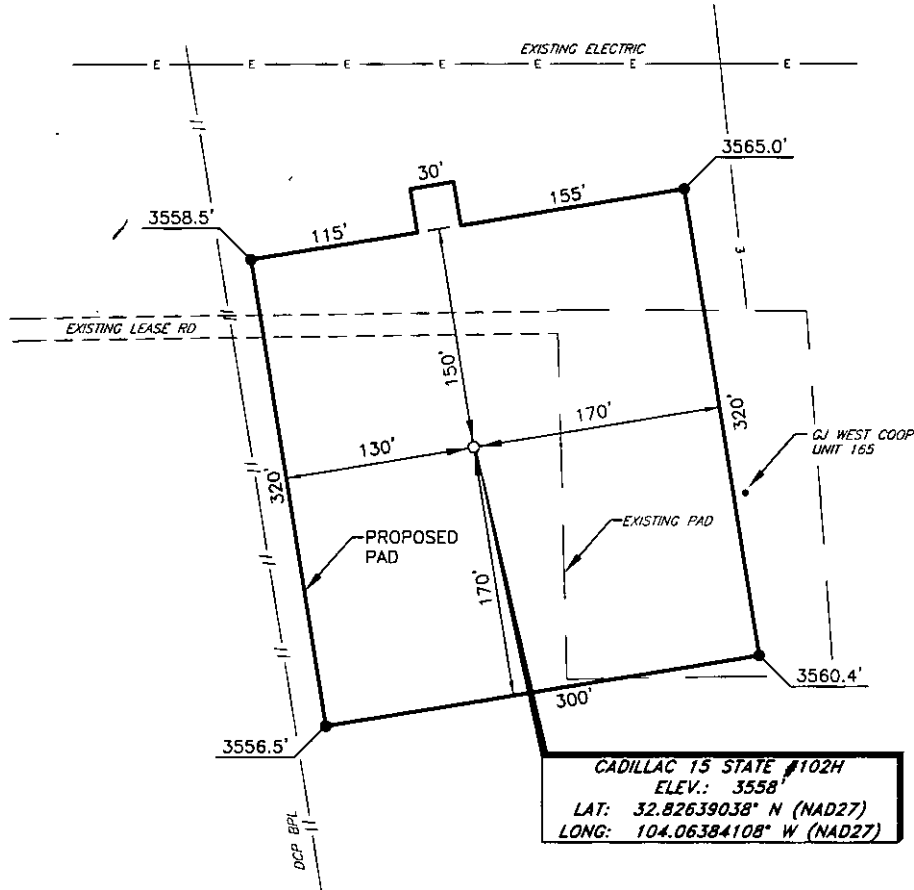


30-015-43829

COG OPERATING, LLC  
CADILLAC 15 STATE #102H  
(300' FNL & 2125' FWL)  
SECTION 22, T17S, R29E  
N. M. P. M., EDDY COUNTY, NEW MEXICO



DIRECTIONS TO LOCATION

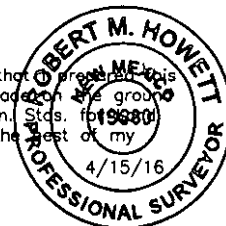
From the intersection of US Hwy. 82 and CR-214 (Barnaval Draw Rd.);  
Go Northwest on CR-214 approx. 0.4 miles to a lease road on the right;  
Turn right and go East approx. 0.1 miles to location on the right.



SCALE: 1" = 100'  
0 50 100  
BEARINGS ARE  
NAD 27 GRID - NM EAST  
DISTANCES ARE GROUND

I, R. M. Howett, a N. M. Professional Surveyor, hereby certify that this is an unclassified survey of a well location from an actual survey made on the ground under my direct supervision, said survey and plat meet the Min. Stds. for 1988 Surveying in the State of N. M. and are true and correct to the best of my knowledge and belief.

Robert M. Howett  
Robert M. Howett NM PS 19680



Firm No.: TX 10193838 NM 4655451

Copyright 2014 - All Rights Reserved

| NO.       | REVISION   | DATE |
|-----------|------------|------|
| JOB NO.:  | LS1603099  |      |
| DWG. NO.: | 1603099PAD |      |

