



## Apache Corporation

Eddy County, NM (NAD27 NME)

Crow Federal

#22H API # 30-015-41164

WB1/Job #1311192 SL: 1680' FNL + 10' FWL  
UL: E 09-175-31E

Survey: Phoenix MWD Surveys

## Phoenix Final Survey Report

24 September, 2013





Phoenix Technology Services  
Phoenix Final Survey Report



|           |                             |                              |                                |
|-----------|-----------------------------|------------------------------|--------------------------------|
| Company:  | Apache Corporation          | Local Co-ordinate Reference: | Well #22H                      |
| Project:  | Eddy County, NM (NAD27 NME) | TVD Reference:               | KB @ 3881.00usft (Capstar 114) |
| Site:     | Crow Federal                | MD Reference:                | KB @ 3881.00usft (Capstar 114) |
| Well:     | #22H                        | North Reference:             | Grid                           |
| Wellbore: | WB1/Job #1311192            | Survey Calculation Method:   | Minimum Curvature              |
| Design:   | Surveys (Capstar 114)       | Database:                    | GCR DB                         |

|             |                                      |               |                |
|-------------|--------------------------------------|---------------|----------------|
| Project     | Eddy County, NM (NAD27 NME)          |               |                |
| Map System: | US State Plane 1927 (Exact solution) | System Datum: | Mean Sea Level |
| Geo Datum:  | NAD 1927 (NADCON CONUS)              |               |                |
| Map Zone:   | New Mexico East 3001                 |               |                |

|                       |              |                   |                     |
|-----------------------|--------------|-------------------|---------------------|
| Site                  | Crow Federal |                   |                     |
| Site Position:        |              | Northing:         | 671,130.90 usft     |
| From:                 | Map          | Easting:          | 643,906.80 usft     |
| Position Uncertainty: | 0.00 usft    | Slot Radius:      | 13-3/16"            |
|                       |              | Latitude:         | 32° 50' 38.92796 N  |
|                       |              | Longitude:        | 103° 51' 53.16689 W |
|                       |              | Grid Convergence: | 0.25 °              |

|                      |           |                     |                     |
|----------------------|-----------|---------------------|---------------------|
| Well                 | #22H      |                     |                     |
| Well Position        | +N/-S     | 0.00 usft           | Northing:           |
|                      | +E/-W     | 0.00 usft           | Easting:            |
| Position Uncertainty | 0.00 usft | Wellhead Elevation: | usft                |
|                      |           | Latitude:           | 32° 51' 5.70786 N   |
|                      |           | Longitude:          | 103° 52' 57.92823 W |
|                      |           | Ground Level:       | 3,870.00 usft       |

|           |                  |             |                 |               |                     |
|-----------|------------------|-------------|-----------------|---------------|---------------------|
| Wellbore  | WB1/Job #1311192 |             |                 |               |                     |
| Magnetics | Model Name       | Sample Date | Declination (°) | Dip Angle (°) | Field Strength (nT) |
|           | IGRF2010_14      | 09/06/13    | 7.50            | 60.66         | 48,733              |

|                   |                            |                 |                 |                  |      |
|-------------------|----------------------------|-----------------|-----------------|------------------|------|
| Design            | Surveys (Capstar 114)      |                 |                 |                  |      |
| Audit Notes:      |                            |                 |                 |                  |      |
| Version:          | 1.0                        | Phase:          | ACTUAL          | Tie On Depth:    | 0.00 |
| Vertical Section: | Depth From (TVD)<br>(usft) | +N/-S<br>(usft) | +E/-W<br>(usft) | Direction<br>(°) |      |
|                   | 0.00                       | 0.00            | 0.00            | 89.59            |      |

|                |           |                                       |            |                             |  |
|----------------|-----------|---------------------------------------|------------|-----------------------------|--|
| Survey Program | Date      | 09/24/13                              |            |                             |  |
| From (usft)    | To (usft) | Survey (Wellbore)                     | Tool Name  | Description                 |  |
| 100.00         | 400.00    | Gyrodata Survey (WB1/Job #1311192)    | CB-GYRO-MS | Camera based gyro multishot |  |
| 481.00         | 9,837.00  | Phoenix MWD Surveys (WB1/Job #131119) | MWD        | MWD - Standard              |  |

