

Vibroseis Program - Lac Maunoir Area

December 1971 to February 1972

Project No. 7-6-6-72-1

By: D. Jardine

January 1975

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IMPERIAL OIL LTD.

WESTERN EXPLORATION DISTRICT

Vibroseis Program - Lac Maunoir Area

December 1971 to February 1972

Operator Imperial Oil Ltd.

Contractor: Western Geophysical Party #35

Permits: Groups 932 & 935

Project No.: 7-6-6-72-1

by

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Manager, Western Exploration District

January 1975

## TABLE OF CONTENTS

	Page
<b>Introduction</b>	1
<b>Locality Map</b>	2
<b>Statistical Data</b>	3
<b>Field Procedures</b>	4
<b>Data Processing</b>	4
<b>Results and Interpretation</b>	4
 <b>Enclosures:</b>	
Cambrian Time Structure	
Lac des Bois Map Sheet	
Lac Maunoir Map Sheet	

Introduction

This is a report on a vibroseis reflection survey conducted by Western Geophysical Party #35 on behalf of Imperial Oil Limited in the Lac Maunoir Area N.W.T. from December 1971 to February 1972.

P. & N. G. GREAGE

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LITIO 99.9%

Statistical Data

Dates: The crew arrived from and left for other assignments.

Shooting began on November 28, 1971 and was completed on March 13, 1972 at which time the crew was released. There was a break from December 21, 1971 to January 4, 1972 inclusive. There were also 14 down days because of weather in February and March and 2 down days because of equipment problems.

Production: A total of 210 miles of line were shot. There were 2091 vibrator points over which a total of 2728 vibrations were made. Also 343 shots were made at 340 shot points for near surface velocity control.

Equipment: The vibrators were twin mounted vibroseis units on trucks. The recorder unit was an S.D.S. Model 1010 Binary gain digital unit, also truck mounted. Other equipment consisted of: shooter truck, reel truck, 2 survey trucks, 2 shot hole drilling rigs, 1 water truck and 2 bulldozers. The crew was supplied by charter air service.

Personnel: Party Manager, Operator and Assistant, Shooter and assistant, two surveyors, two rodmen, four geophysical helpers, two drillers, two drill helpers, water truck driver, four bull dozer operators, cook, cook's helper, and camp attendant.

Surveying: Horizontal angles were measured to + or -20 seconds with a Wilde T-16 theodolite. Horizontal and vertical control was based on previous seismic survey and the baseline survey.

Conditions: Weather conditions were normal ranging from 0°F to -50°F during December and early January. During late January, February and March extreme cold and strong winds with occasional snow were encountered in some combination for about half the time. This caused a total of 14 down days.

#### Field Procedures

A 600% C.D.P. method of recording was used. Four vibrators giving a total of 16 sweeps with a sweep frequency of 56 to 14 Hz over 7 seconds were used. The spread was a symmetrical 2400' split spread. Vibrator points were 450' apart, with geophone stations 150' apart using 18 geophones of 14 Hz peak frequency response over 300'. Average charge size in shot holes were 20 lbs at an average depth of 40'.

#### Data Processing

All of the seismograms were corrected to a datum of +1000' ASL using a datum velocity of 18,000'/s. Weather corrections were applied where the base of the shot did not penetrate the weathering layers.

The data were played back digitally with 6 fold stacked sections being produced on variable density film. The data were all filtered during processing to remove interfering events such as noise and ground roll. Multiple energy was not a problem but a short deconvolution operator was used to whiten the frequency spectrum.

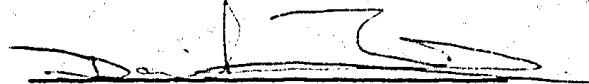
#### Results and Interpretation

The quality of the seismograms obtained was fair to poor with only a few lines achieving good quality results. The only consistent reflection was from the Cambrian top. Intermittent reflections from

both the Paleozoic carbonate top and the Proterozoic Unconformity were obtained but these were neither continuous nor consistent enough to make a meaningful map. No isochron maps were made for this reason.

Major anomalies found were structural highs on all reflectors, coinciding with the surface topographic highs produced by carbonate ridges. Some onlap of Cretaceous beds onto these highs was found but the depth of burial seems insufficient to produce hydrocarbons.

The triangular Maunoir dome was found to be fault controlled at depth on all three sides. It seems likely that this feature was formed by the intersection of the N-S and ENE-WSW magnetic (fault) trends seen on the aeromagnetic control in this area. It seems likely from well results to date that at least one of these fault trends was an effective destroyer of any pooled hydrocarbons.



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Manager, Western Exploration District

JET:gs

IMPERIAL OIL LIMITED  
EDMONTON-ALBERTA

**ZONE B**

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34-12345

**SHENANDOAH MAP  
TIME STRUCTURE  
CAMBRIAN**

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IMPERIAL OIL LIMITED  
EDMONTON-ALBERTA

ZONE II

Gp 96K 2 CL



100

PROJECT No.

PROJECT No.

SEISMICGRAPH MAP  
TIME STRUCTURE  
CAMBRIAN

Salinity Standard - 30.0‰  
Turbidity Standard - 100 NTU  
Sodium Standard - 400 ppm

## LAC DES B ...X

## LAC DES BOIS