37-6-4-99
Shell

Ottawa

GEOPHYSICAL REPORT ON

THE FORT PROVIDENCE AREA

NORTHWEST TERRITORIES

1969 - 1970

TO GOVERNMENT OF CANADA

37-6-4-99

GEOPHYSICAL REPORT ON
THE FORT PROVIDENCE AREA
NORTHWEST TERRITORIES
1969 - 1970
TO GOVERNMENT OF CANADA

TO ACCOMPANY STATEMENT OF
EXPENDITURES FOR WORK CONDUCTED
DURING THE DECEMBER 1969 TO FEBRUARY 1970
PERIOD

SHELL CANADA LIMITED
SOUTHERN DIVISION EXPLORATION
EDMONTON, ALBERTA, MAY 5, 1970

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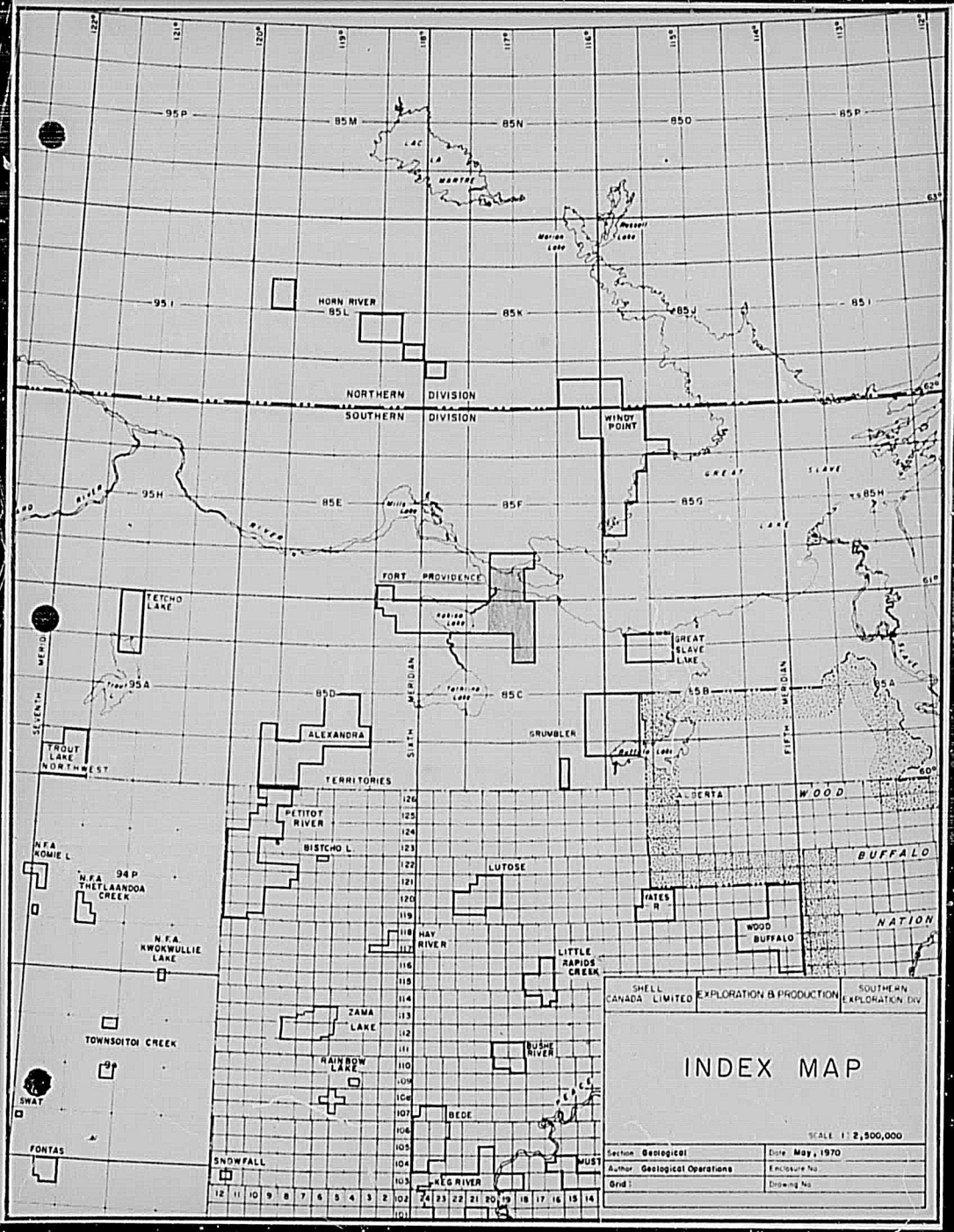

