NM OIL CONSERVATION
ARTESIA DISTRICT
JUL 14 2014
RECEIVED

Form 3160-5
(March 2012)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

FORM APPROVED
OMB No. 1004-0137
Expires: October 31, 2014

**SUNDRY NOTICES AND REPORTS ON WELLS**

***Do not use this form for proposals to drill or to re-enter an abandoned well. Use Form 3160-3 (APD) for such proposals.***

***SUBMIT IN TRIPLICATE*** *– Other instructions on page 2.*

| | |
|---|---|
| 1. Type of Well<br>☑ Oil Well ☐ Gas Well ☐ Other | 5. Lease Serial No.<br>NM-114978 |
| | 6. If Indian, Allottee or Tribe Name |
| | 7. If Unit of CA/Agreement, Name and/or No. |
| | 8. Well Name and No.<br>ROADRUNNER FED #2 |
| 2. Name of Operator<br>STRATA PRODUCTION COMPANY | 9. API Well No.<br>30-015-41041 |
| 3a. Address<br>PO BOX 1030<br>ROSWELL, NM 88202<br>3b. Phone No. *(include area code)*<br>575-622-1127 X 18 | 10. Field and Pool or Exploratory Area<br>FORTY NINER RIDGE DELAWARE |
| 4. Location of Well *(Footage, Sec., T.,R.,M., or Survey Description)*<br>1220 FNL & 660 FWL | 11. County or Parish, State<br>EDDY COUNTY |

12. CHECK THE APPROPRIATE BOX(ES) TO INDICATE NATURE OF NOTICE, REPORT OR OTHER DATA

| TYPE OF SUBMISSION | TYPE OF ACTION | | | |
|---|---|---|---|---|
| ☑ Notice of Intent | ☐ Acidize | ☐ Deepen | ☐ Production (Start/Resume) | ☐ Water Shut-Off |
| | ☐ Alter Casing | ☐ Fracture Treat | ☐ Reclamation | ☐ Well Integrity |
| ☐ Subsequent Report | ☐ Casing Repair | ☐ New Construction | ☐ Recomplete | ☐ Other |
| | ☑ Change Plans | ☐ Plug and Abandon | ☐ Temporarily Abandon | |
| ☐ Final Abandonment Notice | ☐ Convert to Injection | ☐ Plug Back | ☐ Water Disposal | |

13. Describe Proposed or Completed Operation: Clearly state all pertinent details, including estimated starting date of any proposed work and approximate duration thereof. If the proposal is to deepen directionally or recomplete horizontally, give subsurface locations and measured and true vertical depths of all pertinent markers and zones. Attach the Bond under which the work will be performed or provide the Bond No. on file with BLM/BIA. Required subsequent reports must be filed within 30 days following completion of the involved operations. If the operation results in a multiple completion or recompletion in a new interval, a Form 3160-4 must be filed once testing has been completed. Final Abandonment Notices must be filed only after all requirements, including reclamation, have been completed and the operator has determined that the site is ready for final inspection.)

Accepted for record
NMOCD 7-15-14

REQUEST TO CHANGE APD BY:
1. WE WILL NOT DRILL A PILOT HOLE
2. CHANGE INTERMEDIATE CASING CEMENT DESIGN TO HAVE AN OPTION TO EITHER RUN A SINGLE STAGE JOB OR RUN A DV TOOL.
3. CHANGE HOLE SIZE FOR THE PRODUCTION HOLE TO BE 8 3/4" HOLE TO THE KICK OFF POINT AND THEN 7 7/8" HOLE IN THE HORIZONTAL LATERAL
4. CHANGE THE PRODUCTION CASING TO BE A LONG STRING OF 5 1/2" CASING FROM 0 TO 11,542'.
5. CHANGE THE PRODUCTION CASING CEMENT DESIGN TO HAVE AN OPTION TO EITHER RUN A SINGLE STAGE JOB OR RUN A DV TOOL.
DETAILED INFORMATION
1. NO PILOT HOLE WILL BE DRILLED. THE WELL WILL BE DRILLED TO THE KICKOFF POINT AT 7237' AND THEN TURNED HORIZONTALLY AND DRILLED TO 11,542'. A DIRECTIONAL PLAN IS ATTACHED.
2. A 12 1/4" HOLE WILL BE DRILLED TO 3860'. 9 5/8" 36# J-55 CASING WILL BE SET AND CEMENTED TO THE SURFACE. STRATA REQUEST THE OPTION TO CEMENT THE CASING IN A SINGLE STAGE WITH 1175 SX OF PAR5 LITE CEMENT WITH ADDITIVES AND 300 SX OF CLASS C W/ ADDITIVES OR BY SETTING A DV TOOL AT 2000' AND CEMENT THE 1ST STAGE WITH 450 SX OF 35/65 POZ/C W/ ADDITIVES AND 200 SX OF CLASS C W/ADDITIVES. THE 2ND STAGE WOULD BE CEMENTED WITH 575 SX 35/65 POZ W/ADDITIVES AND 100 SX CLASS C W/ADDITIVES. THE OPTION WOULD BE IF LOST CIRCULATION IS ENCOUNTERED OR NOT. ACTUAL CEMENT VOLUMES WILL BE BASED ON FLUID CALIPER AND 50% EXCESS IN OPEN HOLE.
3,4,5 DRILL A 8 3/4" HOLE TO 7237' AND THEN DRILL A 7 7/8" LATERAL TO 11,542'. RUN 5 1/2" 17# P-110 CASING TO TD AND CEMENT WITH MORE INFORMATION IS ATTACHED

LTC

SEE ATTACHED FOR CONDITIONS OF APPROVAL

| | |
|---|---|
| 14. I hereby certify that the foregoing is true and correct. Name *(Printed/Typed)*<br>PAUL RAGSDALE | Title OPERATIONS MANAGER |
| Signature Paul Ragsdale | Date 06/01/2014 |

**THIS SPACE FOR FEDERAL OR STATE OFFICE USE**

| | | |
|---|---|---|
| Approved by | Title | Date |
| Conditions of approval, if any, are attached. Approval of this notice does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon. | Office | |

APPROVED
JUL 7 2014
/s/ Chris Walls
BUREAU OF LAND MANAGEMENT
CARLSBAD FIELD OFFICE

Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

(Instructions on page 2)

Form 3160-5
(March 2012)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

OCD Artesia

FORM APPROVED
OMB No. 1004-0137
Expires: October 31, 2014

**SUNDRY NOTICES AND REPORTS ON WELLS**

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***SUBMIT IN TRIPLICATE*** *– Other instructions on page 2.*

5. Lease Serial No.
NM-114978

6. If Indian, Allottee or Tribe Name

7. If Unit of CA/Agreement, Name and/or No.

1. Type of Well
☑ Oil Well ☐ Gas Well ☐ Other

8. Well Name and No.
ROADRUNNER FED #2

2. Name of Operator
STRATA PRODUCTION COMPANY

9. API Well No.
30-015-41041

3a. Address
PO BOX 1030
ROSWELL, NM 88202

3b. Phone No. *(include area code)*
575-622-1127 X 18

10. Field and Pool or Exploratory Area
FORTY NINER RIDGE DELAWARE

4. Location of Well *(Footage, Sec., T.,R.,M., or Survey Description)*
1220 FNL & 660 FWL

11. County or Parish, State
EDDY COUNTY

12. CHECK THE APPROPRIATE BOX(ES) TO INDICATE NATURE OF NOTICE, REPORT OR OTHER DATA

| TYPE OF SUBMISSION | TYPE OF ACTION | | | |
|---|---|---|---|---|
| ☑ Notice of Intent | ☐ Acidize | ☐ Deepen | ☐ Production (Start/Resume) | ☐ Water Shut-Off |
| | ☐ Alter Casing | ☐ Fracture Treat | ☐ Reclamation | ☐ Well Integrity |
| ☐ Subsequent Report | ☐ Casing Repair | ☐ New Construction | ☐ Recomplete | ☐ Other _____ |
| | ☑ Change Plans | ☐ Plug and Abandon | ☐ Temporarily Abandon | _____ |
| ☐ Final Abandonment Notice | ☐ Convert to Injection | ☐ Plug Back | ☐ Water Disposal | _____ |

13. Describe Proposed or Completed Operation: Clearly state all pertinent details, including estimated starting date of any proposed work and approximate duration thereof. If the proposal is to deepen directionally or recomplete horizontally, give subsurface locations and measured and true vertical depths of all pertinent markers and zones. Attach the Bond under which the work will be performed or provide the Bond No. on file with BLM/BIA. Required subsequent reports must be filed within 30 days following completion of the involved operations. If the operation results in a multiple completion or recompletion in a new interval, a Form 3160-4 must be filed once testing has been completed. Final Abandonment Notices must be filed only after all requirements, including reclamation, have been completed and the operator has determined that the site is ready for final inspection.)

PAGE 2 CONTINUED
3,4,5 CEMENT WITH EITHER A SINGLE STAGE OR WITH A DV TOOL DEPENDENT UPON WHETHER LOST CIRCULATION IS ENCOUNTERED IN THE DELAWARE VERTICAL HOLE. A SINGLE STAGE WOULD BE CEMENTED WITH 1400 SX OF PAR 5 LITE W/ADDITIVES AND 500 SX OF CLASS H W/ADDITIVES AND CEMENT WOULD BE CIRCULATED TO SURFACE. A TWO STAGE JOB WOULD SET THE DV TOOL AT 4000' AND THE 1ST STAGE WOULD BE 500 SX OF PAR 5 LITE AND 500 SX OF CLASS H W/ADDITIVES AND THE SECOND STAGE WOULD BE 900 SX OF PAR 5 LITE. OPEN HOLE VOLUMES ARE CALCULATED USING 50% EXCESS AND CASED HOLE VOLUMES OF 20%.

See Attached for cement plan

14. I hereby certify that the foregoing is true and correct. Name *(Printed/Typed)*
PAUL RAGSDALE

Title OPERATIONS MANAGER

Signature Paul Ragsdale

Date 06/01/2014

**THIS SPACE FOR FEDERAL OR STATE OFFICE USE**

| Approved by | Title | Date |
|---|---|---|
| Conditions of approval, if any, are attached. Approval of this notice does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon. | Office | |

Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

(Instructions on page 2)

REVISION #1
HOLE PROGNOSIS
FORM 3160-3 APPLICATION FOR PERMIT TO DRILL
STRATA PRODUCTION COMPANY
Roadrunner Federal #2
1220' FNL & 660' FWL
SECTION 25-23S-30E
EDDY COUNTY, NEW MEXICO

**2 Stage Intermediate Casing Cement Job with DV Tool at 2000'**

9 5/8" 36# J-55 casing will be set at ~3860' with a DV tool at 2000' and cemented with **1st stage lead** of 450 sacks of 35/65 Poz/C + 5%PF44(BWOW) + 6%PF20 + 3#/skPF42+ 1%PF1 + .125#/skPF29 + .25#/skPF46. Density 12.6, yield 2.06, 10.97 gal/sk H2O. **1st stage tail** of 200sks C +.2%PF13. Density 14.8, yield 1.33, 6.35 gal/sk H2O. **2nd stage lead** of 575sks 35/65 Poz/C +5%PF44(BWOW) +6%PF20 +3#/skPF42 +1%PF1 +.125#/skPF29 +.25#/skPF46. Density 12.6, yield 2.07, 11.01 gal/sk H2O. **2nd stage tail** of 100sks C +.2%PF13. Density 14.8, Yield 1.33, 6.35 gal/sk H2O. Calculated with 100% excess. Cement in sufficient quantity to circulate to surface will be utilized.

**OR If NO LOSS CIRCULATION IS ENCOUNTERED**

A Single Stage Intermediate Casing Cement Job:

9 5/8" 36# J-55 casing will be set at ~3860' and cemented in a single stage. **Lead cement** of 1175 sacks, 412.9 bbls, of 35/65 Poz/C + 5%PF44(BWOW) + 6%PF20 + 3#/skPF42+ 1%PF1 + .125#/skPF29 + .25#/skPF46. Density 12.6, yield 2.06, 10.97 gal/sk H2O and **"tail in"** of 310sks C +.2%PF13. Density 14.8, yield 1.33, 6.35 gal/sk H2O. Calculated with 100% excess but actual cement volumes will be based on a fluid caliper. Cement in sufficient quantity to circulate to surface will be utilized.

**PRODUCTION CASING CEMENT JOB:** A 8 ¾" hole will be drilled to 7237' and then a horizontal lateral will be drilled in the Lower Brushy Canyon formation to 11,452'.

5 1/2" Production Casing 17# N-80 or 17# P-110 (dependent upon availability) will be run to the total depth of the well and cemented with **1490 sacks of 50/50 Poz H** with + 4.5% Bentonite + 5% bwoc MPA-5 + 0.2% bwoc FL-52 + + 5% bwow Sodium Chloride + 5 lbs/sack LCM-1 + 0.005 lbs/sack Static Free + 1 gals/100 sack FP-6L + 0.125 lbs/sack Cello Flake + 106.5% Fresh Water, 12.0 density, 2.20 yield, 11.1 gal/sk H2O followed by **1750 sacks tail Class H 50/50 Poz Cement** + 0.3% bwoc FL-52 + 0.005 lbs/sack Static Free + 1 gals/100 sack FP-6L + 46.2% Fresh Water. 14.8 density, 1.24

yield, 5.21 gal/sk H2O. Calculated with 50% excess. Actual cement volumes will be calculated using a fluid caliper and cement top will be the surface.

