



COG OPERATING LLC

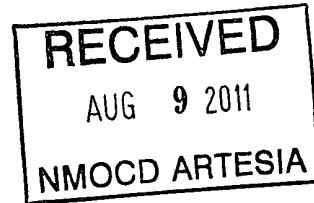
Eddy County, NM (NAN27 NME)

Randall Federal #5

30-015-38506

Randall Federal #5

OH - Job #32D0611545



Survey: MWD Survey

SDI Standard Survey Report

This survey is correct to the best of my knowledge and is supported by actual field data.

[Signature]

Notarized this date 22nd of July, 2011.

[Signature]

Notary Signature
County of Midland
State of Texas





| | | | |
|------------------|-----------------------------|-------------------------------------|-------------------------------------|
| Company: | COG OPERATING LLC | Local Co-ordinate Reference: | Site Randall Federal #5 |
| Project: | Eddy County, NM (NAN27 NME) | TVD Reference: | KB Elev (14) @ 3677 0usft (UDI #40) |
| Site: | Randall Federal #5 | MD Reference: | KB Elev (14) @ 3677 0usft (UDI #40) |
| Well: | Randall Federal #5 | North Reference: | Grid |
| Wellbore: | OH - Job #32D0611545 | Survey Calculation Method: | Minimum Curvature |
| Design: | Actual | Database: | EDM-Regulatory |

| | | | |
|--------------------|--------------------------------------|----------------------|----------------|
| Project | Eddy County, NM (NAN27 NME) | | |
| Map System: | US State Plane 1927 (Exact solution) | System Datum: | Mean Sea Level |
| Geo Datum: | NAD 1927 (NADCON CONUS) | | |
| Map Zone: | New Mexico East 3001 | | |

| | | | | | |
|------------------------------|--------------------|---------------------|-----------------|--------------------------|------------------|
| Site | Randall Federal #5 | | | | |
| Site Position: | | Northing: | 671,244 70 usft | Latitude: | 32° 50' 41 646 N |
| From: | Map | Easting: | 601,353 40 usft | Longitude: | 104° 0' 11 952 W |
| Position Uncertainty: | 0 0 usft | Slot Radius: | 13-3/16" | Grid Convergence: | 0 18 ° |

| | | | | | | |
|-----------------------------|--------------------|----------|----------------------------|-----------------|----------------------|------------------|
| Well | Randall Federal #5 | | | | | |
| Well Position | +N/-S | 0 0 usft | Northing: | 671,244 70 usft | Latitude: | 32° 50' 41 646 N |
| | +E/-W | 0 0 usft | Easting: | 601,353 40 usft | Longitude: | 104° 0' 11 952 W |
| Position Uncertainty | | 0 0 usft | Wellhead Elevation: | usft | Ground Level: | 3,663 0 usft |

| | | | | | |
|------------------|----------------------|--------------------|--------------------|------------------|-----------------------|
| Wellbore | OH - Job #32D0611545 | | | | |
| Magnetics | Model Name | Sample Date | Declination | Dip Angle | Field Strength |
| | IGRF2010 | 6/12/2011 | (°) 7 83 | (°) 60 69 | (nT) 48,941 |

| | | | | | |
|--------------------------|-------------------------|---------------|--------------|----------------------|-----|
| Design | Actual | | | | |
| Audit Notes: | | | | | |
| Version: | 1 0 | Phase: | ACTUAL | Tie On Depth: | 0 0 |
| Vertical Section: | Depth From (TVD) | +N/-S | +E/-W | Direction | |
| | (usft) | (usft) | (usft) | (°) | |
| | 0 0 | 0 0 | 0 0 | 192 83 | |

| | | | | | |
|-----------------------|-------------|------------------------------------|------------------|------------------------------------|--|
| Survey Program | Date | 7/22/2011 | | | |
| From | To | Survey (Wellbore) | Tool Name | Description | |
| (usft) | (usft) | | | | |
| 100 0 | 1,073 0 | Gyro Survey (OH - Job #32D0611545) | Keeper | Standard Wireline Keeper ver 1 0 2 | |
| 1,243 0 | 4,526 0 | MWD Survey (OH - Job #32D0611545) | MWD | MWD - Standard | |