95P
85M
85N
85O
85P
LAC LA MARTRE
Marian Lake
Russell Lake
95I
HORN RIVER
85L
85K
85J
85I
NORTHERN DIVISION
SOUTHERN DIVISION
WINDY POINT
95H
85E
85F
85G
85H
Mills Lake
GREAT SLAVE LAKE
FORT PROVIDENCE
Providence Lake
TETCHO LAKE
95A
85D
Tathlina Lake
85C
85B
85A
ALEXANDRA
GRUMBLER
Buffalo Lake
TROUT LAKE
NORTHWEST TERRITORIES
ALBERTA
WOOD BUFFALO NATION
PETITOT RIVER
BISTCHO L.
LUTOSE
FATES R.
WOOD BUFFALO
N.F.A. KOMIE L.
N.F.A. 94P THETLAANDOA CREEK
N.F.A. KWOKWULLIE LAKE
HAY RIVER
LITTLE RAPIDS CREEK
ZAMA LAKE
TOWNSOITOI CREEK
RAINBOW LAKE
BUSHE RIVER
SWAT
FONTAS
SNOWFALL
BEDE
KEG RIVER
MUSK
SEVENTH MERID.
SIXTH MERIDIAN
FIFTH MERIDIAN
SHELL CANADA LIMITED
EXPLORATION & PRODUCTION
SOUTHERN EXPLORATION DIV.
INDEX MAP
SCALE 1 : 2,500,000
Section Geological
Date May, 1970
Author Geological Operations
Enclosure No.
Grid :
Drawing No.

I. INTRODUCTION

In accordance with section 54 of the Oil and Gas Land Regulations we submit the following report on a geophysical program conducted by Shell Canada Limited in the Fort Providence Area of the Northwest Territories. The survey was carried out between December 1969 and February 1970 and was over P. & N.G. Permits No. 3193, 3194, 4236, 4237, 4238, 4608 and 5355 all of which are held by Shell Canada Limited and form part of Permit Group No. 220. In addition to above permits, this report includes work on Permit 4936 which is held by Tenneco Oil and Mineral Limited, and off permit work for which prior approval was granted.

II. HISTORY OF PERMITS

An updated status of permits in Group No. 220 follows:

Permits No. 3193, 3194	renewed for sixth year	February 23, 1969
Permits No. 4236 to 4238	renewed for second year	April 30, 1969
Permit No. 5355	renewed for first year	October 27, 1969
Permit No. 4608	renewed for second year	January 27, 1969

A special renewal, conditional on a work deposit of $.25/acre, was granted on Permits No. 3193 and 3194. This renewal is for three months beginning February 22, 1970.

III. SEISMIC WORK PERFORMED:

A seismic survey consisting of 123 miles of 600% reflection coverage was carried out by Shell Party 4. A similar mileage of refraction data was recorded simultaneously. Additional shooting consisted of a velocity profile and a noise spread.

27-6-4-10-1

IV. STATISTICAL DATA:

1). Data:

Surveying of seismic program commenced ..... December 15, 1969

Line cutting and clearing commenced ..... December 17, 1969

Drilling of shot holes commenced ..... December 28, 1969

Field crew commenced shooting and recording .... January 5, 1970

Line cutting and clearing completed .....January 21, 1970

Surveying completed ..... January 21, 1970

Drilling completed ..... January 30, 1970

Program completed by field crew ..... February 4, 1970

2). Production:

Miles surveyed 123

Number of shots 1736

Number of shotpoints 1647

Number of stations - reflection 3239

- refraction 3063

Average daily production (profiles) 69

Days worked 24

Shut down due to weather or equipment failure ..... nil

3). Equipment :

Dozers - Two D6C and Two D7 - 17A cats each working two shifts.

Water trucks - one for each drilling crew and one spare.

