



**sperry-sun**  
DRILLING SERVICES  
OF CANADA

Sperry-Sun of Canada

APM v1.12A

07/04/94

FINAL REPORT

FOR

AMOCO CANADA PETROLEUM CO. LTD

WELL

POINTED MOUNTAIN, 123 53'52.78

Sperry-Sun of Canada

APM v1.12A

07/04/94

POINTED MOUNTAIN, 123 53'52.78

# CONTENTS ---

GENERAL

156 MM SECTION

APPENDIX

Sperry-Sun of Canada  
APM v1.12A  
07/04/94

POINTED MOUNTAIN, 123 53'52.78

GENERAL SECTION

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GENERAL WELL DATA

TIME DISTRIBUTION

EVENT LOG

HOLE SECTIONS

DAYS VS DEPTH

FORMATION TOPS

Sperry-Sun of Canada

APM v1.12A

07/04/94

GENERAL DATA

Well: PAN AM A-2 POINTED MTN

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Operator.....: AMOCO CANADA PET CO LTD

Country.....: CANADA

Province.....: NORTHWEST TERRITORIES

Field.....: POINTED MOUNTAIN

LSD No.....: 60 24'33.28/123 53'52.78

Drilling Contractor.: DRIVE WELL SERVICING

Rig Name.....: DRIVE 41

Rig type.....: LAND

Hole type.....: DIRECTIONAL

Well type.....: DEVELOPEMENT

RKB.....: 374.64 (m)

Ground Level.....: 368.29 (m)

Spud date.....: 06/18/94

TD Date.....: 07/04/94

Well head:

Surface latitude....: 60°24'33.28 "

Surface longitude...: 123°53'52.78 "

Operator reps.....: DOUG EASTMAN/BOB PLASCO  
PHIL BOETTCHER/BOB PLASCO

Directional reps....: PAUL THEBEAU  
PAUL HILLYER

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Sperry-Sun of Canada

APM v1.12A

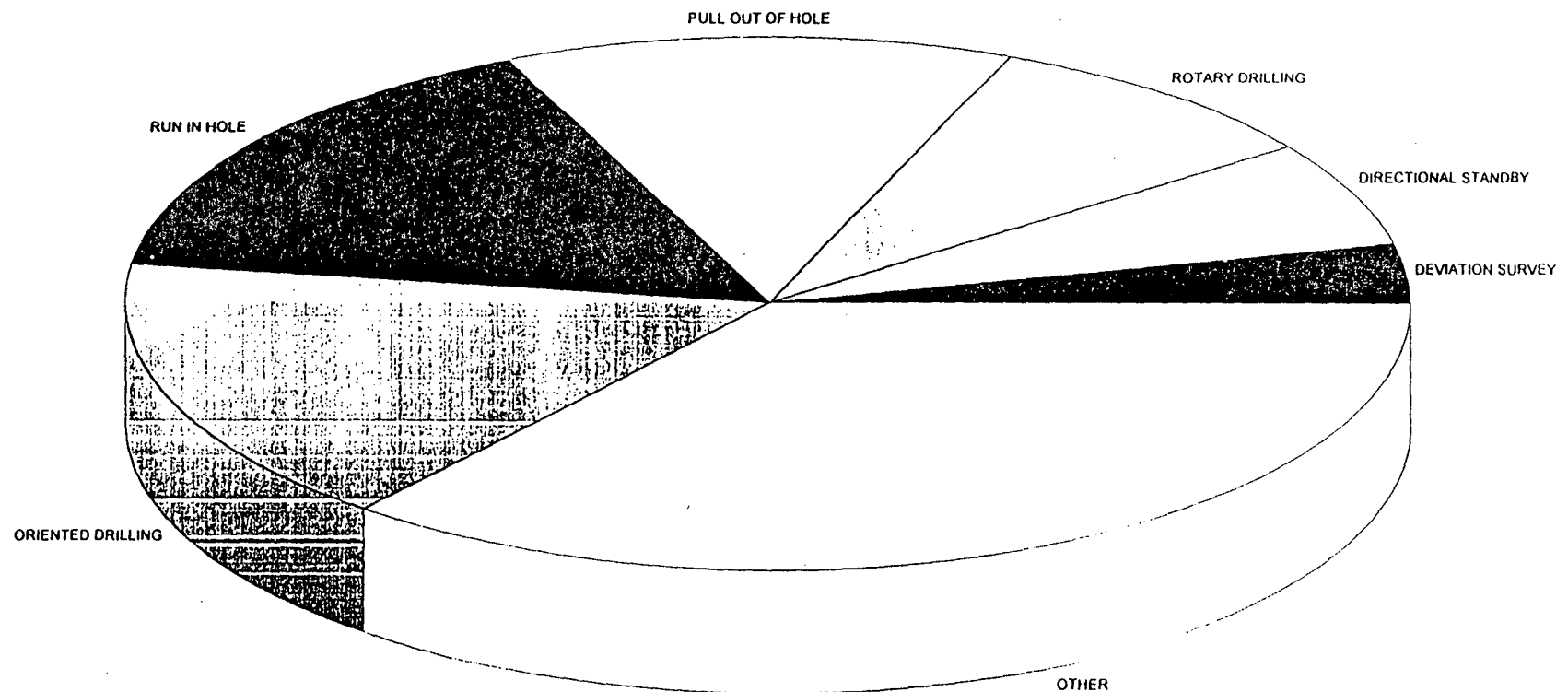
07/04/94

# TIME DISTRIBUTION - TOTAL WELL

Well: PAN AM A-2 POINTED MTN

| Operation           | Total Hours | %      |
|---------------------|-------------|--------|
| OTHER               | 134.25      | 33.73  |
| ORIENTED DRILLING   | 61.75       | 15.52  |
| RUN IN HOLE         | 59.75       | 15.01  |
| PULL OUT OF HOLE    | 48.00       | 12.06  |
| ROTARY DRILLING     | 33.75       | 8.48   |
| DIRECTIONAL STANDBY | 24.00       | 6.03   |
| DEVIATION SURVEY    | 12.75       | 3.20   |
| CIRCULATING         | 8.75        | 2.20   |
| REPAIRING RIG       | 4.00        | 1.01   |
| ROTARY REAMING      | 3.75        | 0.94   |
| SERVICE RIG         | 3.00        | 0.75   |
| CUT & SLIP LINE     | 2.50        | 0.63   |
| TEST BOPS           | 1.50        | 0.38   |
| LEAK OFF TEST       | 0.25        | 0.06   |
| Section Total:      | 398.00      | 100.00 |

**AMOCO CANADA PETROLEUM CO. LTD.**  
**POINTED MOUNTAIN, 50 24'33.28/123**  
**53'52.78**



**Time Distribution - Total for Well**

Sperry-Sun of Canada

APM v1.12A

04/07/94

## TIME DISTRIBUTION CODES

| Code | Description         |
|------|---------------------|
| 1.1  | ROTARY DRILLING     |
| 1.2  | ORIENTED DRILLING   |
| 1.3  | DRILL CEMENT        |
| 2.1  | ROTARY REAMING      |
| 2.2  | ORIENTED REAMING    |
| 2.3  | WASHING             |
| 3.1  | CIRCULATING         |
| 3.2  | CONDITION MUD       |
| 4.1  | PULL OUT OF HOLE    |
| 4.2  | CHANGE BHA          |
| 4.3  | RUN IN HOLE         |
| 4.4  | WIPER TRIP          |
| 5.1  | DEVIATION SURVEY    |
| 5.2  | ORIENT MOTOR        |
| 6.1  | TEST BOPS           |
| 6.2  | CHANGE BOPS         |
| 7.1  | CUT & SLIP LINE     |
| 8.1  | REPAIRING RIG       |
| 8.2  | SERVICE RIG         |
| 9.1  | ROTARY CORING       |
| 9.2  | ORIENTED CORING     |
| 10.1 | E LOGS              |
| 10.2 | RFT                 |
| 10.3 | SIDE-WALL CORES     |
| 11.1 | WAIT ON WEATHER     |
| 11.2 | OTHER               |
| 11.3 | DIRECTIONAL STANDBY |
| 12.1 | FISHING             |
| 13.1 | COMPLETING          |
| 15.1 | RUN CASING          |
| 15.2 | PULL CASING         |
| 15.3 | MILL CASING         |
| 16.1 | CEMENT CASING       |
| 16.2 | CEMENT PLUG         |
| 16.3 | PLUG BACK           |
| 16.4 | WAIT ON CEMENT      |
| 17.1 | WORK PIPE           |
| 17.2 | BACK REAMING        |
| 17.3 | MILL ON JUNK        |
| 18.1 | FIT                 |
| 18.2 | LEAK OFF TEST       |
| 18.3 | DST                 |

Sperry-Sun of Canada

APM v1.12A

04/07/94

## TIME DISTRIBUTION CODES

| Code | Description |
|------|-------------|
| 19.1 | MOVE RIG    |
| 19.2 | RIG UP      |
| 19.3 | SKID RIG    |
| 19.4 | TEAR DOWN   |

Sperry-Sun of Canada

APM v1.12A

04/07/94

# EVENT LOG - TOTAL WELL

Well: PAN AM A-2 POINTED MTN

| Date     | Depth<br>(m) | Section<br>(mm) | Start<br>time | Hours | Operation         | Description                                    |
|----------|--------------|-----------------|---------------|-------|-------------------|------------------------------------------------|
|          | 2855.00      | 156             | 10:00         | 14.00 | OTHER             | TRAVEL FROM NISKU TO LOCATION                  |
| 19/06/94 | 2855.00      | 156             | 00:00         | 24.00 | OTHER             | TRAVEL TO LOCATION                             |
| 20/06/94 |              | 156             | 00:00         | 13.00 | OTHER             | TRAVEL TO LOCATION                             |
|          |              | 156             | 13:00         | 6.00  | RUN IN HOLE       | RUN IN HOLE W/MILL                             |
|          | 2856.00      | 156             | 19:00         | 5.00  | OTHER             | POLISH AND DRESS WINDOW                        |
| 21/06/94 |              | 156             | 00:00         | 1.50  | OTHER             | MILL WINDOW                                    |
|          |              | 156             | 01:30         | 4.25  | PULL OUT OF HOLE  | PULL OUT OF HOLE W/MILL                        |
|          |              | 156             | 05:45         | 1.25  | OTHER             | CHANGE MILLS                                   |
|          |              | 156             | 07:00         | 1.00  | RUN IN HOLE       | RUN IN HOLE                                    |
|          |              | 156             | 08:00         | 0.25  | SERVICE RIG       | SERVICE RIG                                    |
|          |              | 156             | 08:15         | 1.75  | RUN IN HOLE       | RUN IN HOLE                                    |
|          |              | 156             | 10:00         | 0.75  | OTHER             | SAFETY MEETING                                 |
|          |              | 156             | 10:45         | 1.25  | OTHER             | BOP DRILL                                      |
|          |              | 156             | 12:00         | 3.25  | RUN IN HOLE       | RUN IN HOLE W/MILL                             |
|          |              | 156             | 15:15         | 3.50  | OTHER             | DRESS WINDOW W/MILL                            |
|          |              | 156             | 18:45         | 2.00  | CIRCULATING       | CIRCULATING AND DO FORMATION INTEGRITY TEST    |
|          | 2856.00      | 156             | 20:45         | 3.25  | PULL OUT OF HOLE  | PULL OUT OF HOLE W/MILL                        |
| 22/06/94 |              | 156             | 00:00         | 4.50  | PULL OUT OF HOLE  | PULL OUT OF HOLE W/MILL                        |
|          |              | 156             | 04:30         | 1.50  | TEST BOPS         | TEST BOPS                                      |
|          |              | 156             | 06:00         | 1.00  | OTHER             | PICK UP MUD MOTOR                              |
|          |              | 156             | 07:00         | 2.00  | OTHER             | DRILL MOUSEHOLE W/MUD MOTOR                    |
|          |              | 156             | 09:00         | 3.00  | OTHER             | MAKE UP BHA # 1                                |
|          |              | 156             | 12:00         | 2.50  | OTHER             | PICK UP 6 DRILL COLLARS                        |
|          |              | 156             | 14:30         | 0.50  | OTHER             | SHALLOW PULSE TEST                             |
|          |              | 156             | 15:00         | 6.50  | RUN IN HOLE       | RUN IN HOLE W/BHA # 1                          |
|          | 2860.00      | 156             | 21:30         | 2.50  | ORIENTED DRILLING | ORIENTED DRILLING                              |
| 23/06/94 |              | 156             | 00:00         | 0.50  | OTHER             | ORIENT TOOL                                    |
|          |              | 156             | 00:30         | 4.00  | REPAIRING RIG     | REPAIRING RIG REPAIR BROKEN CHAIN IN DRAWWORKS |
|          |              | 156             | 04:30         | 2.50  | ORIENTED DRILLING | ORIENTED DRILLING                              |
|          |              | 156             | 07:00         | 4.00  | ORIENTED DRILLING | ORIENTED DRILLING                              |
|          |              | 156             | 11:00         | 1.00  | DEVIATION SURVEY  | DEVIATION SURVEY                               |
|          |              | 156             | 12:00         | 3.50  | ORIENTED DRILLING | ORIENTED DRILLING                              |
|          |              | 156             | 15:30         | 0.50  | DEVIATION SURVEY  | DEVIATION SURVEY                               |
|          |              | 156             | 16:00         | 1.50  | OTHER             | ORIENT TOOL                                    |
|          |              | 156             | 17:30         | 3.25  | ORIENTED DRILLING | ORIENTED DRILLING                              |
|          |              | 156             | 20:45         | 1.00  | CIRCULATING       | CIRCULATING                                    |
|          |              | 156             | 21:45         | 2.00  | PULL OUT OF HOLE  | PULL OUT OF HOLE W/BHA # 1                     |

