60-6-4-54

# REPORT OF GEOPHYSICAL SURVEY

# REPORT OF SEISMOGRAPH REFLECTION SURVEY



Conducted by

Western Geophysical Company of Canada Ltd.

for

Pan American Petroleum Corporation

May 14 - June 4, 1966
February 3 - 9, 1967

On Cameron Hills, N.W.T. Permit 3876


Prepared by

D. E. Birnie

Exploration Group Supervisor

July 14, 1967

Submitted in support of application for credit; see affidavit made by Glen E. Taylor of May 23, 1967 and in accordance with work obligations under Section 54 (F) of the Territorial Lands Act.

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# T E X T

## INTRODUCTION

During May and June, 1966, and February, 1967, a reflection program was conducted on Northwest Territories Permit 3876 by United Geophysical Company of America and Western Geophysical Company of Canada Ltd. for Pan American Petroleum Corporation.

In the period from May 14th to June 4, 1966 inclusive, United Geophysical Company of America Party 559 spent a total of 29.087 operating days or a total of 22 calendar days working in the area. Western Geophysical Company of Canada Ltd. Party WA No. 2 spent a total of 15.687 operating days or a total of 7 calendar days in the period from February 3 to February 9, 1967. The field operation was conducted on trails dozed at the same time as the seismic work was being done.

United Geophysical Party 559 was under the supervision of Mr. J. H. Lebeau, Party Manager, and Mr. G. E. Planck, Party Manager, supervised the Western Geophysical Party WA No. 2 operation.

Pan American's interpretive staff located in Calgary, Alberta, spent a total of 86 days on this project. The interpretation was carried on simultaneously with the field work and was completed on July 14, 1967. No personnel other than those on the field party and on the interpretive staff worked directly on this project.

Conventional track mounted recording and drilling equipment and a track mounted camp were used in the 1966 operation. The camp consisted

of four trailer units, an office - sleeper unit, a kitchen - diner - sleeper unit, a utility - sleeper unit and a shop trailer. The 1967 operation was conducted with similar wheel mounted equipment.

The soft muskeg presented some problems in the 1967 winter operations.

SEISMIC TECHNIQUE

Shotholes were drilled to an average of 40 feet in depth. The determination of these shot depths was based on examining the record quality and it was found that 40 foot depths yielded the best results. Charge sizes varied from 2½ to 20 pounds. The number of holes used varied from 1 to 3. The holes were drilled with four Mayhew conventional drills. Water was used to maintain circulation.

The instruments used were the Western Geophysical Type FA-40 amplifiers and United Geophysical Type FA-44-B amplifiers using Techno Type magnetic tape and oscillograph camera display.

Subsurface data was obtained by using the 600% multifold average reflection method.

The data appearing on the subsurface maps vertical two-way times between an arbitrary reference plane and the particular level mapped.

