

## Results of Directional Survey

|             |                     |           |                                       |
|-------------|---------------------|-----------|---------------------------------------|
| API number: | <b>30-025-40534</b> |           |                                       |
| OGRID:      |                     | Operator: | <b>CIMAREX ENERGY CO. OF COLORADO</b> |
|             |                     | Property: | <b>RED TANK 4 FEDERAL</b> # 1H        |

|         |        |          |           |                |                |
|---------|--------|----------|-----------|----------------|----------------|
| surface | ULSTR: | <b>D</b> | <b>04</b> | <b>T 23S</b>   | <b>R 32E</b>   |
|         |        |          |           | <b>480 FNL</b> | <b>760 FWL</b> |

|              |           |                |            |                 |                |
|--------------|-----------|----------------|------------|-----------------|----------------|
| BH Loc       | ULSTR:    | <b>M</b>       | <b>04</b>  | <b>T 23S</b>    | <b>R 32E</b>   |
| <b>14929</b> | <b>MD</b> | <b>10747.5</b> | <b>TVD</b> | <b>350 FSL</b>  | <b>717 FWL</b> |
|              |           |                |            | <b>4930 FNL</b> |                |

|              |           |                |            |                |                |
|--------------|-----------|----------------|------------|----------------|----------------|
| Top Perf/OH  | ULSTR:    | <b>D</b>       | <b>04</b>  | <b>T 23S</b>   | <b>R 32E</b>   |
| <b>10700</b> | <b>MD</b> | <b>10617.5</b> | <b>TVD</b> | <b>722 FNL</b> | <b>775 FWL</b> |

|              |           |                |            |                 |                |
|--------------|-----------|----------------|------------|-----------------|----------------|
| Bot Perf/OH  | ULSTR:    | <b>M</b>       | <b>04</b>  | <b>T 23S</b>    | <b>R 32E</b>   |
| <b>14863</b> | <b>MD</b> | <b>10749.3</b> | <b>TVD</b> | <b>416 FSL</b>  | <b>713 FWL</b> |
|              |           |                |            | <b>4864 FNL</b> |                |

|              |              |          |        |          |
|--------------|--------------|----------|--------|----------|
|              | MD           | N/S      | E/W    | VD       |
|              | 10687        | -230.54  | 15.70  | 10610.57 |
| TOP PERFS/OH | <b>10700</b> | -241.53  | 15.24  | 10617.50 |
|              | 10719        | -257.59  | 14.57  | 10627.64 |
|              | 14787        | -4308.41 | -50.71 | 10751.25 |
| BOT PERFS/OH | <b>14863</b> | -4384.29 | -46.78 | 10749.32 |
|              | 14881        | -4402.26 | -45.85 | 10748.86 |

|              |              |          |        |          |
|--------------|--------------|----------|--------|----------|
| NEXT TO LAST | 14881        | -4402.26 | -45.85 | 10748.86 |
| LAST READING | 14929        | -4450.17 | -43.30 | 10747.49 |
| TD           | <b>14929</b> | -4450.17 | -43.30 | 10747.49 |

|                  |      |    |     |    |
|------------------|------|----|-----|----|
| Surface Location | 480  | FN | 760 | FW |
| Projected BHL    | 4930 | FN | 717 | FW |
| Location of      |      |    |     |    |
| Top Perfs/OH     | 722  | FN | 775 | FW |
| Bottom Perfs/OH  | 4864 | FN | 713 | FW |

### SUMMARY of Subsurface Locations

|                  |              |      |    |     |    |             |
|------------------|--------------|------|----|-----|----|-------------|
| Surface Location | D-04-23S-32E | 480  | FN | 760 | FW | Vert. Depth |
|                  |              |      |    |     |    |             |
| Top Perfs/OH     | D-04-23S-32E | 722  | FN | 775 | FW | 10617.50    |
| Bottom Perfs/OH  | M-04-23S-32E | 4864 | FN | 713 | FW | 10749.32    |
|                  |              |      |    |     |    |             |
| Projected TD     | M-04-23S-32E | 4930 | FN | 717 | FW | 10747.49    |

MAR 14 2013



Cimarex

**PATHFINDER**  
A Schlumberger Company

|                     |                                                    |                                         |                                                                                                                                                                                                                             |                                                                              |                                                              |
|---------------------|----------------------------------------------------|-----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------|--------------------------------------------------------------|
| WELL                | Red Tank 4 Federal #1H                             | FIELD                                   | NM Lea County                                                                                                                                                                                                               | STRUCTURE                                                                    | Cactus 104                                                   |
| Magnetic Parameters | Dip: 60.20°<br>Model: BOGIM 2012<br>Mag Dec: 7.58° | Date: October 17, 2012<br>PS: 48528 TWT | Surface Location<br>Lat: N 32 20 22.347<br>Lon: W 103 41 8.534<br>NAD83 New Mexico State Plane, Eastern Zone, US Feet<br>Northing: 487861.76 RLUS<br>Easting: 741353.40 RLUS<br>Grid Conv: 0.346°<br>Scale Fact: 0.99995491 | Microphones<br>Shot: Red Tank 4 Federal #1H<br>Plan: STD1 Rev3 CDS 27-Oct-12 | TVD Ref: KBH(460ft above MSL)<br>Stry Date: October 17, 2012 |