Sperry-Sun of Canada  
APM v1.12A  
04/07/94

EVENT LOG - TOTAL WELL  
Well: PAN AM A-2 POINTED MTN

| Date     | Depth<br>(m) | Section<br>(mm) | Start<br>time | Hours | Operation         | Description                     |
|----------|--------------|-----------------|---------------|-------|-------------------|---------------------------------|
|          | 2914.00      | 156             | 23:45         | 0.25  | SERVICE RIG       | SERVICE RIG                     |
| 24/06/94 | 156          |                 | 00:00         | 2.25  | PULL OUT OF HOLE  | PULL OUT OF HOLE W/BHA # 1      |
|          | 156          |                 | 02:15         | 0.50  | OTHER             | FLOW CHECK                      |
|          | 156          |                 | 02:45         | 0.25  | SERVICE RIG       | SERVICE RIG                     |
|          | 156          |                 | 03:00         | 0.75  | OTHER             | CHANGE BHA                      |
|          | 156          |                 | 03:45         | 2.75  | RUN IN HOLE       | RUN IN HOLE W/BHA # 2           |
|          | 156          |                 | 06:30         | 1.00  | CUT & SLIP LINE   | CUT & SLIP LINE                 |
|          | 156          |                 | 07:30         | 2.75  | RUN IN HOLE       | RUN IN HOLE W/BHA # 2           |
|          | 156          |                 | 10:15         | 1.75  | OTHER             | TRY TO GET MWD TO PULSE         |
|          | 156          |                 | 12:00         | 1.00  | OTHER             | MIX VISCOUS SWEEP AND PUMP SAME |
|          | 156          |                 | 13:00         | 5.00  | PULL OUT OF HOLE  | PULL OUT OF HOLE W/BHA # 2      |
|          | 156          |                 | 18:00         | 0.75  | OTHER             | CHANGE MWD TOOL                 |
|          | 156          |                 | 18:45         | 1.25  | RUN IN HOLE       | RUN IN HOLE W/BHA # 3           |
|          | 156          |                 | 20:00         | 0.25  | SERVICE RIG       | SERVICE RIG                     |
|          | 2914.00      | 156             | 20:15         | 3.75  | RUN IN HOLE       | RUN IN HOLE W/ BHA # 3          |
| 25/06/94 | 156          |                 | 00:00         | 2.25  | RUN IN HOLE       | RUN IN HOLE W/BHA # 3           |
|          | 156          |                 | 02:15         | 0.25  | SERVICE RIG       | SERVICE RIG                     |
|          | 156          |                 | 02:30         | 1.25  | RUN IN HOLE       | RUN IN HOLE W/BHA # 3           |
|          | 156          |                 | 03:45         | 5.25  | ORIENTED DRILLING | ORIENTED DRILLING               |
|          | 156          |                 | 09:00         | 3.00  | DEVIATION SURVEY  | DEVIATION SURVEY & CONNECTIONS  |
|          | 156          |                 | 12:00         | 10.75 | ORIENTED DRILLING | ORIENTED DRILLING               |
|          | 2975.00      | 156             | 22:45         | 1.25  | DEVIATION SURVEY  | DEVIATION SURVEY & CONNECTIONS  |
| 26/06/94 | 156          |                 | 00:00         | 1.75  | ORIENTED DRILLING | ORIENTED DRILLING               |
|          | 156          |                 | 01:45         | 0.75  | CIRCULATING       | CIRCULATING                     |
|          | 156          |                 | 02:30         | 0.25  | OTHER             | PUMP PILL                       |
|          | 156          |                 | 02:45         | 10.25 | PULL OUT OF HOLE  | PULL OUT OF HOLE W/BHA 3        |
|          | 156          |                 | 13:00         | 7.00  | RUN IN HOLE       | RUN IN HOLE W/BHA # 4           |
|          | 156          |                 | 20:00         | 0.25  | SERVICE RIG       | SERVICE RIG                     |
|          | 156          |                 | 20:15         | 1.75  | RUN IN HOLE       | RUN IN HOLE W/BHA # 4           |
|          | 2977.00      | 156             | 22:00         | 2.00  | ROTARY REAMING    | ROTARY REAMING F/2917 T/2946    |
| 27/06/94 | 156          |                 | 00:00         | 1.75  | ROTARY REAMING    | ROTARY REAMING F/2946 T/2978    |
|          | 156          |                 | 01:45         | 7.75  | ORIENTED DRILLING | ORIENTED DRILLING               |
|          | 156          |                 | 09:30         | 2.00  | DEVIATION SURVEY  | DEVIATION SURVEY                |
|          | 156          |                 | 11:30         | 0.25  | SERVICE RIG       | SERVICE RIG                     |
|          | 156          |                 | 11:45         | 6.00  | ORIENTED DRILLING | ORIENTED DRILLING               |
|          | 156          |                 | 17:45         | 1.00  | CIRCULATING       | CIRCULATING                     |
|          | 156          |                 | 18:45         | 1.00  | PULL OUT OF HOLE  | PULL OUT OF HOLE                |
|          | 156          |                 | 19:45         | 0.50  | CIRCULATING       | CIRCULATING                     |

Sperry-Sun of Canada

APM v1.12A

04/07/94

## EVENT LOG - TOTAL WELL

Well: PAN AM A-2 POINTED MTN

| Date     | Depth<br>(m) | Section<br>(mm) | Start<br>time | Hours | Operation           | Description                            |
|----------|--------------|-----------------|---------------|-------|---------------------|----------------------------------------|
|          |              | 156             | 20:15         | 1.00  | PULL OUT OF HOLE    | PULL OUT OF HOLE                       |
|          |              | 156             | 21:15         | 0.50  | CIRCULATING         | CIRCULATING                            |
|          |              | 156             | 21:45         | 0.75  | PULL OUT OF HOLE    | PULL OUT OF HOLE                       |
|          |              | 156             | 22:30         | 0.25  | CIRCULATING         | CIRCULATING                            |
|          |              | 156             | 22:45         | 1.00  | PULL OUT OF HOLE    | PULL OUT OF HOLE                       |
|          | 3013.00      | 156             | 23:45         | 0.25  | CIRCULATING         | CIRCULATING                            |
| 28/06/94 |              | 156             | 00:00         | 0.75  | CUT & SLIP LINE     | CUT & SLIP LINE                        |
|          |              | 156             | 00:45         | 0.25  | SERVICE RIG         | SERVICE RIG                            |
|          |              | 156             | 01:00         | 5.00  | PULL OUT OF HOLE    | PULL OUT OF HOLE W/BHA # 4             |
|          |              | 156             | 06:00         | 2.50  | OTHER               | CHANGE OUT MUD MOTORS AND SERVICE TOOL |
|          |              | 156             | 08:30         | 8.50  | RUN IN HOLE         | RUN IN HOLE W/BHA # 5                  |
|          |              | 156             | 17:00         | 1.00  | CIRCULATING         | CIRCULATING                            |
|          |              | 156             | 18:00         | 5.00  | ORIENTED DRILLING   | ORIENTED DRILLING                      |
|          | 3030.00      | 156             | 23:00         | 1.00  | DEVIATION SURVEY    | DEVIATION SURVEY                       |
| 06/94    |              | 156             | 00:00         | 0.25  | SERVICE RIG         | SERVICE RIG                            |
|          |              | 156             | 00:15         | 6.00  | ORIENTED DRILLING   | ORIENTED DRILLING                      |
|          |              | 156             | 06:15         | 3.00  | DEVIATION SURVEY    | DEVIATION SURVEY                       |
|          |              | 156             | 09:15         | 0.25  | CIRCULATING         | CIRCULATING                            |
|          |              | 156             | 09:30         | 0.25  | LEAK OFF TEST       | LEAK OFF TEST                          |
|          |              | 156             | 09:45         | 3.50  | ORIENTED DRILLING   | ORIENTED DRILLING                      |
|          |              | 156             | 13:15         | 1.00  | DEVIATION SURVEY    | DEVIATION SURVEY                       |
|          |              | 156             | 14:15         | 1.25  | CIRCULATING         | CIRCULATING                            |
|          |              | 156             | 15:30         | 4.75  | PULL OUT OF HOLE    | PULL OUT OF HOLE W/BHA # 5             |
|          |              | 156             | 20:15         | 0.25  | SERVICE RIG         | SERVICE RIG                            |
|          |              | 156             | 20:30         | 3.00  | PULL OUT OF HOLE    | PULL OUT OF HOLE W/BHA # 5             |
|          | 3057.00      | 156             | 23:30         | 0.50  | OTHER               | LAY DOWN BHA # 5                       |
| 30/06/94 |              | 156             | 00:00         | 3.00  | OTHER               | LAY DOWN BHA # 5                       |
|          |              | 156             | 03:00         | 3.50  | RUN IN HOLE         | RUN IN HOLE W/BHA # 6                  |
|          |              | 156             | 06:30         | 0.75  | CUT & SLIP LINE     | CUT & SLIP LINE                        |
|          |              | 156             | 07:15         | 6.50  | RUN IN HOLE         | RUN IN HOLE W/BHA # 6                  |
|          | 3067.00      | 156             | 13:45         | 10.25 | ROTARY DRILLING     | ROTARY DRILLING                        |
| 01/07/94 |              | 156             | 00:00         | 0.25  | SERVICE RIG         | SERVICE RIG                            |
|          |              | 156             | 00:15         | 11.75 | ROTARY DRILLING     | ROTARY DRILLING                        |
|          |              | 156             | 12:00         | 0.25  | SERVICE RIG         | SERVICE RIG                            |
|          | 3156.00      | 156             | 12:15         | 11.75 | ROTARY DRILLING     | ROTARY DRILLING                        |
| 02/07/94 | 3156.00      | 156             | 00:00         | 24.00 | DIRECTIONAL STANDBY | DIRECTIONAL STANDBY                    |

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Sperry-Sun of Canada  
APM v1.12A  
04/07/94

EVENT LOG - TOTAL WELL  
Well: PAN AM A-2 POINTED MTN

| Date     | Depth<br>(m) | Section<br>(mm) | Start<br>time | Hours | Operation | Description     |
|----------|--------------|-----------------|---------------|-------|-----------|-----------------|
| 03/07/94 | 3156.00      | 156             | 00:00         | 24.00 | OTHER     | TRAVEL TO NISKU |
| 04/07/94 | 3156.00      | 156             | 00:00         | 24.00 | OTHER     | TRAVEL TO NISKU |

Sperry-Sun of Canada

APM v1.12A

04/07/94

## HOLE SECTIONS

Well: PAN AM A-2 POINTED MTN

| Hole<br>diameter<br>(cm) | Hole<br>MD<br>(m) | Hole<br>TVD<br>(m) | Casing<br>OD<br>(cm) | Casing<br>MD<br>(m) | Casing<br>TVD<br>(m) | Comments  |
|--------------------------|-------------------|--------------------|----------------------|---------------------|----------------------|-----------|
| 156                      | 3156.00           | 3098.81            |                      |                     |                      | MAIN HOLE |

