

## Results of Directional Survey

|             |              |                               |
|-------------|--------------|-------------------------------|
| API number: | 30-025-41339 | DD                            |
| OGRID:      |              | Operator: APACHE CORP         |
|             | Property:    | NORTHEAST DRINKARD UNIT # 863 |

|         |        |   |    |          |          |
|---------|--------|---|----|----------|----------|
| surface | ULSTR: | G | 22 | T 21S    | R 37E    |
|         |        |   |    | 1440 FNL | 2205 FEL |

|        |        |        |     |          |          |
|--------|--------|--------|-----|----------|----------|
| BH Loc | ULSTR: | B      | 22  | T 21S    | R 37E    |
| 6865   | MD     | 6858.4 | TVD | 1208 FNL | 2201 FEL |

|             |        |        |     |          |          |
|-------------|--------|--------|-----|----------|----------|
| Top Perf/OH | ULSTR: | B      | 22  | T 21S    | R 37E    |
| 5540        | MD     | 5534.8 | TVD | 1265 FNL | 2202 FEL |

|             |        |        |     |          |          |
|-------------|--------|--------|-----|----------|----------|
| Bot Perf/OH | ULSTR: | B      | 22  | T 21S    | R 37E    |
| 6609        | MD     | 6602.8 | TVD | 1221 FNL | 2197 FEL |

|              | MD   | N/S    | E/W  | VD      |
|--------------|------|--------|------|---------|
|              | 5506 | 173.46 | 2.31 | 5500.79 |
| TOP PERFS/OH | 5540 | 174.71 | 2.53 | 5534.77 |
|              | 5693 | 180.36 | 3.50 | 5687.66 |
|              | 6444 | 211.32 | 8.91 | 6437.99 |
| BOT PERFS/OH | 6609 | 219.18 | 8.20 | 6602.80 |
|              | 6631 | 220.23 | 8.11 | 6624.77 |

|              |      |        |      |         |
|--------------|------|--------|------|---------|
| NEXT TO LAST | 6811 | 229.87 | 5.29 | 6804.49 |
| LAST READING | 6865 | 232.45 | 4.40 | 6858.42 |
| TD           | 6865 | 232.45 | 4.40 | 6858.42 |

|                  |      |    |      |    |
|------------------|------|----|------|----|
| Surface Location | 1440 | FN | 2205 | FE |
| Projected BHL    | 1208 | FN | 2201 | FE |
| Location of      |      |    |      |    |
| Top Perfs/OH     | 1265 | FN | 2202 | FE |
| Bottom Perfs/OH  | 1221 | FN | 2197 | FE |

### SUMMARY of Subsurface Locations

| Surface Location | G-22-21S-37E | 1440 | FN | 2205 | FE | Vert. Depth |
|------------------|--------------|------|----|------|----|-------------|
| Top Perfs/OH     | B-22-21S-37E | 1265 | FN | 2202 | FE | 5534.77     |
| Bottom Perfs/OH  | B-22-21S-37E | 1221 | FN | 2197 | FE | 6602.80     |
| Projected TD     | B-22-21S-37E | 1208 | FN | 2201 | FE | 6858.42     |

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HOBBS OCD

FEB 21 2014

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PO Box 1370  
Artesia, NM 88211-1370  
(575) 748-1288

December 11, 2013

Apache Corporation (873)  
303 Veterans Airpark Lane  
Suite 3000  
Midland, TX 79705

RE: **30-025-41339**  
Northeast Drinkard Unit #863  
1440' FNL & 2205' FEL  
Sec. 22, T21S, R37E  
Lea County, New Mexico

Dear Sir,

The attached is the Deviation Survey for the above captioned well.

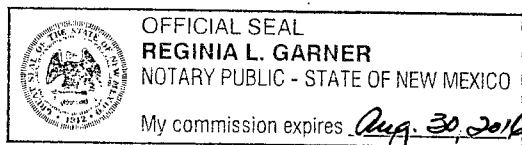
Very truly yours,

A handwritten signature in cursive script, appearing to read "Chris Graham".