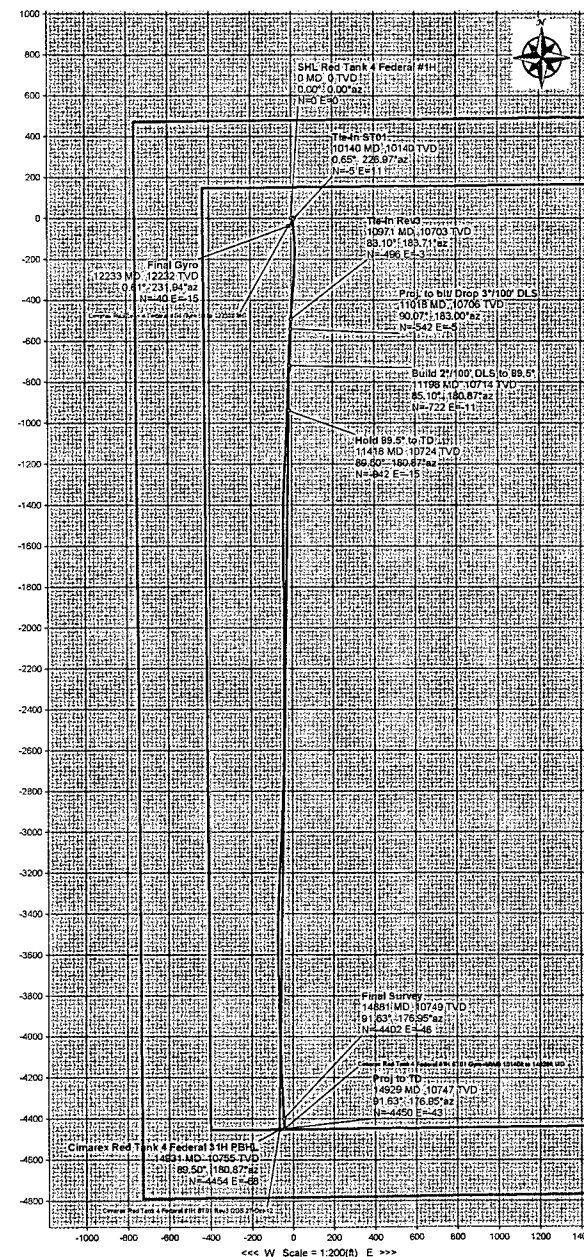
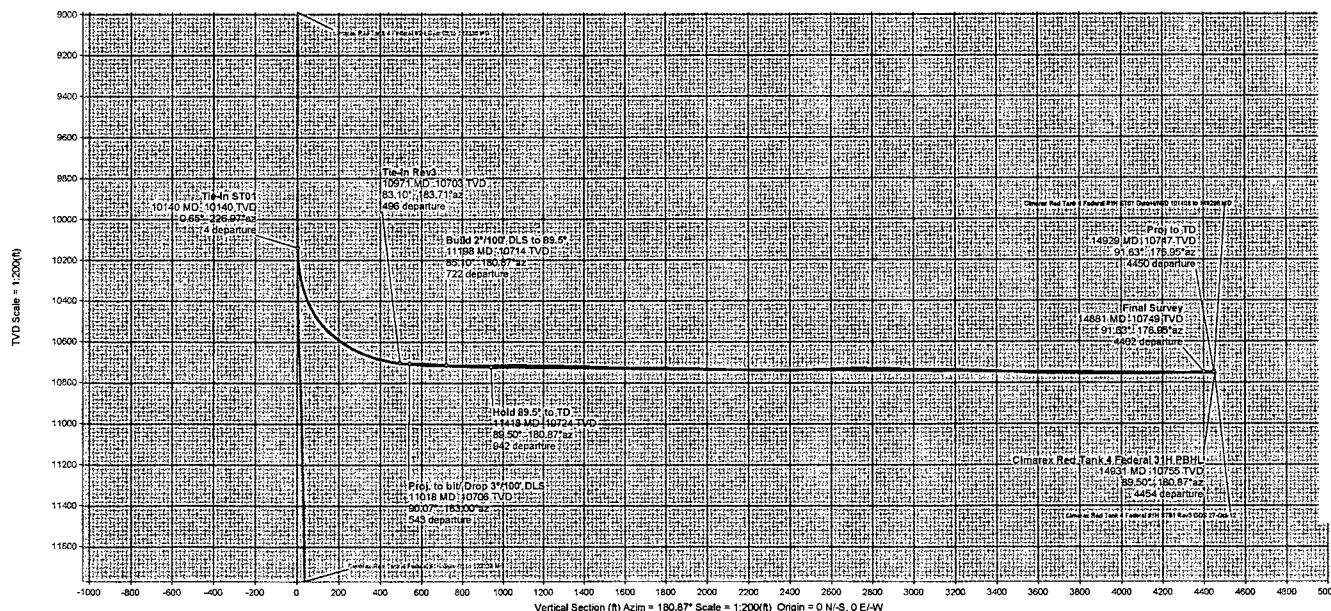


Grid North  
Tot Corr (M->G 7.2383°)  
Mag Dec (7.58°)  
Grid Conv (0.346°)

Legend

Cimarex Red Tank 4 Federal #1H 31H PBHL  
Cimarex Red Tank 4 Federal #1H 31H PBHL  
Cimarex Red Tank 4 Federal #1H 31H PBHL

Cimarex Red Tank 4 Federal #1H 31H PBHL  
Cimarex Red Tank 4 Federal #1H 31H PBHL



Drawn By: J. Schlegel  
Date Created: October 27, 2012 01:12:12 PM  
Checked By: \_\_\_\_\_  
Checked Date: \_\_\_\_\_  
Approved By: \_\_\_\_\_  
Approved Date: \_\_\_\_\_



## Cimarex Red Tank 4 Federal #1H ST01 Gyro+MWD 10140ft to 14929ft MD

(Def Survey)

**Report Date:** November 05, 2012 - 09:20 AM  
**Client:** Cimarex  
**Field:** NM Lea County (NAD 83)  
**Structure / Slot:** Cactus 104 / Cimarex Red Tank 4 Federal #1H  
**Well:** Cimarex Red Tank 4 Federal #1H  
**Borehole:** ST01  
**UWI / API#:** Unknown / Unknown  
**Survey Name:** Cimarex Red Tank 4 Federal #1H ST01 Gyro+MWD 10140ft to 14929ft MD  
**Survey Date:** October 18, 2012  
**Tort / AHD / DDI / ERD Ratio:** 161.134 ° / 4514.588 ft / 6.004 / 0.420  
**Coordinate Reference System:** NAD83 New Mexico State Plane, Eastern Zone, US Feet  
**Location Lat / Long:** N 32° 20' 22.34724", W 103° 41' 8.53382"  
**Location Grid N/E Y/X:** N 487861.700 ftUS, E 741353.400 ftUS  
**CRS Grid Convergence Angle:** 0.3465 °  
**Grid Scale Factor:** 0.99995491

