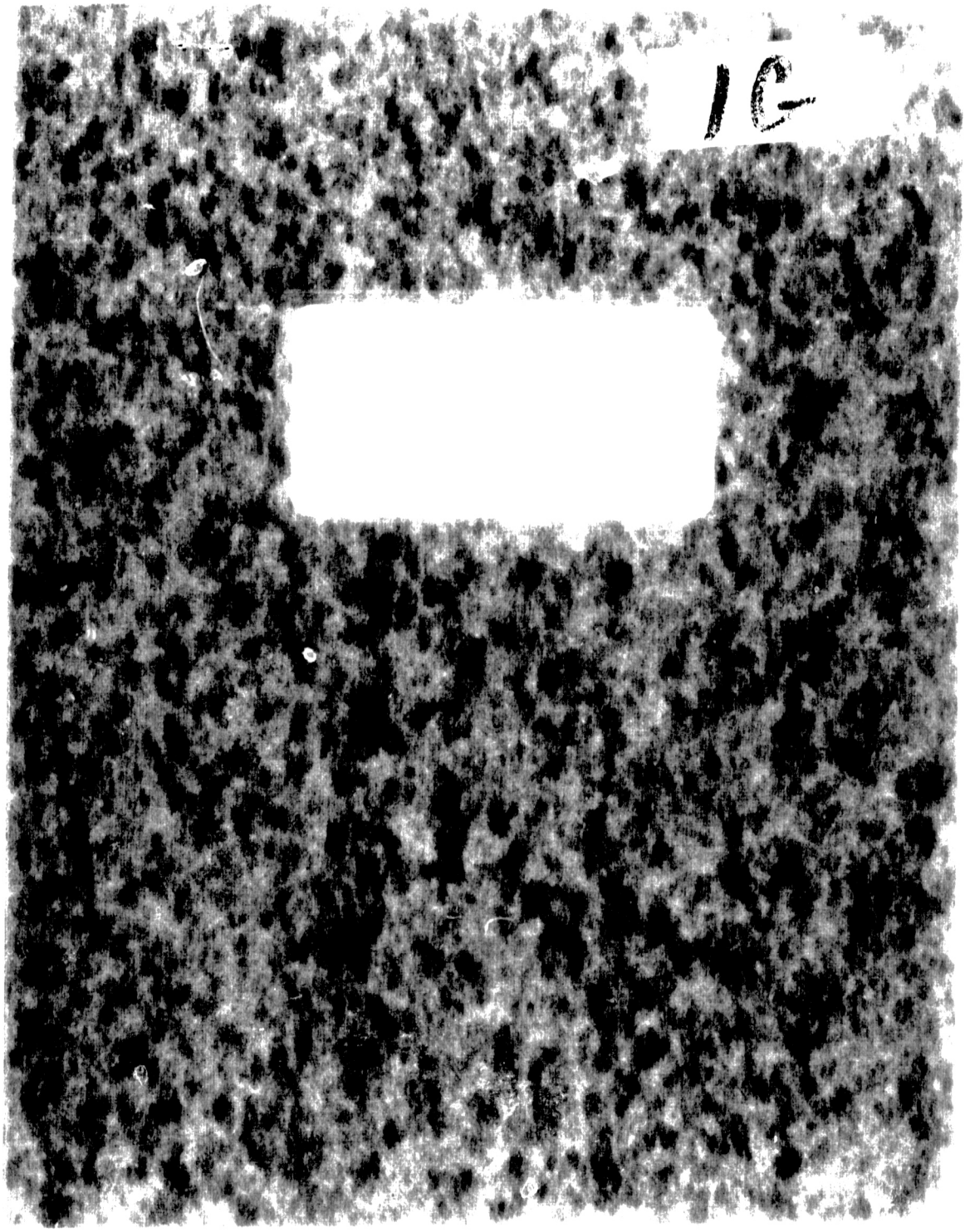


PROJECT NUMBER: 7-6-5-81-01 ~~7-6-5-377~~

COMPANY: Esso Resources

REPORT TITLE: Geophysical Survey Norman Wells, NWT

COMMENTS:

ENGINEERING AND CONTROL BRANCH

ENVIRONMENTAL AND PROTECTION BRANCH

RESOURCE EVALUATION BRANCH

Missing: 1) SP Map Incorporating Older data NOT AVAILABLE
✓ 2) Intvp maps in the 4 areas shot to N of Norman Wells
✓ — see 'Intvp page - no maps made'
✓ 3) Flattened sections 2nd for 13 lines

CANADA BENEFITS BRANCH

ACTION SLIP

FINAL REPORTS

Project No ...7-6-5-81-01.....

The following action has been taken:

Receipt acknowledged .....

Branch Card made .....✓

Reports and maps date-stamped.....

Reports and maps labelled.....

Date rec'd entered in project ledger.....

Memo sent to Land Management.....

Reports for review list edited.....

Inventory sheet made .....

REVIEW and APPROVAL made by:

~~Eng. and Control~~ .....

Resource Eval. ..... Dec 10/82

~~Inv. and Protect.~~.....

PLEASE STATE COMMENTS ON ATTACHED SHEET.

Esso Resources Canada Limited

Western Region - Alberta/British Columbia District

007-06-05-377

Report on Geophysical Survey - 1981

Norman Wells Area, Northwest Territories

Work done in field by Western Geophysical Co. of Canada Ltd.

Data processing done by Esso Resources Canada Limited

Exploratory Permits

Norman Wells Proven Area Agreement and

Groups L-92, L-95 and L-97

By

T.J. Hawkings

March, 1982

Project No. 07-06-05-81-01

0259F

MAPS AND SECTIONS

Maps

One copy of the following maps is included with this report:

Map	Scale	Area
Shotpoint Map	1:100,000	Norman Wells, NWT
Shotpoint Map	1:100,000	Brackett Lake, NWT
Isochron - Kee Scarp to Hume	1:62,500	Norman Wells, NWT

Sections

One copy of the final stacked sections is also included with this report. These seismic sections are shown on the shotpoint map. The sections submitted are:

81 E34 83737
81 E34 83738
81 E34 83739
81 E34 83740
81 E34 83741
81 E34 83742
81 E34 83743
81 E34 83744
81 E34 83745
81 E34 83746
81 E34 83747
81 E34 83748
81 E34 83749
81 E34 83750
81 E34 83751
81 E34 83752
81 E34 83753
81 E34 83754
81 E34 83755
81 E34 83756

Sections (Cont'd)

81 E34 83757
81 E34 83758
81 E34 83759
81 E34 83760
81 E34 83761
81 E34 83762
81 E34 83763
81 E34 83764
81 E34 83765
81 E34 83766
81 E34 83767
81 E34 83768
81 E34 83769
81 E34 83771
81 E34 83772
81 E34 83774
81 E34 83777
81 E34 83780
81 E34 83781
81 E34 83782
81 E34 83783
81 E34 83784
81 E34 83785
81 E34 83786
81 E34 83787
81 E34 83788
81 E34 83794
81 E34 83798

INTRODUCTION

This report covers the geophysical survey conducted by Western Geophysical Co. of Canada Ltd. on behalf of Esso Resources Canada Limited during 1981 on and off permits in the Norman Wells area shown on the index map.

The purpose of this project was to record approximately 290 km of reflection seismic data for better definition of the Norman Wells reef and to explore for Kee Scarp reefal buildups in four additional areas.

The seismic data acquired in this survey was processed by Esso Resources Canada Limited in their Calgary, Alberta, office.

EXPLORATORY PERMITS

1. Norman Wells Proven Area Agreement
2. Group L-92 Leases:
   1842-1848 inclusive, 1980-1989 inclusive, 2918
3. Group L-95 Leases
4. Group L-97 Leases

EXPLORATORY LAND OFF PERMITS

1. Open Crown land adjoining the above leases
2. Leases 2871-2874 inclusive

DATA ACQUISITION

The work in field was done by Western Geophysical Co. of Canada Ltd. (Party 34) in winter 1981.