Chris Graham  
Drilling Superintendent

State of New Mexico }  
County of Eddy }

*The foregoing was acknowledged before me this 11<sup>th</sup> day of December, 2013.*

A handwritten signature in cursive script, appearing to read "Regina L. Garner".  
Notary Public

Apache Corporation (873)  
303 Veterans Airpark Lane  
Suite 3000  
Midland, TX 79705

NEDU 863

30-025-41339  
RE: Northeast Drinkard Unit #863  
1440' FNL & 2205' FEL  
Sec. 22, T21S, R37E  
Lea County, New Mexico

| Date      | Depth | Deviation | Direction |
|-----------|-------|-----------|-----------|
| 12/3/2013 | 143   | 0.40      | 0.00      |
| 12/4/2013 | 334   | 0.30      | 0.00      |
| 12/4/2013 | 569   | 0.10      | 0.00      |
| 12/4/2013 | 813   | 0.40      | 0.00      |
| 12/4/2013 | 1064  | 0.70      | 0.00      |
| 12/4/2013 | 1220  | 0.40      | 0.00      |
| 12/5/2013 | 1381  | 0.70      | 236.50    |
| 12/5/2013 | 1569  | 0.60      | 257.10    |
| 12/5/2013 | 1757  | 0.40      | 312.20    |
| 12/5/2013 | 1944  | 0.60      | 336.60    |
| 12/6/2013 | 2131  | 2.60      | 23.40     |
| 12/6/2013 | 2319  | 4.20      | 17.50     |
| 12/6/2013 | 2694  | 2.80      | 2.30      |
| 12/6/2013 | 2881  | 2.50      | 359.70    |
| 12/6/2013 | 3068  | 1.70      | 5.80      |
| 12/6/2013 | 3192  | 3.00      | 1.90      |
| 12/6/2013 | 3255  | 2.70      | 1.50      |
| 12/6/2013 | 3443  | 1.90      | 2.90      |
| 12/6/2013 | 3630  | 1.50      | 353.60    |
| 12/7/2013 | 3818  | 2.80      | 6.60      |
| 12/7/2013 | 4005  | 2.60      | 5.50      |
| 12/7/2013 | 4193  | 4.00      | 0.20      |
| 12/7/2013 | 4380  | 4.30      | 359.40    |
| 12/7/2013 | 4568  | 4.70      | 11.10     |
| 12/7/2013 | 4756  | 3.60      | 7.00      |
| 12/7/2013 | 4849  | 3.10      | 0.00      |
| 12/7/2013 | 4943  | 3.20      | 341.10    |
| 12/7/2013 | 5037  | 3.20      | 342.90    |
| 12/7/2013 | 5131  | 3.10      | 341.60    |
| 12/7/2013 | 5318  | 3.30      | 347.60    |
| 12/8/2013 | 5506  | 2.20      | 6.60      |
| 12/8/2013 | 5693  | 2.10      | 13.20     |
| 12/8/2013 | 5881  | 2.90      | 9.40      |
| 12/8/2013 | 6068  | 2.50      | 8.70      |
| 12/8/2013 | 6256  | 2.10      | 10.40     |
| 12/8/2013 | 6444  | 2.10      | 9.90      |
| 12/8/2013 | 6631  | 3.50      | 345.90    |
| 12/8/2013 | 6811  | 2.90      | 341.00    |

# EOF



## Apache Corporation (873)

Lea County, NM (NAD83 NME)

NEDU 30-025-41339

#863

WB1/Job #1311551

UL 6 22-215-37E 1440' FUL + 2205' FEL (SURF)  
1208' FUL + 2201' FEL (BHL)