**Survey / DLS Computation:** Minimum Curvature / Lubinski  
**Vertical Section Azimuth:** 180.870 ° (Grid North)  
**Vertical Section Origin:** 0.000 ft, 0.000 ft  
**TVD Reference Datum:** KB  
**TVD Reference Elevation:** 3607.000 ft above MSL  
**Seabed / Ground Elevation:** 3586.000 ft above MSL  
**Magnetic Declination:** 7.584 °  
**Total Gravity Field Strength:** 999.1563 mgn (9.8 based)  
**Total Magnetic Field Strength:** 48526.328 nT  
**Magnetic Dip Angle:** 60.203 °  
**Declination Date:** October 18, 2012  
**Magnetic Declination Model:** BGGM 2012  
**North Reference:** Grid North  
**Grid Convergence Used:** 0.3465 °  
**Total Corr Mag North->Grid North:** 7.2379 °  
**Local Coord Referenced To:** Structure Reference Point

| Comments                      | MD<br>(ft) | Incl<br>(°) | Azim Grid<br>(°) | TVD<br>(ft) | VSEC<br>(ft) | NS<br>(ft) | EW<br>(ft) | Closure<br>(ft) | Closure<br>Azimuth<br>(°) | DLS<br>(°/100ft) | TF<br>(°) |
|-------------------------------|------------|-------------|------------------|-------------|--------------|------------|------------|-----------------|---------------------------|------------------|-----------|
| SHL Red Tank 4<br>Federal #1H | 0.00       | 0.00        | 0.00             | 0.00        | 0.00         | 0.00       | 0.00       | 0.00            | 0.00                      | N/A              | 44.56M    |
|                               | 100.00     | 0.08        | 44.56            | 100.00      | -0.05        | 0.05       | 0.05       | 0.07            | 44.56                     | 0.08             | 357.22M   |
|                               | 200.00     | 0.21        | 357.22           | 200.00      | -0.28        | 0.28       | 0.09       | 0.30            | 17.50                     | 0.17             | 21.55M    |
|                               | 300.00     | 0.26        | 21.55            | 300.00      | -0.68        | 0.68       | 0.16       | 0.70            | 13.59                     | 0.11             | 13.22M    |
|                               | 400.00     | 0.22        | 13.22            | 400.00      | -1.08        | 1.07       | 0.29       | 1.11            | 15.14                     | 0.05             | 9.66M     |
|                               | 435.60     | 0.21        | 9.66             | 435.60      | -1.21        | 1.21       | 0.32       | 1.25            | 14.75                     | 0.05             | 359.77M   |
|                               | 530.80     | 0.18        | 359.77           | 530.80      | -1.53        | 1.53       | 0.35       | 1.57            | 12.77                     | 0.05             | 333.43M   |
|                               | 625.90     | 0.15        | 333.43           | 625.90      | -1.79        | 1.79       | 0.29       | 1.81            | 9.21                      | 0.08             | 285.34M   |
|                               | 721.10     | 0.10        | 285.34           | 721.10      | -1.92        | 1.92       | 0.15       | 1.93            | 4.58                      | 0.12             | 301.55M   |
|                               | 816.20     | 0.12        | 301.55           | 816.20      | -1.99        | 2.00       | -0.01      | 2.00            | 359.68                    | 0.04             | 297.85M   |
|                               | 911.40     | 0.13        | 297.85           | 911.40      | -2.09        | 2.10       | -0.19      | 2.11            | 354.79                    | 0.01             | 317.47M   |
|                               | 1006.50    | 0.05        | 317.47           | 1006.50     | -2.17        | 2.18       | -0.31      | 2.20            | 351.78                    | 0.09             | 239.83M   |
|                               | 1101.60    | 0.05        | 239.83           | 1101.60     | -2.18        | 2.19       | -0.38      | 2.22            | 350.18                    | 0.07             | 237.04M   |
|                               | 1196.80    | 0.17        | 237.04           | 1196.80     | -2.08        | 2.09       | -0.53      | 2.16            | 345.69                    | 0.13             | 194.21M   |
|                               | 1291.90    | 0.19        | 194.21           | 1291.90     | -1.85        | 1.86       | -0.69      | 1.99            | 339.65                    | 0.14             | 142.97M   |
|                               | 1387.10    | 0.43        | 142.97           | 1387.09     | -1.41        | 1.42       | -0.51      | 1.51            | 340.14                    | 0.36             | 90M       |
|                               | 1482.20    | 0.27        | 90.00            | 1482.19     | -1.14        | 1.14       | -0.07      | 1.14            | 356.23                    | 0.36             | 152.97M   |