|                          |         |                   |            |            |            |               |                  |  |
|--------------------------|---------|-------------------|------------|------------|------------|---------------|------------------|--|
| Survey                   |         |                   |            |            |            |               |                  |  |
| MD (usft)                | Inc (°) | Azi (azimuth) (°) | TVD (usft) | N/S (usft) | E/W (usft) | V. Sec (usft) | DLeg (°/100usft) |  |
| 481.00                   | 0.28    | 74.44             | 480.97     | 0.08       | 4.75       | 4.75          | 0.00             |  |
| Tie-on to Gyro           |         |                   |            |            |            |               |                  |  |
| 569.00                   | 0.40    | 74.30             | 568.97     | 0.22       | 5.26       | 5.26          | 0.14             |  |
| First Phoenix MWD Survey |         |                   |            |            |            |               |                  |  |
| 655.00                   | 0.70    | 97.30             | 654.97     | 0.24       | 6.07       | 6.07          | 0.43             |  |
| 743.00                   | 0.80    | 67.00             | 742.96     | 0.41       | 7.17       | 7.17          | 0.46             |  |
| 829.00                   | 0.90    | 68.90             | 828.95     | 0.89       | 8.35       | 8.35          | 0.12             |  |
| 914.00                   | 1.10    | 66.80             | 913.94     | 1.45       | 9.72       | 9.73          | 0.24             |  |
| 1,000.00                 | 1.50    | 72.20             | 999.92     | 2.12       | 11.55      | 11.57         | 0.49             |  |
| 1,085.00                 | 0.60    | 85.60             | 1,084.90   | 2.49       | 13.06      | 13.07         | 1.09             |  |
| 1,173.00                 | 0.20    | 166.90            | 1,172.90   | 2.38       | 13.55      | 13.57         | 0.69             |  |