**OR IF LOSS CIRCULATION IS ENCOUNTERED**

**A 2 STAGE CEMENT JOB WITH A DV TOOL AT 4000'.**
The **first stage** would be 500 sx of 50/50 Poz H with + 4.5% Bentonite + 5% bwoc MPA-5 + 0.2% bwoc FL-52 + + 5% bwow Sodium Chloride + 5 lbs/sack LCM-1 + 0.005 lbs/sack Static Free + 1 gals/100 sack FP-6L + 0.125 lbs/sack Cello Flake + 106.5% Fresh Water, 12.0 density, 2.20 yield, 11.1 gal/sk H2O **followed by 500 sacks tail** Class H 50/50 Poz Cement + 0.3% bwoc FL-52 + 0.005 lbs/sack Static Free + 1 gals/100 sack FP-6L + 46.2% Fresh Water. 14.8 density, 1.24 yield, 5.21 gal/sk H2O. Calculated with 50% excess.
The **second stage** would be 900 sacks of 35/65 Poz/C + 5%PF44(BWOW) + 6%PF20 + 3#/skPF42+ 1%PF1 + .125#/skPF29 + .25#/skPF46. Density 12.6, yield 2.06, 10.97 gal/sk H2O. Density 12.6, yield 2.07, 11.01 gal/sk H2O. Calculated with 50% excess. Actual cement volumes will be calculated using fluid caliper and electric log caliper calculations with projected cement top at the surface.

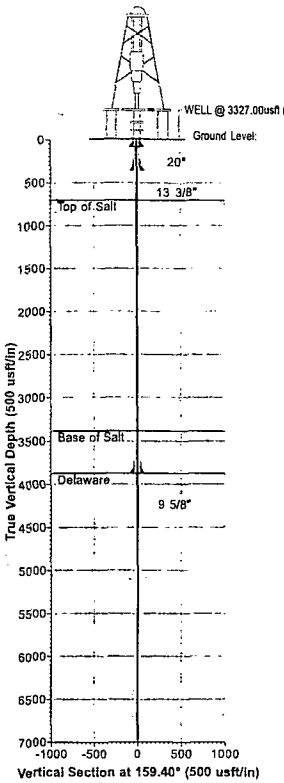
# Strata Production Company

**Project:** Eddy County, New Mexico (NAD 27)
**Site:** Roadrunner Federal
**Well:** #2H
**Wellbore:** Wellbore #1 Job #1411093
**Design:** Plan #2 06-25-14
**Rig:** Silver Oak 11

PHOENIX TECHNOLOGY SERVICES

Azimuths to Grid North
True North: -0.26°
Magnetic North: 7.08°

Magnetic Field
Strength: 48320.8snT
Dip Angle: 60.12°
Date: 06/18/2014
Model: IGRF2010_14




**WELL DETAILS**

Ground Level: 3310.00

| +N/-S | +E/-W | Northing | Easting | Latitude | Longitude |
|---|---|---|---|---|---|
| 0.00 | 0.00 | 465834.99 | 652350.58 | 32° 16' 47.04572 N | 103° 50' 25.33766 W |

**SECTION DETAILS**

| Sec | MD | Inc | Azi | TVD | +N/-S | +E/-W | Dleg | TFace | VSect | Target | Annotation |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | |
| 2 | 7237.60 | 0.00 | 0.00 | 7237.60 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | KOP: Start Build 12.00°/100' |
| 3 | 7978.52 | 88.91 | 180.01 | 7714.98 | -468.38 | -0.10 | 12.00 | 180.01 | 438.41 | | LP at 88.91° Inc, Start Turn 5.30°/100' |
| 4 | 8448.09 | 88.91 | 155.12 | 7724.05 | -923.26 | 100.20 | 5.30 | -90.24 | 899.49 | | EOT: Hold 155.12° Azm |
| 5 | 9551.88 | 88.91 | 155.12 | 7745.05 | -1924.43 | 564.50 | 0.00 | 0.00 | 2000.00 | | Start Build 2.00°/100' |
| 6 | 9606.38 | 90.00 | 155.12 | 7745.57 | -1973.87 | 587.43 | 2.00 | 0.00 | 2054.34 | | Hold 90° Inc |
| 7 | 10354.13 | 90.00 | 155.12 | 7745.57 | -2652.21 | 902.02 | 0.00 | 0.00 | 2800.00 | | Start Build 2.00°/100' |
| 8 | 10444.13 | 91.80 | 155.12 | 7744.16 | -2733.85 | 939.88 | 2.00 | 0.04 | 2889.74 | | Hold 91.8° Inc |
| 9 | 10722.44 | 91.80 | 155.12 | 7735.41 | -2986.21 | 1056.90 | 0.00 | 0.00 | 3167.13 | | Start Drop 2.00°/100' |
| 10 | 10812.44 | 90.00 | 155.12 | 7734.00 | -3067.85 | 1094.76 | 2.00 | -179.96 | 3256.87 | | Hold 90° Inc |
| 11 | 11542.44 | 90.00 | 155.12 | 7734.00 | -3730.10 | 1401.89 | 0.00 | 0.00 | 3984.83 | BHL Roadrunner Federal 2H | TD at 11542.44 |

**DESIGN TARGET DETAILS**

| Name | TVD | +N/-S | +E/-W | Northing | Easting | Latitude | Longitude | Shape |
|---|---|---|---|---|---|---|---|---|
| BHL Roadrunner Federal 2H | 7734.00 | -3730.10 | 1401.89 | 462104.89 | 653752.47 | 32° 16' 10.06891 N | 103° 50' 9.20958 W | Point |
| Target 1 | 7734.00 | -1458.92 | 348.64 | 464376.07 | 652699.22 | 32° 16' 32.59251 N | 103° 50' 21.35491 W | Point |
| Target 4 | 7734.00 | -3015.52 | 1070.81 | 462819.47 | 653421.39 | 32° 16' 17.15548 N | 103° 50' 13.02719 W | Point |
| Target 2 | 7744.00 | -1919.38 | 562.14 | 463915.61 | 652912.72 | 32° 16' 28.02610 N | 103° 50' 18.89288 W | Point |
| Target 3 | 7744.00 | -2650.93 | 901.42 | 463184.06 | 653252.00 | 32° 16' 20.77119 N | 103° 50' 14.98047 W | Point |

Map System: US State Plane 1927 (Exact solution)
Datum: NAD 1927 (NADCON CONUS)
Ellipsoid: Clarke 1866
Zone Name: New Mexico East 3001

Local Origin: Well #2H, Grid North

Latitude: 32° 16' 47.04572 N
Longitude: 103° 50' 25.33766 W

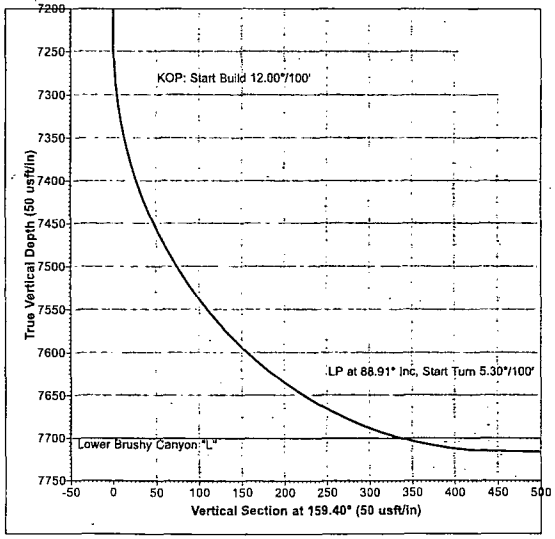
Grid East: 652350.58
Grid North: 465834.99
Scale Factor: 1.000

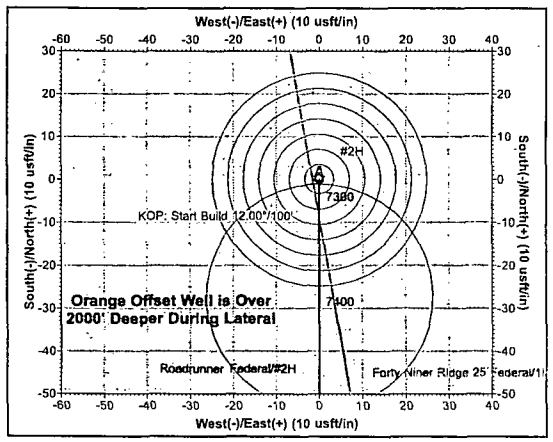
Geomagnetic Model: IGRF2010_14
Sample Date: 18-Jun-14
Magnetic Declination: 7.34°
Dip Angle from Horizontal: 60.12°
Magnetic Field Strength: 48321

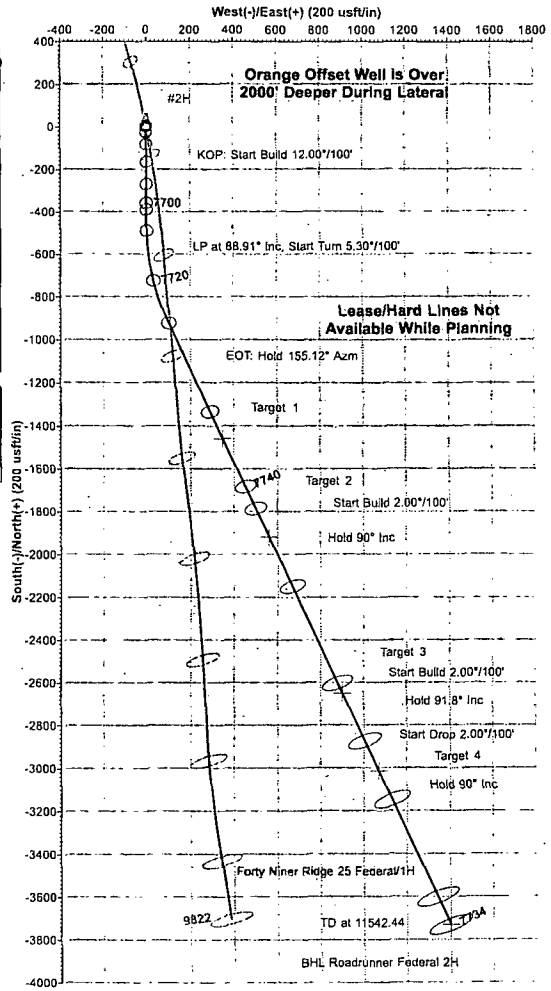
To convert a Magnetic Direction to a Grid Direction, Add 7.08°
To convert a Magnetic Direction to a True Direction, Add 7.34° East
To convert a True Direction to a Grid Direction, Subtract 0.26°

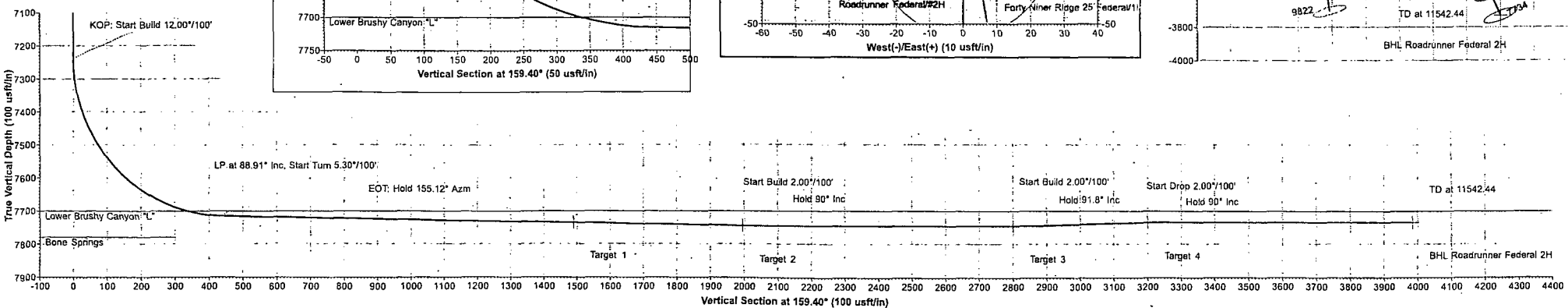
**LEGEND**

1H, Wellbore #1, Surveys V0
Plan #2 06-25-14




Created By: Justin Andoe Date: 9:41, June 25 2014

# Strata Production Company

**Eddy County, New Mexico (NAD 27)**
**Roadrunner Federal**
**#2H**

**Wellbore #1 Job #1411093**

**Plan: Plan #2 06-25-14**

# Standard Planning Report

**25 June, 2014**

PHOENIX
TECHNOLOGY SERVICES

# Phoenix Technology Services

Planning Report

PHOENIX TECHNOLOGY SERVICES

| | | | |
|---|---|---|---|
| **Database:** | Compass 5000 GCR DB | **Local Co-ordinate Reference:** | Well #2H |
| **Company:** | Strata Production Company | **TVD Reference:** | WELL @ 3327.00usft (Silver Oak 11) |
| **Project:** | Eddy County, New Mexico (NAD 27) | **MD Reference:** | WELL @ 3327.00usft (Silver Oak 11) |
| **Site:** | Roadrunner Federal | **North Reference:** | Grid |
| **Well:** | #2H | **Survey Calculation Method:** | Minimum Curvature |
| **Wellbore:** | Wellbore #1 Job #1411093 | | |
| **Design:** | Plan #2 06-25-14 | | |