Drills - Three Mayhew 1000 (Apache 10, Seisform 20 Radco)

Three Failing CFD1 (Apache 31, Seisform 10 Transprovincial)

Two Sewell (Northland, Geoserve)

Recording truck ..... Ford 3/4 ton 4 x 4

Shooting truck ..... Ford 3/4 ton 4 x 4

Recording Unit ..... Shell AQ - 1 (Unit number s-186)

Seismometers ..... Geospace HSJLI

4). Personnel:

Field Manager

1 operator)

) + eight man instrument crew

2 shooters)

2 surveyors each with a helper

2 mechanics

5 drillers each with a helper

2 additional drillers each with a helper January 15 - January 23

5). Surveying:

Lines were located by modified 3° UTM coordinates with reference meridian at 117° west longitude.

6). Conditions:

Apart from drifting which prevented two drills from reaching the field on January 11, no serious operational difficulties were encountered.

No weather data was recorded.

V. FIELD PROCEDURES:

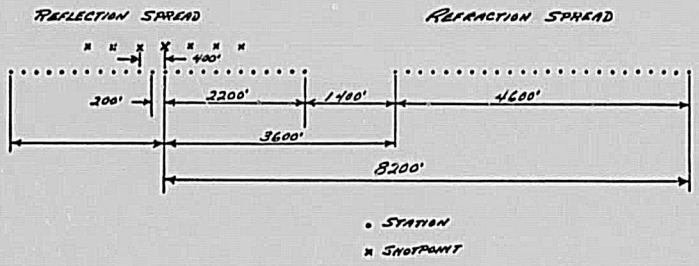
Reflection data was shot as roll-along split spreads where minimum shooting distance = 0' and maximum shooting distance = 2400' and was recorded on channels 25 - 48 of a 48 channel AQ - 1 recording instrument. The field filter was down 3 db with a slope of 18 db per octave at 38 c/s for low cut, and down 3 db with a slope of 18 db per octave at 120 c/s for high cut.

Refraction data was shot as offset enders where near surface distance = 3,600' and far surface distance = 8,200' and was simultaneously recorded on channels 1-24 of the same 48 channel instrument. Field filter for refraction data was open (no filter) for low cut and down 3 db with a slope of 18 db per octave at 120 c/s for high cut.

Charges varied from 5/8# to 2 1/2# and depth from 20' to 60' with 1 1/4# @ 40' predominant. The pickup at each station consisted of eight geophones in series parallel @ 20' spacing.

Reflection shooting geometry consisting of split spreads with shot points at alternate stations such that station interval = 200' and shot point interval = 400' yeilding a maximum stack of 600% with sub-surface points 100 feet apart.

SPREAD DIAGRAM



VI RESULTS & INTERPRETATION:

Field reflection data ranged in quality from good to poor. The poorer were low frequency and/or subject to shear wave interference. The data were digitized frequency normalized, statistically corrected and stacked. The results have been good.

The refraction data recorded the top carbonate rather well. Some problems were encountered in maintaining consistent amplitude resulting in local difficulties in correlation due to inter-trace tangling.

Reflection data indicate the Slave Point reef by a basement time uplift, character change and dips. Refraction data confirm the edges.