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| Project:  | Eddy County, NM (NAD27 NME) | TVD Reference:               | KB @ 3881.00usft (Capstar 114) |
| Site:     | Crow Federal                | MD Reference:                | KB @ 3881.00usft (Capstar 114) |
| Well:     | #22H                        | North Reference:             | Grid                           |
| Wellbore: | WB1/Job #1311192            | Survey Calculation Method:   | Minimum Curvature              |
| Design:   | Surveys (Capstar 114)       | Database:                    | 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) |  |
| 1,258.00     | 0.10       | 162.80               | 1,257.90      | 2.16          | 13.60         | 13.62            | 0.12                |  |
| 1,344.00     | 0.70       | 122.20               | 1,343.90      | 1.81          | 14.07         | 14.08            | 0.73                |  |
| 1,429.00     | 0.70       | 263.10               | 1,428.89      | 1.47          | 14.00         | 14.01            | 1.55                |  |
| 1,515.00     | 1.10       | 252.40               | 1,514.88      | 1.16          | 12.69         | 12.70            | 0.50                |  |
| 1,600.00     | 0.90       | 244.70               | 1,599.87      | 0.63          | 11.31         | 11.31            | 0.28                |  |
| 1,685.00     | 1.00       | 260.40               | 1,684.86      | 0.22          | 9.97          | 9.97             | 0.33                |  |
| 1,771.00     | 1.10       | 260.80               | 1,770.84      | -0.04         | 8.42          | 8.42             | 0.12                |  |
| 1,857.00     | 0.90       | 260.60               | 1,856.83      | -0.28         | 6.93          | 6.93             | 0.23                |  |
| 1,942.00     | 0.90       | 251.90               | 1,941.82      | -0.60         | 5.64          | 5.64             | 0.16                |  |
| 2,028.00     | 1.10       | 243.90               | 2,027.81      | -1.17         | 4.26          | 4.25             | 0.28                |  |
| 2,113.00     | 1.00       | 264.30               | 2,112.79      | -1.60         | 2.79          | 2.78             | 0.45                |  |
| 2,197.00     | 1.00       | 250.40               | 2,196.78      | -1.92         | 1.37          | 1.35             | 0.29                |  |
| 2,283.00     | 0.90       | 266.70               | 2,282.77      | -2.21         | -0.01         | -0.03            | 0.33                |  |
| 2,368.00     | 1.00       | 273.00               | 2,367.76      | -2.21         | -1.42         | -1.44            | 0.17                |  |
| 2,454.00     | 1.10       | 264.30               | 2,453.74      | -2.25         | -2.99         | -3.01            | 0.22                |  |
| 2,541.00     | 1.10       | 265.00               | 2,540.73      | -2.41         | -4.65         | -4.67            | 0.02                |  |
| 2,627.00     | 0.50       | 317.80               | 2,626.72      | -2.20         | -5.73         | -5.74            | 1.04                |  |
| 2,713.00     | 0.20       | 42.30                | 2,712.72      | -1.81         | -5.88         | -5.89            | 0.61                |  |
| 2,798.00     | 0.10       | 357.20               | 2,797.72      | -1.63         | -5.78         | -5.80            | 0.17                |  |
| 2,884.00     | 0.50       | 348.10               | 2,883.72      | -1.19         | -5.86         | -5.87            | 0.47                |  |
| 2,971.00     | 0.40       | 349.30               | 2,970.71      | -0.52         | -6.00         | -6.00            | 0.12                |  |
| 3,056.00     | 0.30       | 310.10               | 3,055.71      | -0.08         | -6.22         | -6.23            | 0.30                |  |
| 3,141.00     | 0.50       | 14.50                | 3,140.71      | 0.42          | -6.30         | -6.30            | 0.54                |  |
| 3,227.00     | 0.50       | 328.40               | 3,226.71      | 1.10          | -6.40         | -6.40            | 0.46                |  |
| 3,313.00     | 0.30       | 318.20               | 3,312.71      | 1.59          | -6.75         | -6.74            | 0.25                |  |
| 3,364.00     | 0.70       | 350.00               | 3,363.70      | 2.00          | -6.89         | -6.88            | 0.93                |  |
| 3,441.00     | 0.70       | 333.80               | 3,440.70      | 2.88          | -7.18         | -7.16            | 0.26                |  |
| 3,527.00     | 0.70       | 325.40               | 3,526.69      | 3.79          | -7.71         | -7.69            | 0.12                |  |
| 3,557.00     | 0.70       | 325.00               | 3,556.69      | 4.09          | -7.92         | -7.89            | 0.02                |  |
| 3,612.00     | 0.70       | 331.80               | 3,611.69      | 4.66          | -8.27         | -8.24            | 0.15                |  |
| 3,654.00     | 0.80       | 315.30               | 3,653.68      | 5.09          | -8.60         | -8.57            | 0.56                |  |
| 3,740.00     | 0.90       | 155.00               | 3,739.68      | 4.91          | -8.74         | -8.70            | 1.95                |  |
| 3,826.00     | 0.60       | 167.10               | 3,825.67      | 3.86          | -8.35         | -8.33            | 0.39                |  |
| 3,911.00     | 0.60       | 164.00               | 3,910.67      | 2.99          | -8.13         | -8.11            | 0.04                |  |
| 3,996.00     | 0.50       | 139.40               | 3,995.66      | 2.28          | -7.77         | -7.75            | 0.30                |  |
| 4,082.00     | 0.70       | 137.90               | 4,081.66      | 1.61          | -7.17         | -7.16            | 0.23                |  |
| 4,166.00     | 0.50       | 118.60               | 4,165.65      | 1.05          | -6.50         | -6.50            | 0.34                |  |
| 4,254.00     | 0.70       | 121.70               | 4,253.65      | 0.59          | -5.71         | -5.71            | 0.23                |  |
| 4,339.00     | 0.80       | 126.80               | 4,338.64      | -0.04         | -4.79         | -4.79            | 0.14                |  |
| 4,425.00     | 0.90       | 127.70               | 4,424.63      | -0.81         | -3.78         | -3.78            | 0.12                |  |
| 4,510.00     | 0.90       | 128.40               | 4,509.62      | -1.64         | -2.73         | -2.74            | 0.01                |  |
| 4,574.00     | 1.00       | 128.80               | 4,573.61      | -2.30         | -1.90         | -1.91            | 0.16                |  |
| 4,600.00     | 0.90       | 130.90               | 4,599.61      | -2.57         | -1.57         | -1.58            | 0.41                |  |
| 4,642.00     | 3.80       | 98.90                | 4,641.57      | -3.01         | 0.06          | 0.04             | 7.32                |  |