Respectfully submitted,

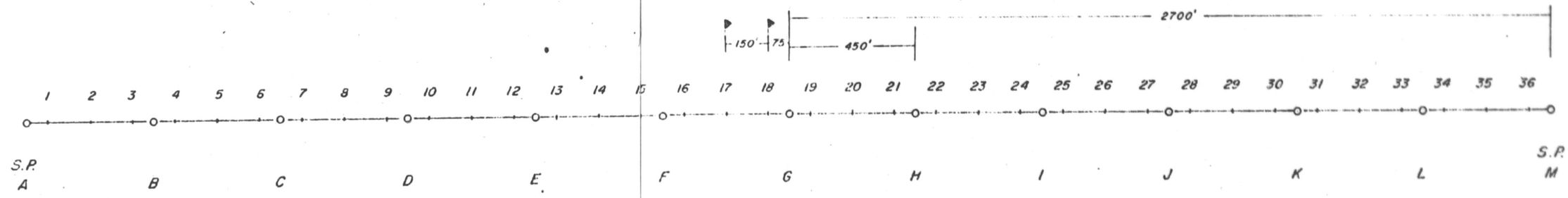
PAN AMERICAN PETROLEUM CORPORATION

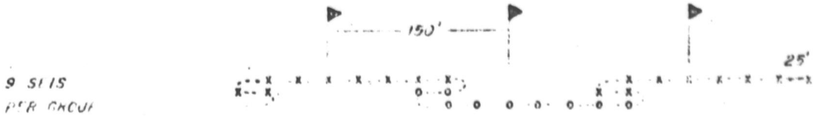
By: D. E. Birnie

D. E. Birnie
Exploration Group Supervisor

CAMERON HILLS

WA-2




9 SIIS
PER GROUP

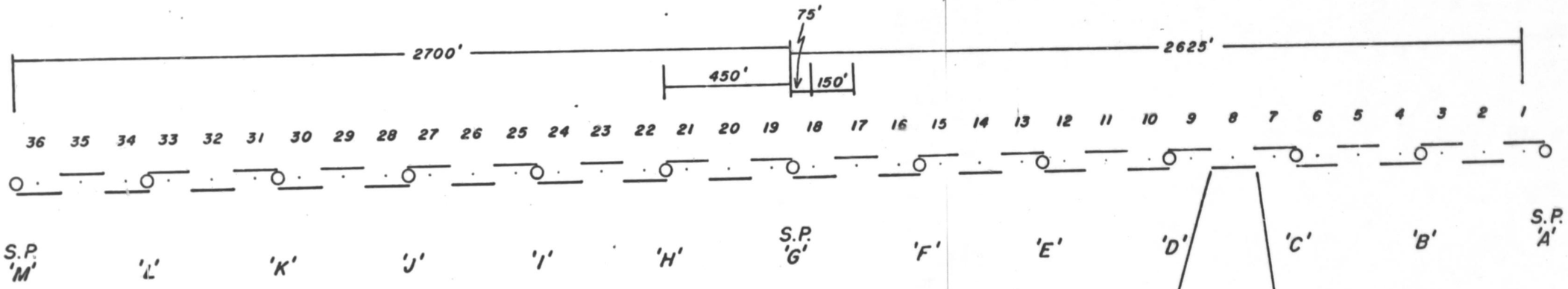
TIGHT CABLE = 25' TAKEOUT SPACING

CAMERON HILLS

U-559

SUMMER 1966

600% SYMMETRICAL

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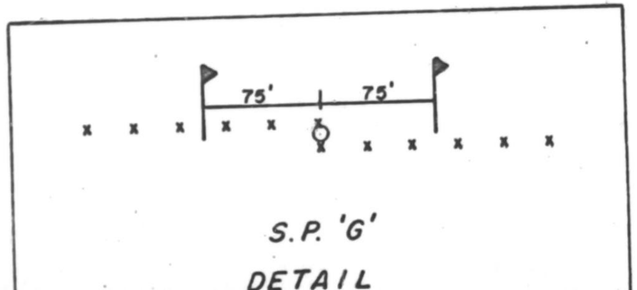
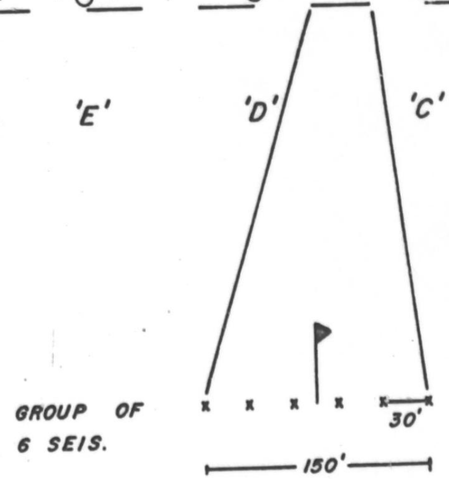


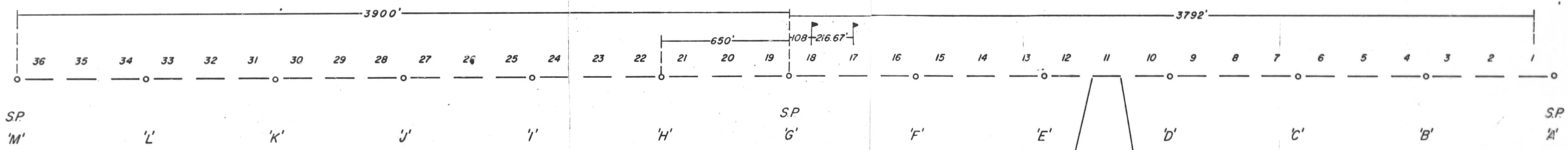




NOTE. THIS LAYOUT APPLIES UNLESS OTHERWISE DESIGNATED ON FIGURE 1.

