PROJECT ACTION SHEET

RESOURCE EVALUATION BRANCH

PROJECT NUMBER: 9229-C20-1E

COMPANY: CANADIAN SUPERIOR (MOBIL)

REPORT TITLE: 1986 CAMERON HILLS SEISMIC

The following action has been taken:

Receipt acknowledged: JUNE 29/98

Reports and maps date-stamped: ✓

Reports for review list edited: ✓

Inventory sheet made: ✓

Mylar: YES

REVIEW AND APPROVAL MADE BY: _____

****RETURN APPROVED REPORTS TO MIKE McLINTON******

COMMENTS: 3 COPIES REPORTS MAPS MYLARS.

PROGRAM NUMBER 9229-C20-1E AREA CAMERON HILLS

YEAR 1986 E.A. _____

FILED UNDER: SAME

REPORTS

OPERATIONS REPORT: NUMBER 1

1986 CAMERON HILLS SEISMIC PROGRAM

INTERPRETATION REPORT: NUMBER _____

MAPS

SHOTPOINT MAPS NUMBER 1

SHOT POINT BASE MAP

INTERPRETATION NUMBER 4

- SLAVE POINT TIME STRUCTURE
- MUSKEG " "
- PRECAMBRIAN " "
- WABAMUN-SLAVE POINT ISOCHRON

OTHER NUMBER 4

SYNTHETIC SEISMOGRAMS

ENCL # 7A, B, C, D

SECTIONS NUMBER 8

STRUCTURAL STACK

LINE 85-366

-367

-368

-369

-370

-371

-372

-373

INTRODUCTION

In March of 1986, Canadian Superior Oil Ltd. (now Mobil Oil Canada) conducted a seismic data acquisition program in the Northwest Territories near the locality of 60'00 N,117'30 W. In order to conduct this survey, it was necessary to obtain authorization from the Canada Oil and Gas Lands Administration of the Federal Government. This report now completes Mobil Oil Canada's obligation to the terms of that work agreement.

The location map in Figure 1 shows the location of the Cameron Hills seismic program. A small scale shotpoint map is shown in Figure 2 and provides a more detailed picture of the seismic line locations. This same map on a 1:50,000 scale is included in Enclosure 1.


N.W.T.
B.C.
CAMERON HILLS
SEISMIC PROGRAM
ALBERTA
SASK.
Ft. McMurray
Peace River
Grande Prairie
Edmonton
Calgary
U.S.A.
CANADIAN SUPERIOR OIL LTD
CAMERON HILLS

FIGURE 1

STATISTICAL SUMMARY

The following is a summary of information pertinent to the operation of the Cameron Hills Seismic Program.

MOBILIZATION DATE: Feb 18/86

DEMOBILIZATION DATE: March 12/86

SIGNIFICANT DATES

Feb 17 Surveying commenced

Feb 19 Started cutting of new lines

March 1 Did testing and started production

March 3 Chaining completed

March 4 Survey completed

March 10 Recording crew completed production

PERSONNEL

Contractor

Sonics

1 - Party Manager

1 - Assistant Party Manager

1 - Supply Man

1 - Mechanic

1 - Vibrator Technician

4 - Vibrator Operators

1 - Observer

1 - Junior Observer

4 - Line Truck Drivers

8 - Helpers

23 Total *this crew has a 70% northern content

Sub-Contractors

Raymac

1 - Catpush

2 - Surveyors

2 - Rodmen

5 Total

Pearson

1 - Cat Foreman

1 - Cook

5 - Cat Skinners

1 - Drag Operator

8 Total

Hofam

1 - Cook

1 - Cook's Helper

1 - Camp Attendant

3 Total

PRODUCTION DATA

Number of Kilometers Recorded: 59.767

Number of Recording Days: 11

March	Line Number	Kms Recorded	Field Hours	Hours/Km
1	85-366	3.63	10.0	2.75
2	85-366	5.67	12.5	2.20
3	85-373	2.16	3.00	1.39
4	85-373	4.81	10.0	2.08
5	85-372	5.83	11.5	1.97
6	85-371	6.77	12.0	1.76
7	85-370	7.92	14.0	1.76
8	85-370, 85-368	6.86	13.0	1.89
9	85-368, 85-367	8.14	15.0	1.84
10	85-367, 85-369	7.99	14.5	1.82
11	85-369	pick up line		3.00

Average daily production: 5.433 km, 1.77 hours/km

Days lost to weather condition: 0

Days lost to equipment failure: 0

DATA ACQUISITION AND FIELD PROCEDURES

This is a summary of the equipment and procedures used in the acquisition of the seismic data.