Statistical Data

Dates

Mobilization days	January 2-8,	1981
Recording days	January 9-April 16,	1981
Demobilization days	April 17,	1981

Production

Number of kilometres shot in:

Brackett Lake	63.80
Oscar Creek	41.45
Norman Wells	129.11
Moon Lake	37.81
Donnelly	19.63
Total	288.8

Number of days worked 97

Equipment

A. Main Units

1 Ford 4x4 Crew Cab
1 Recording Unit FN110
1 Shooting Unit CF60 Crew Cab
3 Cable Trucks FN110 Crew Cab
2 Survey Units CF60 Crew Cab
2 Snowmobiles Polaris Single Track
5 Drilling Rigs CF110 Mayhew 1000 Air
1 Drilling Rig CF110 Mayhew 1000 Air/Water
1 Drilling Rig CF110 Failing Air
2 Water Trucks FN110
1 Mobile Shop FN110
1 Mobile Shop Ford 4x4
1 Support Vehicle Ford 4x4 Crew Cab
1 Support Vehicle Ford 2 wd 12 Man Bus

Equipment

B. Camp

1 Kitchen Unit sleigh mounted
1 Utility Unit sleigh mounted
1 Office/Sleeper Unit sleigh mounted
1 Recreation Hall-Sleeper Unit sleigh mounted
3 Sleeper Units sleigh mounted
1 Kitchen Utility Unit sleigh mounted
2 Power/Shop/Storage Units sleigh mounted
1 Fuel Shop Unit (3,000 gallons) sleigh mounted
1 Fuel Shop Unit (6,000 gallons) sleigh mounted

C. Bulldozer Crew

3 D7F Caterpillar Tractors c/w hydraulic blade and winch
1 D6C Caterpillar Tractors c/w hydraulic blade and winch
1 Safari Bombardier (Foreman vehicle)
1 Ford Crew Cab

D. Bulldozer Camp

1 Kitchen/Utility Unit sleigh mounted
1 Sleeper Unit sleigh mounted
1 Kitchen/Utility/Sleeper Unit sleigh mounted
1 Power Shop Unit sleigh mounted
1 Fuel Shop Unit (2,500 gallons) sleigh mounted

Personnel

A. Recording

1 Observer
1 Assistant Observer
1 Shooter
1 Assistant Shooter
2 Cable Truck Drivers
7 Recording Helpers

B. Drilling

7 Drillers
7 Driller's Helpers
1 Drill Foreman

Personnel (Cont'd)

C. Surveying

2 Surveyors
2 Survey Helpers

D. Catering

2 Cooks
2 Cook's Helpers
1 Camp Attendant

E. Additional

1 Party Manager
1 Clerk
2 Mechanics
1 Supply Man

F. Bulldozing

4 Bulldozer Operators
1 Foreman
1 Cook

Navigation

Normal land seismic surveying procedures were utilized. Horizontal control along the lines was obtained with a theodolite survey using geodetic triangulation stations for take-off positions. Elevation control was obtained from local geodetic bench marks based on mean sea level.

Conditions

Communication between field units and with base camp was via VHF two-way field radios.

SSB radio-telephone service was utilized for communication with headquarters offices in Edmonton and Calgary.

Field Procedures

Sample Rate	2 ms
Record Length	3 sec
Amplifiers	Sercel 338B
Tape System	Sercel 338B
Low Cut Filter	12.5 Hz
Number of Traces	48
Fold	1200%
Group intervals	8, 10, 15, and 33 m
Shot intervals	32, 40, 60, and 132 m
Geophones per group	9
Geophones	14 Hz

For more details on spread and geophone configuration, refer to diagrams at the end of this report.