Sperry-Sun of Canada

APM v1.12A

04/07/94

# DAYS vs DEPTH

Well: PAN AM A-2 POINTED MTN

| Date     | Day Midnight |         | Hole | Company                   | Directional  |
|----------|--------------|---------|------|---------------------------|--------------|
|          | #            | depth   |      |                           |              |
|          |              | (m)     | Size | representative            | driller      |
|          |              |         | (mm) |                           |              |
| 18/06/94 | 1            | 2856.00 | 156  | DOUG EASTMAN/BOB PLASCO   | PAUL THEBEAU |
| 19/06/94 | 2            | 2856.00 | 156  | DOUG EASTMAN/BOB PLASCO   | PAUL THEBEAU |
| 20/06/94 | 3            | 2856.00 | 156  | DOUG EASTMAN/BOB PLASCO   | PAUL THEBEAU |
| 21/06/94 | 4            | 2856.00 | 156  | DOUG EASTMAN/BOB PLASCO   | PAUL THEBEAU |
| 22/06/94 | 5            | 2860.00 | 156  | DOUG EASTMAN/BOB PLASCO   | PAUL THEBEAU |
| 23/06/94 | 6            | 2914.00 | 156  | DOUG EASTMAN/BOB PLASCO   | PAUL THEBEAU |
| 24/06/94 | 7            | 2914.00 | 156  | DOUG EASTMAN/BOB PLASCO   | PAUL THEBEAU |
| 25/06/94 | 8            | 2975.00 | 156  | DOUG EASTMAN/BOB PLASCO   | PAUL THEBEAU |
| 26/06/94 | 9            | 2977.00 | 156  | DOUG EASTMAN/BOB PLASCO   | PAUL THEBEAU |
| 27/06/94 | 10           | 3013.00 | 156  | PHIL BOETTCHER/BOB PLASCO | PAUL THEBEAU |
| 28/06/94 | 11           | 3030.00 | 156  | PHIL BOETTCHER/BOB PLASCO | PAUL THEBEAU |
| 29/06/94 | 12           | 3057.00 | 156  | PHIL BOETTCHER/BOB PLASCO | PAUL THEBEAU |
| 30/06/94 | 13           | 3067.00 | 156  | PHIL BOETTCHER/BOB PLASCO | PAUL THEBEAU |
| 01/07/94 | 14           | 3156.00 | 156  | PHIL BOETTCHER/BOB PLASCO | PAUL THEBEAU |
| 02/07/94 | 15           | 3156.00 | 156  | PHIL BOETTCHER/BOB PLASCO | PAUL THEBEAU |
| 03/07/94 | 16           | 3156.00 | 156  | PHIL BOETTCHER/BOB PLASCO | HILLYER      |
| 04/07/94 | 17           | 3156.00 | 156  | PHIL BOETTCHER/BOB PLASCO | HILLYER      |

Sperry-Sun of Canada

APM v1.12A

04/07/94

# FORMATION TOPS

Well: PAN AM A-2 POINTED MTN

| Formation Names | -----MD (RKB)----- |         | -----TVD (RKB)----- |         | --TVD (Sub-sea)-- |         | Vertical<br>thickness |
|-----------------|--------------------|---------|---------------------|---------|-------------------|---------|-----------------------|
|                 | top                | bottom  | top                 | bottom  | top               | bottom  |                       |
|                 | (m)                | (m)     | (m)                 | (m)     | (m)               | (m)     |                       |
| NAHANNI         | 3078.00            | 3214.00 | 3033.47             | 3147.40 | 2658.83           | 2772.76 | 113.93                |
| 2ND BLACK SHALE | 2768.00            | 3078.00 | 2768.00             | 3033.47 | 2393.36           | 2658.83 | 265.47                |

Sperry-Sun of Canada

APM v1.12A

07/04/94

POINTED MOUNTAIN, 123 53'52.78

156 MM SECTION

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TIME DISTRIBUTION

EVENT LOG

BHA RUNS

BHA TALLIES

BIT RUNS

MOTOR RUNS

MUD DATA

ORIGINAL SURVEY

Sperry-Sun of Canada  
APM v1.12A  
07/04/94

# TIME DISTRIBUTION - 156 MM SECTION

Well: PAN AM A-2 POINTED MTN

| Operation           | Total Hours | %      |
|---------------------|-------------|--------|
| OTHER               | 134.25      | 33.73  |
| ORIENTED DRILLING   | 61.75       | 15.52  |
| RUN IN HOLE         | 59.75       | 15.01  |
| PULL OUT OF HOLE    | 48.00       | 12.06  |
| ROTARY DRILLING     | 33.75       | 8.48   |
| DIRECTIONAL STANDBY | 24.00       | 6.03   |
| DEVIATION SURVEY    | 12.75       | 3.20   |
| CIRCULATING         | 8.75        | 2.20   |
| REPAIRING RIG       | 4.00        | 1.01   |
| ROTARY REAMING      | 3.75        | 0.94   |
| SERVICE RIG         | 3.00        | 0.75   |
| CUT & SLIP LINE     | 2.50        | 0.63   |
| TEST BOPS           | 1.50        | 0.38   |
| LEAK OFF TEST       | 0.25        | 0.06   |
| Section Total:      | 398.00      | 100.00 |

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APM v1.12A  
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EVENT LOG - 156 MM SECTION  
Well: PAN AM A-2 POINTED MTN

| Date     | Depth<br>(m) | Section<br>(mm) | Start<br>time | Hours | Operation         | Description                                    |
|----------|--------------|-----------------|---------------|-------|-------------------|------------------------------------------------|
|          | 2856.00      | 156             | 10:00         | 14.00 | OTHER             | TRAVEL FROM NISKU TO LOCATION                  |
| 19/06/94 | 2856.00      | 156             | 00:00         | 24.00 | OTHER             | TRAVEL TO LOCATION                             |
| 20/06/94 |              | 156             | 00:00         | 13.00 | OTHER             | TRAVEL TO LOCATION                             |
|          |              | 156             | 13:00         | 6.00  | RUN IN HOLE       | RUN IN HOLE W/MILL                             |
|          | 2856.00      | 156             | 19:00         | 5.00  | OTHER             | POLISH AND DRESS WINDOW                        |
| 21/06/94 |              | 156             | 00:00         | 1.50  | OTHER             | MILL WINDOW                                    |
|          |              | 156             | 01:30         | 4.25  | PULL OUT OF HOLE  | PULL OUT OF HOLE W/MILL                        |
|          |              | 156             | 05:45         | 1.25  | OTHER             | CHANGE MILLS                                   |
|          |              | 156             | 07:00         | 1.00  | RUN IN HOLE       | RUN IN HOLE                                    |
|          |              | 156             | 08:00         | 0.25  | SERVICE RIG       | SERVICE RIG                                    |
|          |              | 156             | 08:15         | 1.75  | RUN IN HOLE       | RUN IN HOLE                                    |
|          |              | 156             | 10:00         | 0.75  | OTHER             | SAFETY MEETING                                 |
|          |              | 156             | 10:45         | 1.25  | OTHER             | BOP DRILL                                      |
|          |              | 156             | 12:00         | 3.25  | RUN IN HOLE       | RUN IN HOLE W/MILL                             |
|          |              | 156             | 15:15         | 3.50  | OTHER             | DRESS WINDOW W/MILL                            |
|          |              | 156             | 18:45         | 2.00  | CIRCULATING       | CIRCULATING AND DO FORMATION INTEGRITY TEST    |
|          | 2856.00      | 156             | 20:45         | 3.25  | PULL OUT OF HOLE  | PULL OUT OF HOLE W/MILL                        |
| 22/06/94 |              | 156             | 00:00         | 4.50  | PULL OUT OF HOLE  | PULL OUT OF HOLE W/MILL                        |
|          |              | 156             | 04:30         | 1.50  | TEST BOPS         | TEST BOPS                                      |
|          |              | 156             | 06:00         | 1.00  | OTHER             | PICK UP MUD MOTOR                              |
|          |              | 156             | 07:00         | 2.00  | OTHER             | DRILL MOUSEHOLE W/MUD MOTOR                    |
|          |              | 156             | 09:00         | 3.00  | OTHER             | MAKE UP BHA # 1                                |
|          |              | 156             | 12:00         | 2.50  | OTHER             | PICK UP 6 DRILL COLLARS                        |
|          |              | 156             | 14:30         | 0.50  | OTHER             | SHALLOW PULSE TEST                             |
|          |              | 156             | 15:00         | 6.50  | RUN IN HOLE       | RUN IN HOLE W/BHA # 1                          |
|          | 2860.00      | 156             | 21:30         | 2.50  | ORIENTED DRILLING | ORIENTED DRILLING                              |
| 23/06/94 |              | 156             | 00:00         | 0.50  | OTHER             | ORIENT TOOL                                    |
|          |              | 156             | 00:30         | 4.00  | REPAIRING RIG     | REPAIRING RIG REPAIR BROKEN CHAIN IN DRAWWORKS |
|          |              | 156             | 04:30         | 2.50  | ORIENTED DRILLING | ORIENTED DRILLING                              |
|          |              | 156             | 07:00         | 4.00  | ORIENTED DRILLING | ORIENTED DRILLING                              |
|          |              | 156             | 11:00         | 1.00  | DEVIATION SURVEY  | DEVIATION SURVEY                               |
|          |              | 156             | 12:00         | 3.50  | ORIENTED DRILLING | ORIENTED DRILLING                              |
|          |              | 156             | 15:30         | 0.50  | DEVIATION SURVEY  | DEVIATION SURVEY                               |
|          |              | 156             | 16:00         | 1.50  | OTHER             | ORIENT TOOL                                    |
|          |              | 156             | 17:30         | 3.25  | ORIENTED DRILLING | ORIENTED DRILLING                              |
|          |              | 156             | 20:45         | 1.00  | CIRCULATING       | CIRCULATING                                    |
|          |              | 156             | 21:45         | 2.00  | PULL OUT OF HOLE  | PULL OUT OF HOLE W/BHA # 1                     |

Sperry-Sun of Canada  
APM v1.12A  
04/07/94

# EVENT LOG - 156 MM SECTION

Well: PAN AM A-2 POINTED MTN

| Date     | Depth<br>(m) | Section<br>(mm) | Start<br>time | Hours             | Operation                       | Description                    |
|----------|--------------|-----------------|---------------|-------------------|---------------------------------|--------------------------------|
|          | 2914.00      | 156             | 23:45         | 0.25              | SERVICE RIG                     | SERVICE RIG                    |
| 24/06/94 | 156          | 00:00           | 2.25          | PULL OUT OF HOLE  | PULL OUT OF HOLE W/BHA # 1      |                                |
|          | 156          | 02:15           | 0.50          | OTHER             | FLOW CHECK                      |                                |
|          | 156          | 02:45           | 0.25          | SERVICE RIG       | SERVICE RIG                     |                                |
|          | 156          | 03:00           | 0.75          | OTHER             | CHANGE BHA                      |                                |
|          | 156          | 03:45           | 2.75          | RUN IN HOLE       | RUN IN HOLE W/BHA # 2           |                                |
|          | 156          | 06:30           | 1.00          | CUT & SLIP LINE   | CUT & SLIP LINE                 |                                |
|          | 156          | 07:30           | 2.75          | RUN IN HOLE       | RUN IN HOLE W/BHA # 2           |                                |
|          | 156          | 10:15           | 1.75          | OTHER             | TRY TO GET MWD TO PULSE         |                                |
|          | 156          | 12:00           | 1.00          | OTHER             | MIX VISCOUS SWEEP AND PUMP SAME |                                |
|          | 156          | 13:00           | 5.00          | PULL OUT OF HOLE  | PULL OUT OF HOLE W/BHA # 2      |                                |
|          | 156          | 18:00           | 0.75          | OTHER             | CHANGE MWD TOOL                 |                                |
|          | 156          | 18:45           | 1.25          | RUN IN HOLE       | RUN IN HOLE W/BHA # 3           |                                |
|          | 156          | 20:00           | 0.25          | SERVICE RIG       | SERVICE RIG                     |                                |
|          | 2914.00      | 156             | 20:15         | 3.75              | RUN IN HOLE                     | RUN IN HOLE W/ BHA # 3         |
| 25/06/94 | 156          | 00:00           | 2.25          | RUN IN HOLE       | RUN IN HOLE W/BHA # 3           |                                |
|          | 156          | 02:15           | 0.25          | SERVICE RIG       | SERVICE RIG                     |                                |
|          | 156          | 02:30           | 1.25          | RUN IN HOLE       | RUN IN HOLE W/BHA # 3           |                                |
|          | 156          | 03:45           | 5.25          | ORIENTED DRILLING | ORIENTED DRILLING               |                                |
|          | 156          | 09:00           | 3.00          | DEVIATION SURVEY  | DEVIATION SURVEY & CONNECTIONS  |                                |
|          | 156          | 12:00           | 10.75         | ORIENTED DRILLING | ORIENTED DRILLING               |                                |
|          | 2975.00      | 156             | 22:45         | 1.25              | DEVIATION SURVEY                | DEVIATION SURVEY & CONNECTIONS |
| 26/06/94 | 156          | 00:00           | 1.75          | ORIENTED DRILLING | ORIENTED DRILLING               |                                |
|          | 156          | 01:45           | 0.75          | CIRCULATING       | CIRCULATING                     |                                |
|          | 156          | 02:30           | 0.25          | OTHER             | PUMP PILL                       |                                |
|          | 156          | 02:45           | 10.25         | PULL OUT OF HOLE  | PULL OUT OF HOLE W/BHA 3        |                                |
|          | 156          | 13:00           | 7.00          | RUN IN HOLE       | RUN IN HOLE W/BHA # 4           |                                |
|          | 156          | 20:00           | 0.25          | SERVICE RIG       | SERVICE RIG                     |                                |
|          | 156          | 20:15           | 1.75          | RUN IN HOLE       | RUN IN HOLE W/BHA # 4           |                                |
|          | 2977.00      | 156             | 22:00         | 2.00              | ROTARY REAMING                  | ROTARY REAMING F/2917 T/2946   |
| 27/06/94 | 156          | 00:00           | 1.75          | ROTARY REAMING    | ROTARY REAMING F/2946 T/2978    |                                |
|          | 156          | 01:45           | 7.75          | ORIENTED DRILLING | ORIENTED DRILLING               |                                |
|          | 156          | 09:30           | 2.00          | DEVIATION SURVEY  | DEVIATION SURVEY                |                                |
|          | 156          | 11:30           | 0.25          | SERVICE RIG       | SERVICE RIG                     |                                |
|          | 156          | 11:45           | 6.00          | ORIENTED DRILLING | ORIENTED DRILLING               |                                |
|          | 156          | 17:45           | 1.00          | CIRCULATING       | CIRCULATING                     |                                |
|          | 156          | 18:45           | 1.00          | PULL OUT OF HOLE  | PULL OUT OF HOLE                |                                |
|          | 156          | 19:45           | 0.50          | CIRCULATING       | CIRCULATING                     |                                |