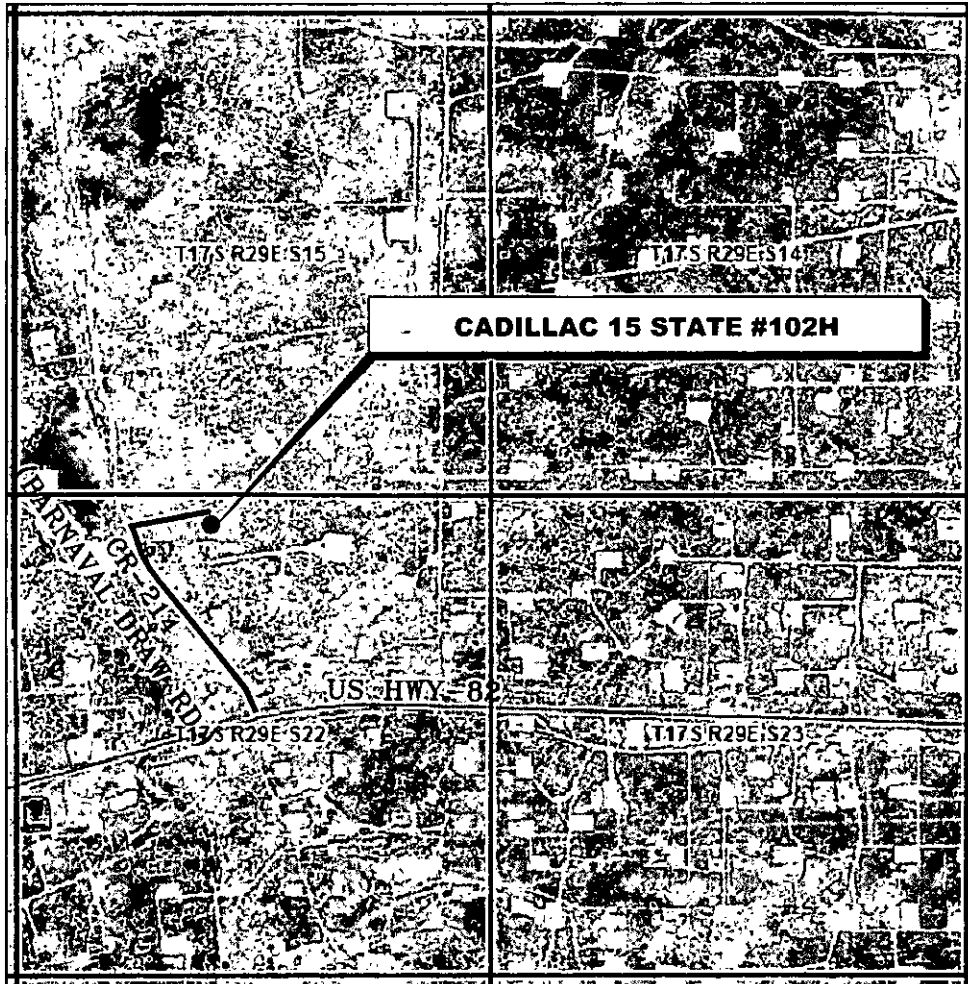
**RRC**

308 W. BROADWAY ST., HOBBS, NM 88240 (575) 964-8200

SCALE: 1" = 100'  
DATE: 4-14-2016  
SURVEYED BY: BC/HD  
DRAWN BY: LPS  
APPROVED BY: RMH  
SHEET : 1 OF 1

# VICINITY MAP

NOT TO SCALE



*SECTION 22, TWP. 17 SOUTH, RGE. 29 EAST,  
N. M. P. M., EDDY CO., NEW MEXICO*

OPERATOR: COG Operating, LLC  
LEASE: Cadillac 15 State  
WELL NO.: 102H

LOCATION: 300' FNL & 2125' FWL  
ELEVATION: 3558'

Firm No.: TX 10193838 NM 4655451

Copyright 2014 - All Rights Reserved

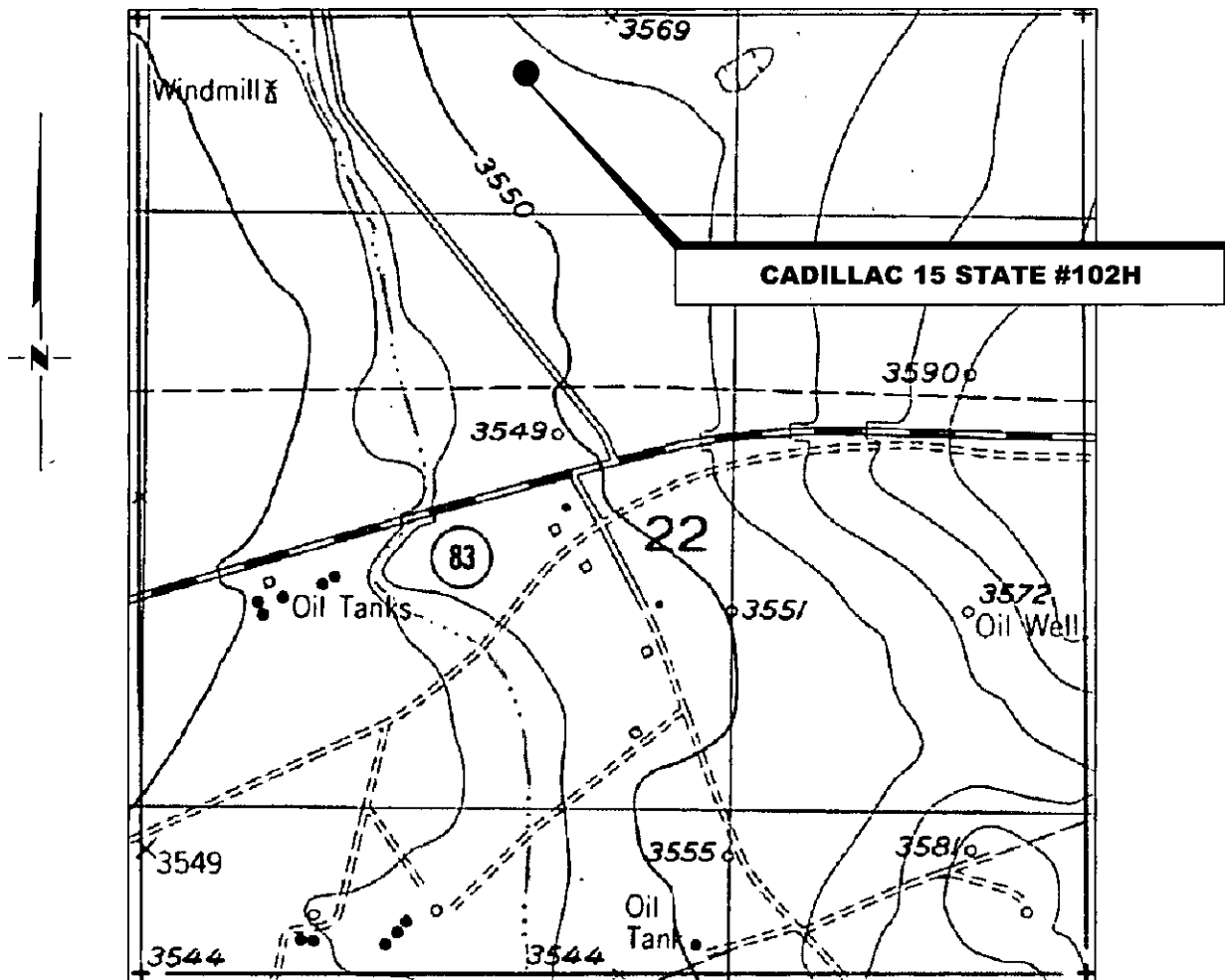
| NO.                 | REVISION | DATE |
|---------------------|----------|------|
| JOB NO.: LS1603099R |          |      |
| DWG. NO.: 1603099VM |          |      |

# RRC

308 W. BROADWAY ST., HOBBS, NM 88240 (575) 964-8200

|                    |
|--------------------|
| SCALE: NTS         |
| DATE: 3-03-2016    |
| SURVEYED BY: ML/CE |
| DRAWN BY: LPS      |
| APPROVED BY: RMH   |
| SHEET : 1 OF 1     |

# LOCATION VERIFICATION MAP



*SECTION 22, TWP. 17 SOUTH, RGE. 29 EAST,  
N. M. P. M., EDDY CO., NEW MEXICO*

OPERATOR: COG Operating, LLC  
LEASE: Cadillac 15 State  
WELL NO.: 102H  
ELEVATION: 3558'

LOCATION: 300' FNL & 2125' FWL  
CONTOUR INTERVAL: 10'  
USGS TOPO. SOURCE MAP:  
Red Lake SE, NM (1955)

Firm No.: TX 10193838 NM 4655451

Copyright 2015 - All Rights Reserved

| NO.                  | REVISION | DATE |
|----------------------|----------|------|
| JOB NO.: LS1603099R  |          |      |
| DWG. NO.: 1603099LVM |          |      |