**Project** Eddy County, New Mexico (NAD 27)

| | | | |
|---|---|---|---|
| **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** Roadrunner Federal

| | | | | | |
|---|---|---|---|---|---|
| **Site Position:** | | **Northing:** | 465,834.99 usft | **Latitude:** | 32° 16' 47.04572 N |
| **From:** | Map | **Easting:** | 652,350.58 usft | **Longitude:** | 103° 50' 25.33766 W |
| **Position Uncertainty:** | 0.00 usft | **Slot Radius:** | 13-3/16 " | **Grid Convergence:** | 0.26 ° |

**Well** #2H

| | | | | | | |
|---|---|---|---|---|---|---|
| **Well Position** | **+N/-S** | 0.00 usft | **Northing:** | 465,834.99 usft | **Latitude:** | 32° 16' 47.04572 N |
| | **+E/-W** | 0.00 usft | **Easting:** | 652,350.58 usft | **Longitude:** | 103° 50' 25.33766 W |
| **Position Uncertainty** | | 0.00 usft | **Wellhead Elevation:** | 0.00 usft | **Ground Level:** | 3,310.00 usft |

**Wellbore** Wellbore #1 Job #1411093

| Magnetics | Model Name | Sample Date | Declination (°) | Dip Angle (°) | Field Strength (nT) |
|---|---|---|---|---|---|
| | IGRF2010_14 | 06/18/14 | 7.34 | 60.12 | 48,321 |

**Design** Plan #2 06-25-14

**Audit Notes:**

| | | | | | |
|---|---|---|---|---|---|
| **Version:** | | **Phase:** | PROTOTYPE | **Tie On Depth:** | 0.00 |

| Vertical Section: | Depth From (TVD) (usft) | +N/-S (usft) | +E/-W (usft) | Direction (°) |
|---|---|---|---|---|
| | 0.00 | 0.00 | 0.00 | 159.40 |

**Plan Sections**

| Measured Depth (usft) | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | +N/-S (usft) | +E/-W (usft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) | TFO (°) | Target |
|---|---|---|---|---|---|---|---|---|---|---|
| 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 7,237.60 | 0.00 | 0.00 | 7,237.60 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 7,978.52 | 88.91 | 180.01 | 7,714.98 | -468.38 | -0.10 | 12.00 | 12.00 | 0.00 | 180.01 | |
| 8,448.09 | 88.91 | 155.12 | 7,724.05 | -923.26 | 100.20 | 5.30 | 0.00 | -5.30 | -90.24 | |
| 9,551.88 | 88.91 | 155.12 | 7,745.05 | -1,924.43 | 564.50 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 9,606.38 | 90.00 | 155.12 | 7,745.57 | -1,973.87 | 587.43 | 2.00 | 2.00 | 0.00 | 0.00 | |
| 10,354.13 | 90.00 | 155.12 | 7,745.57 | -2,652.21 | 902.02 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 10,444.13 | 91.80 | 155.12 | 7,744.16 | -2,733.85 | 939.88 | 2.00 | 2.00 | 0.00 | 0.04 | |
| 10,722.44 | 91.80 | 155.12 | 7,735.41 | -2,986.21 | 1,056.90 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 10,812.44 | 90.00 | 155.12 | 7,734.00 | -3,067.85 | 1,094.76 | 2.00 | -2.00 | 0.00 | -179.96 | |
| 11,542.44 | 90.00 | 155.12 | 7,734.00 | -3,730.10 | 1,401.89 | 0.00 | 0.00 | 0.00 | 0.00 | BHL Roadrunner Fed |

| | | | |
|---|---|---|---|
| **Database:** | Compass 5000 GCR DB | **Local Co-ordinate Reference:** | Well #2H |
| **Company:** | Strata Production Company | **TVD Reference:** | WELL @ 3327.00usft (Silver Oak 11) |
| **Project:** | Eddy County, New Mexico (NAD 27) | **MD Reference:** | WELL @ 3327.00usft (Silver Oak 11) |
| **Site:** | Roadrunner Federal | **North Reference:** | Grid |
| **Well:** | #2H | **Survey Calculation Method:** | Minimum Curvature |
| **Wellbore:** | Wellbore #1 Job #1411093 | | |
| **Design:** | Plan #2 06-25-14 | | |

**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 |
| **Top of Salt** | | | | | | | | | |
| 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 |
| 3,380.00 | 0.00 | 0.00 | 3,380.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **Base of Salt** | | | | | | | | | |
| 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 |
| 3,870.00 | 0.00 | 0.00 | 3,870.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **Delaware** | | | | | | | | | |
| 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 |
| 4,300.00 | 0.00 | 0.00 | 4,300.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 4,400.00 | 0.00 | 0.00 | 4,400.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 4,500.00 | 0.00 | 0.00 | 4,500.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 4,600.00 | 0.00 | 0.00 | 4,600.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 4,700.00 | 0.00 | 0.00 | 4,700.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| | | | |
|---|---|---|---|
| **Database:** | Compass 5000 GCR DB | **Local Co-ordinate Reference:** | Well #2H |
| **Company:** | Strata Production Company | **TVD Reference:** | WELL @ 3327.00usft (Silver Oak 11) |
| **Project:** | Eddy County, New Mexico (NAD 27) | **MD Reference:** | WELL @ 3327.00usft (Silver Oak 11) |
| **Site:** | Roadrunner Federal | **North Reference:** | Grid |
| **Well:** | #2H | **Survey Calculation Method:** | Minimum Curvature |
| **Wellbore:** | Wellbore #1 Job #1411093 | | |
| **Design:** | Plan #2 06-25-14 | | |

**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) |
|---|---|---|---|---|---|---|---|---|---|
| 4,800.00 | 0.00 | 0.00 | 4,800.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 4,900.00 | 0.00 | 0.00 | 4,900.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 5,000.00 | 0.00 | 0.00 | 5,000.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 5,100.00 | 0.00 | 0.00 | 5,100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 5,200.00 | 0.00 | 0.00 | 5,200.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 5,300.00 | 0.00 | 0.00 | 5,300.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 5,400.00 | 0.00 | 0.00 | 5,400.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 5,500.00 | 0.00 | 0.00 | 5,500.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 5,600.00 | 0.00 | 0.00 | 5,600.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 5,700.00 | 0.00 | 0.00 | 5,700.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 5,800.00 | 0.00 | 0.00 | 5,800.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 5,900.00 | 0.00 | 0.00 | 5,900.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 6,000.00 | 0.00 | 0.00 | 6,000.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 6,100.00 | 0.00 | 0.00 | 6,100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 6,200.00 | 0.00 | 0.00 | 6,200.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 6,300.00 | 0.00 | 0.00 | 6,300.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 6,400.00 | 0.00 | 0.00 | 6,400.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 6,500.00 | 0.00 | 0.00 | 6,500.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 6,600.00 | 0.00 | 0.00 | 6,600.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 6,700.00 | 0.00 | 0.00 | 6,700.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 6,800.00 | 0.00 | 0.00 | 6,800.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 6,900.00 | 0.00 | 0.00 | 6,900.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 7,000.00 | 0.00 | 0.00 | 7,000.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 7,100.00 | 0.00 | 0.00 | 7,100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 7,200.00 | 0.00 | 0.00 | 7,200.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 7,237.60 | 0.00 | 0.00 | 7,237.60 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **KOP: Start Build 12.00°/100** | | | | | | | | | |
| 7,250.00 | 1.49 | 180.01 | 7,250.00 | -0.16 | 0.00 | 0.15 | 12.00 | 12.00 | 0.00 |
| 7,275.00 | 4.49 | 180.01 | 7,274.96 | -1.46 | 0.00 | 1.37 | 12.00 | 12.00 | 0.00 |
| 7,300.00 | 7.49 | 180.01 | 7,299.82 | -4.07 | 0.00 | 3.81 | 12.00 | 12.00 | 0.00 |
| 7,325.00 | 10.49 | 180.01 | 7,324.51 | -7.98 | 0.00 | 7.47 | 12.00 | 12.00 | 0.00 |
| 7,350.00 | 13.49 | 180.01 | 7,348.96 | -13.17 | 0.00 | 12.33 | 12.00 | 12.00 | 0.00 |
| 7,375.00 | 16.49 | 180.01 | 7,373.11 | -19.63 | 0.00 | 18.38 | 12.00 | 12.00 | 0.00 |
| 7,400.00 | 19.49 | 180.01 | 7,396.89 | -27.35 | -0.01 | 25.60 | 12.00 | 12.00 | 0.00 |
| 7,425.00 | 22.49 | 180.01 | 7,420.23 | -36.31 | -0.01 | 33.98 | 12.00 | 12.00 | 0.00 |
| 7,450.00 | 25.49 | 180.01 | 7,443.06 | -46.47 | -0.01 | 43.50 | 12.00 | 12.00 | 0.00 |
| 7,475.00 | 28.49 | 180.01 | 7,465.34 | -57.81 | -0.01 | 54.11 | 12.00 | 12.00 | 0.00 |
| 7,500.00 | 31.49 | 180.01 | 7,486.99 | -70.31 | -0.01 | 65.81 | 12.00 | 12.00 | 0.00 |
| 7,525.00 | 34.49 | 180.01 | 7,507.96 | -83.92 | -0.02 | 78.55 | 12.00 | 12.00 | 0.00 |
| 7,550.00 | 37.49 | 180.01 | 7,528.18 | -98.61 | -0.02 | 92.29 | 12.00 | 12.00 | 0.00 |
| 7,575.00 | 40.49 | 180.01 | 7,547.61 | -114.33 | -0.02 | 107.02 | 12.00 | 12.00 | 0.00 |
| 7,600.00 | 43.49 | 180.01 | 7,566.19 | -131.06 | -0.03 | 122.67 | 12.00 | 12.00 | 0.00 |
| 7,625.00 | 46.49 | 180.01 | 7,583.87 | -148.73 | -0.03 | 139.21 | 12.00 | 12.00 | 0.00 |
| 7,650.00 | 49.49 | 180.01 | 7,600.60 | -167.30 | -0.04 | 156.59 | 12.00 | 12.00 | 0.00 |
| 7,675.00 | 52.49 | 180.01 | 7,616.34 | -186.72 | -0.04 | 174.77 | 12.00 | 12.00 | 0.00 |
| 7,700.00 | 55.49 | 180.01 | 7,631.03 | -206.94 | -0.04 | 193.70 | 12.00 | 12.00 | 0.00 |
| 7,725.00 | 58.49 | 180.01 | 7,644.65 | -227.90 | -0.05 | 213.32 | 12.00 | 12.00 | 0.00 |
| 7,750.00 | 61.49 | 180.01 | 7,657.16 | -249.55 | -0.05 | 233.58 | 12.00 | 12.00 | 0.00 |
| 7,775.00 | 64.49 | 180.01 | 7,668.51 | -271.82 | -0.06 | 254.42 | 12.00 | 12.00 | 0.00 |
| 7,800.00 | 67.49 | 180.01 | 7,678.68 | -294.65 | -0.06 | 275.80 | 12.00 | 12.00 | 0.00 |
| 7,825.00 | 70.49 | 180.01 | 7,687.64 | -317.99 | -0.07 | 297.64 | 12.00 | 12.00 | 0.00 |
| 7,850.00 | 73.49 | 180.01 | 7,695.37 | -341.76 | -0.07 | 319.89 | 12.00 | 12.00 | 0.00 |
| 7,867.34 | 75.57 | 180.01 | 7,700.00 | -358.47 | -0.08 | 335.53 | 12.00 | 12.00 | 0.00 |
| **Lower Brushy Canyon "L"** | | | | | | | | | |

| | | | |
|---|---|---|---|
| Database: | Compass 5000 GCR DB | Local Co-ordinate Reference: | Well #2H |
| Company: | Strata Production Company | TVD Reference: | WELL @ 3327.00usft (Silver Oak 11) |
| Project: | Eddy County, New Mexico (NAD 27) | MD Reference: | WELL @ 3327.00usft (Silver Oak 11) |
| Site: | Roadrunner Federal | North Reference: | Grid |
| Well: | #2H | Survey Calculation Method: | Minimum Curvature |
| Wellbore: | Wellbore #1 Job #1411093 | | |
| Design: | Plan #2 06-25-14 | | |