| | | | | | | | |
|-----------------------|--------------------|----------------|----------------------|--------------------|------------------|------------------------|-------------------------|
| Survey | | | | | | | |
| Measured Depth | Inclination | Azimuth | True Vertical | North/South | East/West | Closure Azimuth | Closure Distance |
| (usft) | (°) | (°) | Depth | (usft) | (usft) | (°) | (usft) |
| 0 0 | 0 00 | 0 00 | 0 0 | 0 0 | 0 0 | 0 00 | 0 0 |
| 100 0 | 0 07 | 338 83 | 100 0 | 0 1 | 0 0 | 338 83 | 0 1 |
| 200 0 | 0 34 | 60 28 | 200 0 | 0 3 | 0 2 | 39 29 | 0 3 |
| 300 0 | 0 34 | 167 62 | 300 0 | 0 1 | 0 5 | 77 53 | 0 5 |
| 400 0 | 1 15 | 181 81 | 400 0 | -1 2 | 0 6 | 154 24 | 1 3 |
| 500 0 | 1 10 | 171 35 | 500 0 | -3 1 | 0 7 | 167 74 | 3 2 |
| 600 0 | 0 82 | 170 75 | 600 0 | -4 8 | 0 9 | 168 89 | 4 9 |
| 700 0 | 0 73 | 165 95 | 699 9 | -6 1 | 1 2 | 168 80 | 6 2 |
| 800 0 | 0 58 | 157 06 | 799 9 | -7 2 | 1 6 | 167 76 | 7 4 |
| 900 0 | 0 87 | 120 77 | 899 9 | -8 0 | 2 4 | 163 32 | 8 4 |
| 1,000 0 | 1 24 | 113 34 | 999 9 | -8 9 | 4 1 | 155 41 | 9 7 |



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|------------------|-----------------------------|-------------------------------------|-------------------------------------|
| Company: | COG OPERATING LLC | Local Co-ordinate Reference: | Site Randall Federal #5 |
| Project: | Eddy County, NM (NAN27 NME) | TVD Reference: | KB Elev (14) @ 3677 0usft (UDI #40) |
| Site: | Randall Federal #5 | MD Reference: | KB Elev (14) @ 3677 0usft (UDI #40) |
| Well: | Randall Federal #5 | North Reference: | Grid |
| Wellbore: | OH - Job #32D0611545 | Survey Calculation Method: | Minimum Curvature |
| Design: | Actual | Database: | EDM-Regulatory |

| Survey | | | | | | | |
|--------------------------|--------------------|----------------|------------------------|-----------------------|---------------------|------------------------|----------------------------|
| Measured Depth (usft) | Inclination (°) | Azimuth (°) | True Vertical Depth | North/South (usft) | East/West (usft) | Closure Azimuth (°) | Closure Distance (usft) |
| 1,073 0 | 1 14 | 115 12 | 1,072 9 | -9 5 | 5 4 | 150 16 | 10 9 |



| | | | |
|------------------|-----------------------------|-------------------------------------|-------------------------------------|
| Company: | COG OPERATING LLC | Local Co-ordinate Reference: | Site Randall Federal #5 |
| Project: | Eddy County, NM (NAN27 NME) | TVD Reference: | KB Elev (14) @ 3677 0usft (UDI #40) |
| Site: | Randall Federal #5 | MD Reference: | KB Elev (14) @ 3677 0usft (UDI #40) |
| Well: | Randall Federal #5 | North Reference: | Grid |
| Wellbore: | OH - Job #32D0611545 | Survey Calculation Method: | Minimum Curvature |
| Design: | Actual | Database: | EDM-Regulatory |

| | | | |
|--------------------|--------------------------------------|----------------------|----------------|
| Project | Eddy County, NM (NAN27 NME) | | |
| Map System: | US State Plane 1927 (Exact solution) | System Datum: | Mean Sea Level |
| Geo Datum: | NAD 1927 (NADCON CONUS) | | |
| Map Zone: | New Mexico East 3001 | | |

| | | | | | |
|------------------------------|--------------------|---------------------|-----------------|--------------------------|------------------|
| Site | Randall Federal #5 | | | | |
| Site Position: | | Northing: | 671,244 70 usft | Latitude: | 32° 50' 41 646 N |
| From: | Map | Easting: | 601,353 40 usft | Longitude: | 104° 0' 11 952 W |
| Position Uncertainty: | 0 0 usft | Slot Radius: | 13-3/16" | Grid Convergence: | 0 18 ° |