# RRC

308 W. BROADWAY ST., HOBBS, NM 88240 (575) 964-8200

|                    |
|--------------------|
| SCALE: 1000'       |
| DATE: 4-14-2016    |
| SURVEYED BY: BC/HD |
| DRAWN BY: LPS      |
| APPROVED BY: RMH   |
| SHEET : 1 OF 1     |



**NM OIL CONSERVATION**  
ARTESIA DISTRICT

MAY 27 2016

RECEIVED

## **COG Operating LLC**

Eddy County, NM (NAD-27 2015)

Cadillac 15 State #102H

SHL: 300' FNL, 2125' FWL, Sec 22, T17S, R29E, Unit C

PP: 330' FSL, 2108' FWL, Sec 15, T17S, R29E, Unit N

BHL: 330' FNL, 1980' FWL, Sec 15, T17S, R29E, Unit C

Plan: Design #1

## **Standard Planning Report**

09 May, 2016





TDS  
Planning Report



|           |                                                      |                              |                                                           |
|-----------|------------------------------------------------------|------------------------------|-----------------------------------------------------------|
| Database: | EDM 5000.1 Single User Db                            | Local Co-ordinate Reference: | Well SHL: 300' FNL, 2125' FWL, Sec 22, T17S, R29E, Unit C |
| Company:  | COG Operating LLC                                    | TVD Reference:               | KB @ 3576.00usft (Silver Oak 3)                           |
| Project:  | Eddy County, NM (NAD-27 2015)                        | MD Reference:                | KB @ 3576.00usft (Silver Oak 3)                           |
| Site:     | Cadillac 15 State #102H                              | North Reference:             | Grid                                                      |
| Well:     | SHL: 300' FNL, 2125' FWL, Sec 22, T17S, R29E, Unit C | Survey Calculation Method:   | Minimum Curvature                                         |
| Wellbore: | BHL: 330' FNL, 1980' FWL, Sec 15, T17S, R29E, Unit C |                              |                                                           |
| Design:   | Design #1                                            |                              |                                                           |

|             |                                      |               |                |
|-------------|--------------------------------------|---------------|----------------|
| Project     | Eddy County, NM (NAD-27 2015)        |               |                |
| 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                  | Cadillac 15 State #102H |                           |                             |
| Site Position:        | From: Map               | Northing: 664,457.50 usft | Latitude: 32° 49' 35.006 N  |
|                       |                         | Easting: 582,783.40 usft  | Longitude: 104° 3' 49.827 W |
| Position Uncertainty: | 0.00 usft               | Slot Radius: 13.20 in     | Grid Convergence: 0.15 °    |

|                      |                                                      |                               |                             |
|----------------------|------------------------------------------------------|-------------------------------|-----------------------------|
| Well                 | SHL: 300' FNL, 2125' FWL, Sec 22, T17S, R29E, Unit C |                               |                             |
| Well Position        | +N/-S 0.00 usft                                      | Northing: 664,457.50 usft     | Latitude: 32° 49' 35.006 N  |
|                      | +E/-W 0.00 usft                                      | Easting: 582,783.40 usft      | Longitude: 104° 3' 49.827 W |
| Position Uncertainty | 0.00 usft                                            | Wellhead Elevation: 0.00 usft | Ground Level: 3,558.00 usft |

|           |                                                      |             |                    |                  |                        |
|-----------|------------------------------------------------------|-------------|--------------------|------------------|------------------------|
| Wellbore  | BHL: 330' FNL, 1980' FWL, Sec 15, T17S, R29E, Unit C |             |                    |                  |                        |
| Magnetics | Model Name                                           | Sample Date | Declination<br>(°) | Dip Angle<br>(°) | Field Strength<br>(nT) |
|           | IGRF2015                                             | 5/9/2016    | 7.35               | 60.55            | 48,356                 |

|                   |                            |                 |                 |                    |
|-------------------|----------------------------|-----------------|-----------------|--------------------|
| Design #1         |                            |                 |                 |                    |
| Audit Notes:      |                            |                 |                 |                    |
| Version:          |                            | Phase:          | PLAN            | 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            | 358.31             |

|                          |                    |                |                          |                 |                 |                            |                           |                          |            |                    |
|--------------------------|--------------------|----------------|--------------------------|-----------------|-----------------|----------------------------|---------------------------|--------------------------|------------|--------------------|
| Plan Sections            |                    |                |                          |                 |                 |                            |                           |                          |            |                    |
| Measured Depth<br>(usft) | Inclination<br>(°) | Azimuth<br>(°) | Vertical Depth<br>(usft) | +N/-S<br>(usft) | +E/-W<br>(usft) | Dogleg Rate<br>(°/100usft) | Build Rate<br>(°/100usft) | Turn Rate<br>(°/100usft) | TFO<br>(°) | Target             |
| 0.00                     | 0.00               | 0.00           | 0.00                     | 0.00            | 0.00            | 0.00                       | 0.00                      | 0.00                     | 0.00       |                    |
| 4,229.21                 | 0.00               | 0.00           | 4,229.21                 | 0.00            | 0.00            | 0.00                       | 0.00                      | 0.00                     | 0.00       |                    |
| 5,056.48                 | 91.00              | 358.31         | 4,750.00                 | 529.73          | -15.59          | 11.00                      | 11.00                     | -0.20                    | 358.31     |                    |
| 9,783.62                 | 91.00              | 358.31         | 4,667.50                 | 5,254.10        | -154.60         | 0.00                       | 0.00                      | 0.00                     | 0.00       | PBHL (C15S #102H/L |



TDS  
Planning Report



|           |                                                      |                              |                                                           |
|-----------|------------------------------------------------------|------------------------------|-----------------------------------------------------------|
| Database: | EDM 5000.1 Single User Db                            | Local Co-ordinate Reference: | Well SHL: 300' FNL, 2125' FWL, Sec 22, T17S, R29E, Unit C |
| Company:  | COG Operating LLC                                    | TVD Reference:               | KB @ 3576.00usft (Silver Oak 3)                           |
| Project:  | Eddy County, NM (NAD-27 2015)                        | MD Reference:                | KB @ 3576.00usft (Silver Oak 3)                           |
| Site:     | Cadillac 15 State #102H                              | North Reference:             | Grid                                                      |
| Well:     | SHL: 300' FNL, 2125' FWL, Sec 22, T17S, R29E, Unit C | Survey Calculation Method:   | Minimum Curvature                                         |
| Wellbore: | BHL: 330' FNL, 1980' FWL, Sec 15, T17S, R29E, Unit C |                              |                                                           |
| Design:   | Design #1                                            |                              |                                                           |