30-025-40534

| Comments | MD<br>(ft) | Incl<br>(°) | Azim Grid<br>(°) | TVD<br>(ft) | VSEC<br>(ft) | NS<br>(ft) | EW<br>(ft) | Closure<br>(ft) | Closure<br>Azimuth<br>(°) | DLS<br>(°/100ft) | TF<br>(°) |
|----------|------------|-------------|------------------|-------------|--------------|------------|------------|-----------------|---------------------------|------------------|-----------|
|          | 1577.30    | 0.10        | 152.97           | 1577.29     | -1.07        | 1.06       | 0.19       | 1.08            | 9.96                      | 0.25             | 146.45M   |
|          | 1672.50    | 0.38        | 146.45           | 1672.49     | -0.73        | 0.73       | 0.40       | 0.83            | 28.76                     | 0.30             | 134.35M   |
|          | 1767.60    | 0.55        | 134.35           | 1767.59     | -0.16        | 0.15       | 0.90       | 0.91            | 80.84                     | 0.21             | 124.09M   |
|          | 1862.80    | 0.48        | 124.09           | 1862.78     | 0.37         | -0.40      | 1.56       | 1.61            | 104.33                    | 0.12             | 110.62M   |
|          | 1957.90    | 0.43        | 110.62           | 1957.88     | 0.71         | -0.75      | 2.22       | 2.34            | 108.59                    | 0.12             | 65.99M    |
|          | 2053.00    | 0.33        | 65.99            | 2052.98     | 0.72         | -0.76      | 2.80       | 2.91            | 105.18                    | 0.32             | 33.43M    |
|          | 2148.20    | 0.51        | 33.43            | 2148.18     | 0.25         | -0.30      | 3.29       | 3.30            | 95.14                     | 0.31             | 14.47M    |
|          | 2243.30    | 0.63        | 14.47            | 2243.27     | -0.62        | 0.56       | 3.65       | 3.70            | 81.23                     | 0.23             | 1.22M     |
|          | 2338.40    | 0.72        | 1.22             | 2338.37     | -1.72        | 1.67       | 3.80       | 4.15            | 66.29                     | 0.19             | 323.86M   |
|          | 2433.60    | 0.52        | 323.86           | 2433.56     | -2.67        | 2.61       | 3.55       | 4.41            | 53.66                     | 0.46             | 252.17M   |
|          | 2528.70    | 0.30        | 252.17           | 2528.66     | -2.93        | 2.89       | 3.06       | 4.21            | 46.69                     | 0.54             | 62.04M    |
|          | 2623.90    | 0.16        | 62.04            | 2623.86     | -2.92        | 2.87       | 2.94       | 4.11            | 45.69                     | 0.48             | 353.61M   |
|          | 2719.00    | 0.11        | 353.61           | 2718.96     | -3.07        | 3.03       | 3.05       | 4.30            | 45.23                     | 0.17             | 321.88M   |
|          | 2814.20    | 0.20        | 321.88           | 2814.16     | -3.29        | 3.25       | 2.94       | 4.38            | 42.13                     | 0.13             | 345.84M   |
|          | 2909.30    | 0.05        | 345.84           | 2909.26     | -3.46        | 3.42       | 2.82       | 4.43            | 39.57                     | 0.16             | 283.36M   |
|          | 3004.40    | 0.26        | 283.36           | 3004.36     | -3.55        | 3.51       | 2.60       | 4.37            | 36.59                     | 0.25             | 258.16M   |
|          | 3099.60    | 0.46        | 258.16           | 3099.55     | -3.51        | 3.48       | 2.02       | 4.02            | 30.14                     | 0.26             | 165.52M   |
|          | 3194.70    | 0.45        | 165.52           | 3194.65     | -3.07        | 3.04       | 1.74       | 3.50            | 29.79                     | 0.69             | 39.36M    |
|          | 3289.80    | 0.51        | 39.36            | 3289.75     | -3.04        | 3.01       | 2.10       | 3.67            | 34.97                     | 0.90             | 291.33M   |
|          | 3385.00    | 0.60        | 291.33           | 3384.95     | -3.54        | 3.51       | 1.91       | 4.00            | 28.47                     | 0.95             | 195.28M   |
|          | 3480.10    | 0.76        | 195.28           | 3480.04     | -3.11        | 3.09       | 1.28       | 3.34            | 22.46                     | 1.07             | 99.29M    |
|          | 3575.30    | 0.95        | 99.29            | 3575.24     | -2.38        | 2.35       | 1.89       | 3.01            | 38.78                     | 1.34             | 71.85M    |
|          | 3670.40    | 1.62        | 71.85            | 3670.31     | -2.70        | 2.64       | 3.94       | 4.75            | 56.18                     | 0.94             | 75.53M    |
|          | 3765.60    | 1.84        | 75.53            | 3765.47     | -3.54        | 3.44       | 6.70       | 7.53            | 62.81                     | 0.26             | 59.37M    |
|          | 3860.70    | 1.34        | 59.37            | 3860.53     | -4.53        | 4.39       | 9.14       | 10.14           | 64.33                     | 0.70             | 346.09M   |
|          | 3955.80    | 0.87        | 346.09           | 3955.62     | -5.81        | 5.66       | 9.92       | 11.42           | 60.30                     | 1.44             | 102.68M   |
|          | 4051.00    | 0.37        | 102.68           | 4050.82     | -6.44        | 6.29       | 10.05      | 11.85           | 57.94                     | 1.14             | 97.04M    |
|          | 4146.10    | 1.18        | 97.04            | 4145.91     | -6.28        | 6.10       | 11.32      | 12.86           | 61.66                     | 0.85             | 78.16M    |
|          | 4241.30    | 1.31        | 78.16            | 4241.09     | -6.41        | 6.21       | 13.36      | 14.73           | 65.07                     | 0.45             | 348.77M   |
|          | 4336.40    | 0.84        | 348.77           | 4336.17     | -7.33        | 7.11       | 14.28      | 15.96           | 63.52                     | 1.63             | 259.03M   |
|          | 4431.50    | 0.72        | 259.03           | 4431.27     | -7.89        | 7.68       | 13.56      | 15.59           | 60.46                     | 1.16             | 182.65M   |
|          | 4526.70    | 0.45        | 182.65           | 4526.46     | -7.39        | 7.20       | 12.96      | 14.82           | 60.95                     | 0.79             | 159M      |
|          | 4621.80    | 0.18        | 159.00           | 4621.56     | -6.88        | 6.69       | 12.99      | 14.61           | 62.77                     | 0.31             | 105.04M   |
|          | 4716.90    | 0.17        | 105.04           | 4716.66     | -6.71        | 6.51       | 13.18      | 14.70           | 63.72                     | 0.17             | 43.06M    |
|          | 4812.10    | 0.32        | 43.06            | 4811.86     | -6.87        | 6.67       | 13.50      | 15.06           | 63.72                     | 0.30             | 356.29M   |
|          | 4907.20    | 0.30        | 356.29           | 4906.96     | -7.32        | 7.11       | 13.67      | 15.41           | 62.52                     | 0.26             | 316.45M   |
|          | 5002.40    | 0.22        | 316.45           | 5002.16     | -7.69        | 7.49       | 13.52      | 15.46           | 61.02                     | 0.20             | 310.24M   |
|          | 5097.50    | 0.04        | 310.24           | 5097.26     | -7.85        | 7.64       | 13.37      | 15.40           | 60.25                     | 0.19             | 44.98M    |
|          | 5192.60    | 0.03        | 44.98            | 5192.36     | -7.89        | 7.68       | 13.37      | 15.42           | 60.11                     | 0.05             | 190.85M   |
|          | 5287.80    | 0.08        | 190.85           | 5287.56     | -7.84        | 7.64       | 13.37      | 15.40           | 60.27                     | 0.11             | 269.17M   |
|          | 5382.90    | 0.13        | 269.17           | 5382.66     | -7.77        | 7.57       | 13.25      | 15.26           | 60.27                     | 0.15             | 247.4M    |
|          | 5478.10    | 0.24        | 247.40           | 5477.86     | -7.69        | 7.49       | 12.96      | 14.97           | 59.97                     | 0.14             | 241.96M   |
|          | 5573.20    | 0.16        | 241.96           | 5572.96     | -7.54        | 7.35       | 12.66      | 14.64           | 59.85                     | 0.09             | 221.3M    |
|          | 5668.40    | 0.14        | 221.30           | 5668.16     | -7.39        | 7.20       | 12.46      | 14.39           | 59.98                     | 0.06             | 181.5M    |