Sperry-Sun of Canada  
APM v1.12A  
04/07/94

EVENT LOG - 156 MM SECTION  
Well: PAN AM A-2 POINTED MTN

| Date     | Depth<br>(m) | Section<br>(mm) | Start<br>time | Hours | Operation           | Description                            |
|----------|--------------|-----------------|---------------|-------|---------------------|----------------------------------------|
|          |              | 156             | 20:15         | 1.00  | PULL OUT OF HOLE    | PULL OUT OF HOLE                       |
|          |              | 156             | 21:15         | 0.50  | CIRCULATING         | CIRCULATING                            |
|          |              | 156             | 21:45         | 0.75  | PULL OUT OF HOLE    | PULL OUT OF HOLE                       |
|          |              | 156             | 22:30         | 0.25  | CIRCULATING         | CIRCULATING                            |
|          |              | 156             | 22:45         | 1.00  | PULL OUT OF HOLE    | PULL OUT OF HOLE                       |
|          | 3013.00      | 156             | 23:45         | 0.25  | CIRCULATING         | CIRCULATING                            |
| 28/06/94 |              | 156             | 00:00         | 0.75  | CUT & SLIP LINE     | CUT & SLIP LINE                        |
|          |              | 156             | 00:45         | 0.25  | SERVICE RIG         | SERVICE RIG                            |
|          |              | 156             | 01:00         | 5.00  | PULL OUT OF HOLE    | PULL OUT OF HOLE W/BHA # 4             |
|          |              | 156             | 06:00         | 2.50  | OTHER               | CHANGE OUT MUD MOTORS AND SERVICE TOOL |
|          |              | 156             | 08:30         | 8.50  | RUN IN HOLE         | RUN IN HOLE W/BHA # 5                  |
|          |              | 156             | 17:00         | 1.00  | CIRCULATING         | CIRCULATING                            |
|          |              | 156             | 18:00         | 5.00  | ORIENTED DRILLING   | ORIENTED DRILLING                      |
|          | 3030.00      | 156             | 23:00         | 1.00  | DEVIATION SURVEY    | DEVIATION SURVEY                       |
| 01/06/94 |              | 156             | 00:00         | 0.25  | SERVICE RIG         | SERVICE RIG                            |
|          |              | 156             | 00:15         | 6.00  | ORIENTED DRILLING   | ORIENTED DRILLING                      |
|          |              | 156             | 06:15         | 3.00  | DEVIATION SURVEY    | DEVIATION SURVEY                       |
|          |              | 156             | 09:15         | 0.25  | CIRCULATING         | CIRCULATING                            |
|          |              | 156             | 09:30         | 0.25  | LEAK OFF TEST       | LEAK OFF TEST                          |
|          |              | 156             | 09:45         | 3.50  | ORIENTED DRILLING   | ORIENTED DRILLING                      |
|          |              | 156             | 13:15         | 1.00  | DEVIATION SURVEY    | DEVIATION SURVEY                       |
|          |              | 156             | 14:15         | 1.25  | CIRCULATING         | CIRCULATING                            |
|          |              | 156             | 15:30         | 4.75  | PULL OUT OF HOLE    | PULL OUT OF HOLE W/BHA # 5             |
|          |              | 156             | 20:15         | 0.25  | SERVICE RIG         | SERVICE RIG                            |
|          |              | 156             | 20:30         | 3.00  | PULL OUT OF HOLE    | PULL OUT OF HOLE W/BHA # 5             |
|          | 3057.00      | 156             | 23:30         | 0.50  | OTHER               | LAY DOWN BHA # 5                       |
| 30/06/94 |              | 156             | 00:00         | 3.00  | OTHER               | LAY DOWN BHA # 5                       |
|          |              | 156             | 03:00         | 3.50  | RUN IN HOLE         | RUN IN HOLE W/BHA # 6                  |
|          |              | 156             | 06:30         | 0.75  | CUT & SLIP LINE     | CUT & SLIP LINE                        |
|          |              | 156             | 07:15         | 6.50  | RUN IN HOLE         | RUN IN HOLE W/BHA # 6                  |
|          | 3067.00      | 156             | 13:45         | 10.25 | ROTARY DRILLING     | ROTARY DRILLING                        |
| 01/07/94 |              | 156             | 00:00         | 0.25  | SERVICE RIG         | SERVICE RIG                            |
|          |              | 156             | 00:15         | 11.75 | ROTARY DRILLING     | ROTARY DRILLING                        |
|          |              | 156             | 12:00         | 0.25  | SERVICE RIG         | SERVICE RIG                            |
|          | 3156.00      | 156             | 12:15         | 11.75 | ROTARY DRILLING     | ROTARY DRILLING                        |
| 02/07/94 | 3156.00      | 156             | 00:00         | 24.00 | DIRECTIONAL STANDBY | DIRECTIONAL STANDBY                    |

Sperry-Sun of Canada  
APM v1.12A  
04/07/94

EVENT LOG - 156 MM SECTION  
Well: PAN AM A-2 POINTED MTN

| Date     | Depth<br>(m) | Section<br>(mm) | Start<br>time | Hours | Operation | Description     |
|----------|--------------|-----------------|---------------|-------|-----------|-----------------|
| 03/07/94 | 3156.00      | 156             | 00:00         | 24.00 | OTHER     | TRAVEL TO NISKU |
| 04/07/94 | 3156.00      | 156             | 00:00         | 24.00 | OTHER     | TRAVEL TO NISKU |

Sperry-Sun of Canada  
APM v1.12A  
04/07/94

BHA RUNS SUMMARY

Page:

Well: PAN AM A-2 POINTED MTN

| BHA<br>run | Bit # /<br>Motor #<br>Hole size<br>(mm) | MD in /<br>MD out/<br>Interval<br>(m) | TVD in/<br>TVD out<br>Comments<br>(m) | Method<br>BHA type | ----- Dogleg -----<br>--Expected-- Actual<br>Rot / Orient<br>----- (°/30m)----- | Inc .in/<br>Inc .out<br>(°) | Inc Change<br>Build rate<br>(°/ °/30m) | Dir. in<br>Dir. out<br>Formations<br>(°) | Dir change<br>Turn rate<br>(°/ m. |
|------------|-----------------------------------------|---------------------------------------|---------------------------------------|--------------------|---------------------------------------------------------------------------------|-----------------------------|----------------------------------------|------------------------------------------|-----------------------------------|
| 1          | 1                                       | 2856.00                               | 2831.20                               | STEERABLE          | 1.00 10.00                                                                      | 12.40                       | 0.00                                   | 96.02                                    | 0.00                              |
|            | 1                                       | 2914.00                               | 2885.58                               | B                  |                                                                                 | 12.40                       | 0.00                                   | 96.02                                    | 0.00                              |
|            | 156                                     | 58.00                                 |                                       |                    |                                                                                 |                             |                                        |                                          |                                   |
| 2          | 2                                       | 2914.00                               | 2885.58                               | STEERABLE          | 1.00 8.00                                                                       | 0.00                        | 0.00                                   | 0.00                                     | 0.00                              |
|            | 2                                       | 2914.00                               | 2885.58                               | B                  |                                                                                 | 0.00                        | 0.00                                   | 0.00                                     | 0.00                              |
|            | 156                                     | 0.00                                  | MWD FAILURE                           |                    |                                                                                 |                             |                                        |                                          |                                   |
| 3          | 2RR1                                    | 2914.00                               | 2885.58                               | STEERABLE          | 1.00 8.00                                                                       | 24.30                       | -2.40                                  | 66.60                                    | -25.10                            |
|            | 2RR1                                    | 2977.00                               | 2943.49                               | B                  |                                                                                 | 21.90                       | -1.37                                  | 41.50                                    | -14.27                            |
|            | 156                                     | 63.00                                 |                                       |                    |                                                                                 |                             |                                        |                                          |                                   |
| 4          | 3                                       | 2978.00                               | 2944.42                               | STEERABLE          | 1.00 8.00                                                                       | 21.50                       | 0.30                                   | 41.10                                    | -4.50                             |
|            | 2RR2                                    | 3013.00                               | 2977.01                               | B                  |                                                                                 | 21.80                       | 0.32                                   | 36.60                                    | -4.80                             |
|            | 156                                     | 35.00                                 |                                       |                    |                                                                                 |                             |                                        |                                          |                                   |
| 5          | 4                                       | 3013.00                               | 2977.01                               | STEERABLE          | 1.00 8.00                                                                       | 23.70                       | 9.40                                   | 36.50                                    | -9.40                             |
|            | 3                                       | 3057.00                               | 3015.88                               | B                  |                                                                                 | 33.10                       | 7.68                                   | 27.10                                    | -7.68                             |
|            | 156                                     | 44.00                                 |                                       |                    |                                                                                 |                             |                                        |                                          |                                   |
| 6          | 5                                       | 3057.00                               | 3015.88                               | ROTARY             | 1.00 0.00                                                                       | 33.10                       | 0.00                                   | 27.10                                    | 0.00                              |
|            |                                         | 0.00                                  | 0.00                                  | H                  |                                                                                 | 33.10                       | 0.00                                   | 27.10                                    | 0.00                              |
|            | 156                                     | 0.00                                  |                                       |                    |                                                                                 |                             |                                        |                                          |                                   |

NOTES: 1: Inclination in/out and direction in/out are derived from the original survey closest to the MD in/out within the BHA run course length  
2: BHA types.....: B:build / D:drop / H:hold / T:turn / O:other  
3: formation names:

SPERRY-SUN  
Drilling Services of Canada  
Well: PAN AM A-2 POINTED MTN  
BHA Run 1

| MD in (m) | MD out  | Interval | TVD in  | TVD out | BHA type | Method    |
|-----------|---------|----------|---------|---------|----------|-----------|
| 2856.00   | 2914.00 | 58.00    | 2831.20 | 2885.58 | B        | STEERABLE |

BHA performance: (°/30m)

|                            |            |            |            |            |      |
|----------------------------|------------|------------|------------|------------|------|
|                            | Avg.build: | 0.00       | Avg.turn.: | 0.00       |      |
| Expected dogleg(rotary)... | 1.00       | Max.build: | 0.00       | Max.turn.: | 0.00 |
| Expected dogleg(oriented): | 10.00      | Min.build: | 0.00       | Min.turn.: | 0.00 |

