

Program:
9229-W27-1P

FINAL REPORT
for :
Norman Wells 2D
Reflection Seismic Survey

location of operations :
Latitude : 65° 15' to 65° 19'
Longitude : 126° 49' to 126° 55'

dates of operations :
March 17-23, 1996

contractor :
Western Geophysical

operator :
Imperial Oil Resources Ltd.

report by :

March 20, 1997

9227-J1-1DA

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INTRODUCTION

Four lines identified as W96-08,09,10,12 were acquired by Imperial Oil Resources Ltd. by Western Geophysical as part of a much larger non exclusive program called "The MacKenzie Basin 2D" that was acquired for Western Atlas International Inc.

The project was under the supervision of Mr. Darrel Elliott of Western Geophysical and the field operations were coordinated by Party Managers Lud Letal and Leon Andrew. Residents of the Northwest Territories made up 65% of the crew compliment.

Recording equipment and survey instruments were flown up from Calgary to Norman Wells. As Western Geophysical maintains a shop facility and base in Norman Wells, all equipment was mobilised out of Norman Wells. Expediting for the field operations was based in Western's yard in Norman Wells. Personnel, fuel, food, aircraft, and other essential supplies were coordinated by the expeditors for the field operations.

The lines were located west of Norman Wells. Line 12 was located on Bear Island.

The field crew was setup in 2 separate sleigh camps: a cat camp and a recording camp.

Lines were cleared by Borek Construction. Dozing operations were coordinated by Mr. Rocky Arrnt.

Land use supervision was handled by the Northwest Territories. The permit was issued by the Inuvik Office of Indian and Northern Affairs. Prior to the permit being issued, meetings were held in Fort Norman and Norman Wells with Western Geophysical and local interest groups of the area. These meetings resulted in the conditions being drafted into the Land Use Permit.

SUMMARY

DATES OF OPERTATIONS :

Surveyors and line clearing commenced on March 7, 1996

Recording crew mobilised on March 17, 1996

Recording crew demobilised on March 23, 1996

PERSONNEL :

Recording

- 1 - Observer
- 1 - Assistant Observer
- 4 - Line Drivers
- 10 - Line Crew Helpers
- 1 - Cable Repair Technician

Surveying

- 1 - Cat Push
- 2 - Surveyors
- 3 - Helpers

Catering

- 2 - Cooks
- 2 - Assistant Cooks
- 3 - Camp Attendants

Expediting

- 2 - Expeditors
- 2 - Fuel Drivers

Source

- 1 - Vibrator Technician
- 4 - Vibrator Operators
- 2 - Night Men

Support

- 2 - Party Managers
- 1 - Clerk
- 3 - Mechanics
- 2 - Mechanic Helpers
- 1 - Medic

Line Clearing

- 7 - Dozer Operators
- 1 - Foreman
- 1 - Supply Driver
- 1 - Monitor

EQUIPMENT

Camp :

2 - Kitchens
2 - Utility/Storage
4 - Generator/Shop
2 - Office/Sleeper
5 - Sleepers
6 - Fuel Sloops
1 - Medic
1 - Grocery
1 - Garbage

Sleigh Mounted 10 x 40
Sleigh Mounted 10 x 40
Sleigh Mounted 10 x 40
Sleigh Mounted 10 x 40
Sleigh Mounted 10 x 40
Sleigh Mounted 3000 gallon each
Sleigh Mounted 10 x 40
Sleigh Mounted 10 x 40
Sleigh Mounted 10 x 40

Recording & Survey :

1 - Recorder
5 - Line Units
2 - Shop Units
2 - Party Manager Units
3 - Survey Units
2 - Water Unit
4 - Vibrators
4 - Snow Machines

Track Unit FN - 110
Track Unit FN - 110
Track Unit FN - 110
Track Unit FN - 110
Track Unit FN - 110
Track Unit FN - 110
LRS Buggy
Elan

Line Clearing :

6 - Dozers
1 - Loader
1 - Foreman Unit
1 - Fuel Supply Unity

Caterpillar D7
Caterpillar 977
Delta II
Delta III

PRODUCTION :

Total Kilometers Surveyed :
Down Time per day :
Kilometers Recorded per day :

11.5 km

1.2 km/day

WEATHER AND TERRAIN

Temperatures ranged from -43 to +5 Celsius through out the course of operations. There were occasional snowstorms during the survey which resulted in poor visibility and the lines drifting back in.

The terrain was was generally flat with a few hilly areas.

RECORDING OPERATIONS

Instruments	LRS VISION -1000
Number of Traces	360
Geophone Type	LRS - 1011
Geophone Frequency	14 Hz.
Geophone Array	9 geophones over 15 m. (1.88 m. spacing)
Sample Rate	2 ms.
Record Length	3 sec.
Anti-Alias Filter	412 Hz.
Low Cut Filter	Out
Receiver Interval	15 m.
Source Interval	45 m.
Fold	6000%
Spread	2745 - 60 - X - 60 - 2745 (balanced spread)
Source	LRS 311 buggy vibrator (33,000 lb.)
Number of Vibrators	3
Source Array	drag over 15 m. centered on flag
Number of Sweeps	4 sweeps
Length of Sweep	6 sec.
Sweep Array	8 Hz. - 96 Hz. nonlinear
Survey Instruments	Nikon E.D.M.
GPS Instruments	Trimble SST

DATA PROCESSING

Processing Sequence

1. Demultiplex
2. Trace Edits
3. Spherical Divergence $1/t^*v^{**2}$
4. Gain 800 ms agc
5. Noise Attenuation FK filter in shot mode
6. Deconvolution 4 componnet surface consistent spiking,
Operator length = 100 ms
0.1% white noise
7. Elevation Statics Datum = 0 m
Replacement velocity = 3400 m/s
Maximum power autostatics
8. Residual Statics
9. Velocity Analyses
10. Iterate 8 and 9, as necessary
11. CDP Trim Statics
12. Mute Analyses
13. CDP Stack
14. Migration Steep dip finite difference
100% stacking velocities converted to
interval velocities
Shaping deconvolution 10 - 100 Hz
12-18 - 100-115 Hz
15. Deconvolution
16. Bandpass Filter
17. Noise Attenuation

INTERPRETATION

The 1996 program was designed to image the profile of the top of Kee Scarp as it grades to the platform to the North. The profile was obtained by measuring the Kee Scarp to Hare Indian isochron.

The interpretation used a polarity where a trough corresponds to an increase in impedance on a zero phase section. Overlain on line 89761 in Montage A are the 3 key horizons used in mapping the Kee Scarp to Hare Indian isopach. The Hume was interpreted to guide the correlation of the Hare Indian in stretches where the Hare Indian reflection loses continuity. The Hare Indian reflection generally parallels the Hume. The Kee Scarp to Hare Indian isopach was derived from the isochron by applying a constant interval velocity of 5300m/s. The map shown in montage A is the Kee Scarp to Hare Indian isopach derived from isochron integrated with well controls in the mapped area. Uninterpreted sections of all 3 lines from the 1996 vibroseis program, in the same polarity as the sample interpreted line, are shown in montage A.