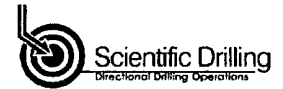
| | | | | | | |
|-----------------------------|--------------------|----------|----------------------------|-----------------|----------------------|------------------|
| Well | Randall Federal #5 | | | | | |
| Well Position | +N/-S | 0 0 usft | Northing: | 671,244 70 usft | Latitude: | 32° 50' 41 646 N |
| | +E/-W | 0 0 usft | Easting: | 601,353 40 usft | Longitude: | 104° 0' 11 952 W |
| Position Uncertainty | | 0 0 usft | Wellhead Elevation: | usft | Ground Level: | 3,663 0 usft |

| | | | | | |
|------------------|----------------------|--------------------|--------------------|------------------|-----------------------|
| Wellbore | OH - Job #32D0611545 | | | | |
| Magnetics | Model Name | Sample Date | Declination | Dip Angle | Field Strength |
| | IGRF2010 | 6/12/2011 | (°) 7.83 | (°) 60 69 | (nT) 48,941 |

| | | | | | |
|--------------------------|-------------------------|---------------|--------------|----------------------|-----|
| Design | Actual | | | | |
| Audit Notes: | | | | | |
| Version: | 1 0 | Phase: | ACTUAL | Tie On Depth: | 0 0 |
| Vertical Section: | Depth From (TVD) | +N/-S | +E/-W | Direction | |
| | (usft) | (usft) | (usft) | (°) | |
| | 0 0 | 0 0 | 0 0 | 192 83 | |

| | | | | | |
|-----------------------|-------------|------------------------------------|------------------|------------------------------------|--|
| Survey Program | Date | 7/22/2011 | | | |
| From | To | Survey (Wellbore) | Tool Name | Description | |
| (usft) | (usft) | | | | |
| 100 0 | 1,073.0 | Gyro Survey (OH - Job #32D0611545) | Keeper | Standard Wireline Keeper ver 1 0 2 | |
| 1,243.0 | 4,526 0 | MWD Survey (OH - Job #32D0611545) | MWD | MWD - Standard | |

| | | | | | | | |
|-----------------------|--------------------|----------------|----------------------|--------------------|------------------|------------------------|-------------------------|
| Survey | | | | | | | |
| Measured Depth | Inclination | Azimuth | True Vertical | North/South | East/West | Closure Azimuth | Closure Distance |
| (usft) | (°) | (°) | Depth | (usft) | (usft) | (°) | (usft) |
| 1,073 0 | 1 14 | 115 12 | 1,072 9 | -9 5 | 5 4 | 150 16 | 10 9 |
| Gyro Tie-in | | | | | | | |
| 1,243.0 | 1 43 | 114 07 | 1,242 9 | -11 1 | 8 9 | 141 17 | 14 2 |
| 1,338 0 | 1 27 | 117.36 | 1,337 8 | -12 0 | 10 9 | 137 77 | 16 3 |
| 1,433 0 | 1 24 | 181 90 | 1,432.8 | -13 5 | 11 8 | 138 88 | 18 0 |
| 1,528 0 | 2 57 | 208 57 | 1,527 8 | -16 4 | 10 8 | 146 77 | 19 7 |
| 1,624.0 | 4 68 | 196 66 | 1,623 6 | -22 1 | 8 6 | 158 68 | 23 7 |
| 1,719.0 | 5 15 | 196 52 | 1,718 2 | -29 9 | 6 3 | 168 10 | 30 5 |
| 1,814 0 | 5 05 | 194 25 | 1,812 8 | -38 0 | 4 1 | 173 91 | 38 2 |
| 1,909 0 | 5 19 | 194 08 | 1,907 5 | -46 2 | 2 0 | 177 55 | 46 3 |
| 2,004 0 | 4 93 | 196 44 | 2,002 1 | -54 3 | -0 2 | 180 23 | 54 3 |