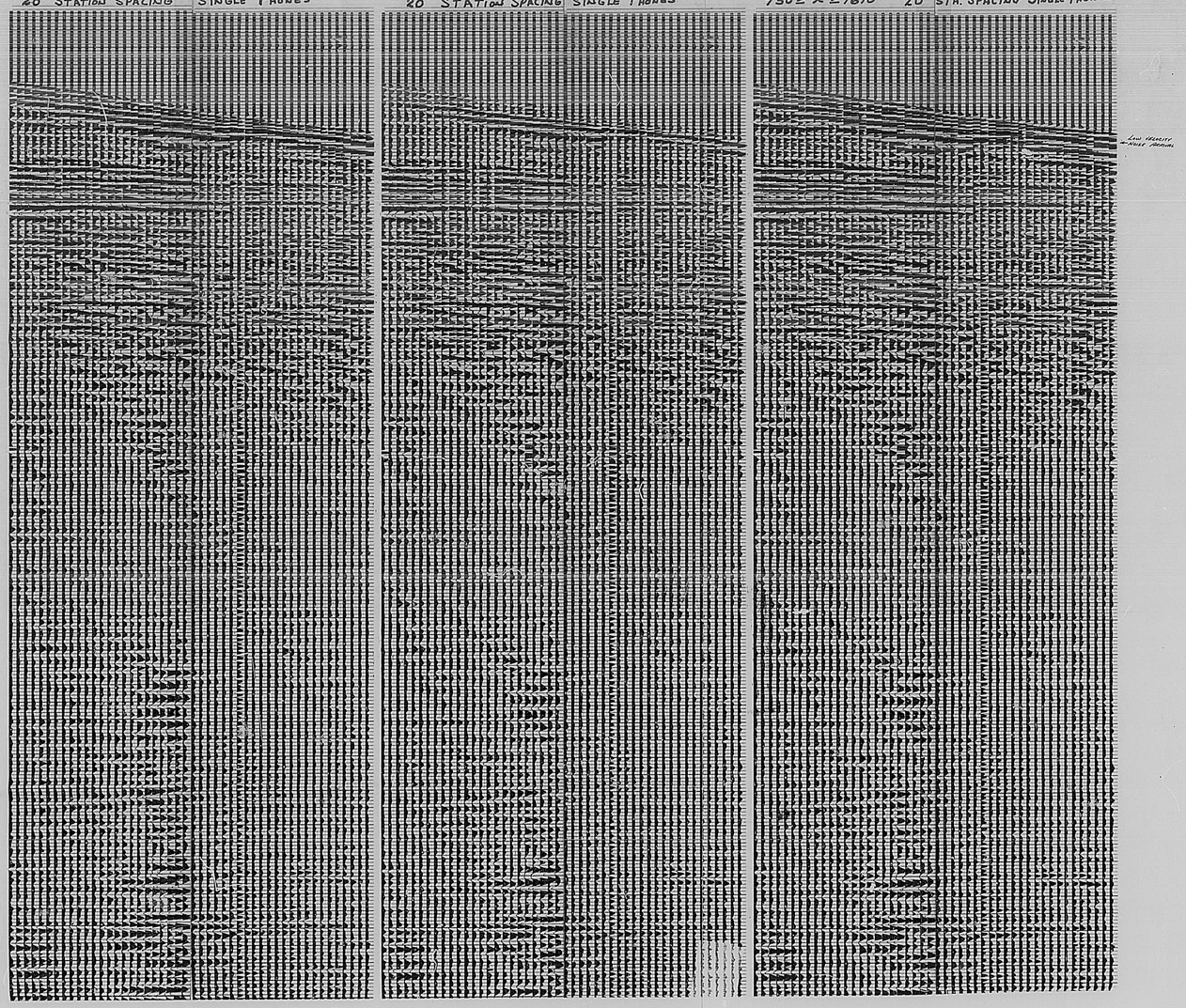
A top carbonate time structure map was prepared. This map shows reef edge and suggests that the embayment is devoid of reefal outliers although some very local structures may be present.