| Comments | MD<br>(ft) | Incl<br>(°) | Azim Grid<br>(°) | TVD<br>(ft) | VSEC<br>(ft) | NS<br>(ft) | EW<br>(ft) | Closure<br>(ft) | Closure<br>Azimuth<br>(°) | DLS<br>(°/100ft) | TF<br>(°) |
|----------|------------|-------------|------------------|-------------|--------------|------------|------------|-----------------|---------------------------|------------------|-----------|
|          | 5763.50    | 0.09        | 181.50           | 5763.26     | -7.23        | 7.04       | 12.38      | 14.25           | 60.39                     | 0.10             | 148.43M   |
|          | 5858.60    | 0.13        | 148.43           | 5858.36     | -7.06        | 6.87       | 12.44      | 14.21           | 61.08                     | 0.08             | 134.93M   |
|          | 5953.80    | 0.16        | 134.93           | 5953.56     | -6.88        | 6.69       | 12.59      | 14.26           | 62.02                     | 0.05             | 97.07M    |
|          | 6048.90    | 0.18        | 97.07            | 6048.66     | -6.77        | 6.58       | 12.83      | 14.42           | 62.87                     | 0.12             | 97.85M    |
|          | 6144.10    | 0.32        | 97.85            | 6143.86     | -6.72        | 6.52       | 13.24      | 14.76           | 63.79                     | 0.15             | 42.11M    |
|          | 6239.20    | 0.23        | 42.11            | 6238.95     | -6.83        | 6.63       | 13.64      | 15.16           | 64.08                     | 0.28             | 5.5M      |
|          | 6334.30    | 0.19        | 5.50             | 6334.05     | -7.13        | 6.92       | 13.78      | 15.42           | 63.32                     | 0.14             | 306.8M    |
|          | 6429.50    | 0.21        | 306.80           | 6429.25     | -7.39        | 7.19       | 13.65      | 15.43           | 62.24                     | 0.21             | 312.04M   |
|          | 6524.60    | 0.21        | 312.04           | 6524.35     | -7.61        | 7.41       | 13.38      | 15.30           | 61.04                     | 0.02             | 293.62M   |
|          | 6619.80    | 0.30        | 293.62           | 6619.55     | -7.82        | 7.62       | 13.03      | 15.09           | 59.66                     | 0.13             | 219.9M    |
|          | 6714.90    | 0.34        | 219.90           | 6714.65     | -7.70        | 7.51       | 12.62      | 14.68           | 59.25                     | 0.41             | 173.67M   |
|          | 6810.00    | 0.47        | 173.67           | 6809.75     | -7.09        | 6.90       | 12.48      | 14.26           | 61.05                     | 0.36             | 191.06M   |
|          | 6905.20    | 0.67        | 191.06           | 6904.94     | -6.16        | 5.97       | 12.42      | 13.78           | 64.33                     | 0.28             | 172.88M   |
|          | 7000.30    | 0.85        | 172.88           | 7000.04     | -4.91        | 4.72       | 12.40      | 13.27           | 69.14                     | 0.31             | 136.52M   |
|          | 7095.40    | 0.88        | 136.52           | 7095.13     | -3.69        | 3.49       | 12.99      | 13.45           | 74.95                     | 0.57             | 110.85M   |
|          | 7190.60    | 0.62        | 110.85           | 7190.32     | -2.99        | 2.78       | 13.97      | 14.24           | 78.75                     | 0.44             | 19.69M    |
|          | 7285.70    | 0.28        | 19.69            | 7285.41     | -3.04        | 2.81       | 14.53      | 14.80           | 79.04                     | 0.72             | 190.63M   |
|          | 7380.90    | 0.21        | 190.63           | 7380.61     | -3.08        | 2.86       | 14.58      | 14.85           | 78.89                     | 0.51             | 55.76M    |
|          | 7476.00    | 0.22        | 55.76            | 7475.71     | -3.02        | 2.79       | 14.70      | 14.96           | 79.24                     | 0.42             | 275.82M   |
|          | 7571.10    | 0.35        | 275.82           | 7570.81     | -3.15        | 2.93       | 14.56      | 14.85           | 78.63                     | 0.57             | 139.73M   |
|          | 7666.30    | 0.49        | 139.73           | 7666.01     | -2.87        | 2.64       | 14.53      | 14.77           | 79.68                     | 0.82             | 72.34M    |
|          | 7761.40    | 0.29        | 72.34            | 7761.11     | -2.64        | 2.41       | 15.02      | 15.21           | 80.89                     | 0.49             | 155.65M   |
|          | 7856.60    | 0.15        | 155.65           | 7856.31     | -2.60        | 2.37       | 15.30      | 15.49           | 81.21                     | 0.33             | 166.45M   |
|          | 7951.70    | 0.19        | 166.45           | 7951.41     | -2.33        | 2.10       | 15.39      | 15.53           | 82.23                     | 0.05             | 158.12M   |
|          | 8046.90    | 0.23        | 158.12           | 8046.61     | -2.00        | 1.77       | 15.50      | 15.60           | 83.49                     | 0.05             | 168.08M   |
|          | 8142.00    | 0.54        | 168.08           | 8141.71     | -1.39        | 1.15       | 15.66      | 15.71           | 85.79                     | 0.33             | 155.65M   |
|          | 8237.10    | 0.58        | 155.65           | 8236.80     | -0.52        | 0.28       | 15.96      | 15.96           | 89.00                     | 0.13             | 144.15M   |
|          | 8332.30    | 0.57        | 144.15           | 8332.00     | 0.30         | -0.55      | 16.43      | 16.44           | 91.90                     | 0.12             | 139.73M   |
|          | 8427.40    | 0.30        | 139.73           | 8427.09     | 0.86         | -1.12      | 16.87      | 16.91           | 93.80                     | 0.29             | 152.49M   |
|          | 8522.50    | 0.20        | 152.49           | 8522.19     | 1.20         | -1.46      | 17.11      | 17.17           | 94.87                     | 0.12             | 174.9M    |
|          | 8617.70    | 0.42        | 174.90           | 8617.39     | 1.69         | -1.95      | 17.21      | 17.32           | 96.47                     | 0.26             | 165.39M   |
|          | 8712.80    | 0.19        | 165.39           | 8712.49     | 2.19         | -2.45      | 17.29      | 17.46           | 98.07                     | 0.25             | 263.75M   |
|          | 8808.00    | 0.21        | 263.75           | 8807.69     | 2.36         | -2.62      | 17.15      | 17.35           | 98.69                     | 0.32             | 259.63M   |
|          | 8903.10    | 0.42        | 259.63           | 8902.79     | 2.45         | -2.70      | 16.64      | 16.85           | 99.23                     | 0.22             | 238.04M   |
|          | 8998.30    | 0.51        | 238.04           | 8997.99     | 2.75         | -2.99      | 15.93      | 16.21           | 100.63                    | 0.21             | 241.57M   |
|          | 9093.40    | 0.66        | 241.57           | 9093.08     | 3.25         | -3.48      | 15.09      | 15.49           | 102.97                    | 0.16             | 253.2M    |
|          | 9188.50    | 0.62        | 253.20           | 9188.18     | 3.67         | -3.89      | 14.12      | 14.64           | 105.39                    | 0.14             | 283.1M    |
|          | 9283.70    | 0.44        | 283.10           | 9283.37     | 3.75         | -3.95      | 13.27      | 13.84           | 106.58                    | 0.34             | 296.3M    |
|          | 9378.80    | 0.49        | 296.30           | 9378.47     | 3.50         | -3.69      | 12.55      | 13.08           | 106.38                    | 0.12             | 312.82M   |
|          | 9474.00    | 0.27        | 312.82           | 9473.67     | 3.17         | -3.36      | 12.02      | 12.48           | 105.60                    | 0.26             | 331.63M   |
|          | 9569.10    | 0.56        | 331.63           | 9568.76     | 2.62         | -2.79      | 11.63      | 11.96           | 103.51                    | 0.33             | 269.07M   |
|          | 9664.20    | 0.53        | 269.07           | 9663.86     | 2.23         | -2.39      | 10.97      | 11.23           | 102.30                    | 0.60             | 193.95M   |
|          | 9759.40    | 0.57        | 193.95           | 9759.06     | 2.70         | -2.86      | 10.42      | 10.80           | 105.35                    | 0.71             | 150.3M    |
|          | 9854.50    | 0.68        | 150.30           | 9854.15     | 3.65         | -3.81      | 10.58      | 11.25           | 109.79                    | 0.50             | 101.57M   |