**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) |
|---|---|---|---|---|---|---|---|---|---|
| 7,875.00 | 76.49 | 180.01 | 7,701.85 | -365.91 | -0.08 | 342.49 | 12.00 | 12.00 | 0.00 |
| 7,900.00 | 79.49 | 180.01 | 7,707.05 | -390.36 | -0.08 | 365.37 | 12.00 | 12.00 | 0.00 |
| 7,925.00 | 82.49 | 180.01 | 7,710.97 | -415.04 | -0.09 | 388.48 | 12.00 | 12.00 | 0.00 |
| 7,950.00 | 85.49 | 180.01 | 7,713.59 | -439.90 | -0.09 | 411.75 | 12.00 | 12.00 | 0.00 |
| 7,975.00 | 88.49 | 180.01 | 7,714.90 | -464.87 | -0.10 | 435.11 | 12.00 | 12.00 | 0.00 |
| 7,978.52 | 88.91 | 180.01 | 7,714.98 | -468.38 | -0.10 | 438.41 | 12.00 | 12.00 | 0.00 |
| LP at 88.91° Inc, Start Turn 5.30°/100' | | | | | | | | | |
| 8,000.00 | 88.91 | 178.87 | 7,715.39 | -489.86 | 0.11 | 458.58 | 5.30 | -0.02 | -5.30 |
| 8,100.00 | 88.89 | 173.57 | 7,717.31 | -589.59 | 6.70 | 554.25 | 5.30 | -0.02 | -5.30 |
| 8,200.00 | 88.88 | 168.27 | 7,719.26 | -688.28 | 22.46 | 652.19 | 5.30 | -0.01 | -5.30 |
| 8,300.00 | 88.89 | 162.97 | 7,721.20 | -785.10 | 47.29 | 751.54 | 5.30 | 0.00 | -5.30 |
| 8,400.00 | 88.90 | 157.67 | 7,723.14 | -879.20 | 80.94 | 851.48 | 5.30 | 0.01 | -5.30 |
| 8,448.09 | 88.91 | 155.12 | 7,724.05 | -923.26 | 100.20 | 899.49 | 5.30 | 0.02 | -5.30 |
| EOT: Hold 155.12° Azm | | | | | | | | | |
| 8,500.00 | 88.91 | 155.12 | 7,725.04 | -970.34 | 122.03 | 951.24 | 0.00 | 0.00 | 0.00 |
| 8,600.00 | 88.91 | 155.12 | 7,726.94 | -1,061.05 | 164.10 | 1,050.95 | 0.00 | 0.00 | 0.00 |
| 8,700.00 | 88.91 | 155.12 | 7,728.85 | -1,151.75 | 206.16 | 1,150.65 | 0.00 | 0.00 | 0.00 |
| 8,800.00 | 88.91 | 155.12 | 7,730.75 | -1,242.45 | 248.22 | 1,250.35 | 0.00 | 0.00 | 0.00 |
| 8,900.00 | 88.91 | 155.12 | 7,732.65 | -1,333.15 | 290.29 | 1,350.05 | 0.00 | 0.00 | 0.00 |
| 9,000.00 | 88.91 | 155.12 | 7,734.55 | -1,423.86 | 332.35 | 1,449.76 | 0.00 | 0.00 | 0.00 |
| 9,100.00 | 88.91 | 155.12 | 7,736.46 | -1,514.56 | 374.42 | 1,549.46 | 0.00 | 0.00 | 0.00 |
| 9,200.00 | 88.91 | 155.12 | 7,738.36 | -1,605.26 | 416.48 | 1,649.16 | 0.00 | 0.00 | 0.00 |
| 9,300.00 | 88.91 | 155.12 | 7,740.26 | -1,695.96 | 458.55 | 1,748.87 | 0.00 | 0.00 | 0.00 |
| 9,400.00 | 88.91 | 155.12 | 7,742.16 | -1,786.67 | 500.61 | 1,848.57 | 0.00 | 0.00 | 0.00 |
| 9,500.00 | 88.91 | 155.12 | 7,744.06 | -1,877.37 | 542.67 | 1,948.27 | 0.00 | 0.00 | 0.00 |
| 9,551.88 | 88.91 | 155.12 | 7,745.05 | -1,924.43 | 564.50 | 2,000.00 | 0.00 | 0.00 | 0.00 |
| Start Build 2.00°/100' | | | | | | | | | |
| 9,606.38 | 90.00 | 155.12 | 7,745.57 | -1,973.86 | 587.43 | 2,054.34 | 2.00 | 2.00 | 0.00 |
| Hold 90° Inc | | | | | | | | | |
| 9,700.00 | 90.00 | 155.12 | 7,745.57 | -2,058.80 | 626.81 | 2,147.70 | 0.00 | 0.00 | 0.00 |
| 9,800.00 | 90.00 | 155.12 | 7,745.57 | -2,149.51 | 668.88 | 2,247.42 | 0.00 | 0.00 | 0.00 |
| 9,900.00 | 90.00 | 155.12 | 7,745.57 | -2,240.23 | 710.96 | 2,347.14 | 0.00 | 0.00 | 0.00 |
| 10,000.00 | 90.00 | 155.12 | 7,745.57 | -2,330.95 | 753.03 | 2,446.86 | 0.00 | 0.00 | 0.00 |
| 10,100.00 | 90.00 | 155.12 | 7,745.57 | -2,421.67 | 795.10 | 2,546.58 | 0.00 | 0.00 | 0.00 |
| 10,200.00 | 90.00 | 155.12 | 7,745.57 | -2,512.39 | 837.17 | 2,646.30 | 0.00 | 0.00 | 0.00 |
| 10,300.00 | 90.00 | 155.12 | 7,745.57 | -2,603.11 | 879.24 | 2,746.02 | 0.00 | 0.00 | 0.00 |
| 10,354.13 | 90.00 | 155.12 | 7,745.57 | -2,652.22 | 902.02 | 2,800.00 | 0.00 | 0.00 | 0.00 |
| Start Build 2.00°/100' | | | | | | | | | |
| 10,400.00 | 90.92 | 155.12 | 7,745.20 | -2,693.83 | 921.32 | 2,845.74 | 2.00 | 2.00 | 0.00 |
| 10,444.13 | 91.80 | 155.12 | 7,744.16 | -2,733.85 | 939.88 | 2,889.74 | 2.00 | 2.00 | 0.00 |
| Hold 91.8° Inc | | | | | | | | | |
| 10,500.00 | 91.80 | 155.12 | 7,742.40 | -2,784.51 | 963.37 | 2,945.42 | 0.00 | 0.00 | 0.00 |
| 10,600.00 | 91.80 | 155.12 | 7,739.26 | -2,875.19 | 1,005.42 | 3,045.10 | 0.00 | 0.00 | 0.00 |
| 10,700.00 | 91.80 | 155.12 | 7,736.12 | -2,965.86 | 1,047.47 | 3,144.77 | 0.00 | 0.00 | 0.00 |
| 10,722.44 | 91.80 | 155.12 | 7,735.41 | -2,986.21 | 1,056.90 | 3,167.13 | 0.00 | 0.00 | 0.00 |
| Start Drop 2.00°/100' | | | | | | | | | |
| 10,800.00 | 90.25 | 155.12 | 7,734.03 | -3,056.56 | 1,089.53 | 3,244.46 | 2.00 | -2.00 | 0.00 |
| 10,812.44 | 90.00 | 155.12 | 7,734.00 | -3,067.84 | 1,094.76 | 3,256.87 | 2.00 | -2.00 | 0.00 |
| Hold 90° Inc | | | | | | | | | |
| 10,900.00 | 90.00 | 155.12 | 7,734.00 | -3,147.28 | 1,131.60 | 3,344.18 | 0.00 | 0.00 | 0.00 |
| 11,000.00 | 90.00 | 155.12 | 7,734.00 | -3,238.00 | 1,173.67 | 3,443.90 | 0.00 | 0.00 | 0.00 |
| 11,100.00 | 90.00 | 155.12 | 7,734.00 | -3,328.72 | 1,215.74 | 3,543.63 | 0.00 | 0.00 | 0.00 |
| 11,200.00 | 90.00 | 155.12 | 7,734.00 | -3,419.43 | 1,257.81 | 3,643.35 | 0.00 | 0.00 | 0.00 |

| | | | |
|---|---|---|---|
| Database: | Compass 5000 GCR DB | Local Co-ordinate Reference: | Well #2H |
| Company: | Strata Production Company | TVD Reference: | WELL @ 3327.00usft (Silver Oak 11) |
| Project: | Eddy County, New Mexico (NAD 27) | MD Reference: | WELL @ 3327.00usft (Silver Oak 11) |
| Site: | Roadrunner Federal | North Reference: | Grid |
| Well: | #2H | Survey Calculation Method: | Minimum Curvature |
| Wellbore: | Wellbore #1 Job #1411093 | | |
| Design: | Plan #2 06-25-14 | | |

**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) |
|---|---|---|---|---|---|---|---|---|---|
| 11,300.00 | 90.00 | 155.12 | 7,734.00 | -3,510.15 | 1,299.89 | 3,743.07 | 0.00 | 0.00 | 0.00 |
| 11,400.00 | 90.00 | 155.12 | 7,734.00 | -3,600.87 | 1,341.96 | 3,842.79 | 0.00 | 0.00 | 0.00 |
| 11,500.00 | 90.00 | 155.12 | 7,734.00 | -3,691.59 | 1,384.03 | 3,942.51 | 0.00 | 0.00 | 0.00 |
| 11,542.44 | 90.00 | 155.12 | 7,734.00 | -3,730.10 | 1,401.89 | 3,984.83 | 0.00 | 0.00 | 0.00 |
| TD at 11542.44 | | | | | | | | | |

**Design Targets**

| Target Name - hit/miss target - Shape | Dip Angle (°) | Dip Dir. (°) | TVD (usft) | +N/-S (usft) | +E/-W (usft) | Northing (usft) | Easting (usft) | Latitude | Longitude |
|---|---|---|---|---|---|---|---|---|---|
| Target 4 | 0.00 | 359.93 | 7,734.00 | -3,015.52 | 1,070.81 | 462,819.47 | 653,421.39 | 32° 16' 17.15549 N | 103° 50' 13.02719 W |
| - plan misses target center by 0.64usft at 10754.90usft MD (7734.58 TVD, -3015.65 N, 1070.56 E) | | | | | | | | | |
| - Point | | | | | | | | | |
| BHL Roadrunner Federa | 0.00 | 359.93 | 7,734.00 | -3,730.10 | 1,401.89 | 462,104.89 | 653,752.47 | 32° 16' 10.06891 N | 103° 50' 9.20968 W |
| - plan hits target center | | | | | | | | | |
| - Point | | | | | | | | | |
| Target 1 | 0.00 | 359.93 | 7,734.00 | -1,458.92 | 348.64 | 464,376.07 | 652,699.22 | 32° 16' 32.59251 N | 103° 50' 21.35491 W |
| - plan misses target center by 1.29usft at 9038.64usft MD (7735.29 TVD, -1458.90 N, 348.61 E) | | | | | | | | | |
| - Point | | | | | | | | | |
| Target 3 | 0.00 | 359.93 | 7,744.00 | -2,650.93 | 901.42 | 463,184.06 | 653,252.00 | 32° 16' 20.77119 N | 103° 50' 14.98047 W |
| - plan misses target center by 1.57usft at 10352.71usft MD (7745.57 TVD, -2650.93 N, 901.42 E) | | | | | | | | | |
| - Point | | | | | | | | | |
| Target 2 | 0.00 | 359.93 | 7,744.00 | -1,919.38 | 562.14 | 463,915.61 | 652,912.72 | 32° 16' 28.02611 N | 103° 50' 18.89288 W |
| - plan misses target center by 0.95usft at 9546.29usft MD (7744.95 TVD, -1919.35 N, 562.14 E) | | | | | | | | | |
| - Point | | | | | | | | | |

**Casing Points**

| Measured Depth (usft) | Vertical Depth (usft) | Name | Casing Diameter (") | Hole Diameter (") |
|---|---|---|---|---|
| 80.00 | 80.00 | 20" | 20 | 26 |
| 350.00 | 350.00 | 13 3/8" | 13-3/8 | 17-1/2 |
| 3,860.00 | 3,860.00 | 9 5/8" | 9-5/8 | 12-1/4 |

**Formations**

| Measured Depth (usft) | Vertical Depth (usft) | Name | Lithology | Dip (°) | Dip Direction (°) |
|---|---|---|---|---|---|
| 700.00 | 700.00 | Top of Salt | | 0.00 | 159.33 |
| 3,380.00 | 3,380.00 | Base of Salt | | 0.00 | 159.33 |
| 3,870.00 | 3,870.00 | Delaware | | 0.00 | 159.33 |
| 7,867.34 | 7,700.00 | Lower Brushy Canyon "L" | | 0.00 | 159.33 |

| | | | |
|---|---|---|---|
| **Database:** | Compass 5000 GCR DB | **Local Co-ordinate Reference:** | Well #2H |
| **Company:** | Strata Production Company | **TVD Reference:** | WELL @ 3327.00usft (Silver Oak 11) |
| **Project:** | Eddy County, New Mexico (NAD 27) | **MD Reference:** | WELL @ 3327.00usft (Silver Oak 11) |
| **Site:** | Roadrunner Federal | **North Reference:** | Grid |
| **Well:** | #2H | **Survey Calculation Method:** | Minimum Curvature |
| **Wellbore:** | Wellbore #1 Job #1411093 | | |
| **Design:** | Plan #2 06-25-14 | | |