DATA PROCESSING

The following steps were involved in processing by Esso Resources Canada Limited:

1. Demultiplex of field tape
2. Edit and Exponential Gain Recovery
3. Null Filter to attenuate linear noise
4. Deconvolution
5. Surface Consistent Short Period Statics
6. Normal Moveout Correction (determined by long trace single fold)
7. Automatic Trim Static in CDP order
8. Front End Mute
9. CDP Stack (600%)
10. Band Pass Filter
11. Gain Scaling for Display

RESULTS AND INTERPRETATION

The 1981 seismic program was designed to fulfill the following criteria:

1. Refine further our understanding of the Norman Wells reef complex, particularly at its downdip end.

2. Explore for a postulated reef buildup at Oscar Creek.

3. Obtain good quality seismic data in the Brackett Lake, Donnelly and Moon Lake areas in search for possible Kee Scarp buildups.

The Norman Wells data are of excellent quality. They help determine the northern as well as the southern edges of the Norman Wells reef complex.

They were incorporated in the enclosed Kee Scarp-Hume Isochron maps.

At Brackett Lake where a Kee Scarp buildup was postulated to be present in a synclinal area, visual inspection of the data indicates that the sediments in the Kee Scarp-Hume interval are structurally deformed. No visible criteria indicating the existence of reefal buildups are present. Consequently, this coverage has not been incorporated into our maps for the area.

The Oscar Creek coverage shows no obvious signs of a reefal buildup in the Kee Scarp interval in front of the Norman Range. A very minor cycle split in the Kee Scarp-Here Indian interval may be suggestive of a thickened Kee Scarp platform. No maps have been drawn for this area.

Moon Lake is an area where the Kee Scarp formation has been preserved in a small synclinal area. The Kee Scarp formation outcrops around its edges and lies only approximately 100 msec below surface in its centre. Excellent data indicates that no Kee Scarp buildups are present in this area. Because of this, the area has not been incorporated into our maps.

Data in the Donnelly synclinal area is unuseable. This may be due to the fact that the lines were shot in outcropping carbonates which may in fact be of Hume age. If this is true, the area cannot be considered prospective for Kee Scarp buildups.