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| Wellbore: | WB1/Job #1311192            | Survey Calculation Method:   | Minimum Curvature              |
| Design:   | Surveys (Capstar 114)       | Database:                    | 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) |
| 4,685.00                 | 9.30       | 88.60                | 4,684.27      | -3.14         | 4.94          | 4.92             | 13.03               |
| 4,728.00                 | 14.00      | 83.50                | 4,726.38      | -2.47         | 13.59         | 13.57            | 11.18               |
| 4,771.00                 | 19.20      | 82.80                | 4,767.57      | -0.99         | 25.78         | 25.77            | 12.10               |
| 4,814.00                 | 23.60      | 85.50                | 4,807.60      | 0.57          | 41.38         | 41.39            | 10.48               |
| 4,856.00                 | 28.10      | 88.60                | 4,845.39      | 1.47          | 59.66         | 59.67            | 11.18               |
| 4,899.00                 | 32.80      | 91.00                | 4,882.45      | 1.52          | 81.45         | 81.46            | 11.29               |
| 4,942.00                 | 36.90      | 92.30                | 4,917.73      | 0.80          | 106.00        | 106.00           | 9.69                |
| 4,985.00                 | 42.20      | 91.90                | 4,950.87      | -0.20         | 133.35        | 133.35           | 12.34               |
| 5,027.00                 | 48.10      | 90.50                | 4,980.48      | -0.81         | 163.11        | 163.10           | 14.24               |
| 5,070.00                 | 53.50      | 89.60                | 5,007.65      | -0.83         | 196.42        | 196.41           | 12.66               |
| 5,113.00                 | 58.20      | 89.30                | 5,031.78      | -0.48         | 231.99        | 231.98           | 10.95               |
| 5,155.00                 | 63.40      | 89.20                | 5,052.26      | 0.00          | 268.64        | 268.63           | 12.38               |
| 5,197.00                 | 68.70      | 88.70                | 5,069.31      | 0.70          | 307.00        | 307.00           | 12.67               |
| 5,239.00                 | 73.40      | 88.70                | 5,082.94      | 1.61          | 346.70        | 346.71           | 11.19               |
| 5,282.00                 | 78.40      | 89.60                | 5,093.41      | 2.22          | 388.39        | 388.40           | 11.80               |
| 5,325.00                 | 83.90      | 90.50                | 5,100.03      | 2.18          | 430.86        | 430.87           | 12.96               |
| 5,368.00                 | 88.00      | 90.30                | 5,103.06      | 1.88          | 473.74        | 473.75           | 9.55                |
| 5,452.00                 | 88.30      | 89.60                | 5,105.78      | 1.96          | 557.70        | 557.70           | 0.91                |
| 5,538.00                 | 88.50      | 89.60                | 5,108.18      | 2.56          | 643.66        | 643.67           | 0.23                |
| 5,623.00                 | 88.40      | 89.30                | 5,110.48      | 3.37          | 728.63        | 728.63           | 0.37                |
| 5,711.00                 | 88.70      | 89.20                | 5,112.70      | 4.52          | 816.59        | 816.60           | 0.36                |
| 5,796.00                 | 88.80      | 89.20                | 5,114.56      | 5.71          | 901.56        | 901.58           | 0.12                |
| 5,885.00                 | 88.90      | 89.30                | 5,116.34      | 6.87          | 990.54        | 990.56           | 0.16                |
| 5,972.00                 | 90.10      | 89.00                | 5,117.10      | 8.16          | 1,077.52      | 1,077.56         | 1.42                |
| 6,058.00                 | 89.60      | 89.00                | 5,117.33      | 9.67          | 1,163.51      | 1,163.55         | 0.58                |
| 6,143.00                 | 89.50      | 89.00                | 5,118.00      | 11.15         | 1,248.50      | 1,248.54         | 0.12                |
| 6,229.00                 | 88.30      | 87.90                | 5,119.65      | 13.47         | 1,334.45      | 1,334.51         | 1.89                |
| 6,314.00                 | 89.20      | 90.10                | 5,121.50      | 14.96         | 1,419.41      | 1,419.48         | 2.80                |
| 6,400.00                 | 89.50      | 90.10                | 5,122.48      | 14.81         | 1,505.40      | 1,505.47         | 0.35                |
| 6,485.00                 | 89.20      | 90.00                | 5,123.44      | 14.73         | 1,590.39      | 1,590.46         | 0.37                |
| 6,571.00                 | 89.20      | 89.50                | 5,124.64      | 15.11         | 1,676.39      | 1,676.45         | 0.58                |
| 6,656.00                 | 89.20      | 89.90                | 5,125.83      | 15.55         | 1,761.38      | 1,761.44         | 0.47                |
| 6,741.00                 | 89.10      | 89.90                | 5,127.09      | 15.70         | 1,846.37      | 1,846.43         | 0.12                |
| 6,826.00                 | 88.80      | 90.10                | 5,128.65      | 15.70         | 1,931.35      | 1,931.41         | 0.42                |
| 6,912.00                 | 88.80      | 90.10                | 5,130.45      | 15.55         | 2,017.33      | 2,017.39         | 0.00                |
| 6,999.00                 | 88.60      | 90.50                | 5,132.42      | 15.10         | 2,104.31      | 2,104.36         | 0.51                |
| 7,087.00                 | 88.30      | 90.30                | 5,134.80      | 14.48         | 2,192.27      | 2,192.32         | 0.41                |
| 7,172.00                 | 87.90      | 90.60                | 5,137.62      | 13.81         | 2,277.22      | 2,277.27         | 0.59                |
| 7,190.43                 | 87.84      | 90.58                | 5,138.31      | 13.63         | 2,295.64      | 2,295.68         | 0.37                |
| 2300' VS Crow Fed 22H    |            |                      |               |               |               |                  |                     |
| 7,194.77                 | 87.82      | 90.57                | 5,138.47      | 13.58         | 2,299.97      | 2,300.01         | 0.37                |
| 2300' VS Crow Fed 22H v2 |            |                      |               |               |               |                  |                     |
| 7,258.00                 | 87.60      | 90.50                | 5,141.00      | 12.99         | 2,363.15      | 2,363.19         | 0.37                |
| 7,344.00                 | 87.50      | 90.30                | 5,144.67      | 12.39         | 2,449.07      | 2,449.10         | 0.26                |