| Comments           | MD<br>(ft) | Incl<br>(°) | Azim Grid<br>(°) | TVD<br>(ft) | VSEC<br>(ft) | NS<br>(ft) | EW<br>(ft) | Closure<br>(ft) | Closure<br>Azimuth<br>(°) | DLS<br>(°/100ft) | TF<br>(°) |
|--------------------|------------|-------------|------------------|-------------|--------------|------------|------------|-----------------|---------------------------|------------------|-----------|
| Tie-In ST01        | 9949.60    | 0.48        | 101.57           | 9949.25     | 4.21         | -4.38      | 11.25      | 12.08           | 111.26                    | 0.54             | 345.27M   |
|                    | 10044.80   | 0.13        | 345.27           | 10044.45    | 4.18         | -4.35      | 11.62      | 12.41           | 110.55                    | 0.58             | 226.97M   |
|                    | 10139.90   | 0.65        | 226.97           | 10139.54    | 4.45         | -4.62      | 11.20      | 12.11           | 112.42                    | 0.76             | 191.97M   |
|                    | 10212.00   | 4.57        | 191.97           | 10211.56    | 7.55         | -7.71      | 10.30      | 12.87           | 126.81                    | 5.62             | 184.94M   |
|                    | 10243.00   | 7.21        | 184.94           | 10242.39    | 10.70        | -10.86     | 9.88       | 14.68           | 137.70                    | 8.81             | 180.55M   |
|                    | 10275.00   | 10.38       | 180.55           | 10274.01    | 15.59        | -15.74     | 9.68       | 18.48           | 148.42                    | 10.12            | 3.9L      |
|                    | 10307.00   | 13.37       | 179.67           | 10305.32    | 22.17        | -22.32     | 9.67       | 24.33           | 156.58                    | 9.36             | 0.5L      |
|                    | 10339.00   | 16.27       | 179.58           | 10336.26    | 30.36        | -30.51     | 9.72       | 32.02           | 162.32                    | 9.06             | 10.44L    |
|                    | 10371.00   | 19.08       | 178.00           | 10366.74    | 40.06        | -40.22     | 9.94       | 41.43           | 166.12                    | 8.91             | 13.03L    |
|                    | 10403.00   | 22.25       | 176.07           | 10396.68    | 51.33        | -51.49     | 10.54      | 52.56           | 168.43                    | 10.13            | 11.84L    |
|                    | 10434.00   | 25.32       | 174.57           | 10425.04    | 63.77        | -63.95     | 11.57      | 64.99           | 169.75                    | 10.09            | 1.37L     |
|                    | 10466.00   | 28.75       | 174.40           | 10453.54    | 78.22        | -78.43     | 12.97      | 79.49           | 170.61                    | 10.72            | 3.57R     |
|                    | 10498.00   | 33.33       | 174.92           | 10480.95    | 94.62        | -94.85     | 14.50      | 95.95           | 171.31                    | 14.34            | 7.49R     |
|                    | 10529.00   | 38.34       | 175.98           | 10506.08    | 112.68       | -112.94    | 15.93      | 114.06          | 171.97                    | 16.28            | 11.23R    |
|                    | 10561.00   | 43.18       | 177.38           | 10530.31    | 133.51       | -133.79    | 17.12      | 134.88          | 172.71                    | 15.39            | 23.1R     |
|                    | 10592.00   | 47.31       | 179.76           | 10552.13    | 155.50       | -155.79    | 17.66      | 156.79          | 173.53                    | 14.39            | 18.88R    |
|                    | 10624.00   | 50.91       | 181.34           | 10573.08    | 179.69       | -179.97    | 17.41      | 180.81          | 174.47                    | 11.85            | 14R       |
|                    | 10655.00   | 53.46       | 182.13           | 10592.08    | 204.17       | -204.45    | 16.67      | 205.13          | 175.34                    | 8.47             | HS        |
|                    | 10687.00   | 55.93       | 182.13           | 10610.57    | 230.28       | -230.54    | 15.70      | 231.08          | 176.10                    | 7.72             | 7.07R     |
|                    | 10719.00   | 59.62       | 182.66           | 10627.64    | 257.33       | -257.59    | 14.57      | 258.00          | 176.76                    | 11.62            | 9.36R     |
|                    | 10750.00   | 63.93       | 183.45           | 10642.29    | 284.62       | -284.85    | 13.11      | 285.16          | 177.37                    | 14.08            | 10.34R    |
| Survey 28-Oct-2012 | 10782.00   | 67.01       | 184.06           | 10655.58    | 313.69       | -313.90    | 11.20      | 314.10          | 177.96                    | 9.78             | 2.99R     |
