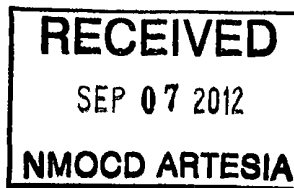


District I :
1625 N French Dr, Hobbs, NM 88240
Phone (575) 393-6161 Fax (575) 393-0720
District II
811 S First St., Artesia, NM 88210
Phone (575) 748-1283 Fax (575) 748-9720
District III
1000 Rio Brazos Road, Aztec, NM 87410
Phone (505) 334-6178 Fax (505) 334-6170
District IV
1220 S St Francis Dr., Santa Fe, NM 87505
Phone (505) 476-3460 Fax (505) 476-3462

State of New Mexico
Energy Minerals and Natural Resources
Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-101
Revised December 16, 2011



Permit

APPLICATION FOR PERMIT TO DRILL, RE-ENTER, DEEPEN, PLUGBACK, OR ADD A ZONE

¹ Operator Name and Address COG Production LLC 550 W Texas Ave., Suite 1000 Midland, TX 79701		² OGRID Number 217955
⁴ Property Code 37487 39328		³ API Number 30-015-40652
³ Property Name Reposado 2 State Com		⁶ Well No. 3H

⁷ Surface Location

UL - Lot	Section	Township	Range	Lot Idn	Feet from	N/S Line	Feet From	E/W Line	County
N	2	26S	29E		360	South	1840	West	Eddy

⁸ Pool Information

Corral Canyon; Bone Spring, South	13354
--	--------------

Additional Well Information

⁹ Work Type N	¹⁰ Well Type O	¹¹ Cable/Rotary R	¹² Lease Type S	¹³ Ground Level Elevation 3017'
¹⁴ Multiple Y	¹⁵ Proposed Depth 9600' TVD of Pilot Hole	¹⁶ Formation Bone Spring	¹⁷ Contractor Patriot	¹⁸ Spud Date 10/01/12
Depth to Ground water		Distance from nearest fresh water well		Distance to nearest surface water

¹⁹ Proposed Casing and Cement Program

Type	Hole Size	Casing Size	Casing Weight/ft	Setting Depth	Sacks of Cement	Estimated TOC
Surf	17 1/2"	13 3/8"	48#	650'	600	Surface
Int 1	12 1/4"	9 5/8"	36#	3100'	980	Surface
Int 2	8 3/4"	7"	29#	8100'	820	Surface
Prod Top Lat	6 1/8"	4 1/2"	11.6#	12168'	450	7270'
Prod Btm Lat	6 1/8"	4 1/2"	11.6#	13287'	640	7800'

Casing/Cement Program: Additional Comments

See attached.

Proposed Blowout Prevention Program

Type	Working Pressure	Test Pressure	Manufacturer
Double Ram	3000	3000	Cameron

I hereby certify that the information given above is true and complete to the best of my knowledge and belief.

I further certify that the drilling pit will be constructed according to NMOCD guidelines ☒, a general permit ☐, or an (attached) alternative OCD-approved plan ☐.

Signature:

Melanie J. Parker

Printed name:

Melanie J. Parker

Title:

Regulatory Coordinator

E-mail Address:

mparker@concho.com

Date:

09/07/2012

Phone:

575-748-6940

OIL CONSERVATION DIVISION

Approved By:

T. C. Shepard

Title:

Geologist

Approved Date:

9/10/2012

Expiration Date:

9/10/2014

Conditions of Approval Attached

COG Operating LLC
Reposado 2 State Com 3H
SHL: 360' FSL & 1840' FWL
BHL(S): 330' FNL & 1840' FWL
S2, T26S, R29E
Eddy County, NM

1. Ground Elevation Above Sea Level: 3017'

2. Proposed Drilling Depths:

Pilot Hole: 9600' MD / TVD
 Lateral 1: 13287' MD / 8820' TVD
 Lateral 2: 12168' MD / 7700' TVD

3. Estimated Tops Of Geological Markers:

Rustler	608'	Avalon Shale	7191'
Top of Salt	1367'	1st Bone Spring Sand	7808'
Base of Salt	3020'	2nd Bone Spring Sand	8619'
Delaware (Lamar)	3081'	Bone Spring Carbonate	8918'
Bone Spring	6884'	Charkey	9259'

4. Possible Mineral Bearing Formations:

Delaware	Gas/Oil
Bone Spring	Gas/Oil

5. Casing Program:

Hole size	Interval	OD of Casing	Weight	Grade	Connection	TOC
17-1/2"	40' - 650'	13-3/8"	48#	H40	STC	Surf
12-1/4"	650' - 3100'	9-5/8"	36#	J55	LTC	Surf
8-3/4"	3100' - 9600'	7" @ 8100'	29#	P110	LTC	Surf
6-1/8"	8100' - 13287'	4-1/2"	11.6#	P110	LTC	7800'
6-1/8"	7200' - 12168'	4-1/2"	11.6#	P110	LTC	7270'