# Phoenix Technology Services

## Phoenix Final Survey Report



|                  |                             |                                     |                                |
|------------------|-----------------------------|-------------------------------------|--------------------------------|
| <b>Company:</b>  | Apache Corporation          | <b>Local Co-ordinate Reference:</b> | Well #22H                      |
| <b>Project:</b>  | Eddy County, NM (NAD27 NME) | <b>TVD Reference:</b>               | KB @ 3881.00usft (Capstar 114) |
| <b>Site:</b>     | Crow Federal                | <b>MD Reference:</b>                | KB @ 3881.00usft (Capstar 114) |
| <b>Well:</b>     | #22H                        | <b>North Reference:</b>             | Grid                           |
| <b>Wellbore:</b> | WB1/Job #1311192            | <b>Survey Calculation Method:</b>   | Minimum Curvature              |
| <b>Design:</b>   | Surveys (Capstar 114)       | <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) |
| 7,429.00                               | 87.10      | 89.70                | 89.70 | 5,148.68      | 12.39         | 2,533.98      | 2,534.00         | 0.85                |
| 7,515.00                               | 87.00      | 89.30                | 89.30 | 5,153.10      | 13.14         | 2,619.86      | 2,619.89         | 0.48                |
| 7,600.00                               | 88.00      | 88.60                | 88.60 | 5,156.81      | 14.70         | 2,704.76      | 2,704.80         | 1.44                |
| 7,686.00                               | 88.10      | 88.60                | 88.60 | 5,159.74      | 16.80         | 2,790.69      | 2,790.74         | 0.12                |
| 7,772.00                               | 87.90      | 88.50                | 88.50 | 5,162.74      | 18.97         | 2,876.61      | 2,876.67         | 0.26                |
| 7,857.00                               | 88.40      | 88.60                | 88.60 | 5,165.48      | 21.12         | 2,961.54      | 2,961.61         | 0.60                |
| 7,943.00                               | 88.70      | 89.50                | 89.50 | 5,167.66      | 22.55         | 3,047.50      | 3,047.58         | 1.10                |
| 8,028.00                               | 88.50      | 89.30                | 89.30 | 5,169.74      | 23.44         | 3,132.47      | 3,132.55         | 0.33                |
| 8,114.00                               | 90.00      | 90.00                | 90.00 | 5,170.86      | 23.96         | 3,218.45      | 3,218.54         | 1.92                |
| 8,199.00                               | 89.70      | 89.90                | 89.90 | 5,171.08      | 24.03         | 3,303.45      | 3,303.54         | 0.37                |
| 8,285.00                               | 89.20      | 89.20                | 89.20 | 5,171.91      | 24.71         | 3,389.45      | 3,389.54         | 1.00                |
| 8,370.00                               | 88.50      | 88.80                | 88.80 | 5,173.61      | 26.19         | 3,474.42      | 3,474.51         | 0.95                |
| 8,456.00                               | 90.00      | 89.60                | 89.60 | 5,174.74      | 27.39         | 3,560.40      | 3,560.50         | 1.98                |
| 8,541.00                               | 89.70      | 89.30                | 89.30 | 5,174.96      | 28.21         | 3,645.39      | 3,645.50         | 0.50                |
| 8,627.00                               | 89.50      | 89.00                | 89.00 | 5,175.56      | 29.49         | 3,731.38      | 3,731.50         | 0.42                |
| 8,712.00                               | 89.00      | 89.30                | 89.30 | 5,176.68      | 30.75         | 3,816.36      | 3,816.49         | 0.69                |
| 8,798.00                               | 88.70      | 89.00                | 89.00 | 5,178.40      | 32.02         | 3,902.34      | 3,902.47         | 0.49                |
| 8,883.00                               | 88.60      | 88.70                | 88.70 | 5,180.40      | 33.73         | 3,987.30      | 3,987.44         | 0.37                |
| 8,972.00                               | 88.30      | 88.60                | 88.60 | 5,182.81      | 35.82         | 4,076.24      | 4,076.39         | 0.36                |
| 9,057.00                               | 87.80      | 87.90                | 87.90 | 5,185.70      | 38.42         | 4,161.15      | 4,161.32         | 1.01                |
| 9,143.00                               | 89.70      | 89.60                | 89.60 | 5,187.58      | 40.29         | 4,247.10      | 4,247.28         | 2.96                |
| 9,228.00                               | 89.80      | 89.70                | 89.70 | 5,187.95      | 40.81         | 4,332.10      | 4,332.28         | 0.17                |
| 9,314.00                               | 89.80      | 90.00                | 90.00 | 5,188.25      | 41.04         | 4,418.10      | 4,418.28         | 0.35                |
| 9,399.00                               | 90.00      | 90.10                | 90.10 | 5,188.40      | 40.96         | 4,503.10      | 4,503.28         | 0.26                |
| 9,485.00                               | 90.10      | 90.10                | 90.10 | 5,188.32      | 40.81         | 4,589.10      | 4,589.27         | 0.12                |
| 9,571.00                               | 90.00      | 90.10                | 90.10 | 5,188.25      | 40.66         | 4,675.10      | 4,675.27         | 0.12                |
| 9,656.00                               | 90.50      | 89.90                | 89.90 | 5,187.88      | 40.66         | 4,760.10      | 4,760.27         | 0.63                |
| 9,742.00                               | 89.50      | 89.60                | 89.60 | 5,187.88      | 41.04         | 4,846.09      | 4,846.26         | 1.21                |
| 9,783.00                               | 89.50      | 89.60                | 89.60 | 5,188.24      | 41.32         | 4,887.09      | 4,887.26         | 0.00                |
| Last Phoenix MWD Survey                |            |                      |       |               |               |               |                  |                     |
| 9,836.50                               | 89.50      | 89.60                | 89.60 | 5,188.70      | 41.70         | 4,940.59      | 4,940.76         | 0.00                |
| BHL v2 Crow Fed 22H                    |            |                      |       |               |               |               |                  |                     |
| 9,836.69                               | 89.50      | 89.60                | 89.60 | 5,188.71      | 41.70         | 4,940.78      | 4,940.95         | 0.00                |
| BHL Crow Fed 22H                       |            |                      |       |               |               |               |                  |                     |
| 9,837.00                               | 89.50      | 89.60                | 89.60 | 5,188.71      | 41.70         | 4,941.09      | 4,941.26         | 0.00                |
| Projection to TD - BHL v3 Crow Fed 22H |            |                      |       |               |               |               |                  |                     |