Survey: Phoenix MWD Surveys

## Phoenix Final Survey Report

11 December, 2013



|                  |                            |                                     |                                 |
|------------------|----------------------------|-------------------------------------|---------------------------------|
| <b>Company:</b>  | Apache Corporation         | <b>Local Co-ordinate Reference:</b> | Well #863                       |
| <b>Project:</b>  | Lea County, NM (NAD83 NME) | <b>TVD Reference:</b>               | KB @ 3432.00usft (Silver Oak 5) |
| <b>Site:</b>     | NEDU                       | <b>MD Reference:</b>                | KB @ 3432.00usft (Silver Oak 5) |
| <b>Well:</b>     | #863                       | <b>North Reference:</b>             | Grid                            |
| <b>Wellbore:</b> | WB1/Job #1311551           | <b>Survey Calculation Method:</b>   | Minimum Curvature               |
| <b>Design:</b>   | Surveys (Silver Oak 5)     | <b>Database:</b>                    | GCR DB                          |

|             |                            |               |                |
|-------------|----------------------------|---------------|----------------|
| Project     | Lea County, NM (NAD83 NME) |               |                |
| Map System: | US State Plane 1983        | System Datum: | Mean Sea Level |
| Geo Datum:  | North American Datum 1983  |               |                |
| Map Zone:   | New Mexico Eastern Zone    |               |                |

|                       |           |              |                 |                   |                    |
|-----------------------|-----------|--------------|-----------------|-------------------|--------------------|
| Site:                 | NEDU      |              |                 |                   |                    |
| Site Position:        |           | Northing:    | 549,246.17 usft | Latitude:         | 32° 30' 15.55234 N |
| From:                 | Map       | Easting:     | 907,874.81 usft | Longitude:        | 103° 8' 39.81023 W |
| Position Uncertainty: | 0.00 usft | Slot Radius: | 13-3/16"        | Grid Convergence: | 0.64 °             |

|                      |           |                     |           |                 |               |                    |
|----------------------|-----------|---------------------|-----------|-----------------|---------------|--------------------|
| Well                 | #863      |                     |           |                 |               |                    |
| Well Position        | +N/-S     | 0.00 usft           | Northing: | 535,909.33 usft | Latitude:     | 32° 28' 3.76029 N  |
|                      | +E/-W     | 0.00 usft           | Easting:  | 906,454.38 usft | Longitude:    | 103° 8' 58.12230 W |
| Position Uncertainty | 0.00 usft | Wellhead Elevation: | usft      | Ground Level:   | 3,414.00 usft |                    |

|           |                  |             |                    |                  |                        |
|-----------|------------------|-------------|--------------------|------------------|------------------------|
| Wellbore  | WB1/Job #1311551 |             |                    |                  |                        |
| Magnetics | Model Name       | Sample Date | Declination<br>(°) | Dip Angle<br>(°) | Field Strength<br>(nT) |
|           | BGGM2013         | 11/11/13    | 7.21               | 60.41            | 48 559                 |

|                   |                        |        |        |               |      |
|-------------------|------------------------|--------|--------|---------------|------|
| Design:           | Surveys (Silver Oak 5) |        |        |               |      |
| Audit Notes:      |                        |        |        |               |      |
| Version:          | 1.0                    | Phase: | ACTUAL | Tie On Depth: | 0.00 |
| Vertical Section: | Depth From (TVD)       | +N/-S  | +E/-W  | Direction     |      |
|                   | (usft)                 | (usft) | (usft) | (°)           |      |
|                   | 0.00                   | 0.00   | 0.00   | 1.80          |      |

|                |              |                                       |           |                |  |
|----------------|--------------|---------------------------------------|-----------|----------------|--|
| Survey Program |              | Date                                  | 12/11/13  |                |  |
| From<br>(usft) | To<br>(usft) | Survey (Wellbore)                     | Tool Name | Description    |  |
| 1,381.00       | 6,865.00     | Phoenix MWD Surveys (WB1/Job #131155) | MWD       | MWD - Standard |  |