**Plan Annotations**

| Measured Depth (usft) | Vertical Depth (usft) | Local Coordinates +N/-S (usft) | +E/-W (usft) | Comment |
|---|---|---|---|---|
| 7,237.60 | 7,237.60 | 0.00 | 0.00 | KOP: Start Build 12.00°/100' |
| 7,978.52 | 7,714.98 | -468.38 | -0.10 | LP at 88.91° Inc, Start Turn 5.30°/100' |
| 8,448.09 | 7,724.05 | -923.26 | 100.20 | EOT: Hold 155.12° Azm |
| 9,551.88 | 7,745.05 | -1,924.43 | 564.50 | Start Build 2.00°/100' |
| 9,606.38 | 7,745.57 | -1,973.86 | 587.43 | Hold 90° Inc |
| 10,354.13 | 7,745.57 | -2,652.22 | 902.02 | Start Build 2.00°/100' |
| 10,444.13 | 7,744.16 | -2,733.85 | 939.88 | Hold 91.8° Inc |
| 10,722.44 | 7,735.41 | -2,986.21 | 1,056.90 | Start Drop 2.00°/100' |
| 10,812.44 | 7,734.00 | -3,067.84 | 1,094.76 | Hold 90° Inc |
| 11,542.44 | 7,734.00 | -3,730.10 | 1,401.89 | TD at 11542.44 |

# Strata Production Company

**Eddy County, New Mexico (NAD 27)**
**Roadrunner Federal**
**#2H**

**Wellbore #1 Job #1411093**
**Plan #2 06-25-14**

# Anticollision Report

**25 June, 2014**

PHOENIX
TECHNOLOGY SERVICES

# Phoenix Technology Services

Anticollision Report

PHOENIX TECHNOLOGY SERVICES

| | | | |
|---|---|---|---|
| **Company:** | Strata Production Company | **Local Co-ordinate Reference:** | Well #2H |
| **Project:** | Eddy County, New Mexico (NAD 27) | **TVD Reference:** | WELL @ 3327.00usft (Silver Oak 11) |
| **Reference Site:** | Roadrunner Federal | **MD Reference:** | WELL @ 3327.00usft (Silver Oak 11) |
| **Site Error:** | 0.00 usft | **North Reference:** | Grid |
| **Reference Well:** | #2H | **Survey Calculation Method:** | Minimum Curvature |
| **Well Error:** | 0.00 usft | **Output errors are at** | 2.00 sigma |
| **Reference Wellbore** | Wellbore #1 Job #1411093 | **Database:** | Compass 5000 GCR DB |
| **Reference Design:** | Plan #2 06-25-14 | **Offset TVD Reference:** | Offset Datum |

**Reference** Plan #2 06-25-14

| | | | |
|---|---|---|---|
| **Filter type:** | NO GLOBAL FILTER: Using user defined selection & filtering criteria | | |
| **Interpolation Method:** | MD Interval 100.00usft | **Error Model:** | ISCWSA |
| **Depth Range:** | Unlimited | **Scan Method:** | Closest Approach 3D |
| **Results Limited by:** | Maximum center-center distance of 4,000.00 usft | **Error Surface:** | Elliptical Conic |
| **Warning Levels Evaluated at:** | 2.00 **Sigma** | **Casing Method:** | Not applied |

**Survey Tool Program** **Date** 06/25/14

| From (usft) | To (usft) | Survey (Wellbore) | Tool Name | Description |
|---|---|---|---|---|
| 0.00 | 11,542.38 | Plan #2 06-25-14 (Wellbore #1 Job #14110 | PHX+MWD+IGRF | PHX+MWD+IGRF v3:standard declination |

**Summary**

| Site Name / Offset Well - Wellbore - Design | Reference Measured Depth (usft) | Offset Measured Depth (usft) | Distance Between Centres (usft) | Distance Between Ellipses (usft) | Separation Factor | Warning |
|---|---|---|---|---|---|---|
| Forty Niner Ridge 25 Federal | | | | | | |
| 1H - Wellbore #1 - Surveys | 7,200.00 | 7,230.87 | 1,690.09 | 1,649.46 | 41.602 | CC |
| 1H - Wellbore #1 - Surveys | 7,243.03 | 7,275.33 | 1,690.17 | 1,649.34 | 41.395 | ES |
| 1H - Wellbore #1 - Surveys | 11,542.44 | 15,100.00 | 2,322.44 | 2,214.96 | 21.609 | SF |

**Offset Design** Forty Niner Ridge 25 Federal - 1H - Wellbore #1 - Surveys — Offset Site Error: 0.00 usft

Survey Program: 100-MWD — Offset Well Error: 0.00 usft

| Reference Measured Depth (usft) | Reference Vertical Depth (usft) | Offset Measured Depth (usft) | Offset Vertical Depth (usft) | Semi Major Axis Reference (usft) | Semi Major Axis Offset (usft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (usft) | Offset Wellbore Centre +E/-W (usft) | Distance Between Centres (usft) | Distance Between Ellipses (usft) | Minimum Separation (usft) | Separation Factor | Warning |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -31.33 | 1,478.77 | -900.25 | 1,731.26 | | | | |
| 100.00 | 100.00 | 108.13 | 108.12 | 0.15 | 0.10 | -31.35 | 1,478.02 | -900.57 | 1,730.83 | 1,730.58 | 0.25 | 6,895.406 | |
| 200.00 | 200.00 | 209.25 | 209.24 | 0.51 | 0.33 | -31.40 | 1,476.60 | -901.24 | 1,729.97 | 1,729.14 | 0.83 | 2,073.870 | |
| 300.00 | 300.00 | 305.91 | 305.88 | 0.87 | 0.53 | -31.44 | 1,475.24 | -901.97 | 1,729.17 | 1,727.78 | 1.39 | 1,243.568 | |
| 400.00 | 400.00 | 400.00 | 399.97 | 1.22 | 0.71 | -31.46 | 1,474.63 | -902.36 | 1,728.82 | 1,726.88 | 1.94 | 893.214 | |
| 439.56 | 439.56 | 434.01 | 433.98 | 1.37 | 0.78 | -31.46 | 1,474.61 | -902.38 | 1,728.80 | 1,726.65 | 2.15 | 804.949 | |
| 500.00 | 500.00 | 494.96 | 494.93 | 1.58 | 0.91 | -31.47 | 1,474.58 | -902.39 | 1,728.78 | 1,726.29 | 2.49 | 694.135 | |
| 600.00 | 600.00 | 595.94 | 595.91 | 1.94 | 1.12 | -31.46 | 1,474.53 | -902.30 | 1,728.70 | 1,725.64 | 3.06 | 564.978 | |
| 700.00 | 700.00 | 696.50 | 696.47 | 2.30 | 1.33 | -31.46 | 1,474.46 | -902.16 | 1,728.56 | 1,724.93 | 3.63 | 476.306 | |
| 800.00 | 800.00 | 795.35 | 795.32 | 2.66 | 1.54 | -31.46 | 1,474.37 | -902.07 | 1,728.44 | 1,724.25 | 4.19 | 412.231 | |
| 900.00 | 900.00 | 894.37 | 894.33 | 3.02 | 1.74 | -31.46 | 1,474.38 | -901.98 | 1,728.41 | 1,723.65 | 4.76 | 363.158 | |
| 1,000.00 | 1,000.00 | 994.50 | 994.47 | 3.38 | 1.96 | -31.45 | 1,474.42 | -901.88 | 1,728.38 | 1,723.05 | 5.33 | 324.204 | |
| 1,100.00 | 1,100.00 | 1,094.57 | 1,094.53 | 3.73 | 2.17 | -31.45 | 1,474.46 | -901.77 | 1,728.35 | 1,722.45 | 5.90 | 292.821 | |
| 1,200.00 | 1,200.00 | 1,194.81 | 1,194.78 | 4.09 | 2.38 | -31.45 | 1,474.49 | -901.65 | 1,728.32 | 1,721.85 | 6.47 | 267.097 | |
| 1,300.00 | 1,300.00 | 1,294.42 | 1,294.39 | 4.45 | 2.58 | -31.44 | 1,474.51 | -901.54 | 1,728.28 | 1,721.24 | 7.03 | 245.678 | |
| 1,400.00 | 1,400.00 | 1,396.17 | 1,396.14 | 4.81 | 2.79 | -31.44 | 1,474.48 | -901.46 | 1,728.22 | 1,720.62 | 7.60 | 227.307 | |
| 1,500.00 | 1,500.00 | 1,496.30 | 1,496.27 | 5.17 | 3.00 | -31.44 | 1,474.39 | -901.36 | 1,728.08 | 1,719.91 | 8.17 | 211.484 | |
| 1,600.00 | 1,600.00 | 1,595.43 | 1,595.40 | 5.53 | 3.21 | -31.44 | 1,474.35 | -901.21 | 1,727.98 | 1,719.24 | 8.74 | 197.694 | |
| 1,700.00 | 1,700.00 | 1,695.94 | 1,695.91 | 5.88 | 3.43 | -31.43 | 1,474.33 | -901.06 | 1,727.88 | 1,718.57 | 9.31 | 185.608 | |
| 1,800.00 | 1,800.00 | 1,796.00 | 1,795.97 | 6.24 | 3.63 | -31.43 | 1,474.29 | -900.92 | 1,727.77 | 1,717.89 | 9.87 | 174.987 | |
| 1,900.00 | 1,900.00 | 1,895.90 | 1,895.86 | 6.60 | 3.84 | -31.43 | 1,474.23 | -900.81 | 1,727.66 | 1,717.22 | 10.44 | 165.501 | |
| 2,000.00 | 2,000.00 | 1,995.79 | 1,995.76 | 6.96 | 4.05 | -31.42 | 1,474.17 | -900.70 | 1,727.55 | 1,716.54 | 11.01 | 156.965 | |
| 2,100.00 | 2,100.00 | 2,095.34 | 2,095.31 | 7.32 | 4.26 | -31.42 | 1,474.13 | -900.60 | 1,727.47 | 1,715.89 | 11.57 | 149.268 | |
| 2,200.00 | 2,200.00 | 2,195.56 | 2,195.52 | 7.68 | 4.47 | -31.42 | 1,474.10 | -900.50 | 1,727.38 | 1,715.24 | 12.14 | 142.274 | |

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

# Phoenix Technology Services

Anticollision Report

PHOENIX TECHNOLOGY SERVICES

| | | | |
|---|---|---|---|
| **Company:** | Strata Production Company | **Local Co-ordinate Reference:** | Well #2H |
| **Project:** | Eddy County, New Mexico (NAD 27) | **TVD Reference:** | WELL @ 3327.00usft (Silver Oak 11) |
| **Reference Site:** | Roadrunner Federal | **MD Reference:** | WELL @ 3327.00usft (Silver Oak 11) |
| **Site Error:** | 0.00 usft | **North Reference:** | Grid |
| **Reference Well:** | #2H | **Survey Calculation Method:** | Minimum Curvature |
| **Well Error:** | 0.00 usft | **Output errors are at** | 2.00 sigma |
| **Reference Wellbore** | Wellbore #1 Job #1411093 | **Database:** | Compass 5000 GCR DB |
| **Reference Design:** | Plan #2 06-25-14 | **Offset TVD Reference:** | Offset Datum |