| Planned Survey             |                 |             |                       |              |              |                         |                         |                        |                       |
|----------------------------|-----------------|-------------|-----------------------|--------------|--------------|-------------------------|-------------------------|------------------------|-----------------------|
| Measured Depth (usft)      | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | +N/-S (usft) | +E/-W (usft) | Vertical Section (usft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) |
| 0.00                       | 0.00            | 0.00        | 0.00                  | 0.00         | 0.00         | 0.00                    | 0.00                    | 0.00                   | 0.00                  |
| 100.00                     | 0.00            | 0.00        | 100.00                | 0.00         | 0.00         | 0.00                    | 0.00                    | 0.00                   | 0.00                  |
| 200.00                     | 0.00            | 0.00        | 200.00                | 0.00         | 0.00         | 0.00                    | 0.00                    | 0.00                   | 0.00                  |
| 300.00                     | 0.00            | 0.00        | 300.00                | 0.00         | 0.00         | 0.00                    | 0.00                    | 0.00                   | 0.00                  |
| 400.00                     | 0.00            | 0.00        | 400.00                | 0.00         | 0.00         | 0.00                    | 0.00                    | 0.00                   | 0.00                  |
| 500.00                     | 0.00            | 0.00        | 500.00                | 0.00         | 0.00         | 0.00                    | 0.00                    | 0.00                   | 0.00                  |
| 600.00                     | 0.00            | 0.00        | 600.00                | 0.00         | 0.00         | 0.00                    | 0.00                    | 0.00                   | 0.00                  |
| 700.00                     | 0.00            | 0.00        | 700.00                | 0.00         | 0.00         | 0.00                    | 0.00                    | 0.00                   | 0.00                  |
| 800.00                     | 0.00            | 0.00        | 800.00                | 0.00         | 0.00         | 0.00                    | 0.00                    | 0.00                   | 0.00                  |
| 900.00                     | 0.00            | 0.00        | 900.00                | 0.00         | 0.00         | 0.00                    | 0.00                    | 0.00                   | 0.00                  |
| 1,000.00                   | 0.00            | 0.00        | 1,000.00              | 0.00         | 0.00         | 0.00                    | 0.00                    | 0.00                   | 0.00                  |
| 1,100.00                   | 0.00            | 0.00        | 1,100.00              | 0.00         | 0.00         | 0.00                    | 0.00                    | 0.00                   | 0.00                  |
| 1,200.00                   | 0.00            | 0.00        | 1,200.00              | 0.00         | 0.00         | 0.00                    | 0.00                    | 0.00                   | 0.00                  |
| 1,300.00                   | 0.00            | 0.00        | 1,300.00              | 0.00         | 0.00         | 0.00                    | 0.00                    | 0.00                   | 0.00                  |
| 1,400.00                   | 0.00            | 0.00        | 1,400.00              | 0.00         | 0.00         | 0.00                    | 0.00                    | 0.00                   | 0.00                  |
| 1,500.00                   | 0.00            | 0.00        | 1,500.00              | 0.00         | 0.00         | 0.00                    | 0.00                    | 0.00                   | 0.00                  |
| 1,600.00                   | 0.00            | 0.00        | 1,600.00              | 0.00         | 0.00         | 0.00                    | 0.00                    | 0.00                   | 0.00                  |
| 1,700.00                   | 0.00            | 0.00        | 1,700.00              | 0.00         | 0.00         | 0.00                    | 0.00                    | 0.00                   | 0.00                  |
| 1,800.00                   | 0.00            | 0.00        | 1,800.00              | 0.00         | 0.00         | 0.00                    | 0.00                    | 0.00                   | 0.00                  |
| 1,900.00                   | 0.00            | 0.00        | 1,900.00              | 0.00         | 0.00         | 0.00                    | 0.00                    | 0.00                   | 0.00                  |
| 2,000.00                   | 0.00            | 0.00        | 2,000.00              | 0.00         | 0.00         | 0.00                    | 0.00                    | 0.00                   | 0.00                  |
| 2,100.00                   | 0.00            | 0.00        | 2,100.00              | 0.00         | 0.00         | 0.00                    | 0.00                    | 0.00                   | 0.00                  |
| 2,200.00                   | 0.00            | 0.00        | 2,200.00              | 0.00         | 0.00         | 0.00                    | 0.00                    | 0.00                   | 0.00                  |
| 2,300.00                   | 0.00            | 0.00        | 2,300.00              | 0.00         | 0.00         | 0.00                    | 0.00                    | 0.00                   | 0.00                  |
| 2,400.00                   | 0.00            | 0.00        | 2,400.00              | 0.00         | 0.00         | 0.00                    | 0.00                    | 0.00                   | 0.00                  |
| 2,500.00                   | 0.00            | 0.00        | 2,500.00              | 0.00         | 0.00         | 0.00                    | 0.00                    | 0.00                   | 0.00                  |
| 2,600.00                   | 0.00            | 0.00        | 2,600.00              | 0.00         | 0.00         | 0.00                    | 0.00                    | 0.00                   | 0.00                  |
| 2,700.00                   | 0.00            | 0.00        | 2,700.00              | 0.00         | 0.00         | 0.00                    | 0.00                    | 0.00                   | 0.00                  |
| 2,800.00                   | 0.00            | 0.00        | 2,800.00              | 0.00         | 0.00         | 0.00                    | 0.00                    | 0.00                   | 0.00                  |
| 2,900.00                   | 0.00            | 0.00        | 2,900.00              | 0.00         | 0.00         | 0.00                    | 0.00                    | 0.00                   | 0.00                  |
| 3,000.00                   | 0.00            | 0.00        | 3,000.00              | 0.00         | 0.00         | 0.00                    | 0.00                    | 0.00                   | 0.00                  |
| 3,100.00                   | 0.00            | 0.00        | 3,100.00              | 0.00         | 0.00         | 0.00                    | 0.00                    | 0.00                   | 0.00                  |
| 3,200.00                   | 0.00            | 0.00        | 3,200.00              | 0.00         | 0.00         | 0.00                    | 0.00                    | 0.00                   | 0.00                  |
| 3,300.00                   | 0.00            | 0.00        | 3,300.00              | 0.00         | 0.00         | 0.00                    | 0.00                    | 0.00                   | 0.00                  |
| 3,400.00                   | 0.00            | 0.00        | 3,400.00              | 0.00         | 0.00         | 0.00                    | 0.00                    | 0.00                   | 0.00                  |
| 3,500.00                   | 0.00            | 0.00        | 3,500.00              | 0.00         | 0.00         | 0.00                    | 0.00                    | 0.00                   | 0.00                  |
| 3,600.00                   | 0.00            | 0.00        | 3,600.00              | 0.00         | 0.00         | 0.00                    | 0.00                    | 0.00                   | 0.00                  |
| 3,700.00                   | 0.00            | 0.00        | 3,700.00              | 0.00         | 0.00         | 0.00                    | 0.00                    | 0.00                   | 0.00                  |
| 3,800.00                   | 0.00            | 0.00        | 3,800.00              | 0.00         | 0.00         | 0.00                    | 0.00                    | 0.00                   | 0.00                  |
| 3,900.00                   | 0.00            | 0.00        | 3,900.00              | 0.00         | 0.00         | 0.00                    | 0.00                    | 0.00                   | 0.00                  |
| 4,000.00                   | 0.00            | 0.00        | 4,000.00              | 0.00         | 0.00         | 0.00                    | 0.00                    | 0.00                   | 0.00                  |
| 4,100.00                   | 0.00            | 0.00        | 4,100.00              | 0.00         | 0.00         | 0.00                    | 0.00                    | 0.00                   | 0.00                  |
| 4,200.00                   | 0.00            | 0.00        | 4,200.00              | 0.00         | 0.00         | 0.00                    | 0.00                    | 0.00                   | 0.00                  |
| 4,229.21                   | 0.00            | 0.00        | 4,229.21              | 0.00         | 0.00         | 0.00                    | 0.00                    | 0.00                   | 0.00                  |
| Start DLS 11.00 TFO 358.31 |                 |             |                       |              |              |                         |                         |                        |                       |
| 4,250.00                   | 2.29            | 358.31      | 4,249.99              | 0.41         | -0.01        | 0.41                    | 11.00                   | 11.00                  | 0.00                  |
| 4,300.00                   | 7.79            | 358.31      | 4,299.78              | 4.80         | -0.14        | 4.80                    | 11.00                   | 11.00                  | 0.00                  |
| 4,350.00                   | 13.29           | 358.31      | 4,348.92              | 13.94        | -0.41        | 13.94                   | 11.00                   | 11.00                  | 0.00                  |
| 4,400.00                   | 18.79           | 358.31      | 4,396.96              | 27.74        | -0.82        | 27.75                   | 11.00                   | 11.00                  | 0.00                  |
| 4,450.00                   | 24.29           | 358.31      | 4,443.45              | 46.08        | -1.36        | 46.10                   | 11.00                   | 11.00                  | 0.00                  |
| 4,500.00                   | 29.79           | 358.31      | 4,487.97              | 68.79        | -2.02        | 68.82                   | 11.00                   | 11.00                  | 0.00                  |