FT. PROVIDENCE 4-1648
CB 2606 L.C. 35@18 H.C. 120@18
730 ≥ X ≥ 1670
20' STATION SPACING SINGLE PHONES

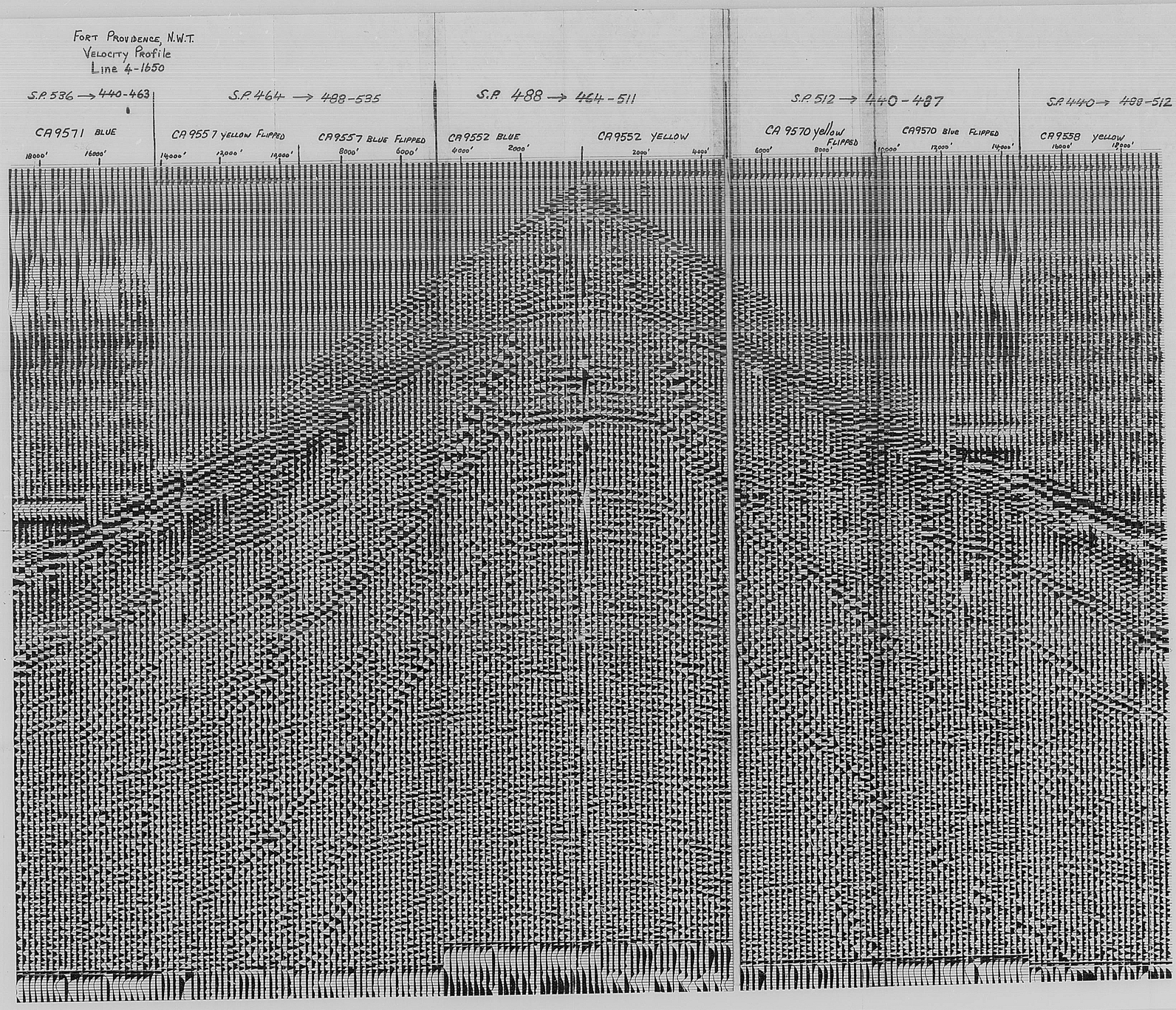
FT. PROVIDENCE 4-1648
CB 2605 L.C. 35 @18 H.C. 120@18
730 ≥ X ≥ 1670
20' STATION SPACING SINGLE PHONES

FT. PROVIDENCE 4-1648
CB 2604 L.C. 35@18 H.C. 120@18
730 ≥ X ≥ 1670 20' STA. SPACING SINGLE PHONES

FORT PROVIDENCE
NOISE SPREAD



FORT PROVIDENCE, N.W.T.
VELOCITY PROFILE
LINE 4-1650



SHELL CANADA LIMITED	EXPLORATION AND PRODUCTION DEPARTMENT	SOUTHERN EXPLORATION DIVISION

FORT PROVIDENCE AREA

TOPOGRAPHY

Plot By:		Datum:	
Interpreter:	ALT.LAMB	Elevation Corr Velocity:	
Supervisor:	G.STEWART	Filter Base (Corr = 0):	
Date:	MAY 1970	Shot Depths (DS) :	
Maps:		Wx Comp:	
Contour Interval:	50'		
Water/Ice Table			
Map Scale:	1"=4000'	Data Quality Grade key:	
Projection:			
Exclusive No.:		good, fair, poor	

NTR-647
62,568 Ac.

NTR-619
31,082 Ac.

NTR-620
31,082 Ac.

NTR-693
30,960Ac.

NTR-501
30,960Ac.