Phoenix Technology Services  
Phoenix Final Survey Report



|           |                             |                              |                                |
|-----------|-----------------------------|------------------------------|--------------------------------|
| Company:  | Apache Corporation          | Local Co-ordinate Reference: | Well #22H                      |
| Project:  | Eddy County, NM (NAD27 NME) | TVD Reference:               | KB @ 3881.00usft (Capstar 114) |
| Site:     | Crow Federal                | MD Reference:                | KB @ 3881.00usft (Capstar 114) |
| Well:     | #22H                        | North Reference:             | Grid                           |
| Wellbore: | WB1/Job #1311192            | Survey Calculation Method:   | Minimum Curvature              |
| Design:   | Surveys (Capstar 114)       | Database:                    | GCR DB                         |

| Survey Annotations    |                       |                   |              |                          |
|-----------------------|-----------------------|-------------------|--------------|--------------------------|
| Measured Depth (usft) | Vertical Depth (usft) | Local Coordinates |              | Comment                  |
|                       |                       | +N/-S (usft)      | +E/-W (usft) |                          |
| 481.00                | 480.97                | 0.08              | 4.75         | Tie-on to Gyro           |
| 569.00                | 568.97                | 0.22              | 5.26         | First Phoenix MWD Survey |
| 9,783.00              | 5,188.24              | 41.32             | 4,887.09     | Last Phoenix MWD Survey  |
| 9,837.00              | 5,188.71              | 41.70             | 4,941.09     | Projection to TD         |

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

DISTRICT I  
1625 N. French Dr., Hobbs, NM 88240  
Phone: (575) 393-6161 Fax: (575) 393-0720

DISTRICT II  
811 S. First St., Artesia, NM 88210  
Phone: (575) 748-1283 Fax: (575) 748-9720