**Offset Design** — Forty Niner Ridge 25 Federal - 1H - Wellbore #1 - Surveys

Offset Site Error: 0.00 usft

Survey Program: 100-MWD

Offset Well Error: 0.00 usft

| Reference Measured Depth (usft) | Reference Vertical Depth (usft) | Offset Measured Depth (usft) | Offset Vertical Depth (usft) | Semi Major Axis Reference (usft) | Semi Major Axis Offset (usft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (usft) | Offset Wellbore Centre +E/-W (usft) | Distance Between Centres (usft) | Distance Between Ellipses (usft) | Minimum Separation (usft) | Separation Factor | Warning |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2,300.00 | 2,300.00 | 2,295.59 | 2,295.55 | 8.04 | 4.67 | -31.42 | 1,474.07 | -900.35 | 1,727.29 | 1,714.58 | 12.71 | 135.907 | |
| 2,400.00 | 2,400.00 | 2,394.52 | 2,394.49 | 8.39 | 4.88 | -31.41 | 1,474.09 | -900.20 | 1,727.22 | 1,713.95 | 13.28 | 130.108 | |
| 2,423.94 | 2,423.94 | 2,417.98 | 2,417.95 | 8.48 | 4.93 | -31.41 | 1,474.10 | -900.18 | 1,727.22 | 1,713.81 | 13.41 | 128.799 | |
| 2,500.00 | 2,500.00 | 2,494.14 | 2,494.10 | 8.75 | 5.09 | -31.41 | 1,474.13 | -900.14 | 1,727.23 | 1,713.39 | 13.84 | 124.778 | |
| 2,600.00 | 2,600.00 | 2,594.45 | 2,594.42 | 9.11 | 5.30 | -31.40 | 1,474.18 | -899.99 | 1,727.19 | 1,712.78 | 14.41 | 119.849 | |
| 2,639.23 | 2,639.23 | 2,633.27 | 2,633.23 | 9.25 | 5.38 | -31.40 | 1,474.22 | -899.93 | 1,727.19 | 1,712.56 | 14.63 | 118.028 | |
| 2,700.00 | 2,700.00 | 2,693.78 | 2,693.75 | 9.47 | 5.51 | -31.40 | 1,474.28 | -899.84 | 1,727.20 | 1,712.22 | 14.98 | 115.312 | |
| 2,800.00 | 2,800.00 | 2,793.33 | 2,793.29 | 9.83 | 5.72 | -31.39 | 1,474.38 | -899.72 | 1,727.22 | 1,711.68 | 15.55 | 111.104 | |
| 2,900.00 | 2,900.00 | 2,892.78 | 2,892.74 | 10.19 | 5.93 | -31.39 | 1,474.52 | -899.59 | 1,727.28 | 1,711.16 | 16.11 | 107.187 | |
| 3,000.00 | 3,000.00 | 2,991.55 | 2,991.51 | 10.54 | 6.14 | -31.38 | 1,474.72 | -899.46 | 1,727.38 | 1,710.70 | 16.68 | 103.545 | |
| 3,100.00 | 3,100.00 | 3,093.01 | 3,092.98 | 10.90 | 6.35 | -31.37 | 1,474.94 | -899.36 | 1,727.51 | 1,710.25 | 17.25 | 100.125 | |
| 3,200.00 | 3,200.00 | 3,192.76 | 3,192.73 | 11.26 | 6.56 | -31.37 | 1,475.07 | -899.23 | 1,727.56 | 1,709.74 | 17.82 | 96.945 | |
| 3,300.00 | 3,300.00 | 3,293.13 | 3,293.10 | 11.62 | 6.77 | -31.36 | 1,475.21 | -899.13 | 1,727.63 | 1,709.24 | 18.39 | 93.953 | |
| 3,400.00 | 3,400.00 | 3,394.26 | 3,394.23 | 11.98 | 6.98 | -31.36 | 1,475.32 | -899.00 | 1,727.65 | 1,708.69 | 18.96 | 91.139 | |
| 3,467.34 | 3,467.34 | 3,461.38 | 3,461.34 | 12.22 | 7.12 | -31.35 | 1,475.36 | -898.92 | 1,727.64 | 1,708.30 | 19.34 | 89.342 | |
| 3,500.00 | 3,500.00 | 3,493.94 | 3,493.91 | 12.34 | 7.19 | -31.35 | 1,475.38 | -898.89 | 1,727.64 | 1,708.12 | 19.52 | 88.496 | |
| 3,600.00 | 3,600.00 | 3,595.15 | 3,595.11 | 12.70 | 7.40 | -31.35 | 1,475.41 | -898.76 | 1,727.60 | 1,707.51 | 20.09 | 85.984 | |
| 3,657.35 | 3,657.35 | 3,651.39 | 3,651.35 | 12.90 | 7.51 | -31.35 | 1,475.44 | -898.68 | 1,727.59 | 1,707.17 | 20.42 | 84.621 | |
| 3,700.00 | 3,700.00 | 3,693.57 | 3,693.53 | 13.05 | 7.60 | -31.34 | 1,475.49 | -898.62 | 1,727.60 | 1,706.94 | 20.66 | 83.633 | |
| 3,800.00 | 3,800.00 | 3,795.06 | 3,795.03 | 13.41 | 7.82 | -31.34 | 1,475.52 | -898.55 | 1,727.59 | 1,706.36 | 21.23 | 81.383 | |
| 3,900.00 | 3,900.00 | 3,901.20 | 3,901.16 | 13.77 | 8.04 | -31.34 | 1,475.32 | -898.42 | 1,727.36 | 1,705.55 | 21.81 | 79.209 | |
| 4,000.00 | 4,000.00 | 4,001.16 | 4,001.12 | 14.13 | 8.25 | -31.34 | 1,474.97 | -898.13 | 1,726.91 | 1,704.54 | 22.38 | 77.179 | |
| 4,100.00 | 4,100.00 | 4,100.48 | 4,100.45 | 14.49 | 8.45 | -31.33 | 1,474.74 | -897.77 | 1,726.52 | 1,703.58 | 22.94 | 75.256 | |
| 4,200.00 | 4,200.00 | 4,200.50 | 4,200.46 | 14.85 | 8.66 | -31.33 | 1,474.44 | -897.56 | 1,726.16 | 1,702.65 | 23.51 | 73.423 | |
| 4,300.00 | 4,300.00 | 4,303.99 | 4,303.95 | 15.20 | 8.88 | -31.34 | 1,473.90 | -897.48 | 1,725.68 | 1,701.59 | 24.09 | 71.649 | |
| 4,400.00 | 4,400.00 | 4,405.87 | 4,405.83 | 15.56 | 9.10 | -31.35 | 1,473.17 | -897.45 | 1,725.05 | 1,700.39 | 24.66 | 69.959 | |
| 4,500.00 | 4,500.00 | 4,507.06 | 4,507.01 | 15.92 | 9.31 | -31.36 | 1,472.30 | -897.45 | 1,724.31 | 1,699.08 | 25.23 | 68.346 | |
| 4,600.00 | 4,600.00 | 4,607.90 | 4,607.85 | 16.28 | 9.52 | -31.38 | 1,471.45 | -897.36 | 1,723.55 | 1,697.75 | 25.80 | 66.808 | |
| 4,700.00 | 4,700.00 | 4,708.18 | 4,708.12 | 16.64 | 9.73 | -31.39 | 1,470.61 | -897.14 | 1,722.71 | 1,696.35 | 26.37 | 65.337 | |
| 4,800.00 | 4,800.00 | 4,806.82 | 4,806.76 | 17.00 | 9.94 | -31.39 | 1,469.85 | -896.90 | 1,721.93 | 1,695.00 | 26.93 | 63.938 | |
| 4,900.00 | 4,900.00 | 4,906.55 | 4,906.49 | 17.36 | 10.14 | -31.40 | 1,469.07 | -896.79 | 1,721.21 | 1,693.71 | 27.50 | 62.593 | |
| 5,000.00 | 5,000.00 | 5,006.26 | 5,006.20 | 17.71 | 10.35 | -31.42 | 1,468.24 | -896.76 | 1,720.49 | 1,692.42 | 28.07 | 61.301 | |
| 5,100.00 | 5,100.00 | 5,104.58 | 5,104.51 | 18.07 | 10.56 | -31.43 | 1,467.49 | -896.74 | 1,719.82 | 1,691.19 | 28.63 | 60.070 | |
| 5,200.00 | 5,200.00 | 5,203.51 | 5,203.44 | 18.43 | 10.77 | -31.44 | 1,466.79 | -896.79 | 1,719.25 | 1,690.05 | 29.20 | 58.887 | |
| 5,300.00 | 5,300.00 | 5,304.25 | 5,304.18 | 18.79 | 10.98 | -31.46 | 1,466.07 | -896.88 | 1,718.68 | 1,688.92 | 29.77 | 57.741 | |
| 5,400.00 | 5,400.00 | 5,405.58 | 5,405.50 | 19.15 | 11.19 | -31.48 | 1,465.20 | -897.08 | 1,718.05 | 1,687.72 | 30.34 | 56.632 | |
| 5,500.00 | 5,500.00 | 5,507.19 | 5,507.11 | 19.51 | 11.40 | -31.50 | 1,464.25 | -897.24 | 1,717.34 | 1,686.43 | 30.91 | 55.562 | |
| 5,600.00 | 5,600.00 | 5,607.09 | 5,607.01 | 19.86 | 11.61 | -31.51 | 1,463.37 | -897.23 | 1,716.58 | 1,685.10 | 31.48 | 54.537 | |
| 5,700.00 | 5,700.00 | 5,708.95 | 5,708.86 | 20.22 | 11.83 | -31.52 | 1,462.53 | -897.00 | 1,715.76 | 1,683.71 | 32.05 | 53.539 | |
| 5,800.00 | 5,800.00 | 5,810.46 | 5,810.37 | 20.58 | 12.04 | -31.53 | 1,461.70 | -896.64 | 1,714.87 | 1,682.25 | 32.62 | 52.574 | |
| 5,900.00 | 5,900.00 | 5,916.15 | 5,916.05 | 20.94 | 12.26 | -31.53 | 1,460.66 | -896.05 | 1,713.74 | 1,680.54 | 33.20 | 51.620 | |
| 6,000.00 | 6,000.00 | 6,020.57 | 6,020.47 | 21.30 | 12.48 | -31.52 | 1,459.44 | -895.21 | 1,712.33 | 1,678.55 | 33.78 | 50.693 | |
| 6,100.00 | 6,100.00 | 6,124.89 | 6,124.77 | 21.66 | 12.70 | -31.51 | 1,458.14 | -893.97 | 1,710.65 | 1,676.29 | 34.36 | 49.790 | |
| 6,200.00 | 6,200.00 | 6,227.06 | 6,226.92 | 22.02 | 12.92 | -31.50 | 1,456.73 | -892.60 | 1,708.76 | 1,673.83 | 34.93 | 48.918 | |
| 6,300.00 | 6,300.00 | 6,327.27 | 6,327.11 | 22.37 | 13.13 | -31.49 | 1,455.22 | -891.34 | 1,706.83 | 1,671.33 | 35.50 | 48.080 | |
| 6,400.00 | 6,400.00 | 6,426.27 | 6,426.09 | 22.73 | 13.34 | -31.49 | 1,453.60 | -890.35 | 1,704.91 | 1,668.84 | 36.07 | 47.273 | |
| 6,500.00 | 6,500.00 | 6,524.29 | 6,524.09 | 23.09 | 13.55 | -31.50 | 1,451.95 | -889.61 | 1,703.08 | 1,666.45 | 36.63 | 46.496 | |
| 6,600.00 | 6,600.00 | 6,625.44 | 6,625.22 | 23.45 | 13.76 | -31.51 | 1,450.24 | -888.96 | 1,701.30 | 1,664.10 | 37.20 | 45.735 | |
| 6,700.00 | 6,700.00 | 6,726.56 | 6,726.32 | 23.81 | 13.97 | -31.52 | 1,448.40 | -888.34 | 1,699.43 | 1,661.66 | 37.77 | 44.993 | |
| 6,800.00 | 6,800.00 | 6,825.15 | 6,824.90 | 24.17 | 14.18 | -31.54 | 1,446.51 | -887.89 | 1,697.56 | 1,659.22 | 38.34 | 44.280 | |
| 6,900.00 | 6,900.00 | 6,925.67 | 6,925.40 | 24.52 | 14.39 | -31.57 | 1,444.51 | -887.64 | 1,695.73 | 1,656.82 | 38.91 | 43.584 | |
| 7,000.00 | 7,000.00 | 7,024.71 | 7,024.41 | 24.88 | 14.60 | -31.60 | 1,442.44 | -887.55 | 1,693.90 | 1,654.43 | 39.47 | 42.912 | |

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

# Phoenix Technology Services

Anticollision Report

PHOENIX TECHNOLOGY SERVICES

| | | | |
|---|---|---|---|
| Company: | Strata Production Company | Local Co-ordinate Reference: | Well #2H |
| Project: | Eddy County, New Mexico (NAD 27) | TVD Reference: | WELL @ 3327.00usft (Silver Oak 11) |
| Reference Site: | Roadrunner Federal | MD Reference: | WELL @ 3327.00usft (Silver Oak 11) |
| Site Error: | 0.00 usft | North Reference: | Grid |
| Reference Well: | #2H | Survey Calculation Method: | Minimum Curvature |
| Well Error: | 0.00 usft | Output errors are at | 2.00 sigma |
| Reference Wellbore | Wellbore #1 Job #1411093 | Database: | Compass 5000 GCR DB |
| Reference Design: | Plan #2 06-25-14 | Offset TVD Reference: | Offset Datum |