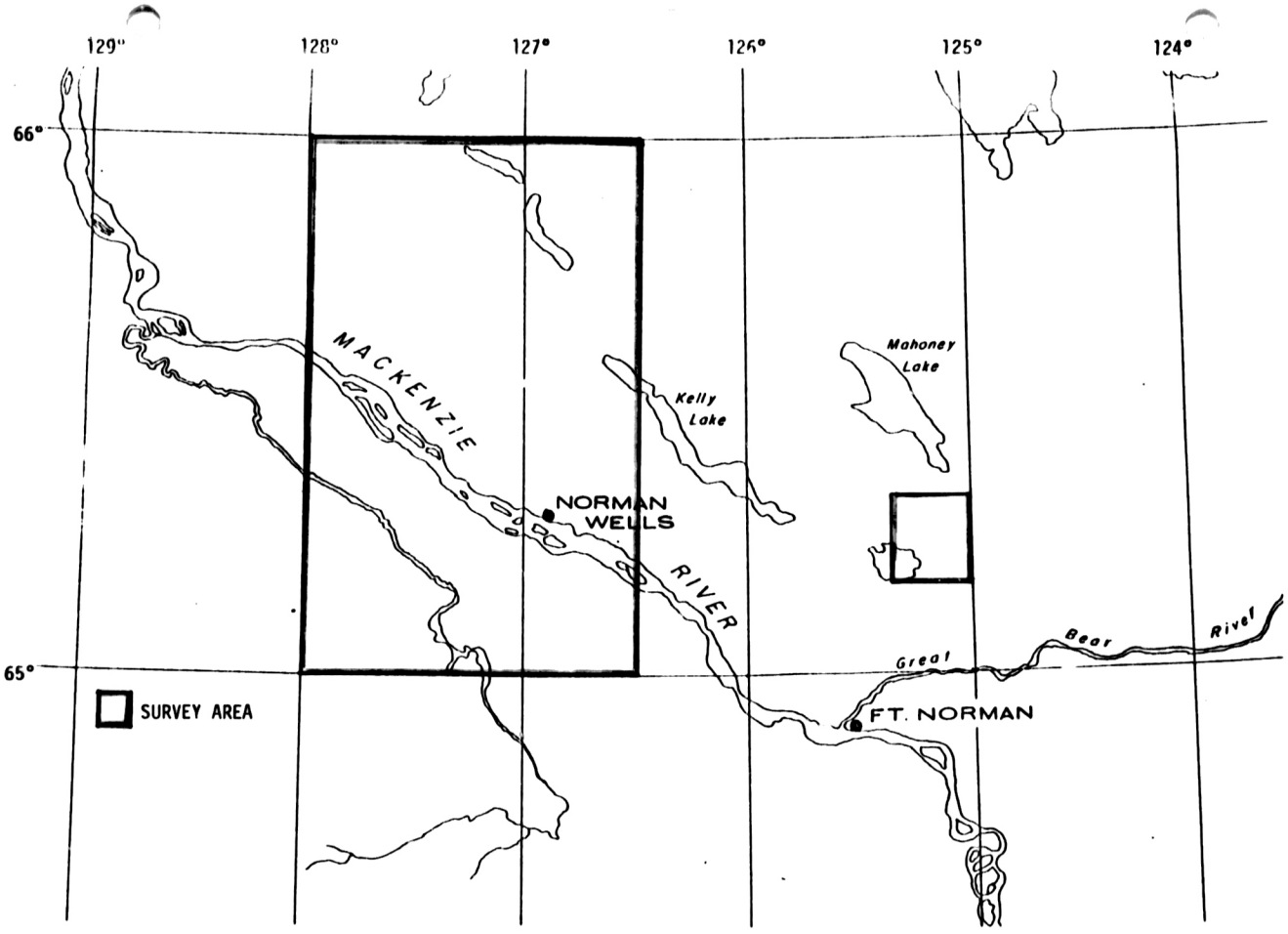
SUMMARY AND CONDITIONS

The seismic program shot during 1981 produced data of excellent quality.

The program was designed to fill in detail on the Norman Wells reef complex as well as to explore for Kee Scarp buildups in four other areas.

The lines at Norman Wells contribute greatly to the understanding of the morphology of the reef complex.

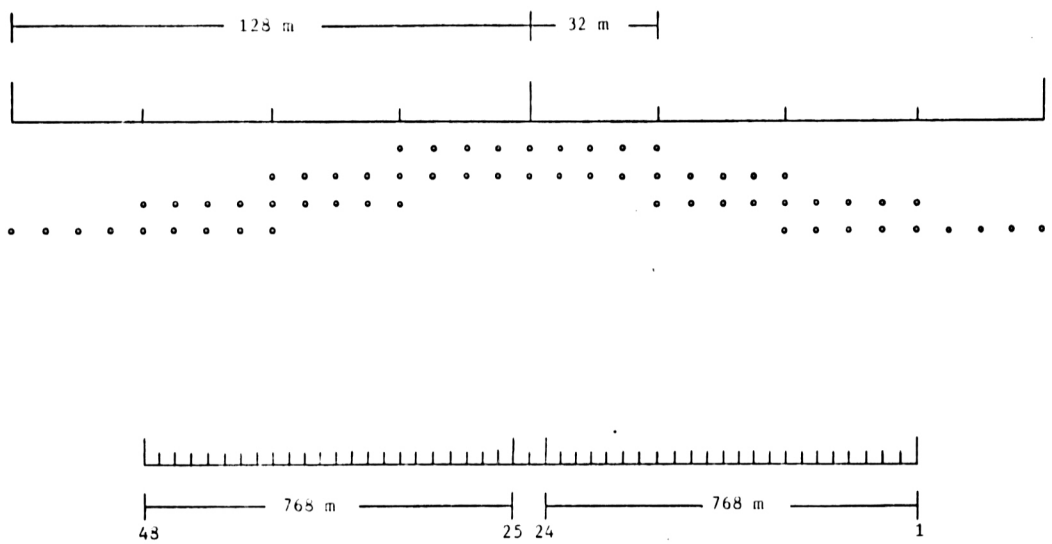
Interpretation of the remaining data does not support the presence of major reefal buildups at Brackett Lake, Moon Lake, or Donnelly.