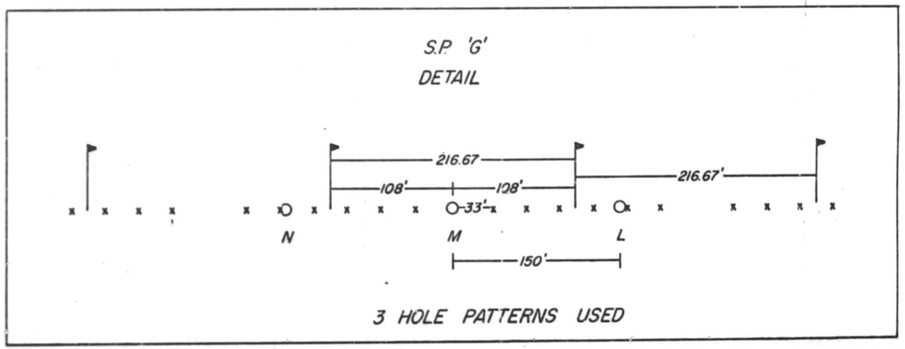
FIGURE 1

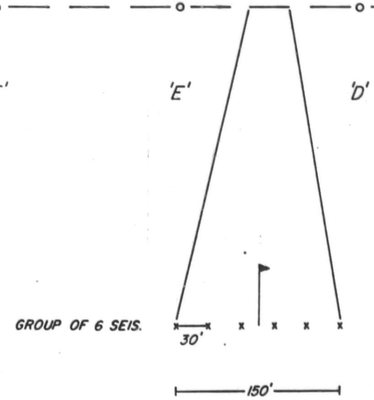
# CAMERON HILLS
# U-559
# SUMMER 1966

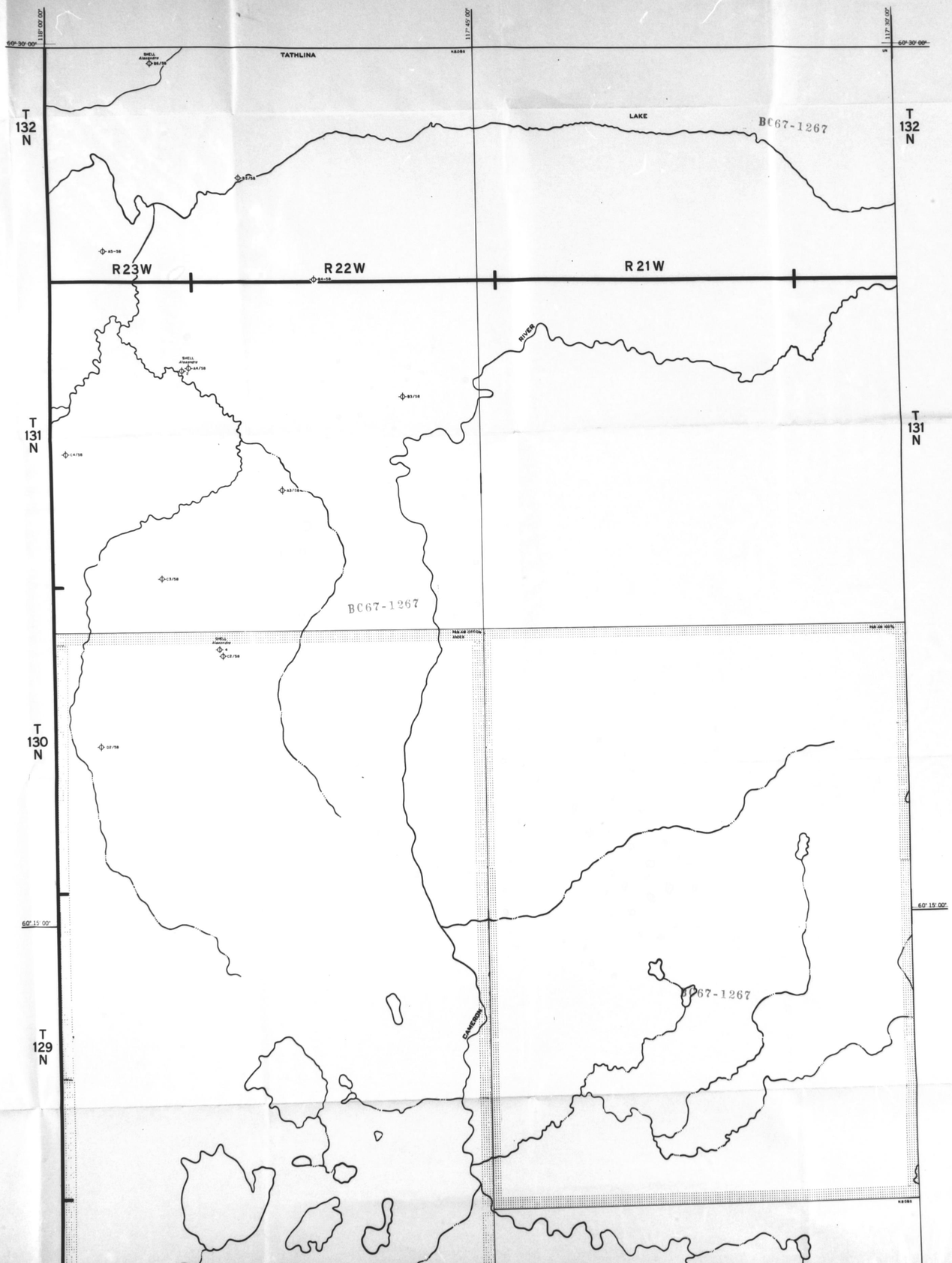
600 %
SYMMETRICAL



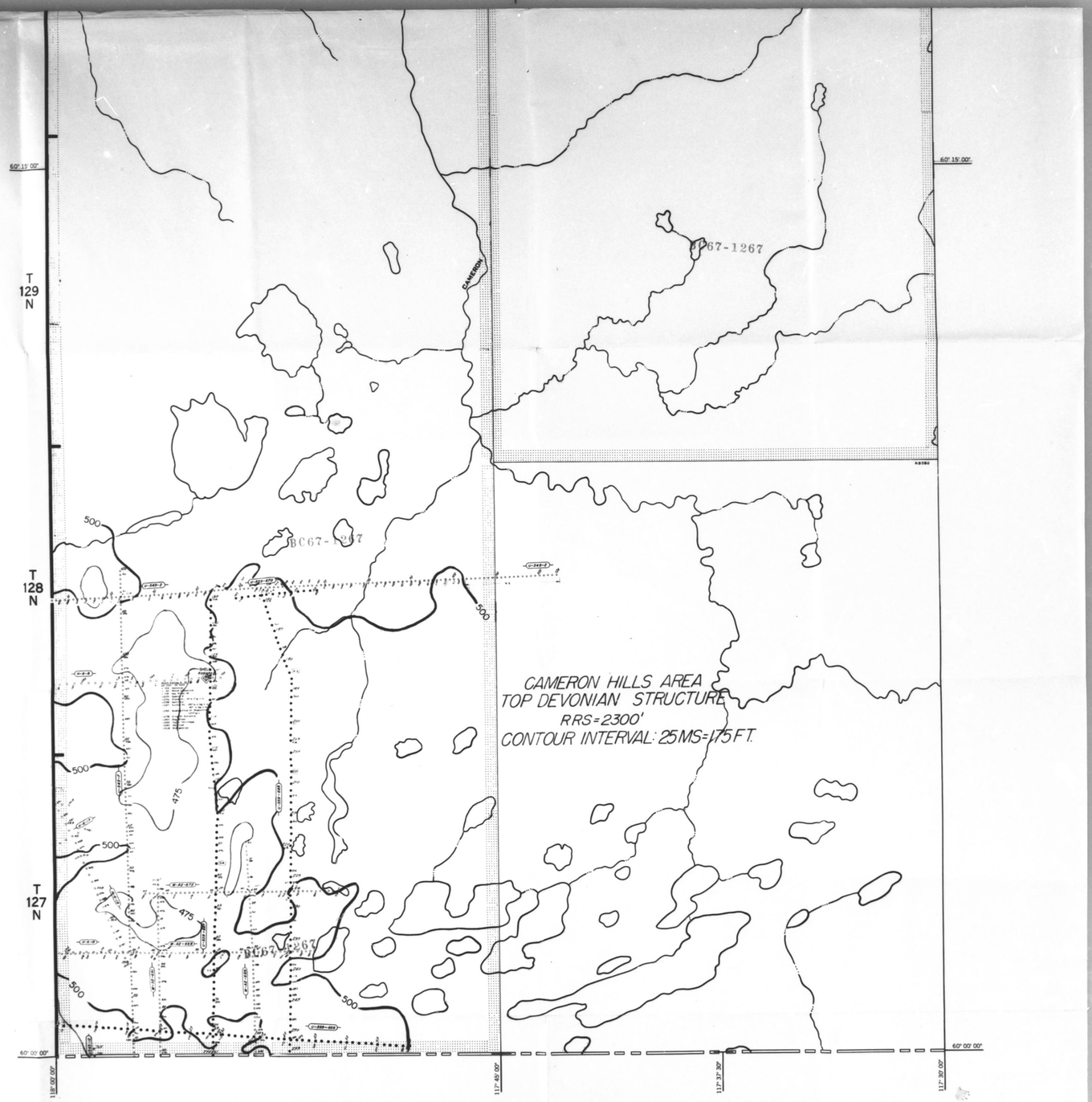

SCALE 1"=400'