SURVEYING EQUIPMENT

Wild T-16 F NR 260064

Geodimeter 112 Type # 571132026

POSITIONING SYSTEM

Sun Shots and Benchmarks

DATA SOURCE

3 Litton Model 315 6x6 truck mounted vibrators with

Pelton Advance I, Model 5 control electronics.

3 vibrators spaced at 18 m over 36 m.

7 moves of 5.14 meters

8 sweeps (vari-sweeps) ,12 seconds/sweep

1. 15-75 Hz
2. 20-80 Hz
3. 25-85 Hz
4. 27-87 Hz
5. 30-90 Hz
6. 33-93 Hz
7. 35-95 Hz
8. 40-100 Hz

RECEIVER SYSTEM

Type:	OYO 14 Hz geophones
Array Geometry:	Inline
# Detectors per Array:	9
Detector Spacing:	9 geophones per array spaced at 2.25 m over 18 m

SPREAD

Shooting Direction:		East-West
Fold:		1500%
Station Interval:		72 m
Shot Point Interval:		18 m
Spread:	(Trace)	1————60 60————120
Distance:	(meters)	1152——90 X 90——1152

RECORDING SYSTEM

Recording Instrument:	FTI - DFS-V
Number of Channels:	120
Record Length:	2 seconds
Sample Rate:	2 milliseconds
Field Filter:	8-128 Hz
	18 dB/oct low, 72 dB/oct high
Notch Filter:	OUT
Tape Format:	SEG B
Tape Density:	1600 BPI

GEOPHYSICAL DATA PROCESSING

The following is a breakdown of the final processing sequence applied to the seismic data. The end result is an unmigrated stacked seismic section. Copies of all the sections are included in Enclosures 2A through 2H.

1. DEMULTIPLEX

Output Sample Rate: 2ms

Output Data Length: 2 sec

2. GEOMETRY

Line, Pattern, Source, Elevation Static

3. AMPLITUDE RECOVERY

Type: Spherical Divergence

4. DEPHASING

Geophone: 14 Hz 60% Damping

5. DECONVOLUTION

Type: Predictive

Prediction Distance: 12 ms

Operator Length: 60 ms

Prewhitening: 0.1%

Application Window: 0-2000 ms

Design Window (near offset- 90 m): 200-1200 ms

Design Window (far offset- 1152 m): 800-1200 ms

6. **CDP GATHERS**

7. **STATICS**

Interactive Refraction Statics

Drift and Weathering Corrections

8. **VELOCITY ANALYSIS**

Referenced to Surface

9. **NORMAL MOVEOUT CORRECTION**

Referenced to Surface

10. **AUTOMATIC SURFACE CONSISTENT STATICS**

Window: 350-1100 ms

Maximum Shift: +/- 24ms

# of Iterations: 3

11. **RE-ITERATION OF STEPS 8. AND 9.**

12. **REFLECTION STRENGTH GAIN**

Standout After Gain: 1.75

13. **TRACE MUTE**

Offset (m):	230	310	900	1160
Time (ms)	0	300	900	1000

14. CDP STACKING

Stacking Fold: 1500%

15. AUTOMATIC TRIM STATICS (C.D.P.)

Window: 350-1100 ms

Maximum Shift: +/- 12 ms

Model Traces: 5 Traces

16. FILTER APPLICATION

Type: Bandpass

Domain: Frequency

Passband: 18/18 - 60/36

Application: 0-2000 ms

17. GAIN (RMS)

Length of First Gain Zone: 400 ms

Length of Longest Gain Zone: 400 ms

2000 RMS Amplitude

18. DISPLAY

Horizontal Scale: 12 Traces/Inch, 1 inch = 216 m

Vertical Scale: 7.5 Inches/Sec

Geospace Plotting Gain: 11 dB

INTERPRETATION

The overall quality of the seismic data was acceptable and displayed good reflector continuity. Line 86-366, however, was of much lower quality than the other lines. The reason for this drop in data quality is probably related to the fact that most of the survey is located over a Cretaceous clastic outcrop except line 85-366 which is located over a Wabamun carbonate outcrop.