DISTRICT III  
1000 Rio Brazos Road, Aztec, NM 87410  
Phone: (505) 334-6178 Fax: (505) 334-6170

DISTRICT IV  
1220 S. St. Francis Dr., Santa Fe, NM 87505  
Phone: (505) 476-3460 Fax: (505) 476-3462

State of New Mexico  
Energy, Minerals & Natural Resources Department  
OIL CONSERVATION DIVISION  
1220 South St. Francis Dr.  
Santa Fe, New Mexico 87505

Form C-102  
Revised August 1, 2011  
Submit one copy to appropriate  
District Office

AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

|                           |                                     |                                  |
|---------------------------|-------------------------------------|----------------------------------|
| API Number<br>30-15-41166 | Pool Code<br>26770                  | Pool Name<br>Fren; Glorieta-Yeso |
| Property Code<br>308711   | Property Name<br>CROW FEDERAL       | Well Number<br>22H               |
| OGRID No.<br>873          | Operator Name<br>APACHE CORPORATION | Elevation<br>3870'               |

| UL or lot No. | Section | Township | Range | Lot Idn | Feet from the | North/South line | Feet from the | East/West line | County |
|---------------|---------|----------|-------|---------|---------------|------------------|---------------|----------------|--------|
| E             | 9       | 17-S     | 31-E  |         | 1680          | NORTH            | 10            | WEST           | EDDY   |

| UL or lot No. | Section | Township | Range | Lot Idn | Feet from the | North/South line | Feet from the | East/West line | County |
|---------------|---------|----------|-------|---------|---------------|------------------|---------------|----------------|--------|
| H             | 9       | 17-S     | 31-E  |         | 1673.7        | NORTH            | 331.3         | EAST           | EDDY   |

| UL or lot No. | Section | Township | Range | Lot Idn | Feet from the | North/South line | Feet from the | East/West line | County |
|---------------|---------|----------|-------|---------|---------------|------------------|---------------|----------------|--------|
| E             | 9       | 17-S     | 31-E  |         | 1679          | NORTH            | 68.8          | WEST           | EDDY   |

|                        |                 |                    |           |
|------------------------|-----------------|--------------------|-----------|
| Dedicated Acres<br>160 | Joint or Infill | Consolidation Code | Order No. |
|------------------------|-----------------|--------------------|-----------|

NO ALLOWABLE WILL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE BEEN CONSOLIDATED OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION

|                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                    |                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                    |                                                                                                                                                                                                    | <p><b>OPERATOR CERTIFICATION</b></p> <p>I hereby certify that the information herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.</p> <p>Signature: <i>Fatima Vasquez</i> Date: 03/11/2014</p> <p>Printed Name: Fatima Vasquez</p> <p>E-mail Address: Fatima.Vasquez@apachecorp.com</p> |
| <p><b>GEODETIC COORDINATES</b><br/>NAD 27 NME<br/>SURFACE LOCATION<br/>Y=673813.2 N<br/>X=638370.3 E</p> <p>LAT.=32.851586° N<br/>LONG.=103.882758° W</p> <p>LAT.=32° 51' 06" N<br/>LONG.=103° 52' 58" W</p> <p>KICK OFF POINT<br/>NAD 27 NME<br/>Y=673810.2 N<br/>X=638370.3 E</p> <p>LAT.=32.851577° N<br/>LONG.=103.882758° W</p> | <p><b>PENETRATION POINT</b><br/>NAD 27 NME<br/>Y=673814.6 N<br/>X=638429.0 E</p> <p>LAT.=32.851589° N<br/>LONG.=103.882567° W</p> <p>LAT.=32° 51' 06" N<br/>LONG.=103° 52' 57" W</p> <p>FIRST TAKE POINT<br/>NAD 27 NME<br/>Y=673815.3 N<br/>X=638812.0 E</p> <p>LAT.=32.851586° N<br/>LONG.=103.881320° W</p> | <p><b>LAST TAKE POINT</b><br/>NAD 27 NME<br/>Y=673854.2 N<br/>X=643211.2 E</p> <p>LAT.=32.851640° N<br/>LONG.=103.866994° W</p> <p>LAT.=32° 51' 06" N<br/>LONG.=103° 52' 01" W</p> | <p><b>AS-DRILLED BOTTOM HOLE LOCATION</b><br/>NAD 27 NME<br/>Y=673854.8 N<br/>X=643310.2 E</p> <p>LAT.=32.851641° N<br/>LONG.=103.866672° W</p> <p>LAT.=32° 51' 06" N<br/>LONG.=103° 52' 00" W</p> | <p><b>SURVEYOR CERTIFICATION</b></p> <p>I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.</p> <p>MAY 17, 2012</p> <p>Date of Survey</p> <p>Signature: <i>GARY G. EIDSON</i> Seal of Professional Surveyor:</p> <p></p> <p>Certificate Number: Gary G. Eidson 12641<br/>J. Eidson 3239</p> <p>ACK REPLY TO: JWSW W.O.: 14.13.0147</p>                                                                                                                                                                                          |