118° 00' 00"
117° 45' 00"
117° 30' 00"
60° 30' 00"
60° 15' 00"
TATHLINA
LAKE
RIVER
CAMERON
R23W
R22W
R21W
T 132 N
T 131 N
T 130 N
T 129 N
SHELL Alexander
BC67-1267

1 of 2




**MAP EVALUATION**

Qualification considers type of map or plan, amount of relief considered critical, quality of data and density of control, (geophysical or geological)

- Geological data
- Reliable Geophysical Data
- Qualitatively Reliable Geophysical data
- Unreliable Geophysical Data

**SHOOTING HISTORY (Not in detail)**

| INCL. DATES | SHOT BY | SHOT FOR | S.P. AND/OR LINE No's |
|---|---|---|---|
| MAY - JUNE 1966 | UNITED 559 | PAN AM. | U-666,670,688,687 |
| FEB.5-9, 1967 | WA-2 | PAN AM. | U-688,670,689,690 |
| APR.14-21, 1967 | UNITED 845 | PAN AM. | U-F.S. |
| JAN.-MAR. 1967 | M-5 | PAN AM. | M-5,10,17,18 |

**INTERPRETIVE HISTORY**

| FINAL REPORT No. | DATE | INTERP | CO AFFIL. | APPROX.LOC. ON MAP * |
|---|---|---|---|---|
| 6650 | SEPT.1,1966 | J.R. MORRISON | PAN AM. | SW/4 |
| 6685 | NOV.24,1966 | J.D. BIRRELL | PAN AM. | SW/4 |

This map replaces/supersedes Registration No. _____ dated _____ which is to be destroyed/kept (Refer transmittal dated _____ )

Map distribution: ☐ Division ☐ General Office

Prints prepared this report: ☐F ☐S

D-1 — SLAVE POINT
SLAVE POINT-RED BEDS
D-1 STRUCTURE

This map checked by _____ Pan Am. Geophysicist/Geologist



VELOCITY PLAT AND EFFECT OF REF. PLANE AND/OR VELOCITY ON TIME MAP

LEGEND
A Geophysical Survey
B S.V.L.
C Synthetic Record
D Computed 1966/67

**PAN AMERICAN PETROLEUM CORPORATION**
CALGARY DIVISION

AREA: South Tathlina Lake — GRID: CM 24SW
PROVINCE: N.W.T. — SCALE: 1" = 4000'
HORIZON: D-1
TYPE OF MAP: STRUCTURE — CONTOUR INT. 25 MS
SHOT BY: UNITED 559, WA-2 FOR: PAN AM.
INCL. DATES: MAY-JUNE 1966, JAN.-MAR. 1967
INTERP BY: M. EVANS — CO AFFIL.: PAN AM.
REPORT No. — DATE: JULY 14, 1967
REMARKS:

BC67-1267

GEOLOGICAL INT: — DATE: JULY 14, 1967
FROM GEOPH REPORT No.(s) — DATED:
REMARKS:

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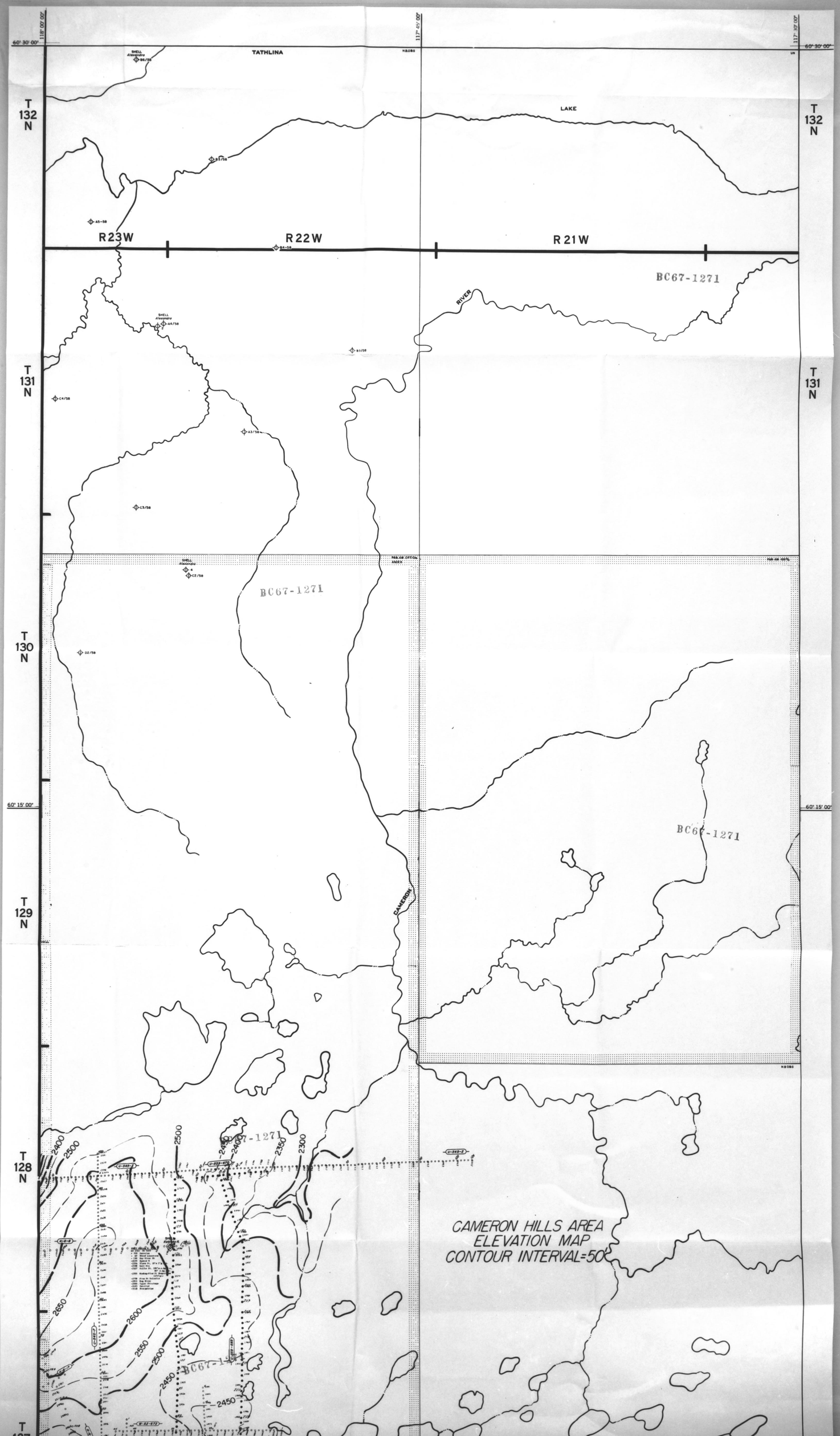
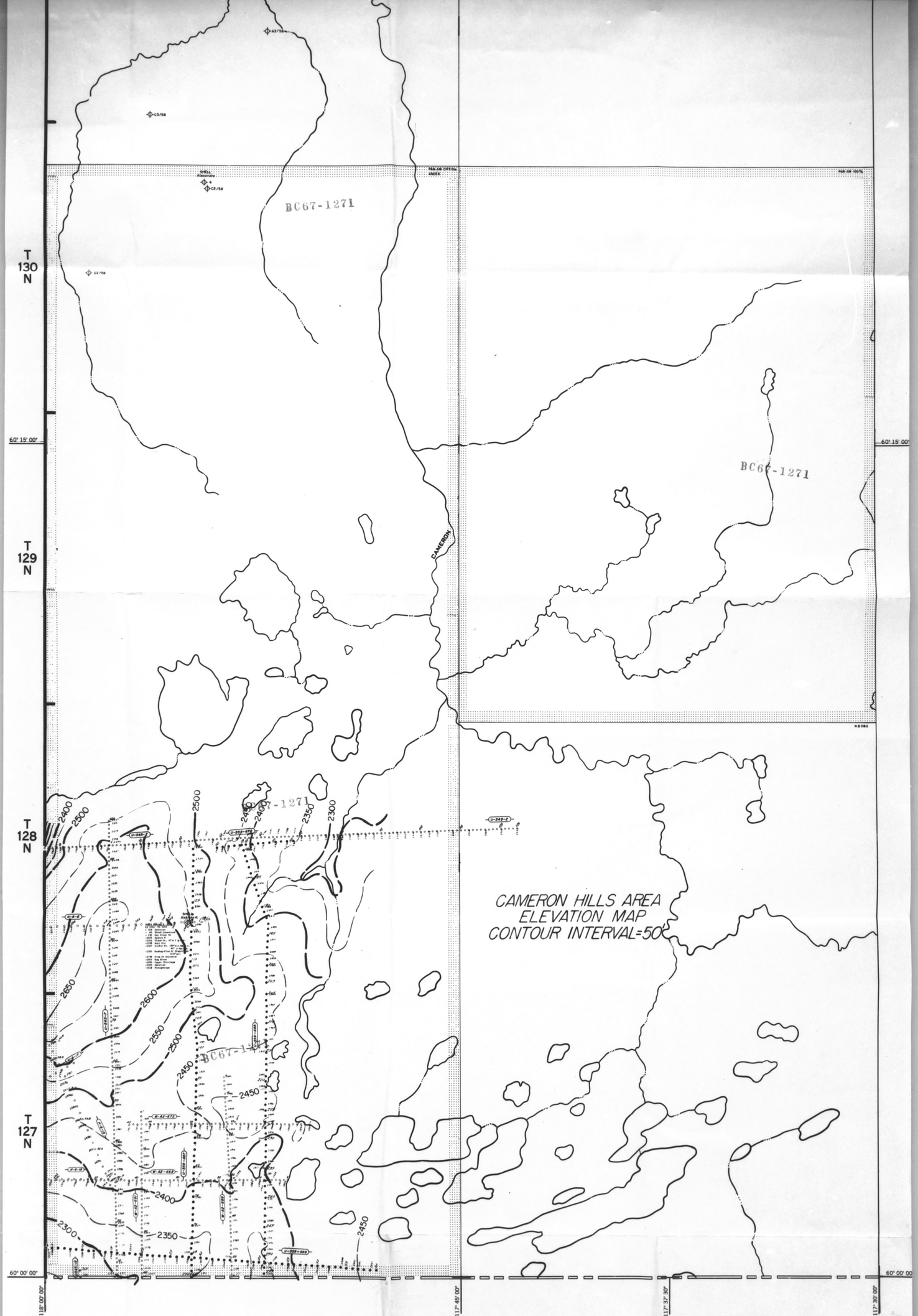

TATHLINA
LAKE
RIVER
CAMERON
R23W
R22W
R21W
T 132 N
T 131 N
T 130 N
T 129 N
T 128 N
T 127
60° 30' 00"
60° 15' 00"
118° 00' 00"
117° 45' 00"
117° 30' 00"
BC67-1271
CAMERON HILLS AREA
ELEVATION MAP
CONTOUR INTERVAL=50'

1 of 2




## MAP EVALUATION

Qualification considers type of map or play, amount of relief considered critical, quality of data and density of control, (geophysical or geological)