NTR-621
30,960

P-3193

P-4237

P-5555

P-3194

P-4238

P-4239

P-4240

P-1656

850

800

750

700

650

600

550

500

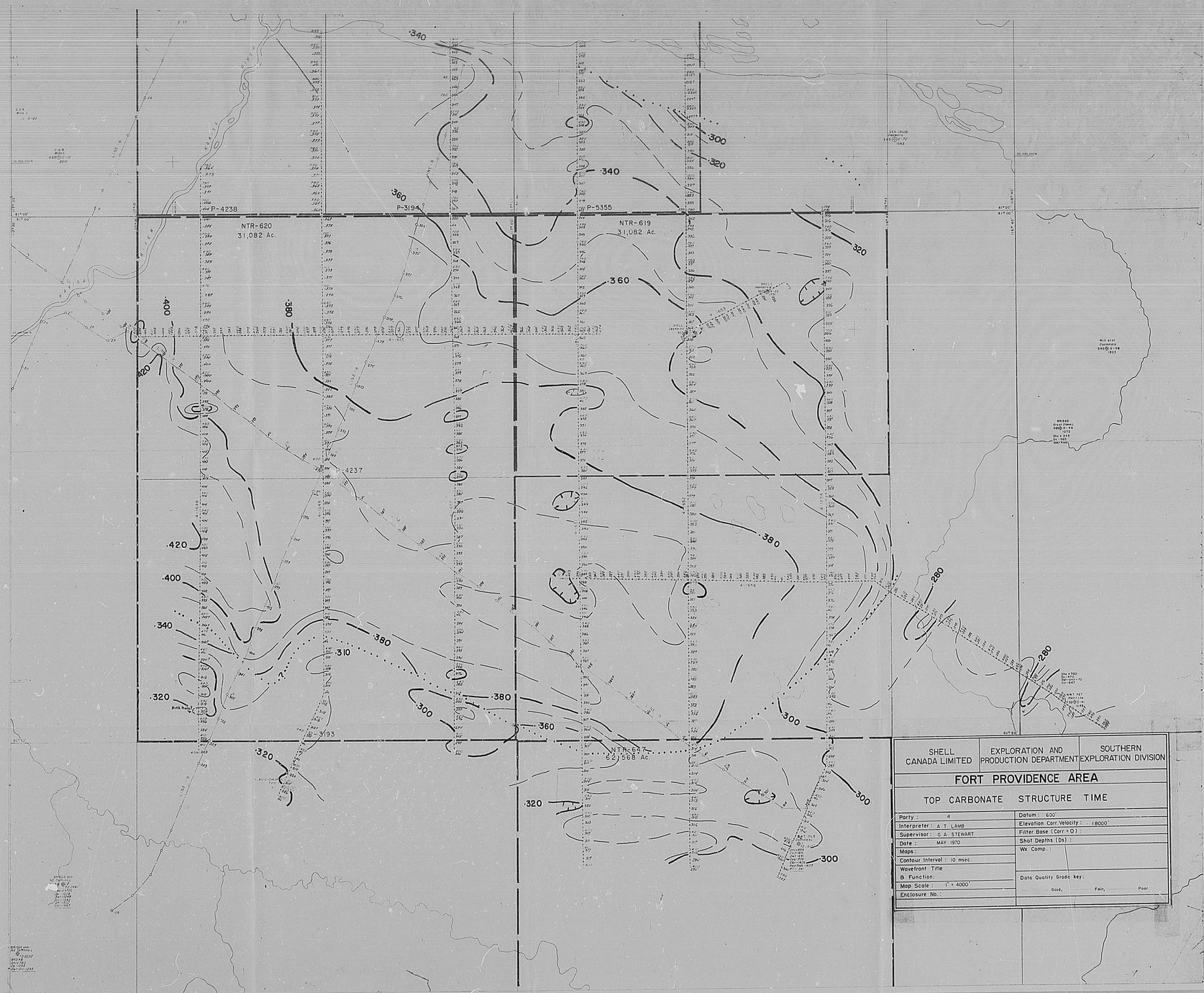
LAKE

BEAVER

ISLAND

BIG

30x



SHELL CANADA LIMITED	EXPLORATION AND PRODUCTION DEPARTMENT	SOUTHERN EXPLORATION DIVISION

FORT PROVIDENCE AREA

TOP CARBONATE STRUCTURE TIME

Party : 4	Datum : 600'
Interpreter : A T LAMB	Elevation Corr Velocity : 18000'
Supervisor : G A STEWART	Filter Base (Corr / O) :
Date : MAY 1970	Shot Depths (Ds) :
Maps :	Wx Comp :
Contour Interval : 10 msec	
Wavefront Title & Function:	Data Quality Grade key: Good, Fair, Poor
Map Scale : 1" = 4000'	
Enclosure No.:	