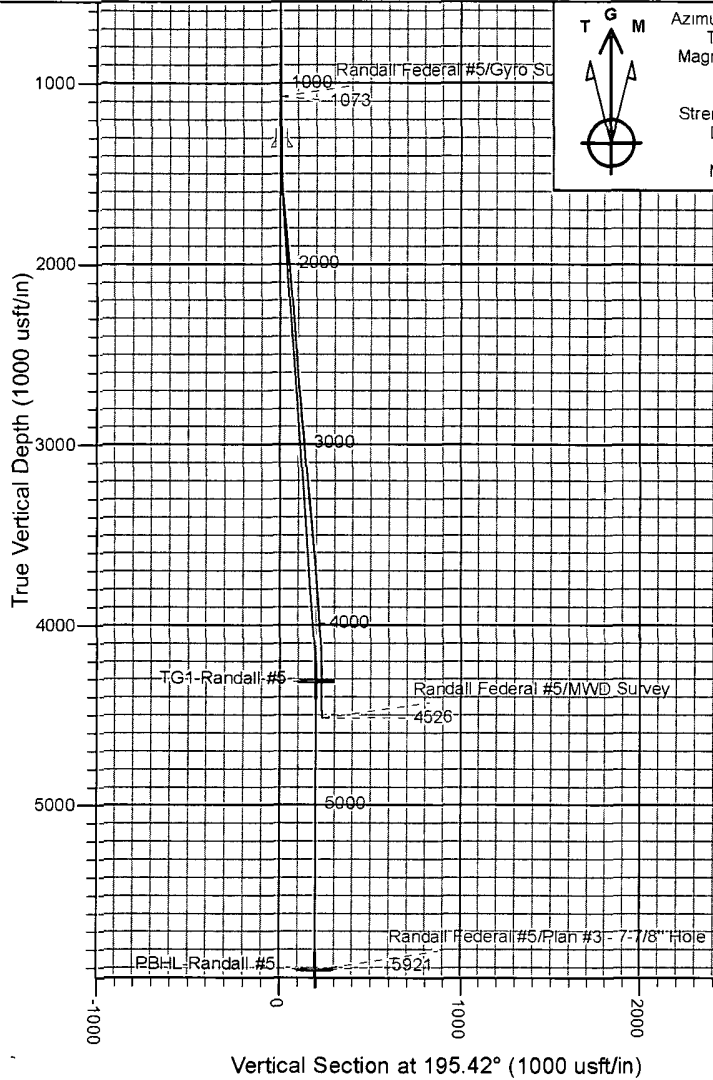
| | | | |
|------------------|-----------------------------|-------------------------------------|-------------------------------------|
| Company: | COG OPERATING LLC | Local Co-ordinate Reference: | Site Randall Federal #5 |
| Project: | Eddy County, NM (NAN27 NME) | TVD Reference: | KB Elev (14) @ 3677 0usft (UDI #40) |
| Site: | Randall Federal #5 | MD Reference: | KB Elev (14) @ 3677 0usft (UDI #40) |
| Well: | Randall Federal #5 | North Reference: | Grid |
| Wellbore: | OH - Job #32D0611545 | Survey Calculation Method: | Minimum Curvature |
| Design: | Actual | Database: | EDM-Regulatory |