- Geological data
- Reliable Geophysical Data
- Qualitatively Reliable Geophysical data
- Unreliable Geophysical Data

## SHOOTING HISTORY (Not in detail)

| INCL. DATES | SHOT BY | SHOT FOR | S.P. AND/OR LINE No's |
|---|---|---|---|
| MAY - JUNE 1966 | UNITED 559 | PAN AM | U-568,670,685,687 |
| FEB.3-9, 1967 | WA-2 | PAN AM. | U-568,670,689,691 |
| APR.14-23, 1967 | UNITED 545 | PAN AM. | U-7, 2 |
| JAN.-MAR. 1967 | K-6 | PAN AM. | K-8, 15, 17, 18 |

## INTERPRETIVE HISTORY

| FINAL REPORT No. | DATE | INTERP. | CO. AFFIL. | APPROX. LOC. ON MAP |
|---|---|---|---|---|
| 6650 | SEPT. 1, 1966 | J.K. MORRISON | PAN AM. | SW/4 |
| 6683 | NOV. 29, 1966 | J.D. BIRRELL | PAN AM. | SW/4 |

This map replaces/supplements Registration No. _____ dated _____, which is to be destroyed/kept (Refer transmittal dated _____)

Map distribution: ☐ Division ☐ General Office

Wings prepared this report:
D-1 - SLAVE POINT
SLAVE POINT-RED BEDS
D-1 STRUCTURE

This map checked by _____
Pan Am Geophysicist/Geologist

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VELOCITY PLAT AND EFFECT OF REF. PLANE AND/OR VELOCITY ON TIME MAP.

LEGEND
- Conventional Survey
- C.V.S.
- Synthetic Record
- Computed Velocity

## PAN AMERICAN PETROLEUM CORPORATION
CALGARY DIVISION

AREA: South Tathlina Lake — GRID: CM 24 SW
PROVINCE: N.W.T. — SCALE: 1" = 4000'
HORIZON:
TYPE OF MAP: ELEVATION — CONTOUR INT. 50'
SHOT BY: UNITED 559, WA-2 FOR: PAN AM.
INCL. DATES: MAY-JUNE 1966, JAN.-MAR. 1967
INTERP BY: H. EVANS — CO. AFFIL: PAN AM.
REPORT No. — DATE: JULY 14, 1967
REMARKS:

BC67-1271

GEOLOGICAL INT: — DATE JULY 14, 1967
FROM GEOPH REPORT No.(s) — DATED
REMARKS:

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TATHLINA

TATHLINA

RIVER

LAKE

LAKE

R23W5

R22W5

R21W5

T 132 N

T 131 N

60° 22' 30"

60° 15' 00"

60° 07' 30"