TDS  
Planning Report



|           |                                                      |                              |                                                           |
|-----------|------------------------------------------------------|------------------------------|-----------------------------------------------------------|
| Database: | EDM 5000.1 Single User Db                            | Local Co-ordinate Reference: | Well SHL: 300' FNL, 2125' FWL, Sec 22, T17S, R29E, Unit C |
| Company:  | COG Operating LLC                                    | TVD Reference:               | KB @ 3576.00usft (Silver Oak 3)                           |
| Project:  | Eddy County, NM (NAD-27 2015)                        | MD Reference:                | KB @ 3576.00usft (Silver Oak 3)                           |
| Site:     | Cadillac 15 State #102H                              | North Reference:             | Grid                                                      |
| Well:     | SHL: 300' FNL, 2125' FWL, Sec 22, T17S, R29E, Unit C | Survey Calculation Method:   | Minimum Curvature                                         |
| Wellbore: | BHL: 330' FNL, 1980' FWL, Sec 15, T17S, R29E, Unit C |                              |                                                           |
| Design:   | Design #1                                            |                              |                                                           |

Planned Survey

| Measured Depth (usft)            | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | +N-S (usft) | +E-W (usft) | Vertical Section (usft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) |
|----------------------------------|-----------------|-------------|-----------------------|-------------|-------------|-------------------------|-------------------------|------------------------|-----------------------|
| 4,550.00                         | 35.29           | 358.31      | 4,530.10              | 95.66       | -2.81       | 95.70                   | 11.00                   | 11.00                  | 0.00                  |
| 4,600.00                         | 40.79           | 358.31      | 4,569.47              | 126.44      | -3.72       | 126.50                  | 11.00                   | 11.00                  | 0.00                  |
| 4,650.00                         | 46.29           | 358.31      | 4,605.70              | 160.85      | -4.73       | 160.92                  | 11.00                   | 11.00                  | 0.00                  |
| 4,700.00                         | 51.79           | 358.31      | 4,638.47              | 198.58      | -5.84       | 198.67                  | 11.00                   | 11.00                  | 0.00                  |
| 4,750.00                         | 57.29           | 358.31      | 4,667.46              | 239.27      | -7.04       | 239.38                  | 11.00                   | 11.00                  | 0.00                  |
| 4,800.00                         | 62.79           | 358.31      | 4,692.43              | 282.55      | -8.31       | 282.68                  | 11.00                   | 11.00                  | 0.00                  |
| 4,850.00                         | 68.29           | 358.31      | 4,713.12              | 328.03      | -9.65       | 328.17                  | 11.00                   | 11.00                  | 0.00                  |
| 4,900.00                         | 73.79           | 358.31      | 4,729.37              | 375.28      | -11.04      | 375.44                  | 11.00                   | 11.00                  | 0.00                  |
| 4,950.00                         | 79.29           | 358.31      | 4,741.00              | 423.86      | -12.47      | 424.05                  | 11.00                   | 11.00                  | 0.00                  |
| 5,000.00                         | 84.79           | 358.31      | 4,747.93              | 473.34      | -13.93      | 473.54                  | 11.00                   | 11.00                  | 0.00                  |
| 5,050.00                         | 90.29           | 358.31      | 4,750.07              | 523.25      | -15.40      | 523.48                  | 11.00                   | 11.00                  | 0.00                  |
| 5,056.48                         | 91.00           | 358.31      | 4,750.00              | 529.73      | -15.59      | 529.96                  | 11.00                   | 11.00                  | 0.00                  |
| Start 4727.13 hold at 5056.48 MD |                 |             |                       |             |             |                         |                         |                        |                       |
| 5,100.00                         | 91.00           | 358.31      | 4,749.24              | 573.22      | -16.87      | 573.47                  | 0.00                    | 0.00                   | 0.00                  |
| 5,200.00                         | 91.00           | 358.31      | 4,747.50              | 673.17      | -19.81      | 673.46                  | 0.00                    | 0.00                   | 0.00                  |
| 5,300.00                         | 91.00           | 358.31      | 4,745.75              | 773.11      | -22.75      | 773.44                  | 0.00                    | 0.00                   | 0.00                  |
| 5,400.00                         | 91.00           | 358.31      | 4,744.01              | 873.05      | -25.69      | 873.43                  | 0.00                    | 0.00                   | 0.00                  |
| 5,500.00                         | 91.00           | 358.31      | 4,742.26              | 972.99      | -28.63      | 973.41                  | 0.00                    | 0.00                   | 0.00                  |
| 5,600.00                         | 91.00           | 358.31      | 4,740.52              | 1,072.93    | -31.57      | 1,073.40                | 0.00                    | 0.00                   | 0.00                  |
| 5,700.00                         | 91.00           | 358.31      | 4,738.77              | 1,172.87    | -34.51      | 1,173.38                | 0.00                    | 0.00                   | 0.00                  |
| 5,800.00                         | 91.00           | 358.31      | 4,737.03              | 1,272.81    | -37.45      | 1,273.37                | 0.00                    | 0.00                   | 0.00                  |