| Measured Depth (usft) | Inclination (°) | Azimuth (°) | True Vertical Depth | North/South (usft) | East/West (usft) | Closure Azimuth (°) | Closure Distance (usft) |
|--------------------------|-----------------|-------------|---------------------|--------------------|------------------|---------------------|-------------------------|
| 2,099 0 | 4 88 | 197 53 | 2,096 7 | -62.1 | -2 6 | 182 39 | 62 2 |
| 2,194 0 | 4 16 | 195 49 | 2,191 4 | -69.3 | -4 7 | 183 91 | 69 4 |
| 2,289 0 | 4 88 | 196.21 | 2,286 1 | -76 5 | -6 8 | 185 07 | 76 8 |
| 2,384 0 | 4 46 | 197 21 | 2,380 8 | -83 9 | -9 0 | 186 12 | 84 4 |
| 2,486 0 | 4 26 | 196 10 | 2,482.5 | -91 3 | -11 2 | 187 01 | 92 0 |
| 2,581 0 | 5 04 | 199 12 | 2,577 2 | -98.6 | -13 6 | 187 83 | 99.6 |
| 2,675 0 | 4 93 | 198 10 | 2,670.9 | -106 4 | -16 2 | 188 65 | 107 6 |
| 2,770 0 | 4 85 | 200.17 | 2,765 5 | -114.0 | -18 8 | 189 38 | 115 6 |
| 2,865 0 | 5 06 | 202.84 | 2,860 2 | -121 7 | -21 8 | 190 18 | 123 6 |
| 2,960 0 | 5 22 | 199 04 | 2,954.8 | -129 6 | -24 9 | 190.86 | 132 0 |
| 3,055 0 | 4 83 | 197 58 | 3,049 4 | -137 5 | -27 5 | 191 31 | 140 2 |
| 3,151 0 | 5 03 | 195 57 | 3,145 1 | -145.4 | -29 8 | 191 60 | 148 4 |
| 3,246.0 | 5 18 | 198 86 | 3,239 7 | -153 5 | -32 3 | 191 90 | 156 9 |
| 3,341 0 | 5 05 | 196 58 | 3,334 3 | -161 5 | -34 9 | 192 20 | 165 3 |
| 3,437 0 | 5 24 | 197 57 | 3,429 9 | -169 8 | -37 5 | 192 44 | 173.9 |
| 3,531 0 | 5 27 | 200 78 | 3,523.5 | -177 9 | -40 3 | 192 76 | 182 4 |
| 3,626 0 | 4 69 | 188 09 | 3,618 2 | -185 8 | -42 4 | 192 85 | 190 6 |
| 3,721 0 | 4 82 | 189 92 | 3,712 8 | -193 6 | -43 6 | 192 69 | 198 5 |
| 3,816 0 | 4 53 | 187 55 | 3,807 5 | -201 3 | -44 8 | 192 55 | 206 2 |
| 3,911 0 | 4 68 | 188 23 | 3,902 2 | -208 8 | -45 8 | 192 38 | 213 8 |
| 3,974 0 | 4 02 | 192 89 | 3,965 0 | -213.5 | -46 7 | 192.34 | 218.6 |
| 4,038 0 | 2 80 | 199 28 | 4,028 9 | -217 2 | -47 7 | 192 39 | 222 4 |
| 4,101 0 | 2 08 | 191 00 | 4,091 9 | -219 7 | -48 4 | 192 43 | 225 0 |
| 4,165 0 | 1 33 | 176 83 | 4,155 8 | -221 6 | -48 6 | 192 37 | 226 9 |
| 4,228 0 | 0 83 | 179 64 | 4,218 8 | -222 8 | -48 6 | 192 30 | 228 0 |
| 4,323 0 | 0.48 | 200 16 | 4,313 8 | -223 9 | -48 7 | 192 28 | 229 1 |
| 4,419.0 | 0 85 | 208 16 | 4,409 8 | -224 9 | -49 2 | 192 34 | 230 2 |
| 4,476 0 | 0 76 | 186 95 | 4,466 8 | -225 6 | -49.4 | 192 36 | 231 0 |
| Last MWD Survey | | | | | | | |
| 4,526 0 | 0 76 | 186 95 | 4,516 8 | -226 3 | -49 5 | 192 34 | 231 6 |
| Projection to Bit | | | | | | | |

| Measured Depth (usft) | Vertical Depth (usft) | Local Coordinates | | Comment |
|-----------------------|-----------------------|-------------------|--------------|-------------------|
| | | +N/-S (usft) | +E/-W (usft) | |
| 1,073 0 | 1,072 9 | -9 5 | 5 4 | Gyro Tie-in |
| 4,476.0 | 4,466 8 | -225 6 | -49 4 | Last MWD Survey |
| 4,526 0 | 4,516 8 | -226 3 | -49.5 | Projection to Bit |



Project: Eddy County, NM (NAN27 NME)
 Site: Randall Federal #5
 Well: Randall Federal #5
 Wellbore: OH - Job #32D0611545
 Design: Plan #3 - 7-7/8" Hole