The first phase of the seismic interpretation involved correlating the seismic responses of geologic boundaries of interest with seismic reflectors on the real data. This was done by creating synthetic seismograms from the acoustic well logs in the area and then matching these synthetics to the seismic data. The synthetics are included in Enclosures 7A-7C and examples of the synthetic to seismic ties are shown in Figures 3 through 5.

Analysis of the seismic sections revealed that structural relief exists on the Slave Point, Muskeg, and Precambrian markers. The seismic suggests that this relief is related to faulting of the Precambrian basement which was active up until Slave Point time.

Maps were created to show the location and areal extent of these structural features. These maps include Slave Point, Muskeg, and Precambrian Time Structure maps as well as a Wabamun - Slave Point Isochron map. These 1:50,000 maps were hand contoured using a 10 millisecond contour interval. In depth , 10 milliseconds corresponds to roughly 100 feet of relief.

The four maps all show that the regional strike trends northwest and the dip is down to the southwest. Local highs and lows are expressed as contour departures from the direction of regional strike. The Slave Point Time

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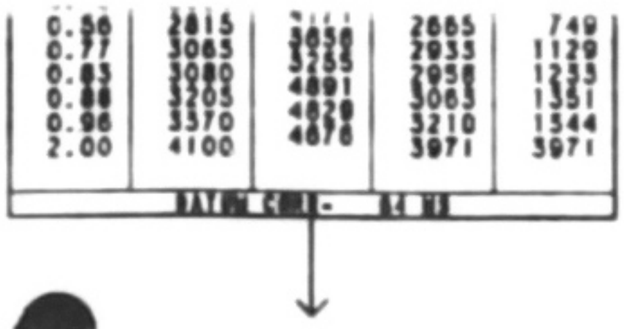
Structure map (Enclosure 3) and the Wabamun - Slave Point Isochron map Enclosure 6) both show that local relief exists on the Slave Point event. The isochron indicates that these features trend roughly northeast over the map area. The Muskeg and Precambrian Time Structure maps (Enclosures 4 and 5) also display the same type of features in the same general areas. This correlation of highs and lows supports the conclusion that the relief on the Slave Point event is related to underlying structure on the Precambrian Basement.

The size of the structures cannot be accurately determined given the present data coverage however a reasonable estimate would put them at around one square mile in area.