|                    | 10813.00   | 70.26       | 184.24           | 10666.87    | 342.51       | -342.69    | 9.11       | 342.81          | 178.48                    | 10.50            | HS        |
|                    | 10845.00   | 72.98       | 184.24           | 10676.96    | 372.82       | -372.97    | 6.86       | 373.03          | 178.95                    | 8.50             | 7.09R     |
|                    | 10877.00   | 75.71       | 184.59           | 10685.59    | 403.57       | -403.69    | 4.49       | 403.71          | 179.36                    | 8.60             | 4.58R     |
|                    | 10908.00   | 77.91       | 184.77           | 10692.67    | 433.69       | -433.77    | 2.03       | 433.77          | 179.73                    | 7.12             | 10.37L    |
| Survey 29-Oct-12   | 10940.00   | 80.28       | 184.33           | 10698.72    | 465.04       | -465.09    | -0.46      | 465.09          | 180.06                    | 7.53             | 12.32L    |
|                    | 10971.00   | 83.10       | 183.71           | 10703.20    | 495.67       | -495.69    | -2.61      | 495.69          | 180.30                    | 9.31             | 9.56L     |
|                    | 11116.00   | 88.81       | 182.75           | 10713.42    | 640.12       | -640.03    | -10.75     | 640.12          | 180.96                    | 3.99             | 31.22L    |
|                    | 11211.00   | 90.13       | 181.95           | 10714.30    | 735.08       | -734.95    | -14.65     | 735.09          | 181.14                    | 1.62             | 20.82R    |
|                    | 11306.00   | 90.84       | 182.22           | 10713.50    | 830.06       | -829.88    | -18.11     | 830.08          | 181.25                    | 0.80             | 148.21L   |
| Survey 30-Oct-12   | 11401.00   | 90.13       | 181.78           | 10712.69    | 925.04       | -924.82    | -21.42     | 925.07          | 181.33                    | 0.88             | 167.86R   |
|                    | 11495.00   | 89.34       | 181.95           | 10713.13    | 1019.02      | -1018.77   | -24.48     | 1019.06         | 181.38                    | 0.86             | 96.42R    |
|                    | 11590.00   | 89.25       | 182.75           | 10714.30    | 1113.98      | -1113.68   | -28.38     | 1114.04         | 181.46                    | 0.85             | 90R       |
|                    | 11685.00   | 89.25       | 182.92           | 10715.54    | 1208.92      | -1208.55   | -33.07     | 1209.01         | 181.57                    | 0.18             | LS        |
|                    | 11779.00   | 88.55       | 182.92           | 10717.35    | 1302.84      | -1302.41   | -37.86     | 1302.96         | 181.67                    | 0.74             | 116.81L   |
| Survey 30-Oct-12   | 11874.00   | 88.02       | 181.87           | 10720.19    | 1397.76      | -1397.29   | -41.83     | 1397.91         | 181.71                    | 1.24             | 84.71L    |
|                    | 11969.00   | 88.11       | 180.90           | 10723.40    | 1492.70      | -1492.20   | -44.12     | 1492.86         | 181.69                    | 1.02             | 77.18L    |
|                    | 12063.00   | 88.55       | 178.97           | 10726.14    | 1586.64      | -1586.16   | -44.02     | 1586.77         | 181.59                    | 2.11             | HS        |
|                    | 12158.00   | 89.60       | 178.97           | 10727.67    | 1681.58      | -1681.13   | -42.31     | 1681.66         | 181.44                    | 1.11             | 26.57L    |
|                    | 12252.00   | 89.96       | 178.79           | 10728.03    | 1775.52      | -1775.11   | -40.47     | 1775.57         | 181.31                    | 0.43             | 120R      |
| Survey 30-Oct-12   | 12347.00   | 89.25       | 180.02           | 10728.69    | 1870.49      | -1870.10   | -39.49     | 1870.52         | 181.21                    | 1.49             | 170.36L   |
|                    | 12442.00   | 88.72       | 179.93           | 10730.37    | 1965.46      | -1965.09   | -39.44     | 1965.48         | 181.15                    | 0.57             | 145.32R   |
|                    | 12536.00   | 88.46       | 180.11           | 10732.68    | 2059.42      | -2059.06   | -39.48     | 2059.44         | 181.10                    | 0.34             | 115.92R   |
|                    |            |             |                  |             |              |            |            |                 |                           |                  |           |