NOTE: AS-DRILLED BOTTOM HOLE DATA PLOTTED FROM PHOENIX TECHNOLOGY SERVICES SURVEY REPORT ON 09/24/13

CORNER COORDINATES TABLE  
A - Y=674172.6 N, X=638358.2 E  
B - Y=674209.2 N, X=643639.5 E  
C - Y=672852.6 N, X=638365.7 E  
D - Y=672888.0 N, X=643646.5 E

## Additional data for EC transaction #238555 that would not fit on the form

### 32. Additional remarks, continued

holes. Frac w/ 179 bbl 15% HCl & 182,760# sand (100 Mesh & 40/70).  
Set CBP @ 8286'. Stage 6 - Perf Paddock @ 8236'-8238', 8136'-8138', 8036'-8038' w/ 5 SPF, 45  
holes. Frac w/ 179 bbl 15% HCl & 178,720# sand (100 Mesh & 40/70).  
Set CBP @ 7986'. Stage 7 - Perf Paddock @ 7936'-7938', 7836'-7838', 7736'-7738' w/ 5 SPF, 45  
holes. Frac w/ 179 bbl 15% HCl & 181,750# sand (100 Mesh & 40/70).  
Set CBP @ 7700'. Stage 8 - Perf Paddock @ 7636'-7638', 7536'-7538', 7436'-7438' w/ 5 SPF, 45  
holes. Frac w/ 182 bbl 15% HCl & 180,540# sand (100 Mesh & 40/70).  
Set CBP @ 7380'. Stage 9 - Perf Paddock @ 7336'-7338', 7236'-7238', 7136'-7138' w/ 5 SPF, 45  
holes. Frac w/ 180 bbl 15% HCl & 175,330# sand (100 Mesh & 40/70).  
Set CBP @ 7086'. Stage 10 - Perf Paddock @ 7036'-7038', 6936'-6938', 6836'-6838' w/ 5 SPF, 45  
holes. Frac w/ 179 bbl 15% HCl & 180,720# sand (100 Mesh & 40/70).  
12/05/2013 Set CBP @ 6786'. Stage 11 - Perf Paddock @ 6736'-6738', 6636'-6638', 6536'-6538' w/ 5  
SPF, 45 holes. Frac w/ 180.8 bbl 15% HCl & 180,260# sand (100 Mesh & 40/70).  
Set CBP @ 6486'. Stage 12 - Perf Paddock @ 6436'-6438', 6336'-6338', 6236'-6238' w/ 5 SPF, 45  
holes. Frac w/ 182 bbl 15% HCl & 180,180# sand (100 Mesh & 40/70).  
Set CBP @ 6186'. Stage 13 - Perf Paddock @ 6136'-6138', 6036'-6038', 5936'-5938' w/ 5 SPF, 45  
holes. Frac w/ 178 bbl 15% HCl & 182,830# sand (100 Mesh & 40/70).  
Set CBP @ 5886'. Stage 14 - Perf Paddock @ 5836'-5838', 5736'-5738', 5636'-5638' w/ 5 SPF, 45  
holes. Frac w/ 179 bbl 15% HCl & 180,060# sand (100 Mesh & 40/70).  
Set CBP @ 5590'. Stage 15 - Perf Paddock @ 5536'-5538', 5436'-5438', 5336'-5338' w/ 5 SPF, 45  
holes. Frac w/ 182.8 bbl 15% HCl & 201,840# sand (100 Mesh & 40/70).  
12/18/2013 RIH w/ bit & tbg. Tag 1st plug.  
12/19/2013 DO plugs - #1@ 5590', #2@ 5886', #3@ 6186', #4@ 6486', #5@ 6786', #6@ 7086', #7@ 7380',  
#8@ 7700', #9@ 7986', #10@ 8286', #11@ 8586', #12@ 8886', & #13@ 9186'.  
12/20/2013 DO #14@ 9486'. Circ hole clean to PBSD @ 9835'.  
01/10/2014 RIH w/ 2-7/8" J-55 6.5# prod tbg. Submersible @ 4586'. Desander @ 4668'. ETD @  
4995'.

01/31/2014 POP.