|                                 |           |            |                      |            |            |            |               |             |
|---------------------------------|-----------|------------|----------------------|------------|------------|------------|---------------|-------------|
| <b>Survey</b>                   | <b>MD</b> | <b>Inc</b> | <b>Azi (azimuth)</b> | <b>TVD</b> | <b>N/S</b> | <b>E/W</b> | <b>V. Sec</b> | <b>DLeg</b> |
|                                 | (usft)    | (°)        | (°)                  | (usft)     | (usft)     | (usft)     | (usft)        | (°/100usft) |
|                                 | 1,200.00  | 0.76       | 208.42               | 1,199.96   | -6.36      | 1.41       | -6.31         | 0.00        |
| <b>Tie-on to Gyro</b>           |           |            |                      |            |            |            |               |             |
|                                 | 1,381.00  | 0.70       | 236.50               | 1,380.95   | -8.02      | -0.08      | -8.02         | 0.20        |
| <b>First Phoenix MWD Survey</b> |           |            |                      |            |            |            |               |             |
|                                 | 1,569.00  | 0.60       | 257.10               | 1,568.94   | -8.88      | -2.00      | -8.94         | 0.13        |
|                                 | 1,757.00  | 0.40       | 312.20               | 1,756.93   | -8.66      | -3.45      | -8.76         | 0.26        |
|                                 | 1,944.00  | 0.60       | 336.60               | 1,943.92   | -7.32      | -4.32      | -7.45         | 0.15        |
|                                 | 2,131.00  | 2.60       | 23.40                | 2,130.85   | -2.53      | -3.02      | -2.62         | 1.19        |
|                                 | 2,319.00  | 4.20       | 17.50                | 2,318.51   | 7.95       | 0.74       | 7.97          | 0.87        |
|                                 | 2,506.00  | 3.40       | 5.00                 | 2,505.10   | 20.01      | 3.28       | 20.10         | 0.61        |
|                                 | 2,694.00  | 2.80       | 2.30                 | 2,692.82   | 30.15      | 3.95       | 30.26         | 0.33        |
|                                 | 2,881.00  | 2.50       | 359.70               | 2,879.62   | 38.79      | 4.11       | 38.90         | 0.17        |

|                  |                            |                                     |                                 |
|------------------|----------------------------|-------------------------------------|---------------------------------|
| <b>Company:</b>  | Apache Corporation         | <b>Local Co-ordinate Reference:</b> | Well #863                       |
| <b>Project:</b>  | Lea County, NM (NAD83 NME) | <b>TVD Reference:</b>               | KB @ 3432.00usft (Silver Oak 5) |
| <b>Site:</b>     | NEDU                       | <b>MD Reference:</b>                | KB @ 3432.00usft (Silver Oak 5) |
| <b>Well:</b>     | #863                       | <b>North Reference:</b>             | Grid                            |
| <b>Wellbore:</b> | WB1/Job #1311551           | <b>Survey Calculation Method:</b>   | Minimum Curvature               |
| <b>Design:</b>   | Surveys (Silver Oak 5)     | <b>Database:</b>                    | GCR DB                          |