| Comments                   | MD<br>(ft) | Incl<br>(°) | Azim Grid<br>(°) | TVD<br>(ft) | VSEC<br>(ft) | NS<br>(ft) | EW<br>(ft) | Closure<br>(ft) | Closure<br>Azimuth<br>(°) | DLS<br>(°/100ft) | TF<br>(°) |
|----------------------------|------------|-------------|------------------|-------------|--------------|------------|------------|-----------------|---------------------------|------------------|-----------|
|                            | 12631.00   | 88.29       | 180.46           | 10735.38    | 2154.38      | -2154.02   | -39.95     | 2154.39         | 181.06                    | 0.41             | 10.52L    |
| Survey 31-Oct-12           | 12726.00   | 89.69       | 180.20           | 10737.05    | 2249.35      | -2249.00   | -40.50     | 2249.36         | 181.03                    | 1.50             | 160.91R   |
|                            | 12820.00   | 89.43       | 180.29           | 10737.77    | 2343.35      | -2343.00   | -40.90     | 2343.35         | 181.00                    | 0.29             | 12.38L    |
|                            | 12915.00   | 90.66       | 180.02           | 10737.70    | 2438.34      | -2437.99   | -41.16     | 2438.34         | 180.97                    | 1.33             | 2.55L     |
|                            | 12986.00   | 92.68       | 179.93           | 10735.63    | 2509.29      | -2508.96   | -41.12     | 2509.30         | 180.94                    | 2.85             | 90R       |
|                            | 13081.00   | 92.68       | 180.37           | 10731.19    | 2604.18      | -2603.85   | -41.37     | 2604.18         | 180.91                    | 0.46             | 154.44R   |
|                            |            |             |                  |             |              |            |            |                 |                           |                  |           |
| Survey 3-Nov-12            | 13176.00   | 90.84       | 181.25           | 10728.27    | 2699.13      | -2698.80   | -42.72     | 2699.13         | 180.91                    | 2.15             | 158.74R   |
|                            | 13270.00   | 88.81       | 182.04           | 10728.56    | 2793.12      | -2792.75   | -45.41     | 2793.12         | 180.93                    | 2.32             | 90R       |
|                            | 13365.00   | 88.81       | 182.22           | 10730.53    | 2888.07      | -2887.66   | -48.94     | 2888.08         | 180.97                    | 0.19             | HS        |
|                            | 13460.00   | 88.99       | 182.22           | 10732.35    | 2983.03      | -2982.58   | -52.62     | 2983.04         | 181.01                    | 0.19             | 76.35R    |
|                            | 13555.00   | 89.16       | 182.92           | 10733.89    | 3077.98      | -3077.47   | -56.88     | 3077.99         | 181.06                    | 0.76             | 142.36R   |
|                            |            |             |                  |             |              |            |            |                 |                           |                  |           |
| survey 4-Nov-12            | 13649.00   | 88.81       | 183.19           | 10735.55    | 3171.89      | -3171.32   | -61.89     | 3171.92         | 181.12                    | 0.47             | 130L      |
|                            | 13744.00   | 88.29       | 182.57           | 10737.96    | 3266.80      | -3266.17   | -66.66     | 3266.85         | 181.17                    | 0.85             | 129.72L   |
|                            | 13838.00   | 87.85       | 182.04           | 10741.12    | 3360.72      | -3360.04   | -70.44     | 3360.78         | 181.20                    | 0.73             | 100.31L   |
|                            | 13933.00   | 87.58       | 180.55           | 10744.91    | 3455.64      | -3454.93   | -72.59     | 3455.70         | 181.20                    | 1.59             | 75.72L    |
|                            | 14028.00   | 87.85       | 179.49           | 10748.70    | 3550.55      | -3549.86   | -72.62     | 3550.60         | 181.17                    | 1.15             | 35.03L    |
|                            |            |             |                  |             |              |            |            |                 |                           |                  |           |
| Final Survey<br>Proj to TD | 14123.00   | 88.72       | 178.88           | 10751.54    | 3645.47      | -3644.80   | -71.27     | 3645.50         | 181.12                    | 1.12             | 18.27L    |
|                            | 14218.00   | 89.78       | 178.53           | 10752.78    | 3740.39      | -3739.77   | -69.12     | 3740.41         | 181.06                    | 1.18             | 172.67R   |
|                            | 14313.00   | 89.08       | 178.62           | 10753.73    | 3835.31      | -3834.74   | -66.76     | 3835.32         | 181.00                    | 0.74             | 10.04R    |
|                            | 14408.00   | 90.04       | 178.79           | 10754.46    | 3930.24      | -3929.71   | -64.61     | 3930.24         | 180.94                    | 1.03             | 100.3L    |
|                            | 14503.00   | 89.96       | 178.35           | 10754.46    | 4025.16      | -4024.68   | -62.24     | 4025.16         | 180.89                    | 0.47             | 40.24L    |
|                            |            |             |                  |             |              |            |            |                 |                           |                  |           |
|                            | 14597.00   | 90.48       | 177.91           | 10754.10    | 4119.05      | -4118.63   | -59.17     | 4119.05         | 180.82                    | 0.72             | 55.81L    |
|                            | 14692.00   | 90.84       | 177.38           | 10753.00    | 4213.89      | -4213.54   | -55.27     | 4213.90         | 180.75                    | 0.67             | 30.57L    |
|                            | 14787.00   | 91.28       | 177.12           | 10751.25    | 4308.69      | -4308.41   | -50.71     | 4308.71         | 180.67                    | 0.54             | 25.9L     |
|                            | 14881.00   | 91.63       | 176.95           | 10748.86    | 4402.45      | -4402.26   | -45.85     | 4402.50         | 180.60                    | 0.41             | HS        |
|                            | 14929.00   | 91.63       | 176.95           | 10747.49    | 4450.31      | -4450.17   | -43.30     | 4450.38         | 180.56                    | 0.00             |           |
|                            |            |             |                  |             |              |            |            |                 |                           |                  |           |
|                            |            |             |                  |             |              |            |            |                 |                           |                  |           |
|                            |            |             |                  |             |              |            |            |                 |                           |                  |           |

Survey Type: Def Survey

Survey Error Model: ISCWSA Rev 0 \*\*\* 3-D 95.000% Confidence 2.7955 sigma  
Survey Program:

| Description | MD From<br>(ft) | MD To<br>(ft) | EOU Freq<br>(ft) | Hole Size<br>(in) | Casing Diameter<br>(in) | Survey Tool Type         | Borehole / Survey                                                                        |
|-------------|-----------------|---------------|------------------|-------------------|-------------------------|--------------------------|------------------------------------------------------------------------------------------|
|             | 0.000           | 21.000        | Act Stns         | 30.000            | 30.000                  | SLB_NSG+MSHOT-Depth Only | Original Borehole / Cimarex Red Tank 4 Federal #1H Gyro 0ft to 12233ft MD                |
|             | 21.000          | 10139.900     | Act Stns         | 30.000            | 30.000                  | SLB_NSG+MSHOT            | Original Borehole / Cimarex Red Tank 4 Federal #1H Gyro 0ft to ST01 / Cimarex Red Tank 4 |
|             | 10139.900       | 14929.000     | Act Stns         | 30.000            | 30.000                  | SLB_MWD-STD              | Federal #1H ST01 Gyro+MWD                                                                |