| 5,900.00                         | 91.00           | 358.31      | 4,735.28              | 1,372.76    | -40.39      | 1,373.35                | 0.00                    | 0.00                   | 0.00                  |
| 6,000.00                         | 91.00           | 358.31      | 4,733.53              | 1,472.70    | -43.33      | 1,473.33                | 0.00                    | 0.00                   | 0.00                  |
| 6,100.00                         | 91.00           | 358.31      | 4,731.79              | 1,572.64    | -46.27      | 1,573.32                | 0.00                    | 0.00                   | 0.00                  |
| 6,200.00                         | 91.00           | 358.31      | 4,730.04              | 1,672.58    | -49.22      | 1,673.30                | 0.00                    | 0.00                   | 0.00                  |
| 6,300.00                         | 91.00           | 358.31      | 4,728.30              | 1,772.52    | -52.16      | 1,773.29                | 0.00                    | 0.00                   | 0.00                  |
| 6,400.00                         | 91.00           | 358.31      | 4,726.55              | 1,872.46    | -55.10      | 1,873.27                | 0.00                    | 0.00                   | 0.00                  |
| 6,500.00                         | 91.00           | 358.31      | 4,724.81              | 1,972.40    | -58.04      | 1,973.26                | 0.00                    | 0.00                   | 0.00                  |
| 6,600.00                         | 91.00           | 358.31      | 4,723.06              | 2,072.35    | -60.98      | 2,073.24                | 0.00                    | 0.00                   | 0.00                  |
| 6,700.00                         | 91.00           | 358.31      | 4,721.32              | 2,172.29    | -63.92      | 2,173.23                | 0.00                    | 0.00                   | 0.00                  |
| 6,800.00                         | 91.00           | 358.31      | 4,719.57              | 2,272.23    | -66.86      | 2,273.21                | 0.00                    | 0.00                   | 0.00                  |
| 6,900.00                         | 91.00           | 358.31      | 4,717.83              | 2,372.17    | -69.80      | 2,373.20                | 0.00                    | 0.00                   | 0.00                  |
| 7,000.00                         | 91.00           | 358.31      | 4,716.08              | 2,472.11    | -72.74      | 2,473.18                | 0.00                    | 0.00                   | 0.00                  |
| 7,100.00                         | 91.00           | 358.31      | 4,714.34              | 2,572.05    | -75.68      | 2,573.17                | 0.00                    | 0.00                   | 0.00                  |
| 7,200.00                         | 91.00           | 358.31      | 4,712.59              | 2,672.00    | -78.62      | 2,673.15                | 0.00                    | 0.00                   | 0.00                  |
| 7,300.00                         | 91.00           | 358.31      | 4,710.85              | 2,771.94    | -81.56      | 2,773.14                | 0.00                    | 0.00                   | 0.00                  |
| 7,400.00                         | 91.00           | 358.31      | 4,709.10              | 2,871.88    | -84.50      | 2,873.12                | 0.00                    | 0.00                   | 0.00                  |
| 7,500.00                         | 91.00           | 358.31      | 4,707.36              | 2,971.82    | -87.44      | 2,973.11                | 0.00                    | 0.00                   | 0.00                  |
| 7,600.00                         | 91.00           | 358.31      | 4,705.61              | 3,071.76    | -90.39      | 3,073.09                | 0.00                    | 0.00                   | 0.00                  |
| 7,700.00                         | 91.00           | 358.31      | 4,703.87              | 3,171.70    | -93.33      | 3,173.08                | 0.00                    | 0.00                   | 0.00                  |
| 7,800.00                         | 91.00           | 358.31      | 4,702.12              | 3,271.64    | -96.27      | 3,273.06                | 0.00                    | 0.00                   | 0.00                  |
| 7,900.00                         | 91.00           | 358.31      | 4,700.37              | 3,371.59    | -99.21      | 3,373.05                | 0.00                    | 0.00                   | 0.00                  |
| 8,000.00                         | 91.00           | 358.31      | 4,698.63              | 3,471.53    | -102.15     | 3,473.03                | 0.00                    | 0.00                   | 0.00                  |
| 8,100.00                         | 91.00           | 358.31      | 4,696.88              | 3,571.47    | -105.09     | 3,573.01                | 0.00                    | 0.00                   | 0.00                  |
| 8,200.00                         | 91.00           | 358.31      | 4,695.14              | 3,671.41    | -108.03     | 3,673.00                | 0.00                    | 0.00                   | 0.00                  |
| 8,300.00                         | 91.00           | 358.31      | 4,693.39              | 3,771.35    | -110.97     | 3,772.98                | 0.00                    | 0.00                   | 0.00                  |
| 8,400.00                         | 91.00           | 358.31      | 4,691.65              | 3,871.29    | -113.91     | 3,872.97                | 0.00                    | 0.00                   | 0.00                  |
| 8,500.00                         | 91.00           | 358.31      | 4,689.90              | 3,971.24    | -116.85     | 3,972.95                | 0.00                    | 0.00                   | 0.00                  |
| 8,600.00                         | 91.00           | 358.31      | 4,688.16              | 4,071.18    | -119.79     | 4,072.94                | 0.00                    | 0.00                   | 0.00                  |
| 8,700.00                         | 91.00           | 358.31      | 4,686.41              | 4,171.12    | -122.73     | 4,172.92                | 0.00                    | 0.00                   | 0.00                  |
| 8,800.00                         | 91.00           | 358.31      | 4,684.67              | 4,271.06    | -125.67     | 4,272.91                | 0.00                    | 0.00                   | 0.00                  |