**Offset Design** — Forty Niner Ridge 25 Federal - 1H - Wellbore #1 - Surveys — Offset Site Error: 0.00 usft

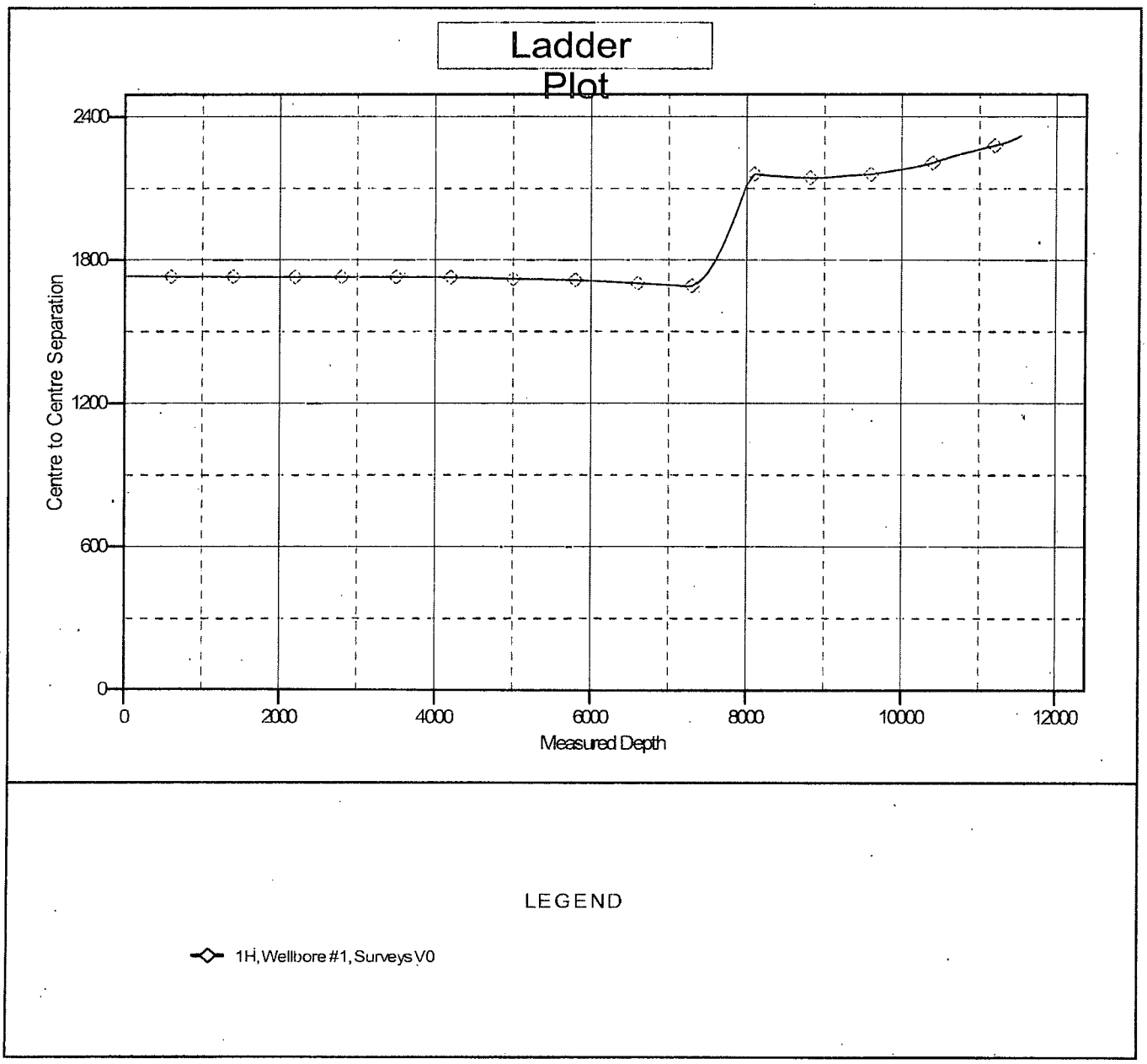
Survey Program: 100-MWD — Offset Well Error: 0.00 usft

| Reference Measured Depth (usft) | Reference Vertical Depth (usft) | Offset Measured Depth (usft) | Offset Vertical Depth (usft) | Semi Major Axis Reference (usft) | Semi Major Axis Offset (usft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (usft) | Offset Wellbore Centre +E/-W (usft) | Distance Between Centres (usft) | Distance Between Ellipses (usft) | Minimum Separation (usft) | Separation Factor | Warning |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7,100.00 | 7,100.00 | 7,125.30 | 7,124.98 | 25.24 | 14.82 | -31.64 | 1,440.32 | -887.52 | 1,692.09 | 1,652.05 | 40.04 | 42.256 | |
| 7,200.00 | 7,200.00 | 7,230.87 | 7,230.52 | 25.60 | 15.04 | -31.67 | 1,438.02 | -887.23 | 1,690.09 | 1,649.46 | 40.63 | 41.602 | CC |
| 7,243.03 | 7,243.01 | 7,275.33 | 7,274.98 | 25.75 | 15.13 | 148.32 | 1,437.03 | -886.96 | 1,690.17 | 1,649.34 | 40.83 | 41.395 | ES |
| 7,300.00 | 7,299.82 | 7,332.06 | 7,331.69 | 25.94 | 15.25 | 148.24 | 1,435.78 | -886.52 | 1,691.31 | 1,650.33 | 40.99 | 41.266 | |
| 7,400.00 | 7,396.89 | 7,424.58 | 7,424.19 | 26.25 | 15.45 | 147.45 | 1,433.90 | -885.90 | 1,709.15 | 1,668.72 | 40.43 | 42.277 | |
| 7,500.00 | 7,486.99 | 7,511.51 | 7,511.11 | 26.56 | 15.63 | 145.66 | 1,432.24 | -885.55 | 1,744.34 | 1,705.21 | 39.13 | 44.580 | |
| 7,600.00 | 7,566.19 | 7,586.60 | 7,586.18 | 26.90 | 15.79 | 142.42 | 1,430.98 | -885.35 | 1,795.67 | 1,758.05 | 37.62 | 47.735 | |
| 7,700.00 | 7,631.03 | 7,643.11 | 7,642.69 | 27.30 | 15.90 | 136.77 | 1,430.25 | -885.25 | 1,861.26 | 1,824.37 | 36.89 | 50.451 | |
| 7,800.00 | 7,678.68 | 7,688.00 | 7,687.58 | 27.78 | 16.00 | 127.27 | 1,429.89 | -885.23 | 1,938.50 | 1,900.22 | 38.28 | 50.636 | |
| 7,900.00 | 7,707.05 | 7,707.24 | 7,706.82 | 28.36 | 16.04 | 110.87 | 1,429.79 | -885.26 | 2,023.98 | 1,981.68 | 42.30 | 47.849 | |
| 8,000.00 | 7,715.39 | 7,714.22 | 7,713.79 | 29.05 | 16.05 | 92.80 | 1,429.76 | -885.28 | 2,113.97 | 2,068.92 | 45.06 | 46.920 | |
| 8,100.00 | 7,717.31 | 12,015.38 | 9,869.58 | 29.86 | 50.09 | -178.16 | -635.92 | 81.64 | 2,160.07 | 2,125.30 | 34.77 | 62.127 | |
| 8,200.00 | 7,719.26 | 12,078.00 | 9,868.40 | 30.82 | 50.99 | -178.37 | -698.30 | 86.98 | 2,156.13 | 2,120.77 | 35.37 | 60.967 | |
| 8,300.00 | 7,721.20 | 12,173.00 | 9,867.75 | 31.94 | 52.37 | -178.85 | -792.97 | 94.91 | 2,153.08 | 2,116.90 | 36.18 | 59.503 | |
| 8,400.00 | 7,723.14 | 12,260.23 | 9,867.67 | 33.21 | 53.63 | -179.48 | -879.88 | 102.32 | 2,150.64 | 2,113.63 | 37.01 | 58.104 | |
| 8,500.00 | 7,725.04 | 12,362.61 | 9,867.38 | 34.64 | 55.13 | 179.62 | -981.85 | 111.47 | 2,148.39 | 2,110.38 | 38.01 | 56.528 | |
| 8,600.00 | 7,726.94 | 12,463.54 | 9,866.70 | 36.21 | 56.67 | 178.70 | -1,082.38 | 120.48 | 2,146.30 | 2,107.22 | 39.08 | 54.925 | |
| 8,700.00 | 7,728.85 | 12,552.00 | 9,866.10 | 37.90 | 58.06 | 177.89 | -1,170.53 | 127.82 | 2,144.76 | 2,104.62 | 40.15 | 53.423 | |
| 8,800.00 | 7,730.75 | 12,635.81 | 9,865.82 | 39.71 | 59.35 | 177.11 | -1,254.05 | 134.64 | 2,144.12 | 2,102.86 | 41.26 | 51.964 | |
| 8,818.74 | 7,731.11 | 12,652.07 | 9,865.81 | 40.07 | 59.60 | 176.96 | -1,270.27 | 135.98 | 2,144.10 | 2,102.62 | 41.49 | 51.683 | |
| 8,900.00 | 7,732.65 | 12,725.94 | 9,865.83 | 41.62 | 60.72 | 176.29 | -1,343.87 | 142.19 | 2,144.33 | 2,101.82 | 42.51 | 50.446 | |
| 9,000.00 | 7,734.55 | 12,812.61 | 9,866.07 | 43.61 | 62.04 | 175.50 | -1,430.21 | 149.86 | 2,145.30 | 2,101.50 | 43.80 | 48.974 | |
| 9,100.00 | 7,736.46 | 12,886.59 | 9,866.75 | 45.68 | 63.19 | 174.85 | -1,503.82 | 157.06 | 2,147.35 | 2,102.30 | 45.06 | 47.661 | |
| 9,200.00 | 7,738.36 | 12,980.23 | 9,868.70 | 47.81 | 64.67 | 174.08 | -1,596.80 | 168.04 | 2,150.76 | 2,104.20 | 46.56 | 46.198 | |
| 9,300.00 | 7,740.26 | 13,100.80 | 9,870.09 | 49.99 | 66.64 | 173.10 | -1,716.42 | 183.05 | 2,153.62 | 2,105.19 | 48.43 | 44.471 | |
| 9,400.00 | 7,742.16 | 13,220.75 | 9,870.14 | 52.23 | 68.64 | 172.12 | -1,835.49 | 197.51 | 2,155.95 | 2,105.52 | 50.43 | 42.751 | |
| 9,500.00 | 7,744.06 | 13,336.27 | 9,868.69 | 54.51 | 70.57 | 171.14 | -1,950.30 | 210.20 | 2,157.64 | 2,105.10 | 52.54 | 41.069 | |
| 9,600.00 | 7,745.56 | 13,434.11 | 9,866.75 | 56.82 | 72.22 | 170.29 | -2,047.62 | 220.17 | 2,159.67 | 2,105.21 | 54.46 | 39.654 | |
| 9,700.00 | 7,745.57 | 13,522.74 | 9,865.01 | 59.17 | 73.70 | 169.50 | -2,135.85 | 228.34 | 2,163.84 | 2,107.39 | 56.44 | 38.336 | |
| 9,800.00 | 7,745.57 | 13,618.18 | 9,863.05 | 61.55 | 75.30 | 168.64 | -2,230.92 | 236.50 | 2,168.58 | 2,109.93 | 58.65 | 36.973 | |
| 9,900.00 | 7,745.57 | 13,716.13 | 9,860.81 | 63.95 | 76.93 | 167.75 | -2,328.55 | 244.02 | 2,173.81 | 2,112.78 | 61.04 | 35.616 | |
| 10,000.00 | 7,745.57 | 13,818.26 | 9,857.94 | 66.38 | 78.60 | 166.81 | -2,430.34 | 251.89 | 2,179.11 | 2,115.50 | 63.61 | 34.259 | |
| 10,100.00 | 7,745.57 | 13,905.39 | 9,855.63 | 68.83 | 80.02 | 166.02 | -2,517.19 | 258.51 | 2,185.12 | 2,119.09 | 66.03 | 33.094 | |
| 10,200.00 | 7,745.57 | 14,002.74 | 9,852.74 | 71.29 | 81.63 | 165.11 | -2,614.28 | 264.86 | 2,191.66 | 2,122.88 | 68.78 | 31.865 | |
| 10,300.00 | 7,745.57 | 14,090.77 | 9,849.84 | 73.78 | 83.11 | 164.26 | -2,702.13 | 269.76 | 2,198.75 | 2,127.27 | 71.49 | 30.757 | |
| 10,400.00 | 7,745.20 | 14,166.24 | 9,847.56 | 76.27 | 84.36 | 163.50 | -2,777.50 | 273.01 | 2,207.36 | 2,133.44 | 73.93 | 29.858 | |
| 10,500.00 | 7,742.40 | 14,276.06 | 9,844.28 | 78.79 | 86.12 | 162.43 | -2,887.15 | 277.93 | 2,218.89 | 2,141.72 | 77.18 | 28.751 | |
| 10,600.00 | 7,739.26 | 14,439.71 | 9,837.85 | 81.32 | 88.77 | 161.03 | -3,050.13 | 291.07 | 2,229.39 | 2,147.68 | 81.71 | 27.284 | |
| 10,700.00 | 7,736.12 | 14,530.68 | 9,833.80 | 83.85 | 90.27 | 160.32 | -3,140.44 | 301.30 | 2,238.91 | 2,154.21 | 84.70 | 26.434 | |
| 10,800.00 | 7,734.03 | 14,618.69 | 9,830.69 | 86.40 | 91.75 | 159.71 | -3,227.67 | 312.50 | 2,248.17 | 2,160.26 | 87.91 | 25.573 | |
| 10,900.00 | 7,734.00 | 14,727.76 | 9,827.56 | 88.96 | 93.61 | 158.95 | -3,335.53 | 328.38 | 2,255.82 | 2,164.42 | 91.40 | 24.681 | |
| 11,000.00 | 7,734.00 | 14,824.35 | 9,824.74 | 91.52 | 95.27 | 158.30 | -3,430.90 | 343.44 | 2,263.36 | 2,168.74 | 94.62 | 23.921 | |
| 11,100.00 | 7,734.00 | 14,924.00 | 9,821.69 | 94.09 | 97.02 | 157.63 | -3,529.28 | 359.01 | 2,271.07 | 2,173.08 | 97.99 | 23.178 | |
| 11,200.00 | 7,734.00 | 15,016.55 | 9,818.62 | 96.67 | 98.68 | 157.00 | -3,620.72 | 372.92 | 2,279.09 | 2,177.79 | 101.30 | 22.498 | |
| 11,300.00 | 7,734.00 | 15,100.00 | 9,815.82 | 99.26 | 100.16 | 156.42 | -3,703.24 | 385.03 | 2,287.63 | 2,183.14 | 104.49 | 21.894 | |
| 11,400.00 | 7,734.00 | 15,100.00 | 9,815.82 | 101.85 | 100.16 | 156.42 | -3,703.24 | 385.03 | 2,298.95 | 2,193.24 | 105.72 | 21.746 | |
| 11,500.00 | 7,734.00 | 15,100.00 | 9,815.82 | 104.45 | 100.16 | 156.42 | -3,703.24 | 385.03 | 2,314.55 | 2,207.60 | 106.95 | 21.641 | |
| 11,542.44 | 7,734.00 | 15,100.00 | 9,815.82 | 105.56 | 100.16 | 156.42 | -3,703.24 | 385.03 | 2,322.44 | 2,214.96 | 107.48 | 21.609 | SF |