BC67-1736

RIVER

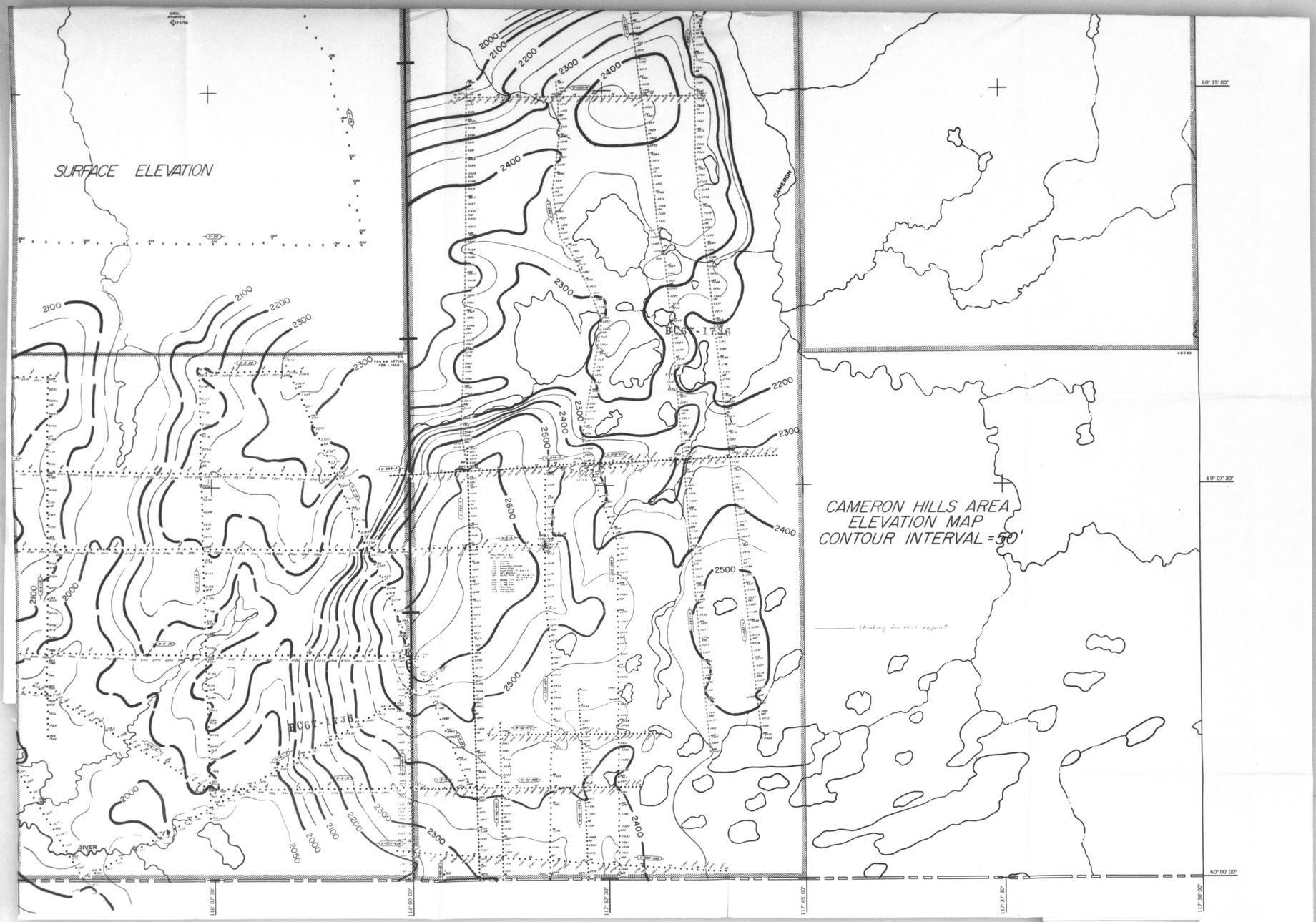
SURFACE ELEVATION

1100
1200
1300
1400
1500
1600
1700
1800
1900
2000
2100
2200
2300
2400
2500

CAMERON

BC67-1736

1 of 2




CAMERON HILLS AREA
ELEVATION MAP
CONTOUR INTERVAL = 50'

showing for this report

PAN AMERICAN PETROLEUM CORPORATION
CALGARY DIVISION

| | |
|---|---|
| AREA: South Tathlina Lake | GRID: CM. 24/S.W. |
| PROVINCE: N. W. T. | SCALE: 1"=4000' |
| HORIZON: SURFACE | |
| TYPE OF MAP: ELEVATION | CONTOUR INT: 50' |
| SHOT BY: UNITED 545 | FOR: PAN AM. |
| INCL. DATES: SEPT - OCT. 1967 | |
| INTERP BY: R.S. RYAN | CO. AFFIL: PAN AM. |
| REPORT No. 67144 | DATE: DEC. 27, 1967 |
| REMARKS: BC67-1736 | |
| GEOLOGICAL INT: R.L. PEMBERTON | DATE: DEC. 27, 1967 |
| FROM GEOPH. REPORT No.(s) | DATED |
| REMARKS: | |

CLASS I

242

# REPORT OF GEOPHYSICAL SURVEY

# REPORT OF SEISMOGRAPH REFLECTION SURVEY

Conducted by

United Geophysical Company of Canada Ltd.

for

Pan American Petroleum Corporation

During April, September, October and November, 1967

On and off Federal Permit 3876 and on Federal Permit 3879, Cameron Hills Area, N.W.T.
National Topographic Grid 85-C-4, 85-C-5 and 85-D-1

Prepared by

D. E. Birnie

Exploration Group Supervisor

December 27, 1967



Submitted in accordance with Government Regulations under Section 54(F) of the Territorial Lands Act.

Previous reports submitted by Pan American Petroleum covering the same National Topographic Grid 85-C are dated July 14, 1967 and August 30, 1967.

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# TEXT

## INTRODUCTION

During April, September, October and November, 1967, a seismograph reflection survey was conducted on and off Northwest Territories Federal Permit 3876 and on Permit 3879 by United Geophysical Company of Canada Ltd. for Pan American Petroleum Corporation.

During April, 1967 United Geophysical Company Party 545, spent 14 calendar days in this area. During September, October and November, 1967 United Geophysical Company Party 545 spent 41 calendar days in this area working on seismic lines cut and cleared at the same time as the seismic work was being done. The seismic equipment was left on location between the April and September work periods.

United Geophysical Party 545 was under the supervision of Mr. J. G. Johnson, Party Manager.

Pan American's interpretative staff located in Calgary, Alberta spent a total of 100 days on this project. The interpretation was done following completion of the field work and was completed on December 15, 1967. No personnel other than those on the field party and on the interpretative staff worked directly on the project.

Conventional track mounted recording and drilling equipment and a track mounted camp were used in the operation. The camp consisted of four trailer units, an office-utility-sleeper unit, a kitchen-diner-sleeper unit, a sleeper unit and a shop trailer.

The topography and soft muskeg presented some problems in the operations.

Other reports submitted in this area by Pan American Petroleum are dated July 14, 1967 and August 30, 1967.

SEISMIC TECHNIQUE

Shotholes were drilled to an average of 40 feet in depth. Determination of this shot depth was based on the record quality. Near surface lithology varied considerably, with the drill logs showing muskeg, boulders, sand, gravel and clay. One hole, loaded with a 5 pound charge was used at each shotpoint location. The holes were drilled with three Mayhew conventional drills.

A spread configuration as shown on the seismic diagram was used to obtain 600% multifold coverage.

The instruments used by United Geophysical Party 545 were the III Type amplifiers manufactured by Geo Space Corporation, Houston, Texas. The data were recorded on Techno type analogue magnetic tapes.

The reflection method was used to obtain the subsurface data throughout the entire area.

The data that appear on the subsurface map are vertical two-way times between an arbitrary reference plane and the particular horizon mapped.

Respectfully submitted,

PAN AMERICAN PETROLEUM CORPORATION

By: D. E. Birnie

D. E. Birnie
Exploration Group Supervisor

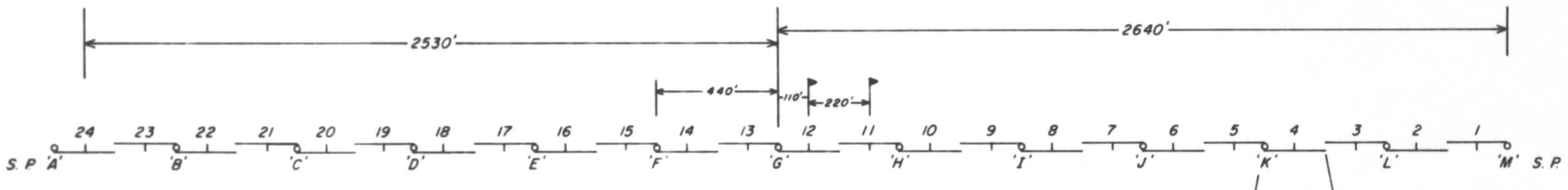
# CAMERON HILLS

UNITED 545

SPRING AND FALL 1967

600% SYMMETRICAL SPREADS

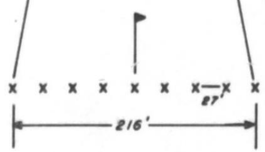
SCALE 1" = 440'





S. P. 'G' DETAIL

ONE HOLE PER SHOT POINT USED




GROUP OF 9 SEIS.