BHA components: BIT I, MTR AJ, SUB XO, SUB FS, MWD HS, NMDC, NMDC, 18 x 122 DC

Formations: 2ND BLACK SHALE

|        |             |     |                |                    |
|--------|-------------|-----|----------------|--------------------|
| Bit# 1 | Size: 156   | mm  | Type: ATJ M33D | Make: HUGHES       |
|        | TFA.: 2.936 | cm2 | Hrs.: 16.25    | Condition: 7-8-1MM |

|        |                                           |    |           |                    |
|--------|-------------------------------------------|----|-----------|--------------------|
| Mtr# 1 | Size: 121                                 | mm | Type: PDM | Make: SPERRY DRILL |
|        | Desr: 1.83 DEG ADJ 6.3 STG 4/5 LOBE SLICK |    |           |                    |

BHA run summary:

THIS BH WAS USED TO STEER OUT OF WINDOW IN THE CASING AT 2854m AND DRILL AHEAD TO 2914m. A SURVEY WAS TAKEN WHEN THE SENSOR WAS AT 2853m AND AN ANGLE OF 14 DEGREES WAS SEEN. WE DID NOT GYRO OUT OF THE WINDOW AND AS A RESULT WE COULD NOT GET AN AZIMUTH THAT WAS GOOD UNTIL A DEPTH OF 2914m. WE THEN USED THE ANGLE WE SAW FROM THE SURVEY TAKEN IN THE SHOE AND CALLED IT THE ORIGINAL HOLE DIRECTION OF 96.02 AZ, AND PUT IN THE SURVEY AT 2900.77m OF 22.1 DEGREES AND 69.4 AZ AND INTERPOLATED BETWEEN THESE POINTS TO GET A AZIMUTH FOR THE SURVEY STATIONS IN BETWEEN THESE TWO. THIS BHA WAS PULLED TO CHANGE THE BIT. WHEN THE MOTOR REACHED SURFACE THE PROTECTOR SLEEVE WAS SCREWED OFF AND ON TOP OF THE BIT. THE SLEEVE HAD BEEN TORQUED TO 3500 FT/LBS. THE MOTOR WAS LAYED DOWN BECAUSE OF THREAD DAMAGE TO THE SLEEVE AREA.

Sperry-Sun of Canada  
APM v1.12A  
04/07/94

BHA # 1 - BHA TALLY  
Well: PAN AM A-2 POINTED MTN

MD in...: 2855.00 m    TVD in.: 2831.20 m    Bit size: 156 mm  
MD out...: 2914.00 m    TVD out: 2885.58 m    Jets.....: 2/12.7 1/7.1 mm  
Interval: 58.00 m    TPA.....: 2.936 cm2

| Description             | S/n     | Weight<br>(daN) | Item<br>length<br>(m) | Item<br>OD<br>(mm) | Item<br>ID<br>(mm) | Bit/STB<br>gauge<br>(mm) | Len.fr.<br>bit<br>(m) | Belly<br>length<br>(m) | Bit to<br>CB STB<br>(m) |
|-------------------------|---------|-----------------|-----------------------|--------------------|--------------------|--------------------------|-----------------------|------------------------|-------------------------|
| 156mm INSERT BIT        | L12WG   |                 | 0.15                  |                    |                    |                          | 0.15                  |                        |                         |
| ADJUS.121mm1.83DEG MSBH | 475012B | 1               | 8.65                  | 121                |                    |                          | 8.80                  |                        |                         |
| 121mm CROSSOVER         | 2941    |                 | 0.73                  | 121                | 44                 |                          | 9.53                  |                        |                         |
| 121mm FLOAT SUB         | 3227    |                 | 0.77                  | 121                | 58                 |                          | 10.30                 |                        |                         |
| 119mm MWD HOS           | C-514A  | 497             | 9.54                  | 119                | 74                 |                          | 19.84                 |                        |                         |
| 122mm NON-MAG DC        | C-568   | 656             | 9.48                  | 122                | 58                 |                          | 29.32                 |                        |                         |
| 122mm NON-MAG DC        | C-567   | 649             | 9.48                  | 122                | 59                 |                          | 38.80                 |                        |                         |
| 121mm DRILL COLLAR x 18 |         | 11694           | 170.84                | 122                | 59                 |                          | 209.64                |                        |                         |
|                         |         | 13497           | 209.64                |                    |                    |                          |                       |                        |                         |

| WEIGHTS:   | In air<br>(daN) | In 1.02 gm/cc mud<br>(daN) | With 5% safety factor<br>(daN) |
|------------|-----------------|----------------------------|--------------------------------|
| Total BHA  | 13497           | 11741                      | 11154                          |
| Excl. HWDP | 13497           | 11741                      | 11154                          |
| Below JARS | 0               | 0                          | 0                              |
| Above JARS | 0               | 0                          | 0                              |

SPERRY-SUN  
Drilling Services of Canada  
Well: PAN AM A-2 POINTED MTN  
BHA Run 2

| MD in (m) | MD out  | Interval | TVD in  | TVD out | BHA type | Method    |
|-----------|---------|----------|---------|---------|----------|-----------|
| 2914.00   | 2914.00 | 0.00     | 2885.58 | 2895.58 | B        | STEERABLE |

BHA performance: (°/30m)

|                            |      |            |      |            |      |
|----------------------------|------|------------|------|------------|------|
|                            |      | Avg.build: | 0.00 | Avg.turn.: | 0.00 |
| Expected dogleg(rotary)... | 1.00 | Max.build: | 0.00 | Max.turn.: | 0.00 |
| Expected dogleg(oriented): | 8.00 | Min.build: | 0.00 | Min.turn.: | 0.00 |

BHA components: BIT I, MTR AJ, SUB XO, SUB FS, MWD HS, NMDC, NMDC, 18 x 122 DC

Formations: 2ND BLACK SHALE

|        |             |     |                |             |
|--------|-------------|-----|----------------|-------------|
| Bit# 2 | Size: 156   | mm  | Type: ATJM-33D | Make: HUGHS |
|        | TFA.: 2.252 | cm2 | Hrs.: 0.00     | Condition:  |

|        |                   |               |           |                    |
|--------|-------------------|---------------|-----------|--------------------|
| Mtr# 2 | Size: 121         | mm            | Type: PDM | Make: SPERRY DRILL |
|        | Desr: 1.5 DEG ADJ | 6.3 STG SLICK |           |                    |

BHA run summary:

THIS BHA WAS TRIPPED OUT BECAUSE MWD QUIT PULSING BEFORE WE GOT TO BOTTOM.

Sperry-Sun of Canada  
APM v1.12A  
04/07/94

BHA # 2 - BHA TALLY  
Well: PAN AM A-2 POINTED MTN

MD in...: 2914.00 m    TVD in.: 2885.58 m    Bit size: 156 mm  
MD out...: 2914.00 m    TVD out: 2885.58 m    Jets.....: 2/7.9 1/12.7 mm  
Interval: 0.00 m    TFA.....: 2.252 cm2

| Description             | S/n     | Weight<br>(daN) | Item<br>length<br>(m) | Item<br>OD<br>(mm) | Item<br>ID<br>(mm) | Bit/STB<br>gauge<br>(mm) | Len.fr.<br>bit<br>(m) | Belly<br>length<br>(m) | Bit to<br>CB STB<br>(m) |
|-------------------------|---------|-----------------|-----------------------|--------------------|--------------------|--------------------------|-----------------------|------------------------|-------------------------|
| 156mm INSERT BIT        | L13WG   |                 | 0.15                  |                    |                    |                          | 0.15                  |                        |                         |
| ADJUS.121mm1.5Dg M/S BH | 475013B |                 | 8.64                  | 121                |                    |                          | 8.79                  |                        |                         |
| 121mm CROSSOVER         | 2941    |                 | 0.73                  | 121                | 44                 |                          | 9.52                  |                        |                         |
| 121mm FLOAT SUB         | 3227    |                 | 0.77                  | 121                | 58                 |                          | 10.29                 |                        |                         |
| 119mm MWD HOS           | C-514A  | 497             | 9.54                  | 119                | 74                 |                          | 19.83                 |                        |                         |
| 122mm NON-MAG DC        | C-568   | 656             | 9.48                  | 122                | 58                 |                          | 29.31                 |                        |                         |
| 122mm NON-MAG DC        | C-567   | 649             | 9.48                  | 122                | 59                 |                          | 38.79                 |                        |                         |
| 121mm DRILL COLLAR x 18 |         | 11694           | 170.84                | 122                | 59                 |                          | 209.63                |                        |                         |
|                         |         |                 | 13496                 | 209.63             |                    |                          |                       |                        |                         |

| WEIGHTS:   | In air<br>(daN) | In 1.02 gm/cc mud<br>(daN) | With 5% safety factor<br>(daN) |
|------------|-----------------|----------------------------|--------------------------------|
| Total BHA  | 13496           | 11741                      | 11154                          |
| Excl. HWDP | 13496           | 11741                      | 11154                          |
| Below JARS | 0               | 0                          | 0                              |
| Above JARS | 0               | 0                          | 0                              |

SPERRY-SUN  
Drilling Services of Canada  
Well: PAN AM A-2 POINTED MTN  
BHA Run 3

| MD in (m) | MD out  | Interval | TVD in  | TVD out | BHA type | Method    |
|-----------|---------|----------|---------|---------|----------|-----------|
| 2914.00   | 2977.00 | 63.00    | 2885.58 | 2943.49 | B        | STEERABLE |

BHA performance: (°/30m)

|                            |            |            |            |            |
|----------------------------|------------|------------|------------|------------|
|                            | Avg.build: | -1.37      | Avg.turn.: | -14.27     |
| Expected dogleg(rotary)... | 1.00       | Max.build: | 0.95       | Max.turn.: |
| Expected dogleg(oriented): | 8.00       | Min.build: | -2.19      | Min.turn.: |

BHA components: BIT I, MTR AJ, SUB XO, SUB FS, MWD HS, NMDC, NMDC, 18 x 122 DC

Formations: 2ND BLACK SHALE

|           |             |     |                |                    |
|-----------|-------------|-----|----------------|--------------------|
| Bit# 2RR1 | Size: 156   | mm  | Type: ATJM-33D | Make: HUGHS        |
|           | TFA.: 2.252 | cm2 | Hrs.: 20.25    | Condition: 7-7-1MM |

|           |                   |     |           |                    |
|-----------|-------------------|-----|-----------|--------------------|
| Mtr# 2RR1 | Size: 121         | mm  | Type: PDM | Make: SPERRY DRILL |
|           | Desr: 1.5 DEG ADJ | 6.3 | STG SLICK |                    |

BHA run summary:

THIS BHA WAS USED TO DRILL FROM 2914m TO 2977m. NO PROBLEMS WERE HAD ON THIS RUN. THE BHA WAS PULLED TO CHANGE THE BIT.