PROJECT NO: 07-06-05-81-01
REFLECTION SEISMIC

NORMAN WELLS

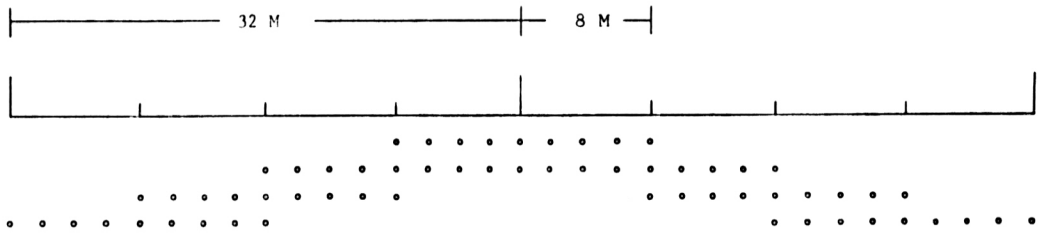
SPREAD and GEOPHONE CONFIGURATION

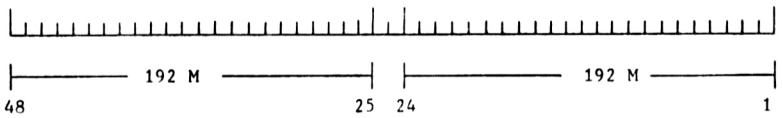


Shot Point Interval 128 m
Group Interval 32 m
Trace Length 64 m
Single Hole
Group Gap
Spread 768-32-0-32-768

For Norman Wells South

SPREAD and GEOPHONE CONFIGURATION

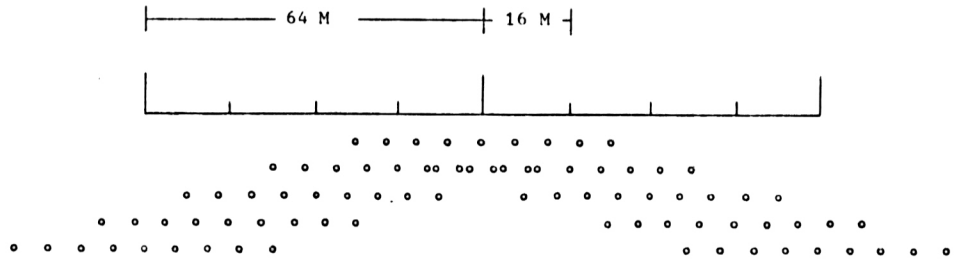


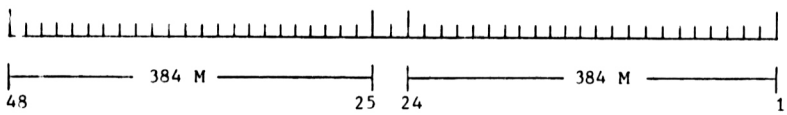


SHOT POINT INTERVAL ---------- 32 M
GROUP INTERVAL ---------- 8 M
TRACE LENGTH ---------- 16 M
SINGLE HOLE
GROUP GAP
SPREAD 192-8-0-8-192

FOR: NORMAN WELLS
OSCAR CREEK

SPREAD and GEOPHONE CONFIGURATION





SHOT POINT INTERVAL ---------- 64 M
GROUP INTERVAL ---------- 16 M
TRACE LENGTH ---------- 32 M
SINGLE HOLE
GROUP GAP
SPREAD 384-0-384

FOR: MOON LAKE
DONNELLY
BRACKETT LAKE