| Survey                  |            |                      |               |               |               |                  |                     |  |
|-------------------------|------------|----------------------|---------------|---------------|---------------|------------------|---------------------|--|
| MD<br>(usft)            | Inc<br>(°) | Azi (azimuth)<br>(°) | TVD<br>(usft) | N/S<br>(usft) | E/W<br>(usft) | V. Sec<br>(usft) | DLeg<br>(°/100usft) |  |
| 3,068.00                | 1.70       | 5.80                 | 3,066.50      | 45.63         | 4.37          | 45.74            | 0.44                |  |
| 3,255.00                | 2.70       | 1.50                 | 3,253.36      | 52.79         | 4.77          | 52.92            | 0.54                |  |
| 3,443.00                | 1.90       | 2.70                 | 3,441.20      | 60.33         | 5.03          | 60.46            | 0.43                |  |
| 3,630.00                | 1.50       | 353.60               | 3,628.12      | 65.86         | 4.91          | 65.98            | 0.26                |  |
| 3,818.00                | 2.80       | 6.60                 | 3,815.99      | 72.87         | 5.16          | 72.99            | 0.73                |  |
| 4,005.00                | 2.60       | 5.50                 | 4,002.78      | 81.63         | 6.09          | 81.78            | 0.11                |  |
| 4,193.00                | 4.00       | 0.20                 | 4,190.46      | 92.43         | 6.52          | 92.59            | 0.76                |  |
| 4,380.00                | 4.30       | 359.40               | 4,376.97      | 105.96        | 6.47          | 106.11           | 0.16                |  |
| 4,567.00                | 4.70       | 11.10                | 4,563.40      | 120.49        | 7.87          | 120.68           | 0.53                |  |
| 4,756.00                | 3.60       | 7.00                 | 4,751.90      | 133.98        | 10.09         | 134.23           | 0.60                |  |
| 4,943.00                | 3.20       | 341.10               | 4,938.58      | 144.74        | 9.11          | 144.96           | 0.84                |  |
| 5,131.00                | 3.10       | 341.60               | 5,126.30      | 154.53        | 5.81          | 154.64           | 0.06                |  |
| 5,318.00                | 3.30       | 347.60               | 5,313.01      | 164.59        | 3.06          | 164.60           | 0.21                |  |
| 5,506.00                | 2.20       | 6.60                 | 5,500.79      | 173.46        | 2.31          | 173.44           | 0.75                |  |
| 5,693.00                | 2.10       | 13.20                | 5,687.66      | 180.36        | 3.50          | 180.38           | 0.14                |  |
| 5,881.00                | 2.90       | 9.40                 | 5,875.48      | 188.40        | 5.07          | 188.47           | 0.43                |  |
| 6,068.00                | 2.50       | 8.70                 | 6,062.27      | 197.10        | 6.46          | 197.21           | 0.21                |  |
| 6,256.00                | 2.10       | 10.40                | 6,250.12      | 204.54        | 7.70          | 204.68           | 0.22                |  |
| 6,444.00                | 2.10       | 9.90                 | 6,437.99      | 211.32        | 8.91          | 211.50           | 0.01                |  |
| 6,631.00                | 3.50       | 345.90               | 6,624.77      | 220.23        | 8.11          | 220.38           | 0.96                |  |
| 6,811.00                | 2.90       | 341.00               | 6,804.49      | 229.87        | 5.29          | 229.92           | 0.37                |  |
| Last Phoenix MWD Survey |            |                      |               |               |               |                  |                     |  |
| 6,865.00                | 2.90       | 341.00               | 6,858.42      | 232.45        | 4.40          | 232.48           | 0.00                |  |
| Projection to TD        |            |                      |               |               |               |                  |                     |  |

| Survey Annotations          |                             |                   |                 |                          |  |
|-----------------------------|-----------------------------|-------------------|-----------------|--------------------------|--|
| Measured<br>Depth<br>(usft) | Vertical<br>Depth<br>(usft) | Local Coordinates |                 | Comment                  |  |
|                             |                             | +N/-S<br>(usft)   | +E/-W<br>(usft) |                          |  |
| 1,200.00                    | 1,199.96                    | -6.36             | 1.41            | Tie-on to Gyro           |  |
| 1,381.00                    | 1,380.95                    | -8.02             | -0.08           | First Phoenix MWD Survey |  |
| 6,811.00                    | 6,804.49                    | 229.87            | 5.29            | Last Phoenix MWD Survey  |  |
| 6,865.00                    | 6,858.42                    | 232.45            | 4.40            | Projection to TD         |  |

Checked By: \_\_\_\_\_ Approved By: \_\_\_\_\_ Date: \_\_\_\_\_