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APM v1.12A  
04/07/94

BHA # 3 - BHA TALLY  
Well: PAN AM A-2 POINTED MTN

MD in...: 2914.00 m    TVD in.: 2985.58 m    Bit size: 156 mm  
MD out...: 2977.00 m    TVD out: 2943.49 m    Jets.....: 2/7.9 1/12.7 mm  
Interval: 63.00 m    TFA.....: 2.252 cm2

| Description             | S/n     | Weight<br>(daN) | Item<br>length<br>(m) | Item<br>OD<br>(mm) | Item<br>ID<br>(mm) | Bit/STB<br>gauge<br>(mm) | Len.fr.<br>bit<br>(m) | Belly<br>length<br>(m) | Bit to<br>CB STB<br>(m) |
|-------------------------|---------|-----------------|-----------------------|--------------------|--------------------|--------------------------|-----------------------|------------------------|-------------------------|
| 156mm INSERT BIT        | L13WG   |                 | 0.15                  |                    |                    |                          | 0.15                  |                        |                         |
| ADJUS.121mm1.5Dg M/S BH | 475013B |                 | 8.64                  | 121                |                    |                          | 8.79                  |                        |                         |
| 121mm CROSSOVER         | 2941    |                 | 0.73                  | 121                | 44                 |                          | 9.52                  |                        |                         |
| 121mm FLOAT SUB         | 3227    |                 | 0.77                  | 121                | 58                 |                          | 10.29                 |                        |                         |
| 119mm MWD HOS           | C-514A  | 497             | 9.54                  | 119                | 74                 |                          | 19.83                 |                        |                         |
| 122mm NON-MAG DC        | C-568   | 656             | 9.48                  | 122                | 58                 |                          | 29.31                 |                        |                         |
| 122mm NON-MAG DC        | C-567   | 649             | 9.48                  | 122                | 59                 |                          | 38.79                 |                        |                         |
| 121mm DRILL COLLAR x 18 |         | 11694           | 170.84                | 122                | 59                 |                          | 209.63                |                        |                         |
|                         |         | 13496           | 209.63                |                    |                    |                          |                       |                        |                         |

| WEIGHTS:   | In air<br>(daN) | In 1.02 gm/cc mud<br>(daN) | With 5% safety factor<br>(daN) |
|------------|-----------------|----------------------------|--------------------------------|
| Total BHA  | 13496           | 11741                      | 11154                          |
| Excl. HWDP | 13496           | 11741                      | 11154                          |
| Below JARS | 0               | 0                          | 0                              |
| Above JARS | 0               | 0                          | 0                              |

SPERRY-SUN  
Drilling Services of Canada  
Well: PAN AM A-2 POINTED MTN

Mtr# 2RR2      Size: 121      mm      Typ

| MD in (m) | MD out  | Interval | TVD in  | TVD out | BHA type | Method    |
|-----------|---------|----------|---------|---------|----------|-----------|
| 2978.00   | 3013.00 | 35.00    | 2944.42 | 2977.01 | B        | STEERABLE |

BHA performance: (°/30m)

|                            |            |            |            |            |
|----------------------------|------------|------------|------------|------------|
|                            | Avg.build: | 0.32       | Avg.turn.: | -4.80      |
| Expected dogleg(rotary)... | 1.00       | Max.build: | 1.89       | Max.turn.: |
| Expected dogleg(oriented): | 8.00       | Min.build: | -2.17      | Min.turn.: |
|                            |            |            |            | -11.07     |

BHA components: BIT P, MTR AJ, SUB XO, SUB FS, MWD HS, NMDC, NMDC, 4 x 122 DC, JAR, 14 x 122 DC

Formations: 2ND BLACK SHALE

|        |              |     |             |                                  |
|--------|--------------|-----|-------------|----------------------------------|
| Bit# 3 | Size: 156    | mm  | Type: PDC   | Make: DB STRATA BIT              |
|        | TFA.: 10.033 | cm2 | Hrs.: 13.75 | Condition: INSIDE & GUAGE DAMAGE |

|           |                   |     |           |                    |
|-----------|-------------------|-----|-----------|--------------------|
| Mtr# 2RR2 | Size: 121         | mm  | Type: PDM | Make: SPERRY DRILL |
|           | Desr: 1.5 DEG ADJ | 6.3 | STG SLICK |                    |

BHA run summary:

THIS BHA WAS RUN TO DRILL FROM 2978m TO 3013m USING A PDC TYPE TD268. THIS BIT GAVE US PENETRATION RATES OF 6 TO 10 MINUTES PER METER ROTATING AND 10 TO 15 MINUTES PER METER SLIDING. THE MAXIMUM BIT WIEGHT WE WERE ABLE TO CARRY WAS 3 TO 4 DAN WITH A DIFFERENTIAL PRESSURE OF 1400 TO 1700 KPA. WHEN MORE WEIGHT THAN THIS WAS PUT ON THE BIT IT WOULD BIT INTO THE FORMATION AND STALL THE MOTOR. SLIDING WE GOT 7 TO 8 DAN ON THE BIT WITH THE SAME DIFFERENTIAL PRESSURE. THE BIT WAS PULLED BECAUSE THE PENETRATION RATE DROPPED TO 75 MINUTES PER METER. THE BIT CONDITION WAS ONE ROW OF CUTTERS ON THE INSIDE HAD FAILED AND THE BIT WAS CORED OUT WHERE THESE WERE MISSING. THERE WAS ALSO A ROW OF CUTTERS DAMAGED ON THE OUTSIDE GUAGE RING WHICH ALSO CORED OUT. WITH THESE CUTTERS MISSING THE BIT COULD NOT EFFECTIVELY CUT ALL OF THE FORMATION AND WAS JUST SPINNING ON WHAT IT COULD NOT CUT.

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 APM v1.12A  
 04/07/94

BHA # 4 - BHA TALLY  
 Well: PAN AM A-2 POINTED MTN

MD in...: 2978.00 m    TVD in.: 2944.42 m    Bit size: 156 mm  
 MD out...: 3013.00 m    TVD out: 2977.01 m    Jets.....: 3/20.6 mm  
 Interval: 35.00 m    TFA.....: 10.033 cm2

| Description             | S/n       | Weight<br>(daN) | Item<br>length<br>(m) | Item<br>OD<br>(mm) | Item<br>ID<br>(mm) | Bit/STB<br>gauge<br>(mm) | Len.fr.<br>bit<br>(m) | Belly<br>length<br>(m) | Bit to<br>CS STB<br>(m) |
|-------------------------|-----------|-----------------|-----------------------|--------------------|--------------------|--------------------------|-----------------------|------------------------|-------------------------|
| 156mm PDC               | 4930324   |                 | 0.20                  |                    |                    | 25                       | 0.20                  |                        |                         |
| ADJUS.121mm1.5Dg M/S BH | 475013B   |                 | 8.64                  | 121                |                    |                          | 8.84                  |                        |                         |
| 121mm CROSSOVER         | 2941      |                 | 0.73                  | 121                | 44                 |                          | 9.57                  |                        |                         |
| 121mm FLOAT SUB         | 3227      |                 | 0.77                  | 121                | 58                 |                          | 10.34                 |                        |                         |
| 119mm MWD HOS           | C-514A    | 497             | 9.54                  | 119                | 74                 |                          | 19.88                 |                        |                         |
| 122mm NON-MAG DC        | C-568     | 656             | 9.48                  | 122                | 58                 |                          | 29.36                 |                        |                         |
| 122mm NON-MAG DC        | C-567     | 649             | 9.48                  | 122                | 59                 |                          | 38.84                 |                        |                         |
| 121mm DRILL COLLAR x 4  |           | 2598            | 37.96                 | 122                | 59                 |                          | 76.80                 |                        |                         |
| 121mm JARS              | 34141704S |                 | 3.72                  | 119                | 51                 |                          | 80.52                 |                        |                         |
| 121mm DRILL COLLAR x 14 |           | 9095            | 132.88                | 122                | 59                 |                          | 213.40                |                        |                         |
|                         |           |                 | 13495                 | 213.40             |                    |                          |                       |                        |                         |

| WEIGHTS:   | In air<br>(daN) | In 1.02 gm/cc mud<br>(daN) | With 5% safety factor<br>(daN) |
|------------|-----------------|----------------------------|--------------------------------|
| Total BHA  | 13495           | 11740                      | 11153                          |
| Excl. HWDP | 13495           | 11740                      | 11153                          |
| Below JARS | 4400            | 3828                       | 3636                           |
| Above JARS | 9095            | 7912                       | 7516                           |

SPERRY-SUN  
Drilling Services of Canada  
Well: PAN AM A-2 POINTED MTN  
BHA Run 5

| MD in (m) | MD out  | Interval | TVD in  | TVD out | BHA type | Method    |
|-----------|---------|----------|---------|---------|----------|-----------|
| 3013.00   | 3057.00 | 44.00    | 2977.01 | 3015.88 | B        | STEERABLE |

BHA performance: (°/30m)

|                            |            |            |            |            |
|----------------------------|------------|------------|------------|------------|
|                            | Avg.build: | 7.68       | Avg.turn.: | -7.68      |
| Expected dogleg(rotary)... | 1.00       | Max.build: | 11.47      | Max.turn.: |
| Expected dogleg(oriented): | 8.00       | Min.build: | 5.84       | Min.turn.: |

BHA components: BIT I, MTR AJ, SUB XO, SUB FS, MWD HS, NMDC, NMDC, 4 x 122 DC, JAR, 14 x 122 DC

Formations: 2ND BLACK SHALE

|        |                 |             |                    |
|--------|-----------------|-------------|--------------------|
| Bit# 4 | Size: 156 mm    | Type: F57D  | Make: SMITH TOOL   |
|        | TFA.: 2.168 cm2 | Hrs.: 18.25 | Condition: 7-4-2MM |

|        |                                       |           |                    |
|--------|---------------------------------------|-----------|--------------------|
| Mtr# 3 | Size: 121 mm                          | Type: PDM | Make: SPERRY DRILL |
|        | Desr: 1.5 DEG ADJ MS BH 3.5 STG SLICK |           |                    |

BHA run summary:

THIS BHA WAS USED TO DRILL FROM 3013m TO 3057m. THIS RUN WAS MADE WITH A 3.5 STAGE MOTOR AND WE WERE ABLE TO CARRY 1200 TO 1400 KPA DIFFERENTIAL, ANY MORE THAN THIS AND WE WERE STALLING THE MOTOR. THE BHA WAS PULLED TO CHANGE THE

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APM v1.12A  
04/07/94

BHA # 5 - BHA TALLY  
Well: PAN AM A-2 POINTED MTN

MD in...: 3013.00 m    TVD in.: 2977.01 m    Bit size: 156 mm  
MD out...: 3057.00 m    TVD out: 3013.88 m    Jets.....: 2/8.7    1/11.1 mm  
Interval: 44.00 m    TFA.....: 2.153 cm2

| Description             | S/n       | Weight<br>(daN) | Item<br>length<br>(m) | Item<br>OD<br>(mm) | Item<br>ID<br>(mm) | Bit/STB<br>gauge<br>(mm) | Len.fr.<br>bit<br>(m) | Belly<br>length<br>(m) | Bit to<br>CB STB<br>(m) |
|-------------------------|-----------|-----------------|-----------------------|--------------------|--------------------|--------------------------|-----------------------|------------------------|-------------------------|
| 156mm PDC               | LA22934   |                 | 0.15                  |                    |                    |                          | 0.15                  |                        |                         |
| ADJUS.121mm1.5deg MS BH | 475110    |                 | 6.33                  | 121                |                    |                          | 6.48                  |                        |                         |
| 121mm CROSSOVER         | 2941      |                 | 0.73                  | 121                | 44                 |                          | 7.21                  |                        |                         |
| 121mm FLOAT SUB         | 3227      |                 | 0.77                  | 121                | 58                 |                          | 7.98                  |                        |                         |
| 119mm MWD HOS           | C-514A    | 497             | 9.54                  | 119                | 74                 |                          | 17.52                 |                        |                         |
| 122mm NON-MAG DC        | C-568     | 656             | 9.48                  | 122                | 58                 |                          | 27.00                 |                        |                         |
| 122mm NON-MAG DC        | C-567     | 649             | 9.48                  | 122                | 59                 |                          | 36.48                 |                        |                         |
| 121mm DRILL COLLAR x 4  |           |                 | 2598                  | 37.96              | 122                | 59                       |                       | 74.44                  |                         |
| 121mm JARS              | 34141704S |                 | 3.72                  | 119                | 51                 |                          | 78.16                 |                        |                         |
| 121mm DRILL COLLAR x 14 |           | 9095            | 132.98                | 122                | 59                 |                          | 211.04                |                        |                         |
|                         |           | 13495           | 211.04                |                    |                    |                          |                       |                        |                         |

| WEIGHTS:   | In air<br>(daN) | In 1.02 gm/cc mud<br>(daN) | With 5% safety factor<br>(daN) |
|------------|-----------------|----------------------------|--------------------------------|
| Total BHA  | 13495           | 11740                      | 11153                          |
| Excl. HWDP | 13495           | 11740                      | 11153                          |
| Below JARS | 4400            | 3828                       | 3636                           |
| Above JARS | 9095            | 7912                       | 7516                           |

SPERRY-SUN  
Drilling Services of Canada  
Well: PAN AM A-2 POINTED MTN  
BHA Run 6

|           |        |          |         |         |          |        |
|-----------|--------|----------|---------|---------|----------|--------|
| MD in (m) | MD out | Interval | TVD in  | TVD out | BHA type | Method |
| 3057.00   | 0.00   | 0.00     | 3015.88 | 0.00    | H        | ROTARY |

BHA performance: (°/30m)

|                            |            |            |            |            |
|----------------------------|------------|------------|------------|------------|
|                            | Avg.build: | 0.00 *     | Avg.turn.: | 0.00       |
| Expected dogleg(rotary)... | 1.00       | Max.build: | 5.84 *     | Max.turn.: |
| Expected dogleg(oriented): | 0.00       | Min.build: | 5.84 *     | Min.turn.: |
|                            |            |            |            | -6.18      |