TATHLINA

TATHLINA

LAKE

RIVER

LAKE

R23W5

R22W5

R21W5

T 132 N

T 131 N

60° 22' 30"

60° 15' 00"

60° 07' 30"

BC67-1758

RIVER

CAMERON

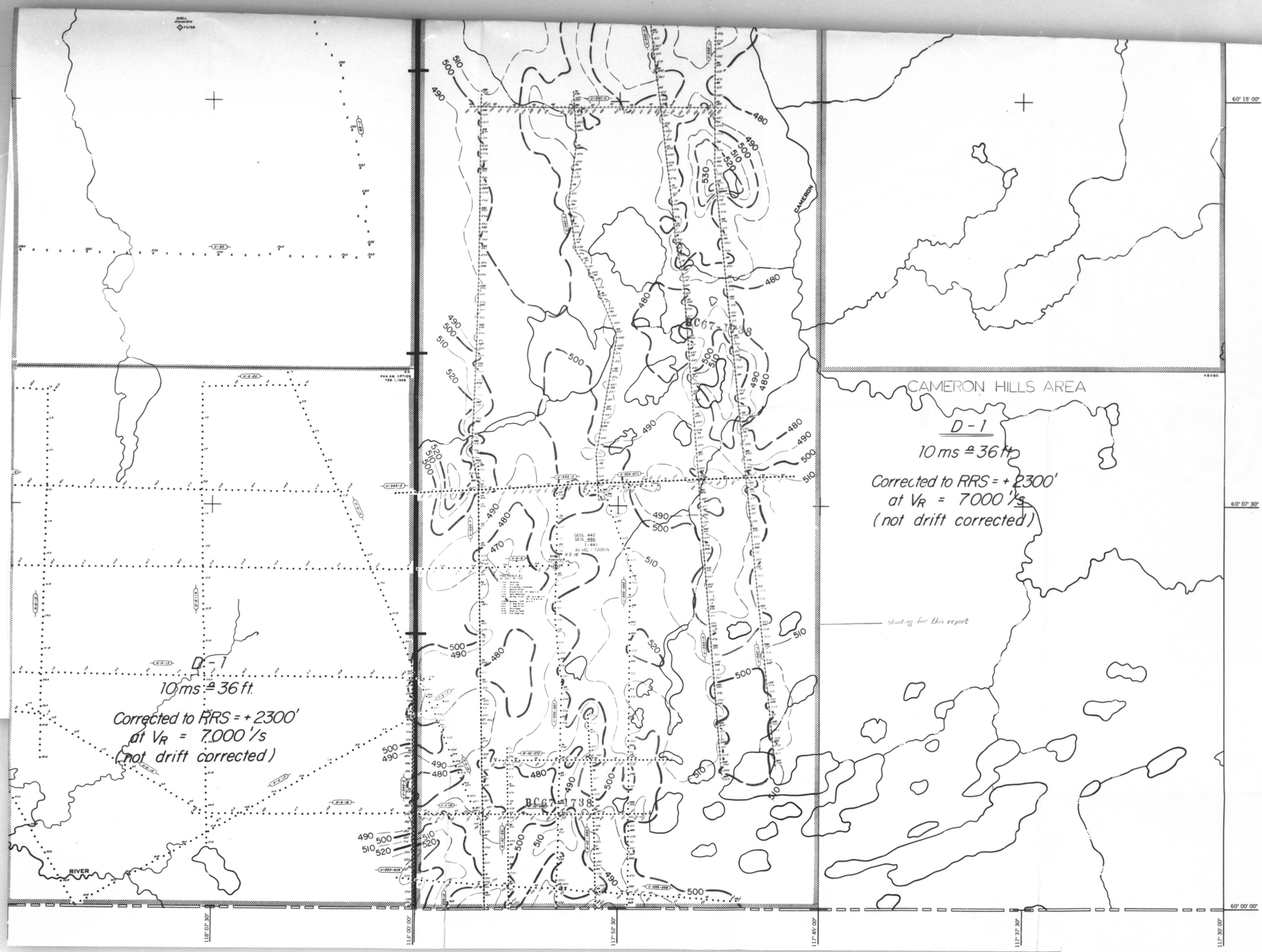
D: SHALLOW FROM SURFACE CONTINUITY VERY POOR

CAMERON HILLS AREA

D-1

10 ms ≙ 36 Hz

Corrected to RRS = + 2300'
at $V_R$ = 7000 f/s
(not drift corrected)




**PAN AMERICAN PETROLEUM CORPORATION**
CALGARY DIVISION

| | |
|---|---|
| AREA: South Tathlina Lake | GRID: CM 24/SW |
| PROVINCE: N.W.T. | SCALE: 1"=4000' |
| HORIZON: D-1 | |
| TYPE OF MAP: STRUCTURE | CONTOUR INT.: 10 MS. |
| SHOT BY: UNITED 545 | FOR: PAN AM. |
| INCL. DATES: SEPT - OCT. 1967 | |
| INTERP. BY: R.S. RYAN | CO. AFFIL.: PAN AM. |
| REPORT No. 67144 | DATE: DEC. 27, 1967 |
| REMARKS: | |
| BC67-1738 | |
| GEOLOGICAL INT.: R.I. PEMBERTON | DATE: DEC. 27, 1967 |
| FROM GEOPH REPORT No.(s) | DATED: |
| REMARKS: | |

CLASS I

CM-24/SW