|           |                                                      |                              |                                                           |
|-----------|------------------------------------------------------|------------------------------|-----------------------------------------------------------|
| Database: | EDM 5000.1 Single User Db                            | Local Co-ordinate Reference: | Well SHL: 300' FNL, 2125' FWL, Sec 22, T17S, R29E, Unit C |
| Company:  | COG Operating LLC                                    | TVD Reference:               | KB @ 3576.00usft (Silver Oak 3)                           |
| Project:  | Eddy County, NM (NAD-27 2015)                        | MD Reference:                | KB @ 3576.00usft (Silver Oak 3)                           |
| Site:     | Cadillac 15 State #102H                              | North Reference:             | Grid                                                      |
| Well:     | SHL: 300' FNL, 2125' FWL, Sec 22, T17S, R29E, Unit C | Survey Calculation Method:   | Minimum Curvature                                         |
| Wellbore: | BHL: 330' FNL, 1980' FWL, Sec 15, T17S, R29E, Unit C |                              |                                                           |
| Design:   | Design #1                                            |                              |                                                           |

| Planned Survey        |                 |             |                       |              |              |                         |                         |                        |                       |  |
|-----------------------|-----------------|-------------|-----------------------|--------------|--------------|-------------------------|-------------------------|------------------------|-----------------------|--|
| Measured Depth (usft) | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | +N/-S (usft) | +E/-W (usft) | Vertical Section (usft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) |  |
| 8,900.00              | 91.00           | 358.31      | 4,682.92              | 4,371.00     | -128.62      | 4,372.89                | 0.00                    | 0.00                   | 0.00                  |  |
| 9,000.00              | 91.00           | 358.31      | 4,681.18              | 4,470.94     | -131.56      | 4,472.88                | 0.00                    | 0.00                   | 0.00                  |  |
| 9,100.00              | 91.00           | 358.31      | 4,679.43              | 4,570.88     | -134.50      | 4,572.86                | 0.00                    | 0.00                   | 0.00                  |  |
| 9,200.00              | 91.00           | 358.31      | 4,677.69              | 4,670.83     | -137.44      | 4,672.85                | 0.00                    | 0.00                   | 0.00                  |  |
| 9,300.00              | 91.00           | 358.31      | 4,675.94              | 4,770.77     | -140.38      | 4,772.83                | 0.00                    | 0.00                   | 0.00                  |  |
| 9,400.00              | 91.00           | 358.31      | 4,674.20              | 4,870.71     | -143.32      | 4,872.82                | 0.00                    | 0.00                   | 0.00                  |  |
| 9,500.00              | 91.00           | 358.31      | 4,672.45              | 4,970.65     | -146.26      | 4,972.80                | 0.00                    | 0.00                   | 0.00                  |  |
| 9,600.00              | 91.00           | 358.31      | 4,670.71              | 5,070.59     | -149.20      | 5,072.79                | 0.00                    | 0.00                   | 0.00                  |  |
| 9,700.00              | 91.00           | 358.31      | 4,668.96              | 5,170.53     | -152.14      | 5,172.77                | 0.00                    | 0.00                   | 0.00                  |  |
| 9,783.62              | 91.00           | 358.31      | 4,667.50              | 5,254.10     | -154.60      | 5,256.37                | 0.00                    | 0.00                   | 0.00                  |  |
| TD at 9783.62         |                 |             |                       |              |              |                         |                         |                        |                       |  |

| Design Targets                                                |               |              |            |              |              |                 |                |                  |                  |  |
|---------------------------------------------------------------|---------------|--------------|------------|--------------|--------------|-----------------|----------------|------------------|------------------|--|
| Target Name                                                   | Dip Angle (°) | Dip Dir. (°) | TVD (usft) | +N/-S (usft) | +E/-W (usft) | Northing (usft) | Easting (usft) | Latitude         | Longitude        |  |
| KOP (C15S #102H/L1 D<br>- plan hits target center<br>- Point  | 0.00          | 0.00         | 4,229.21   | 0.00         | 0.00         | 664,457.50      | 582,783.40     | 32° 49' 35.006 N | 104° 3' 49.827 W |  |
| PBHL (C15S #102H/L1)<br>- plan hits target center<br>- Point  | 0.00          | 0.00         | 4,667.50   | 5,254.10     | -154.60      | 669,711.60      | 582,628.80     | 32° 50' 27.000 N | 104° 3' 51.483 W |  |
| PP (C15S #102H/L1 D)<br>- plan hits target center<br>- Point  | 0.00          | 0.00         | 4,748.25   | 629.80       | -18.53       | 665,087.30      | 582,764.87     | 32° 49' 41.238 N | 104° 3' 50.026 W |  |
| EOC (C15S #102H/L1 D)<br>- plan hits target center<br>- Point | 0.00          | 0.00         | 4,750.00   | 529.73       | -15.59       | 664,987.23      | 582,767.82     | 32° 49' 40.248 N | 104° 3' 49.994 W |  |