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

| | | | |
|---|---|---|---|
| **Company:** | Strata Production Company | **Local Co-ordinate Reference:** | Well #2H |
| **Project:** | Eddy County, New Mexico (NAD 27) | **TVD Reference:** | WELL @ 3327.00usft (Silver Oak 11) |
| **Reference Site:** | Roadrunner Federal | **MD Reference:** | WELL @ 3327.00usft (Silver Oak 11) |
| **Site Error:** | 0.00 usft | **North Reference:** | Grid |
| **Reference Well:** | #2H | **Survey Calculation Method:** | Minimum Curvature |
| **Well Error:** | 0.00 usft | **Output errors are at** | 2.00 sigma |
| **Reference Wellbore** | Wellbore #1 Job #1411093 | **Database:** | Compass 5000 GCR DB |
| **Reference Design:** | Plan #2 06-25-14 | **Offset TVD Reference:** | Offset Datum |

Reference Depths are relative to WELL @ 3327.00usft (Silver Oak 11)
Offset Depths are relative to Offset Datum
Central Meridian is 104° 19' 60.00000 W
Coordinates are relative to: #2H
Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 30
Grid Convergence at Surface is: 0.26°



| | | | |
|---|---|---|---|
| **Company:** | Strata Production Company | **Local Co-ordinate Reference:** | Well #2H |
| **Project:** | Eddy County, New Mexico (NAD 27) | **TVD Reference:** | WELL @ 3327.00usft (Silver Oak 11) |
| **Reference Site:** | Roadrunner Federal | **MD Reference:** | WELL @ 3327.00usft (Silver Oak 11) |
| **Site Error:** | 0.00 usft | **North Reference:** | Grid |
| **Reference Well:** | #2H | **Survey Calculation Method:** | Minimum Curvature |
| **Well Error:** | 0.00 usft | **Output errors are at** | 2.00 sigma |
| **Reference Wellbore** | Wellbore #1 Job #1411093 | **Database:** | Compass 5000 GCR DB |
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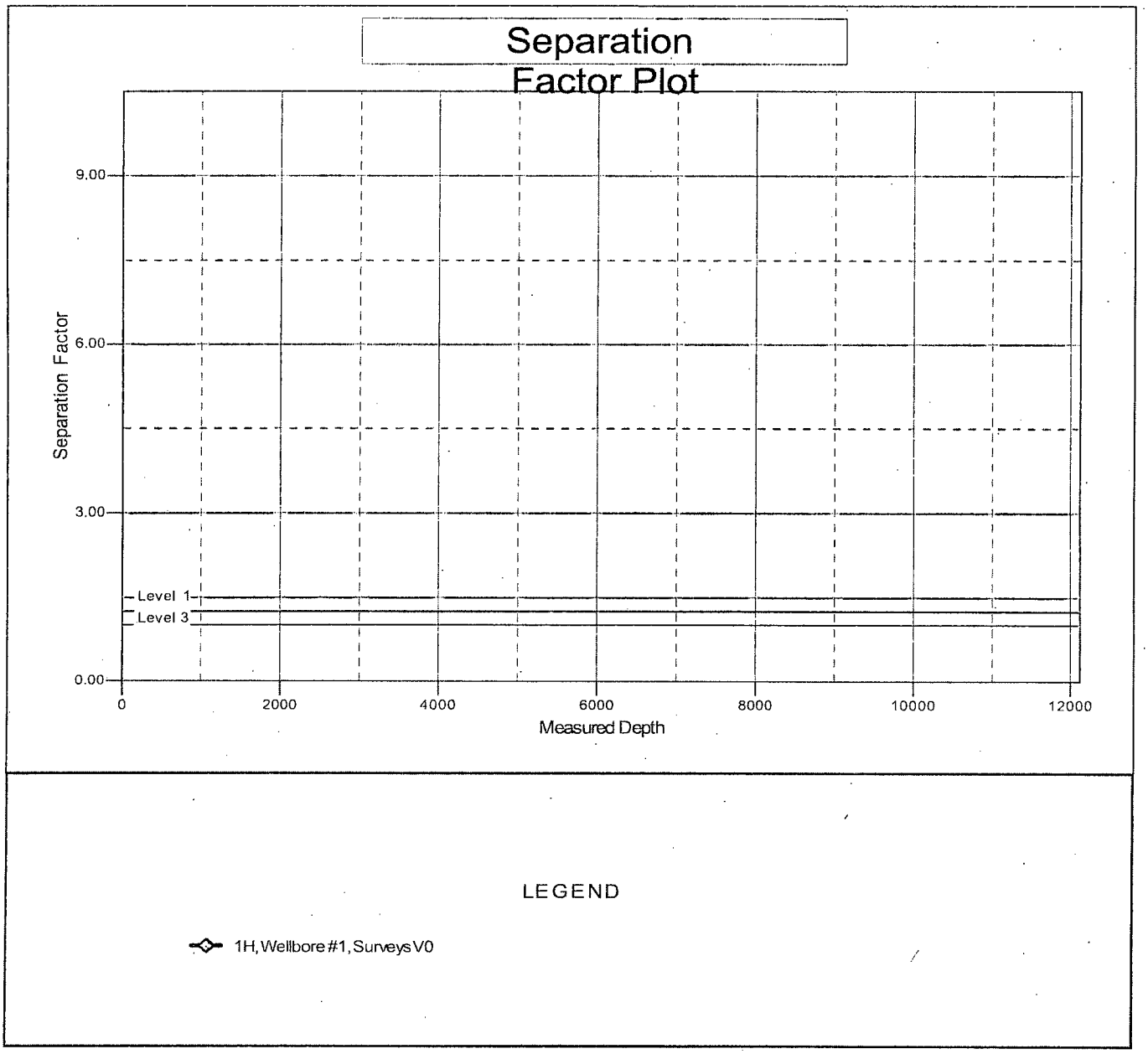
Reference Depths are relative to WELL @ 3327.00usft (Silver Oak 11)
Offset Depths are relative to Offset Datum
Central Meridian is 104° 19' 60.00000 W

Coordinates are relative to: #2H
Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 30
Grid Convergence at Surface is: 0.26°



# PECOS DISTRICT
# CONDITIONS OF APPROVAL

| | |
|---|---|
| OPERATOR'S NAME: | STRATA PRODUCTION |
| LEASE NO.: | NM114978 |
| WELL NAME & NO.: | 2-ROADRUNNER FEDERAL |
| SURFACE HOLE FOOTAGE: | 1220'/N. & 660'/W. |
| BOTTOM HOLE FOOTAGE | 330'/S. & 2062'/W. |
| LOCATION: | Section 25, T. 23 S., R. 30 E., NMPM |
| COUNTY: | Eddy County, New Mexico |

## I. DRILLING

### A. DRILLING OPERATIONS REQUIREMENTS

The BLM is to be notified a minimum of 4 hours in advance for a representative to witness:

a. Spudding well
b. Setting and/or Cementing of all casing strings
c. BOPE tests

☒ **Eddy County**
Call the Carlsbad Field Office, 620 East Greene St., Carlsbad, NM 88220, (575) 361-2822

1. **Due to recent H2S encounters in the salt formation, it is recommended that monitoring equipment be onsite for potential Hydrogen Sulfide prior to drilling out the surface shoe. If Hydrogen Sulfide is encountered, please report measurements and formations to the BLM.**

2. Unless the production casing has been run and cemented or the well has been properly plugged, the drilling rig shall not be removed from over the hole without prior approval. **If the drilling rig is removed without approval – an Incident of Non-Compliance will be written and will be a "Major" violation.**

3. Floor controls are required for 3M or Greater systems. These controls will be on the rig floor, unobstructed, readily accessible to the driller and will be operational at all times during drilling and/or completion activities. Rig floor is defined as the area immediately around the rotary table; the area immediately above the substructure on which the draw works is located, this does not include the dog house or stairway area.

4. **The record of the drilling rate along with the GR/N well log run from TD to surface (horizontal well – vertical portion of hole) shall be submitted to the BLM office as well as all other logs run on the borehole 30 days from completion. If available, a digital copy of the logs is to be submitted in addition to the paper**

**copies. The Rustler top and top and bottom of Salt are to be recorded on the Completion Report.**

## B. CASING

**Changes to the approved APD casing program need prior approval if the items substituted are of lesser grade or different casing size. The Operator can exchange the components of the proposal with that of superior strength (i.e. changing from J-55 to N-80, or from 36# to 40#).**
**Changes to the approved cement program need prior approval if the altered cement plan has less volume or strength or if the changes are substantial (i.e. Multistage tool, ECP, etc.).**

**Centralizers required on surface casing per Onshore Order 2.III.B.1.f.**

**Wait on cement (WOC) time prior to drilling out for a primary cement job will be a minimum 18 hours for a water basin, 24 hours in the potash area, or 500 pounds compressive strength, whichever is greater for all casing strings. DURING THIS WOC TIME, NO DRILL PIPE, ETC. SHALL BE RUN IN THE HOLE. Provide compressive strengths including hours to reach required 500 pounds compressive strength prior to cementing each casing string. IF OPERATOR DOES NOT HAVE THE WELL SPECIFIC CEMENT DETAILS ONSITE PRIOR TO PUMPING THE CEMENT FOR EACH CASING STRING, THE WOC WILL BE 30 HOURS. See individual casing strings for details regarding lead cement slurry requirements.**

**No pea gravel permitted for remedial or fall back remedial without prior authorization from the BLM engineer.**

**HIGH CAVE/KARST**
**R-111-P Potash**
**Possible lost circulation in the Delaware Mountain Group.**

1. The **13-3/8** inch surface casing shall be set at **approximately 350 feet (a minimum of 25 feet into the Rustler Anhydrite and above the salt)** and cemented to the surface. **If salt is encounter set casing at least 25 feet above the salt.**

    a. If cement does not circulate to the surface, the appropriate BLM office shall be notified and a temperature survey utilizing an electronic type temperature survey with surface log readout will be used or a cement bond log shall be run to verify the top of the cement. Temperature survey will be run a minimum of six hours after pumping cement and ideally between 8-10 hours after completing the cement job.

    **b. Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry.**

c. Wait on cement (WOC) time for a remedial job will be a minimum of 4 hours after bringing cement to surface or 500 pounds compressive strength, whichever is greater.

d. If cement falls back, remedial cementing will be done prior to drilling out that string.

2. The minimum required fill of cement behind the **9-5/8** inch intermediate casing is:

Single Stage option:

☒ Cement to surface. If cement does not circulate see B.1.a, c-d above.

Multi-stage Option:
**Operator proposes a contingency two stage cement job if lost circulation is encountered, DV tool will be set at approximately 2000'. If no lost circulation is encountered the casing will be cemented to surface in a single stage.**

a. First stage to DV tool:

☒ Cement to circulate. If cement does not circulate, contact the appropriate BLM office before proceeding with second stage cement job. Operator should have plans as to how they will achieve circulation on the next stage. **Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to potash and cave/karst.**

b. Second stage above DV tool:

☒ Cement to surface. If cement does not circulate see B.1.a, c-d above. **Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to potash and cave/karst**

3. The minimum required fill of cement behind the **5-1/2** inch production casing is:

Single Stage option:

☒ Cement to surface. If cement does not circulate, contact the appropriate BLM office. **Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to potash.**

Multi-stage Option:
**Operator proposes a contingency two stage cement job if lost circulation is encountered, DV tool will be set at approximately 4000'. If no lost circulation is encountered the casing will be cemented to surface in a single stage.**

a. First stage to DV tool:

☒ Cement to circulate. If cement does not circulate, contact the appropriate BLM office before proceeding with second stage cement job. Operator should have plans as to how they will achieve circulation on the next stage. **Additional cement may be required – excess calculates to 9%.**

b. Second stage above DV tool:

☒ Cement to surface. If cement does not circulate, contact the appropriate BLM office.

4. If hardband drill pipe is rotated inside casing, returns will be monitored for metal. If metal is found in samples, drill pipe will be pulled and rubber protectors which have a larger diameter than the tool joints of the drill pipe will be installed prior to continuing drilling operations.

5. Whenever a casing string is cemented in the R-111-P potash area, the NMOCD requirements shall be followed.

CRW 070714