BHA components: BIT I, SUB NB, SUB FS, SUB SK, 16 x 127 DC, JAR, 6 x 121 DC

Formations: 2ND BLACK SHALE, NAHANNI

|        |             |     |             |                  |
|--------|-------------|-----|-------------|------------------|
| Bit# 5 | Size: 156   | mm  | Type: F57D  | Make: SMITH TOOL |
|        | TFA.: 2.168 | cm2 | Hrs.: 35.75 | Condition: 5-4-I |

|      |         |    |       |       |
|------|---------|----|-------|-------|
| Mtr# | Size: 0 | mm | Type: | Make: |
|      | Desr:   |    |       |       |

BHA run summary:

Sperry-Sun of Canada  
APM v1.12A  
04/07/94

BHA # 6 - BHA TALLY  
Well: PAN AM A-2 POINTED MTN

MD in...: 3057.00 m    TVD in.: 3015.88 m    Bit size: 156 mm  
MD out...: 0.00 m    TVD out: 0.00 m    Jets....: 2/9.7 1/11.1 mm  
Interval:    TFA.....: 2.168 cm2

| Description             | S/n        | Weight<br>(daN) | Item<br>length<br>(m) | Item<br>OD<br>(mm) | Item<br>ID<br>(mm) | Bit/STB<br>gauge<br>(mm) | Len.fr.<br>bit<br>(m) | Belly<br>length<br>(m) | Bit to<br>CB STB<br>(m) |
|-------------------------|------------|-----------------|-----------------------|--------------------|--------------------|--------------------------|-----------------------|------------------------|-------------------------|
| 156mm INSERT BIT        | LA2290     |                 | 0.15                  |                    |                    |                          | 0.15                  |                        |                         |
| 124mm BIT SUB           | 2786       |                 | 0.50                  | 124                | 54                 |                          | 0.65                  |                        |                         |
| 121mm FLOAT SUB         | 3227       |                 | 0.77                  | 121                | 58                 |                          | 1.42                  |                        |                         |
| 121mm SHOCK SUB         | 1454711900 |                 | 2.15                  | 122                | 38                 |                          | 3.57                  |                        |                         |
| 121mm DRILL COLLAR x 16 |            | 7274            | 148.30                | 127                | 59                 |                          | 151.87                |                        |                         |
| 121mm JARS              | 34141704S  |                 | 3.72                  | 119                | 51                 |                          | 155.59                |                        |                         |
| 121mm DRILL COLLAR x 6  |            | 3815            | 57.03                 | 121                | 59                 |                          | 212.62                |                        |                         |
|                         |            | 11089           | 212.62                |                    |                    |                          |                       |                        |                         |

| WEIGHTS:   | In air<br>(daN) | In 1.02 gm/cc mud<br>(daN) | With 5% safety factor<br>(daN) |
|------------|-----------------|----------------------------|--------------------------------|
| Total BHA  | 11089           | 9647                       | 9164                           |
| Excl. HWDP | 11089           | 9647                       | 9164                           |
| Below JARS | 7274            | 6328                       | 6011                           |
| Above JARS | 3815            | 3319                       | 3153                           |

Sperry-Sun of Canada

APM v1.12A

04/07/94

# BIT RECORDS

Well: PAN AM A-2 POINTED MTN

| BHA Bit<br>run # | Size<br>(mm) | MD in /<br>MD out/<br>Interval<br>(m) | Inc. in<br>Inc. out<br>Change<br>(°) | Bit type /<br>Make/<br>S/n      | IADC code<br>BHA type<br>Motor       | Jets /<br>TFA<br>(mm/cm2) | HOB /<br>Av.ROP<br>(m/hr) | Condition /<br>Formations  |
|------------------|--------------|---------------------------------------|--------------------------------------|---------------------------------|--------------------------------------|---------------------------|---------------------------|----------------------------|
| 1 1              | 156          | 2856.00<br>2914.00<br>58.00           | 12.40<br>12.40<br>0.00               | ATJ M33D<br>HUGHES<br>L12WG     | 537<br>B<br>121 mm SPERRY DRILL PDM  | 2/12.7 1/7.1<br>2.936     | 16.25<br>3.57             | 7-8-1MM<br>A               |
| 2 2              | 156          | 2914.00<br>2914.00<br>0.00            | <br><br>0.00                         | ATJM-33D<br>HUGHES<br>L13WG     | 537X<br>B<br>121 mm SPERRY DRILL PDM | 2/7.9 1/12.7<br>2.252     | <br>0.00                  | A                          |
| 3 2RR1           | 156          | 2914.00<br>2977.00<br>63.00           | 24.30<br>21.90<br>-2.40              | ATJM-33D<br>HUGHES<br>L13WG     | 537X<br>B<br>121 mm SPERRY DRILL PDM | 2/7.9 1/12.7<br>2.252     | 20.25<br>3.11             | 7-7-1MM<br>A               |
| 4 3              | 156          | 2978.00<br>3013.00<br>35.00           | 21.50<br>21.80<br>0.30               | PDC<br>DB STRATA BIT<br>4930324 | M646<br>B<br>121 mm SPERRY DRILL PDM | 3/20.6<br>10.033          | 13.75<br>2.55             | INSIDE & GUAGE DAMAGE<br>A |
| 5 4              | 156          | 3013.00<br>3057.00<br>44.00           | 23.70<br>33.10<br>9.40               | F57D<br>SMITH TOOL<br>LA2293    | 637Y<br>B<br>121 mm SPERRY DRILL PDM | 2/8.7 1/11.1<br>2.168     | 18.25<br>2.41             | 7-4-2MM<br>A               |
| 6 5              | 156          | 3057.00<br>0.00<br>0.00               | 33.10<br>33.10<br>0.00               | F57D<br>SMITH TOOL<br>LA2290    | 637Y<br>H                            | 2/8.7 1/11.1<br>2.168     | 35.75<br>0.00             | 5-4-I                      |

NOTES: 1: Inclination in/out derived from the original survey closest to the MD in/out within the BHA run course length

2: BHA types..... B:build / D:drop / H:hold / T:turn / O:other

3: formation names:

A: 2ND BLACK SHALE

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APM v1.12A  
04/07/94

# MOTOR RUNS SUMMARY

Well: PAN AM A-2 POINTED MTN

| BHA run | DHM # | Hole size /<br>Motor size/<br>Description<br>(mm) | MD in /<br>MD out/<br>Interval<br>(m) | Inc. in /<br>Inc. out/<br>Change | Dir. in /<br>Dir. out/<br>Change | Type /<br>Make /<br>s/n | Bit type /<br>BHA type /<br>Flow rate<br>(ml/min) | Formations<br>Hours<br>Total<br>in-hole | Drlg -<br>Circ | Drlg  |
|---------|-------|---------------------------------------------------|---------------------------------------|----------------------------------|----------------------------------|-------------------------|---------------------------------------------------|-----------------------------------------|----------------|-------|
| 1       | 1     | 156                                               | 2856.00                               | 12.40                            | 96.02                            | PDM                     | ATJ M33D                                          |                                         |                |       |
|         |       | 121                                               | 2914.00                               | 12.40                            | 96.02                            | SPERRY DRILL            | B                                                 |                                         |                |       |
|         |       |                                                   | 58.00                                 | 0.00                             | 0.00                             | 475012B                 | 0.00                                              | 39.00                                   | 18.75          | 15.25 |
|         |       | 1.83 DEG ADJ 6.3 STG 4/5 LOBE SLICK               |                                       |                                  |                                  |                         |                                                   |                                         |                |       |
| 2       | 2     | 156                                               | 2914.00                               | 0.00                             | 0.00                             | PDM                     | ATJM-33D                                          |                                         |                |       |
|         |       | 121                                               | 2914.00                               | 0.00                             | 0.00                             | SPERRY DRILL            | B                                                 |                                         |                |       |
|         |       |                                                   | 0.00                                  | 0.00                             | 0.00                             | 475013B                 | 0.00                                              |                                         |                |       |
|         |       | 1.5 DEG ADJ 6.3 STG SLICK                         |                                       |                                  |                                  |                         |                                                   |                                         |                |       |
| 3       | 2RR1  | 156                                               | 2914.00                               | 24.30                            | 66.60                            | PDM                     | ATJM-33D                                          |                                         |                |       |
|         |       | 121                                               | 2977.00                               | 21.90                            | 41.50                            | SPERRY DRILL            | B                                                 |                                         |                |       |
|         |       |                                                   | 63.00                                 | -2.40                            | -25.10                           | 475013B                 | 0.00                                              | 55.00                                   | 23.00          | 20.25 |
|         |       | 1.5 DEG ADJ 6.3 STG SLICK                         |                                       |                                  |                                  |                         |                                                   |                                         |                |       |
| 4       | 2RR2  | 156                                               | 2978.00                               | 21.50                            | 41.10                            | PDM                     | PDC                                               |                                         |                |       |
|         |       | 121                                               | 3013.00                               | 21.80                            | 36.60                            | SPERRY DRILL            | B                                                 |                                         |                |       |
|         |       |                                                   | 35.00                                 | 0.30                             | -4.50                            | 475013B                 | 0.00                                              | 39.00                                   | 21.75          | 13.50 |
|         |       | 1.5 DEG ADJ 6.3 STG SLICK                         |                                       |                                  |                                  |                         |                                                   |                                         |                |       |
| 5       | 3     | 156                                               | 3013.00                               | 23.70                            | 36.50                            | PDM                     | F57D                                              |                                         |                |       |
|         |       | 121                                               | 3057.00                               | 33.10                            | 27.10                            | SPERRY DRILL            | B                                                 |                                         |                |       |
|         |       |                                                   | 44.00                                 | 9.40                             | -9.40                            | 475110                  | 0.00                                              | 46.00                                   | 23.50          | 18.25 |
|         |       | 1.5 DEG ADJ MS BH 3.5 STG SLICK                   |                                       |                                  |                                  |                         |                                                   |                                         |                |       |

NOTES: 1: Inclination in/out and direction in/out are derived from the original survey closest to the MD in/out within the BHA run course length  
2: BHA types.....: B:build / D:drop / H:hold / T:turn / O:other  
3: formation names:

Sperry-Sun of Canada  
APM v1.12A  
04/07/94

# MUD DATA

Well: PAN AM A-2 POINTED MTN

| MD      | Mud type      | MW      | Vis      | PV   | YP  | pH/<br>Aw* | Water<br>loss | Temp<br>out | Oil/Water/Solids | Sand |
|---------|---------------|---------|----------|------|-----|------------|---------------|-------------|------------------|------|
| (m)     |               | (gm/cc) | (sec/lt) | (cp) |     |            | (cc)          | (°C)        | ----- (%) -----  | (%)  |
| 2856.00 | POLYMER WATER | 1.01    | 30       | 3    |     | 9.0        |               |             | 0.0/ 0.0/ 1.0    | 0.0  |
| 2860.00 | POLYMER WATER | 1.01    | 29       | 3    |     |            |               |             | 0.0/ 0.0/ 1.0    | 0.0  |
| 0.00    | POLYMER WATER | 1.01    | 29       | 3    |     |            |               |             | 0.0/ 0.0/ 1.0    | 0.0  |
| 0.00    | POLYMER WATER | 1.01    | 29       | 3    |     |            |               |             | 0.0/ 0.0/ 1.0    | 0.0  |
| 2977.00 | POLYMER WATER | 1.01    | 32       | 3    |     |            | 14.6          |             | 0.0/ 0.0/ 1.0    | 0.0  |
| 2977.00 | POLYMER WATER | 1.01    | 32       | 12   | 2.1 | 10.0       | 8.0           | 35          | 0.0/ 0.0/ 1.0    | 0.0  |
| 3013.00 | POLYMER WATER | 1.01    | 32       | 12   | 2.1 | 10.0       | 8.0           | 35          | 0.0/ 0.0/ 1.0    | 0.0  |
| 3030.00 | POLYMER WATER | 1.01    | 38       | 11   | 2.1 | 10.0       | 10.0          | 26          | 0.0/ 0.0/ 1.0    | 0.0  |
| 3057.00 | POLYMER WATER | 1.01    | 38       | 11   | 2.1 | 10.0       | 10.0          | 26          | 0.0/ 0.0/ 1.0    | 0.0  |
| 3067.00 | POLYMER WATER | 1.01    | 38       | 11   | 2.1 | 10.0       | 10.0          | 26          | 0.0/ 0.0/ 1.0    | 0.0  |
| 3156.00 | POLYMER WATER | 1.02    | 45       | 21   | 4.2 | 10.0       | 7.2           | 26          | 0.0/ 0.0/ 1.0    | 0.0  |
| 3156.00 | POLYMER WATER | 1.02    | 45       | 21   | 4.2 | 10.0       | 7.2           | 26          | 0.0/ 0.0/ 1.0    | 0.0  |
| 3156.00 | POLYMER WATER | 1.02    | 45       | 21   | 4.2 | 10.0       | 7.2           | 26          | 0.0/ 0.0/ 1.0    | 0.0  |
| 3156.00 | POLYMER WATER | 1.02    | 45       | 21   | 4.2 | 10.0       | 7.2           | 26          | 0.0/ 0.0/ 1.0    | 0.0  |