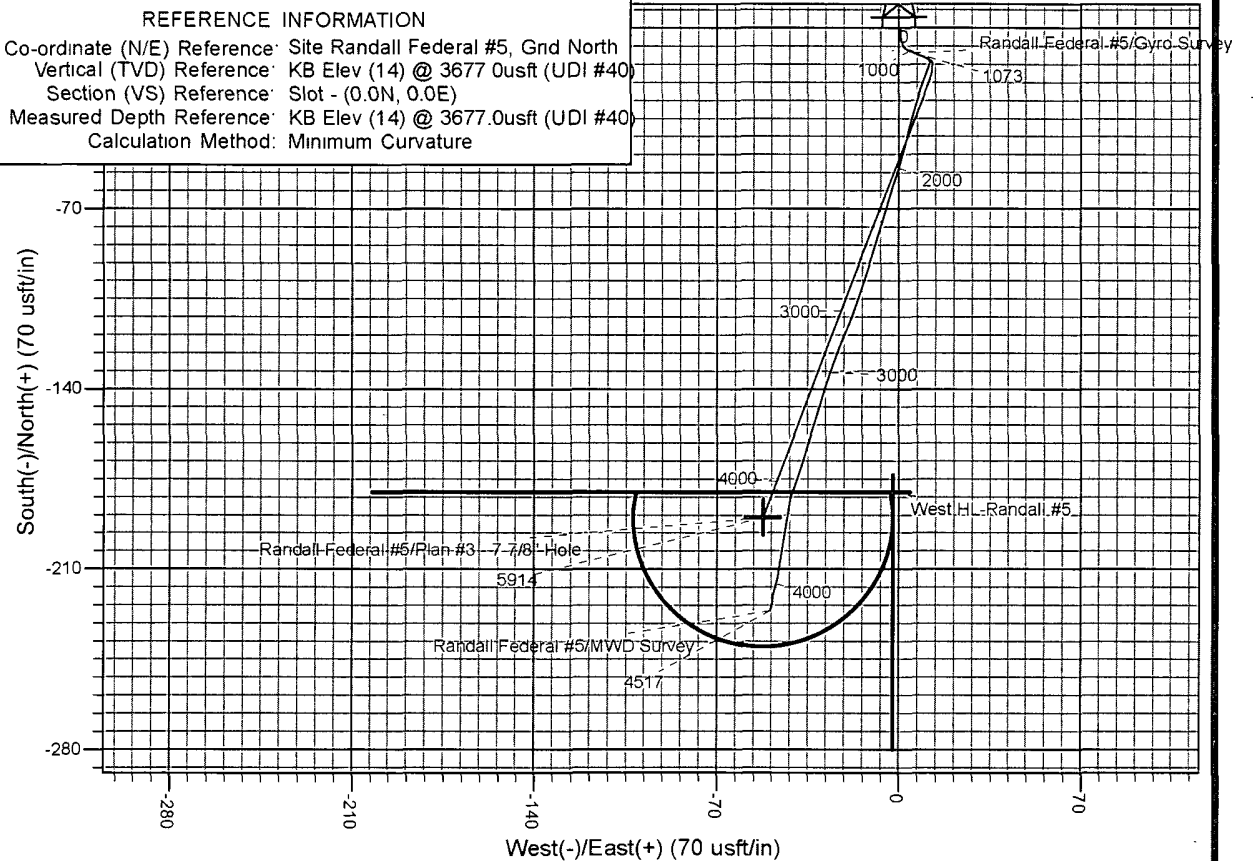


Azimuths to Grid North
 True North -0 18°
 Magnetic North 7 65°
 Magnetic Field
 Strength 48941 5snT
 Dip Angle 60 69°
 Date 6/12/2011
 Model IGRF2010

| +N/-S | +E/-W | Northing | Easting | Latitude | Longitude | Slot |
|-------|-------|-----------|-----------|------------------|------------------|------|
| 0.0 | 0.0 | 671244.70 | 601353 40 | 32° 50' 41 646 N | 104° 0' 11.952 W | |

WELL DETAILS: Randall Federal #5
 KB Elev (14) @ 3677 0usft (UDI #40)
 Ground Level: 3663.0

REFERENCE INFORMATION
 Co-ordinate (N/E) Reference: Site Randall Federal #5, Grd North
 Vertical (TVD) Reference: KB Elev (14) @ 3677 0usft (UDI #40)
 Section (VS) Reference: Slot - (0.0N, 0.0E)
 Measured Depth Reference: KB Elev (14) @ 3677.0usft (UDI #40)
 Calculation Method: Minimum Curvature



COMPANY DETAILS: COG OPERATING LLC
 223032
 Calculation Method: Minimum Curvature
 Error System: ISCWSA
 Scan Method: Closest Approach 3D
 Error Surface: Elliptical Conic
 Warning Method: Error Ratio

PROJECT DETAILS: Eddy County, NM (NAN27 NME)
 Geodetic System: NAD State Plane 1927 (Exact solution)
 Datum: NAD 1927 (NADCON CONUS)
 Ellipsoid: Clarke 1866
 Zone: New Mexico East 3001
 System Datum: Mean Sea Level

SITE DETAILS: Randall Federal #5
 Site Centre Latitude: 32° 50' 41 646 N
 Longitude: 104° 0' 11.952 W
 Positional Uncertainty: 0 0
 Convergence: 0 18
 Local North: Grid