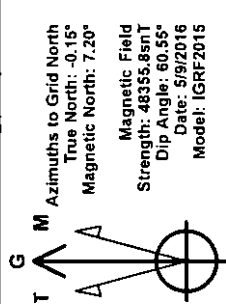
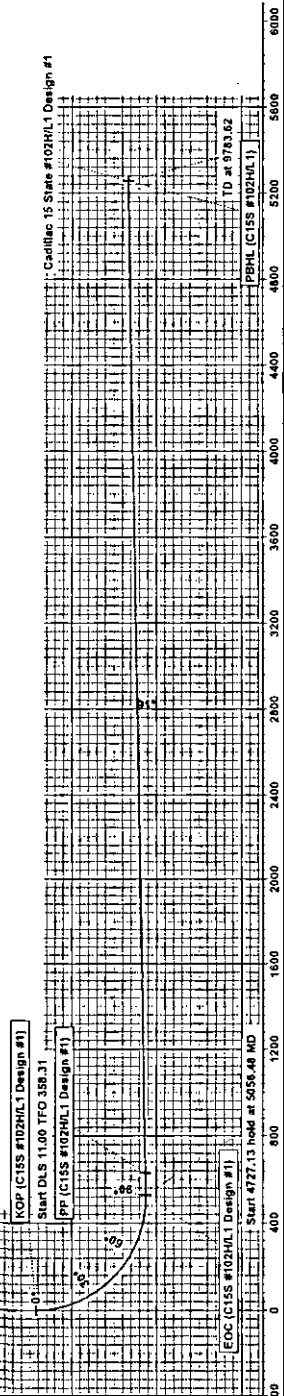
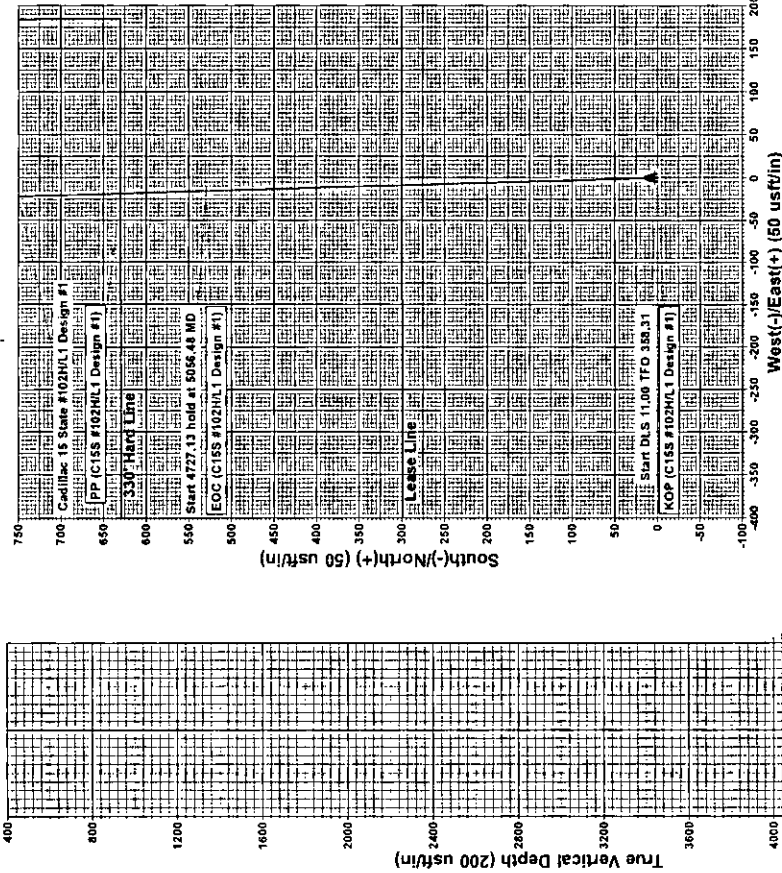
| Plan Annotations      |                       |                   |              |                                  |  |
|-----------------------|-----------------------|-------------------|--------------|----------------------------------|--|
| Measured Depth (usft) | Vertical Depth (usft) | Local Coordinates |              |                                  |  |
|                       |                       | +N/-S (usft)      | +E/-W (usft) | Comment                          |  |
| 4,229.21              | 4,229.21              | 0.00              | 0.00         | Start DLS 11.00 TFO 358.31       |  |
| 5,056.48              | 4,750.00              | 529.73            | -15.59       | Start 4727.13 hold at 5056.48 MD |  |
| 9,783.62              | 4,667.50              | 5,254.10          | -154.60      | TD at 9783.62                    |  |



COG Operating LLC  
Project: Eddy County, NM (NAD-27 2015)  
Site: Cadillac 15 State #102HL  
Well: SHL: 300' FNL, 2125' FWL, Sec 22, T17S, R29E, Unit C  
Wellbore: BHL: 330' FNL, 1980' FWL, Sec 15, T17S, R29E, Unit C  
Plan: Design #1 (SHL: 300' FNL, 2125' FWL, Sec 22, T17S, R29E, Unit C/BHL: 330' FNL, 1980' FWL, Sec 15, T17S, R29E, Unit C)

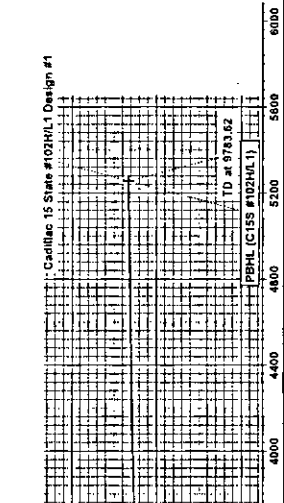
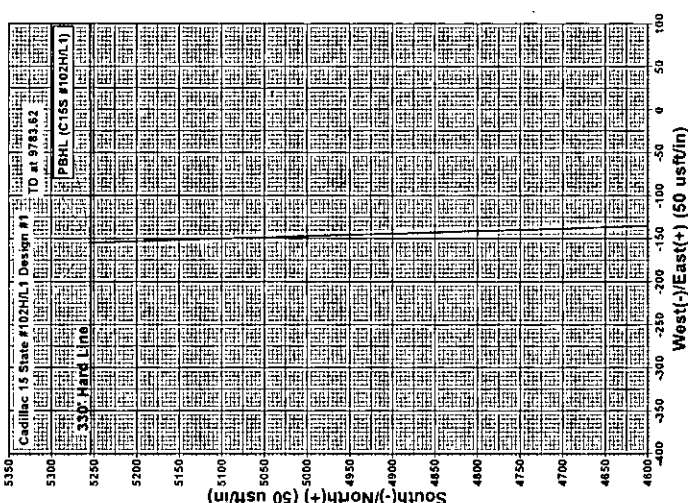
#### Section Details

| Sec | MD      | Inc   | Azi    | TVD     | +N/-S   | +E/-W   | Dleg  | TTrace | VSecl   | Target               |
|-----|---------|-------|--------|---------|---------|---------|-------|--------|---------|----------------------|
| 1   | 0.00    | 0.00  | 0.00   | 0.00    | 0.00    | 0.00    | 0.00  | 0.00   | 0.00    | 0.00                 |
| 2   | 4229.21 | 0.00  | 0.00   | 4229.21 | 0.00    | 0.00    | 0.00  | 0.00   | 0.00    | 0.00                 |
| 3   | 5056.48 | 91.00 | 358.31 | 4750.00 | 529.73  | -15.59  | 11.00 | 358.31 | 529.96  | 0.00                 |
| 4   | 9783.62 | 91.00 | 358.31 | 4667.50 | 9254.10 | -154.80 | 0.00  | 0.00   | 5256.37 | PBHL (C15S #102HL.1) |



Ground Elevation: 3558.00  
RKB Elevation: KB @ 3576.00usft (Silver Oak 3)  
Rig Name: Silver Oak 3

Northings 664457.50 Eastings 582783.40 Latitude 32° 49' 35.006 N Longitude 104° 3' 49.827 W



PROJECT DETAILS: Eddy County, NM (NAD-27 2015)  
Geodetic System: US State Plane 1927 (Exact solution)  
Datum: NAD 1927 (NADCON CONUS)  
Ellipsoid: Clarke 1866  
Zone: New Mexico East 3001  
System Datum: Mean Sea Level  
Local North: Grid



Terra Directional Services LLC  
322 Spring Hill Drive, Suite A300, Spring, Tx 77386  
Phone: 432-425-7532