9-28-126-20W5

LINE 85-370

FIGURE 3

SYNTHETIC TO SEISMIC TIE

Polarity: Reverse to Field

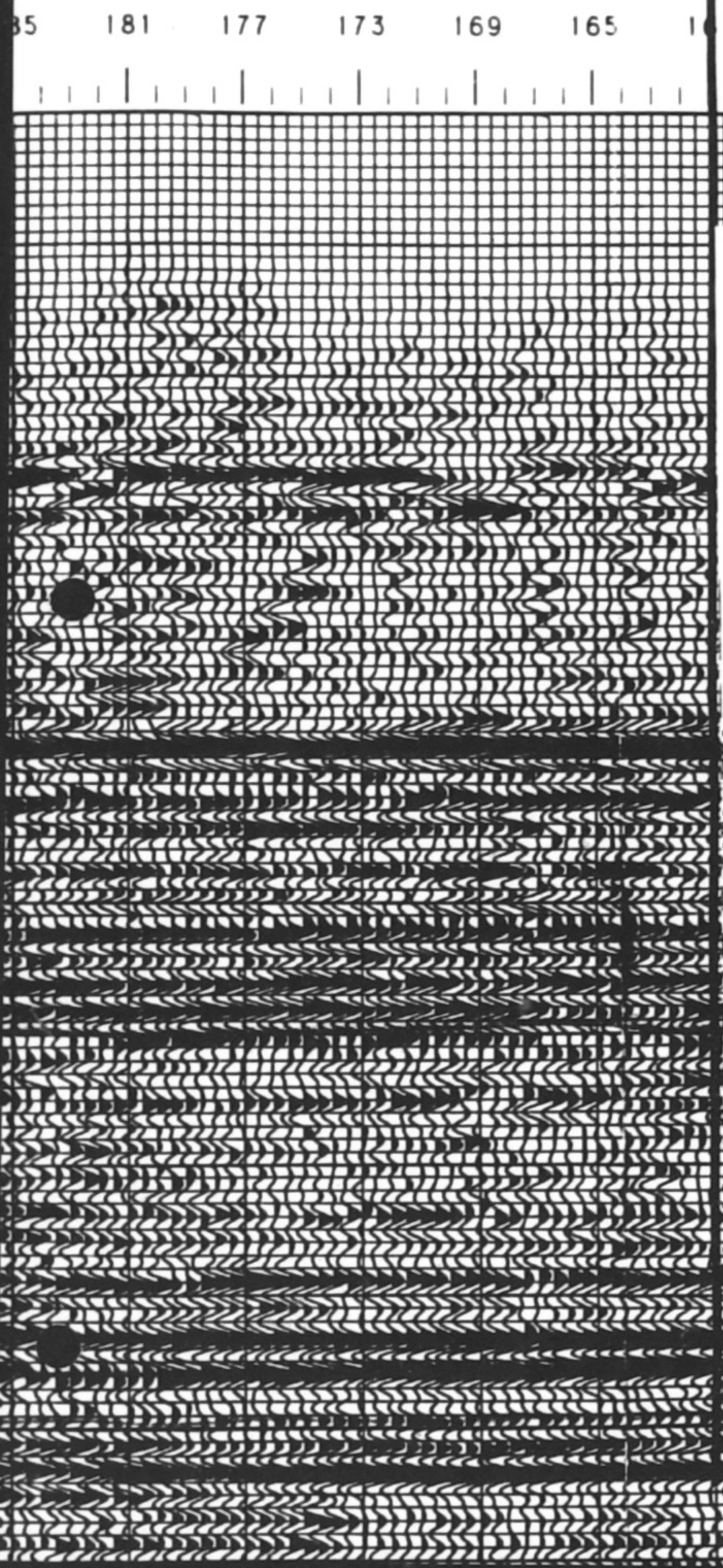


FIGURE 4

F-51 60.10 117.30

LINE 85-370

85-367 STTN.307

SYNTHETIC TO SEISMIC TIE

Polarity: Reverse to Field

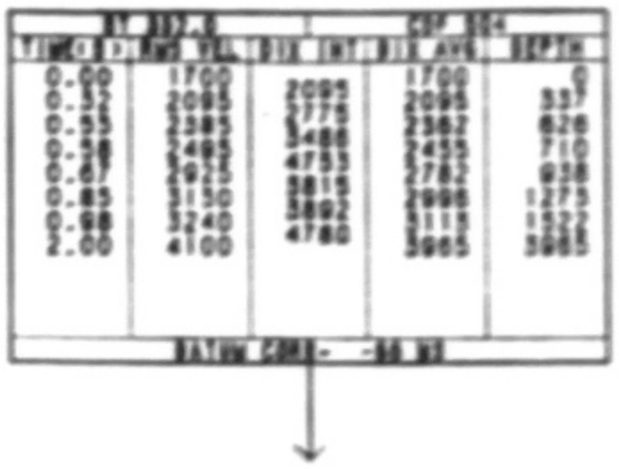
WABAMUN

SLAVE POINT

MUSKEG

KEG RIVER

PRECAMBRIAN



A-05 60.10 117.30

FIGURE 5

SYNTHETIC TO SEISMIC TIE

LINE 85-373

85-372 STTN. 3[illegible]7

86-T-095 STTN. 404

Polarity: Reverse to Field

361 357 353 349 345 341 33[illegible] 3

317

NORMAL

NORMAL RICKER @ 4 dg
30.0 Hz 24.0 ms

REFLECTION COEFFICIENTS

0.15

0.00

-0.15

WABAMUN

SLAVE POINT

MUSKEG

KEG RIVER

PRECAMBRIAN