Slave Point Zone.

II. OPERATIONS

1. General Accessibility

The first campsite was located approximately 177 miles from the town of Fort Nelson, British Columbia and was accessible via the Simpson Trail from Fort Nelson to the boundary between British Columbia and the Northwest Territories, then east via the trail along the boundary line for 28 miles and then north along a network of well roads and old sets lines for 36 miles to the campsite, which was about 7 miles from the southeast portion of the lake. The second campsite was located approximately 5 miles west of the southwestern tip of the lake and approximately 200 miles from Fort Nelson, British Columbia.

The area is accessible only in the winter after enough frost is in the ground to freeze the muskegs and wet terrain.

sufficiently to withstand the weight of the vehicles.

2. Location of Camps

Site No. 1 - Grid 60° 30' North, Longitude 120° 45'

Block No. 66 on S.P. 566, Line U-9

Site No. 2 - Grid 60° 30' North, Longitude 121° 30'

Block No. 95 on S.P. 27, Line U-40-10

3. Surface Conditions

The forest cover consists of fir, spruce, poplar and jackpine trees, thickly interlaced with muskeg.

4. Topography

Lines AP 1, 2, 3, 9, 10 and 11 are located on hilly terrain and the rest of the lines are in relatively flat areas covered with numerous soft muskegs and hummocks.

The topography ranges from approximately 1,625 feet to approximately 2,300 feet above sea level.

Numerous small streams which empty into Trout Lake drain the area, with the Island River providing the principal source of drainage from the southeast.

5. Logistics

Due to the nature of the program, some very long drive times to and from the field were incurred. The long drive times

were due to a combination of distance and very rough terrain across the muskegs and hummocks. Some of the units logged as much as seven hours drive time for a day in some instances.

A mobile radio and a single side band radio were installed in camp. Reception on the single side band radio ranged from fair to extremely poor. The mobile radio was only a 25 watt radio and was not of any use. Any mobile unit in the area should be at least an 80 watt radio.

There is a fairly good air strip in the area and is located beside the Island River and approximately one mile north of the Pan Am et al Island River R 0 18 well site.

6. Outside Service

Bulldozing - From 2 to 3 dozers were contracted from Tompkins Contracting Ltd. for the purpose of cutting and cleaning of lines for recording purposes, access routes, snow plowing, towing vehicles, making campsites, detours, creek fills and etc.

Drilling - Two top drive, one sugar, and two conventional drills were contracted from Sando Drilling and one conventional drill was contracted from Jackpine Drilling during the course of operations. Two conventional drills had extra personnel for shift work.

One spare water truck was also contracted from Sando Drilling.

Catering - Catering Services were contracted from
Crown Caterers Ltd.

III. SEISMIC TECHNIQUE

1. Instruments

SDS 1010 24 trace Binary Gain Digital Recording
System

2. Geophones

9 per trace, spaced 25 feet apart + 14 HZ Mark L-2

3. Cables

Eight sections C.D.P. cables - 2,800 feet in length
12 traces per section - 225 feet between takeouts

4. Filter Setting

Low = out (12-Out)

5. Sample Rate

2 Milliseconds

6. Record Length

4 seconds

7. Parameters

Type of coverage - 400% C.D.P.

Group Interval - 220 feet

Shot Point Interval - 660 feet

Spread - 2640' - 220' - 0 - 220' - 2640'

Shot Points - Two holes per location drilled to a depth of 60 feet and spaced 110 feet apart.

Charge Size - 5 pounds per hole

IV. COMMENTS

1. Recording

During the course of operations the recording unit was idle for a total of seventeen days due to lack of sufficient holes being drilled ahead of the crew.

The quality of the field data ranged from very poor to very good with the majority of the recording being considered to be in the fair to good range.

In instances where single holes were shot instead of the standard of 2 holes per location, there did not appear to be any appreciable deterioration in the quality of the data. The same holds true for instances where 2 holes at 40 feet were shot instead of 2 holes at 60 feet.

2. Drilling

Drilling conditions proved to be much more difficult than was anticipated prior to commencing the work. Operations were severely hampered by a combination of these more difficult drilling conditions, long drive times to and from the field over rough terrain, breakdowns, flu, extremely cold weather, logistics, communications, and lack of a full complement of competent and reliable drill personnel.

Gravel was frequently encountered and the auger type drills were not able to drill the holes, consequently conventional drills would have to drill in these areas of gravel.

3. Surveying

Teledyne Exploration's survey within the program area established a number of discrepancies which exist on the present base map, and are as follows:

(1) The Pan Am et al Island River 0-12 well is mis-plotted to the east by 700 feet in relation to coordinates as per legal survey.

(2) The A.P.L. - Canso Island River M-51 well in actual fact falls in D-52 (West longitude: $121^{\circ} 10' 46.35''$ North latitude: $60^{\circ} 21' 01.2''$)

(3) The shoreline as shown on the base map in relation to three Geodetic Triangulation Stations would indicate that the shoreline should be shifted to the southeast approximately 800 feet.

The survey was accomplished by use of a Theodolite

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Survey Instrument.

Locations were computed and then plotted on a sepiia base map supplied by the Client.

V. DATA PROCESSING

The data of the Trout Lake Area were processed in Teledyne's Processing Centre by Mr. R. Donnelly and Mr. H. G. Corall. The following steps were employed to yield fully corrected structure - and 100% near trace select - sections.

- (1) Gain Recovery,
- (2) Application of Normal Moveout curve,
- (3) Digital filter, 0.0 sec. to 3.0 sec.
20(30 db) - 55(90 db),
- (4) Correctional Statics, (Drift and Elevation Correction),
- (5) Paper display of fully corrected N.M.O. sections,
- (6) Additional statics and omits to flatten,
- (7) Near trace select for 100% flattened section,
- (8) Stack of 400% section,
- (9) Additional structure statics,
- (10) Apply digital A.G.C., 0.0 - 2.3 sec. - .100 + .200,
2.3 - 3.0 sec. - .200 + .100,
- (11) Film display of structure section and 100% near trace select.

The film sections were presented in:

Var/Calvo 100% shaded

6 traces per inch - horizontal scale

7 1/2 inches per sec. - vertical scale

out ~ 1/100 - Analog plotting filter

The quality of the presented film sections was considered good; clearly defining various reflection markers present in the Trout Lake Area.

All pertinent data were transmitted to Mr. E. Jackson, Vye Exploration Ltd., 512 Sixth Street S.W., Calgary, Alberta, for interpretational purposes.

VI. STATISTICAL SUMMARY

1. Recording and Shooting

Date work started: December 8, 1971

Date work completed: January 26, 1972

Working days: 18

Non-productive days: 32
(Moving, holidays, waiting on drills, etc.)

Miles of line shot: 63.13

Average miles of line per day: 1.26

Average miles of line per working day: 3.51

Number of shot point locations: 519

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Average number of locations shot per day: 10.4

Average number of locations shot per working day: 28.83

2. Drilling

Date drilling started: December 8, 1971

Date drilling completed: January 24, 1972

Total footage drilled and loaded: 54,252

Average footage drilled per location: 104.5

Total number of shifts drilled: 138

Average footage per drill shift: 393.1

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J. H. Jackson
J. H. JACKSON - SUPERVISOR