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APM v1.12A  
04/07/94

ORIGINAL WORKING SURVEYS  
Well: PAN AM A-2 POINTED MTN

| MD<br>(m) | Angle | Direction<br>(azimuth) | Survey<br>type | TVD<br>(m) | Rect.Coordinates |              | Vertical<br>section<br>(m) | Dog-leg<br>severity<br>(°/30m) | Rate of<br>build<br>(°/30m) | Rate of<br>turn<br>(°/30m) |
|-----------|-------|------------------------|----------------|------------|------------------|--------------|----------------------------|--------------------------------|-----------------------------|----------------------------|
|           |       |                        |                |            | N(-S)<br>(m)     | E(-W)<br>(m) |                            |                                |                             |                            |
| 2854.00   | 14.00 | 96.02                  | TIE ON         | 2829.28    | 2.87             | 303.98       | 0.00                       | 0.00                           | 0.00                        | 0.00                       |
| 2862.57   | 17.80 | 89.20                  | MWD            | 2837.52    | 2.78             | 306.32       | 289.77                     | 14.80                          | 13.30                       | -23.87                     |
| 2891.11   | 21.00 | 73.15                  | MWD            | 2864.46    | 4.33             | 315.59       | 299.02                     | 6.51                           | 3.37                        | -16.87                     |
| 2900.76   | 22.30 | 70.50                  | MWD            | 2873.43    | 5.44             | 318.97       | 302.58                     | 5.06                           | 4.05                        | -8.24                      |
| 2910.53   | 24.00 | 70.30                  | MWD            | 2882.41    | 6.73             | 322.59       | 306.42                     | 5.23                           | 5.22                        | -0.61                      |
| 2920.00   | 24.30 | 66.60                  | MWD            | 2891.05    | 8.15             | 326.19       | 310.29                     | 4.89                           | 0.95                        | -11.72                     |
| 2929.85   | 24.00 | 61.50                  | MWD            | 2900.04    | 9.91             | 329.81       | 314.29                     | 6.42                           | -0.92                       | -15.53                     |
| 2939.41   | 23.30 | 56.40                  | MWD            | 2908.80    | 11.89            | 333.10       | 318.04                     | 6.78                           | -2.19                       | -16.00                     |
| 2949.13   | 23.20 | 50.30                  | MWD            | 2917.73    | 14.17            | 336.17       | 321.71                     | 7.43                           | -0.31                       | -18.83                     |
| 2958.77   | 22.70 | 46.00                  | MWD            | 2926.61    | 16.68            | 338.97       | 325.18                     | 5.44                           | -1.56                       | -13.39                     |
| 2972.78   | 21.90 | 41.50                  | MWD            | 2939.57    | 20.51            | 342.65       | 329.92                     | 4.04                           | -1.71                       | -9.64                      |
| 2982.45   | 21.50 | 41.10                  | MWD            | 2948.56    | 23.20            | 345.00       | 333.04                     | 1.32                           | -1.24                       | -1.24                      |
| 2992.13   | 20.80 | 41.80                  | MWD            | 2957.58    | 25.82            | 347.31       | 336.09                     | 2.30                           | -2.17                       | 2.17                       |
| 3001.07   | 21.20 | 38.50                  | MWD            | 2965.93    | 28.26            | 349.38       | 338.85                     | 4.19                           | 1.34                        | -11.07                     |
| 3010.58   | 21.80 | 36.60                  | MWD            | 2974.78    | 31.03            | 351.50       | 341.77                     | 2.90                           | 1.89                        | -5.99                      |
| 3020.27   | 23.70 | 36.50                  | MWD            | 2983.71    | 34.04            | 353.73       | 344.88                     | 5.89                           | 5.89                        | -0.31                      |
| 3029.85   | 26.00 | 33.00                  | MWD            | 2992.41    | 37.35            | 356.02       | 348.14                     | 8.54                           | 7.20                        | -10.96                     |
| 3039.53   | 29.70 | 30.70                  | MWD            | 3000.97    | 41.19            | 358.40       | 351.67                     | 11.94                          | 11.47                       | -7.13                      |
| 3057.00   | 33.10 | 27.10                  | EXTRAP         | 3015.88    | 49.16            | 362.79       | 358.46                     | 6.66                           | 5.84                        | -6.18                      |

VERTICAL SECTION IS RELATIVE TO WELL HEAD ALONG AZIMUTH 70.55 °.  
MINIMUM CURVATURE CALCULATION METHOD USED.

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APM v1.12A

07/04/94

POINTED MOUNTAIN, 123 53'52.78

APPENDIX

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IADC BIT CONDITION GRADING

BHA COMPONENT CODES

IADC BIT CONDITION GRADING

The IADC grading system for fixed cutter bits records 8 parameters which are as follows:

| Cutting structure |            |            |          | B          | G           | Remarks     |               |
|-------------------|------------|------------|----------|------------|-------------|-------------|---------------|
| Inner Rows        | Outer rows | Dull char. | Location | Brng/seals | Gauge 1/16" | Other char. | Reason pulled |
| a                 | b          | c          | d        | e          | f           | g           | h             |

| a and b                                            |
|----------------------------------------------------|
| 0: no wear<br> <br>8: no useable cutting structure |

| d                                                                                                              |
|----------------------------------------------------------------------------------------------------------------|
| C: cone<br>N: nose<br>T: taper<br>S: shoulder<br>G: gauge<br>A: all areas/rows<br>M: middle row<br>H: heel row |

| e                                                                                                                                                           |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Non-sealed bearings<br>0: no life used<br> <br>8: all life used<br><br>Sealed bearings<br>E: seals effective<br>F: seals failed<br><br>X: fixed cutter bits |

| c and g                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| *BC: broken cone<br>BT: broken teeth/cutters<br>BU: balled up<br>*CC: cracked cone<br>*CD: cone dragged<br>CI: cone interference<br>CR: cored<br>CT: chipped teeth/cutters<br>ER: erosion<br>FC: flat crested wear<br>HC: heat checking<br>JD: junk damage<br>*LC: lost cone<br>LN: lost nozzle<br>LT: lost teeth/cutters<br>OC: off-centre wear<br>PB: pinched bit<br>PN: plugged nozzle/flow passage<br>RG: rounded gauge<br>RO: ring out<br>SD: shirttail damage<br>SS: self sharpening wear<br>TR: tracking<br>WO: washed out - bit<br>WT: worn teeth/cutters<br>NO: no major/other dull characteristics<br><br>* show cone # under location |

| f                                                                               |
|---------------------------------------------------------------------------------|
| 1 in gauge<br>1/16 under gauge<br>1/8 under gauge<br>3/16 under gauge<br>etc... |

| h                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| BHA: change bottomhole assembly<br>DMP: downhole motor failure<br>DSF: drillstring failure<br>DST: drill stem test<br>DTP: downhole tool failure<br>LOG: run logs<br>RIG: repair rig<br>CM: condition mud<br>CP: core point<br>DP: drill plug<br>FM: formation change<br>HP: hole problems<br>HR: hours<br>PP: pump pressure<br>PR: penetration rate<br>TD: total depth/casing depth<br>TQ: torque<br>TW: twist-off<br>WC: weather conditions<br>WO: washout - drillstring |

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APM v1.12A

04/07/94

# BHA COMPONENT CODES

Well: PAN AM A-2 POINTED MTN

| Group         | Description           | Code   |
|---------------|-----------------------|--------|
| BITS          | mm PDC BIT            | BIT P  |
| BITS          | mm MILLED TOOTH BIT   | BIT M  |
| BITS          | mm CORE BIT           | BIT C  |
| BITS          | mm INSERT BIT         | BIT I  |
| BITS          | mm DIAMOND BIT        | BIT D  |
| COLLARS       | mm DRILL COLLAR       | DC     |
| COLLARS       | mm SHORT DC           | SDC    |
| COLLARS       | mm NON-MAG DC         | NMDC   |
| COLLARS       | mm SHORT NON-MAG DC   | SNMDC  |
| COLLARS       | mm FLEX NON-MAG DC    | FNMDC  |
| COLLARS       | mm SHORT FLEX NMDC    | SFNMDC |
| DRILL PIPE    | mm GRADE E DRILLPIPE  | DP E   |
| DRILL PIPE    | mm GRADE G DRILLPIPE  | DP G   |
| DRILL PIPE    | mm GRADE S135 DP      | DP S   |
| FISHING TOOLS | mm OVERSHOT           | O/S    |
| HWDP          | mm HWDP               | HWDP   |
| JARS          | mm JARS               | JAR    |
| MILLING TOOLS | mm MILL               | MILL   |
| MOTORS        | mm PDM                | MTR P  |
| MOTORS        | mm TURBINE            | MTR T  |
| MOTORS        | mm 1. DEG /S BH       | MTR BH |
| MOTORS        | mm x DEG /S DB        | MTR DB |
| MOTORS        | ADJUS. mm deg /S BH   | MTR AJ |
| MWD TOOLS     | mm MWD HOS            | MWD HS |
| MWD TOOLS     | mm TELECO MWD         | MWD T  |
| REAMERS       | mm STG /PT REAMER     | RR     |
| REAMERS       | mm NB /PT REAMER      | RR NB  |
| STABILIZERS   | mm HOLE OPENER        | STB HO |
| STABILIZERS   | mm MANDREL STB        | STB M  |
| STABILIZERS   | mm NEAR BIT STB       | STB NB |
| STABILIZERS   | mm NON-MAG STB        | STB NM |
| STABILIZERS   | mm NON-MAG STRING STB | STBNMS |
| STABILIZERS   | mm NON-ROTATING STB   | STB NR |
| STABILIZERS   | mm STRING STB         | STB S  |
| SUBS          | mm BIT SUB            | SUB NB |
| SUBS          | mm EXTENSION SUB      | SUB XT |
| SUBS          | mm CROSSOVER          | SUB XO |
| SUBS          | mm SHOCK SUB          | SUB SK |
| SUBS          | mm UBHO SUB           | SUB UB |
| SUBS          | mm ORIENTATION SUB    | SUB OR |
| SUBS          | mm HANG OFF SUB       | SUB HO |
| SUBS          | mm DOUBLE PIN SUB     | SUB DP |
| SUBS          | mm NM CROSSOVER       | SUBNXO |

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APM v1.12A  
04/07/94

# BHA COMPONENT CODES

Well: PAN AM A-2 POINTED MTN

| Group | Description   | Code   |
|-------|---------------|--------|
| SUBS  | mm FLOAT SUB  | SUB FS |
| SUBS  | mm PICKUP SUB | SUB PU |

# AMOCO ~~ET AL~~ Pan Am Pointed Mountain A-1

(P-53)

## DAY CURVE INFORMATION

SPUD - TD EST DAYS \_\_\_\_\_ ACT DAYS \_\_\_\_\_  
 SPUD - RR EST DAYS \_\_\_\_\_ ACT DAYS \_\_\_\_\_  
 AUTHORIZED TO \_\_\_\_\_ m

## RECORD WELL

LOCATION \_\_\_\_\_  
 SPUD - TD \_\_\_\_\_ DAYS \_\_\_\_\_ HRS.  
 CORE \_\_\_\_\_ YES \_\_\_\_\_ NO

## CONTRACTOR INFORMATION

RIG NAME \_\_\_\_\_  
 SPUD DATE \_\_\_\_\_  
 RIG RELEASE DATE \_\_\_\_\_

## COST CURVE INFORMATION

CONSTRUCTION ESTIMATE \$ \_\_\_\_\_  
 MIRU ESTIMATE \$ \_\_\_\_\_  
 DRY HOLE \$ \_\_\_\_\_ CASE