- Drill 8-3/4" vertical pilot hole to ~9600'. Log OH, set 100 sx H (17.2/0.98) plug f/ 9350' - 9600', 340 sx H plug f/ 7900' - 8800'. Dress off top cement plug to 8100'. Run and cement 7" casing.
- Drill out below 7" to 1st KOP and drill lateral 1 to ~ 13287' MD / 8820' TVD. Run 4-1/2" liner f/ ~ 7800' - 13287' and circulate cement.
- Set whipstock and mill window / KOP for lateral 2 @ ~ 7227'. Drill lateral 2 to ~ 12168' MD & 7700' TVD. Run 4-1/2" liner f/ ~ 7270' - 12168' and circulate cement.

6. Cementing and Setting Depths:

String	Depths	Sx	Slurry
*13-3/8" Surface	0' - 650'	265 335	Lead: C w/ 4% gel & 2% CaCl ₂ (13.5/1.75) Tail: C w/ 2% CaCl ₂ (14.8 / 1.34)
9-5/8" Intermediate	0' - 3100'	790 190	Lead: C w/ 4% gel & 1% CaCl ₂ (13.5/1.75) Tail: C w/ 1% CaCl ₂ (14.8 / 1.34)
7" Intermediate	0' - 8100'	720 100	Lead: 65:35:6 H blend (12.7/1.99) Tail: H + additives (15.6/1.18)
4-1/2" Production Liner 1	7800' - 13287'	640	50:50:2 H blend (14.4/1.24)
4-1/2" Production Liner 2	7270' - 12168'	100 350	Howco Acid Soluble cement (15.0/2.60) 50:50:2 H blend (14.4/1.24)

*If necessary, will run a temperature survey and 1" to surface with C w/ 2% CaCl₂.

7. Pressure Control Equipment: After setting 13-3/8" casing and installing 2000 psi casing head, NU 13-5/8" 2000 psi double ram BOP and test with clear fluid to 2000 psi using 3rd party testers.

After setting 9-5/8" casing and installing 3000 psi casing head, NU 11" 3000 psi double ram BOP and 3000 psi annular BOP, and test with clear fluid to 3000 psi using 3rd party testers.

8. Proposed Mud Circulating System:

<u>Interval</u>	<u>Mud Wt.</u>	<u>Visc.</u>	<u>FL</u>	<u>Type Mud System</u>
40' - 650'	8.5 - 8.9	32 - 34	NC	Fresh water gel/lime slurry. Add paper for seepage. If losses occur, utilize 6-12 lb/bbl LCM. If necessary, spot high vis LCM pill for losses. If not regained, dry drill to depth.
650' - 3100'	10.0 - 10.2	28 - 32	NC	Saturated salt water. Add paper for seepage and utilize MF-55 or salt gel sweeps for hole cleaning. If losses occur, utilize 6-10 lb/bbl LCM.
3100' - 9600'	8.6 - 9.2	28 - 34		Cut brine. Drill out w/ cut brine using paper and high viscosity sweeps for seepage and hole cleaning. Sweep with MF-55 or salt gel as necessary for hole cleaning. Spot a high vis pill on bottom for running casing.
8100' - 13287' & 7227' - 12168'	9.0 - 9.3	28 - 34		Cut brine. Drill interval w/ cut brine using PHPA and/or XC for hole cleaning and stability. Weight up with sack salt, if necessary.

DISTRICT I
1625 N. FRANCES DR., BOBBS, NM 88240

State of New Mexico
Energy, Minerals and Natural Resources Department

Form C-102

DISTRICT II
1801 W. GRAND AVENUE, ARTESIA, NM 88210

OIL CONSERVATION DIVISION
11885 SOUTH ST. FRANCIS DR.
Santa Fe, New Mexico 87505

Revised October 12, 2010
Submit to Appropriate District Office
State Lease - 4 Copies
Fee Lease - 3 Copies

DISTRICT III
1000 RIO BRAZOS RD., AZTEC, NM 87410

DISTRICT IV
11885 S. ST. FRANCIS DR., SANTA FE, NM 87505

WELL LOCATION AND ACREAGE DEDICATION PLAT

☐ AMENDED REPORT

API Number 30-015-40652	Pool Code 13354	Pool Name CORRAL CANYON; B.S. South
39328	Property Name REPOSADO 2 STATE COM	Well Number 3H
OGRID No. 217955	Operator Name COG PRODUCTION, LLC	Elevation 3017'

Surface Location

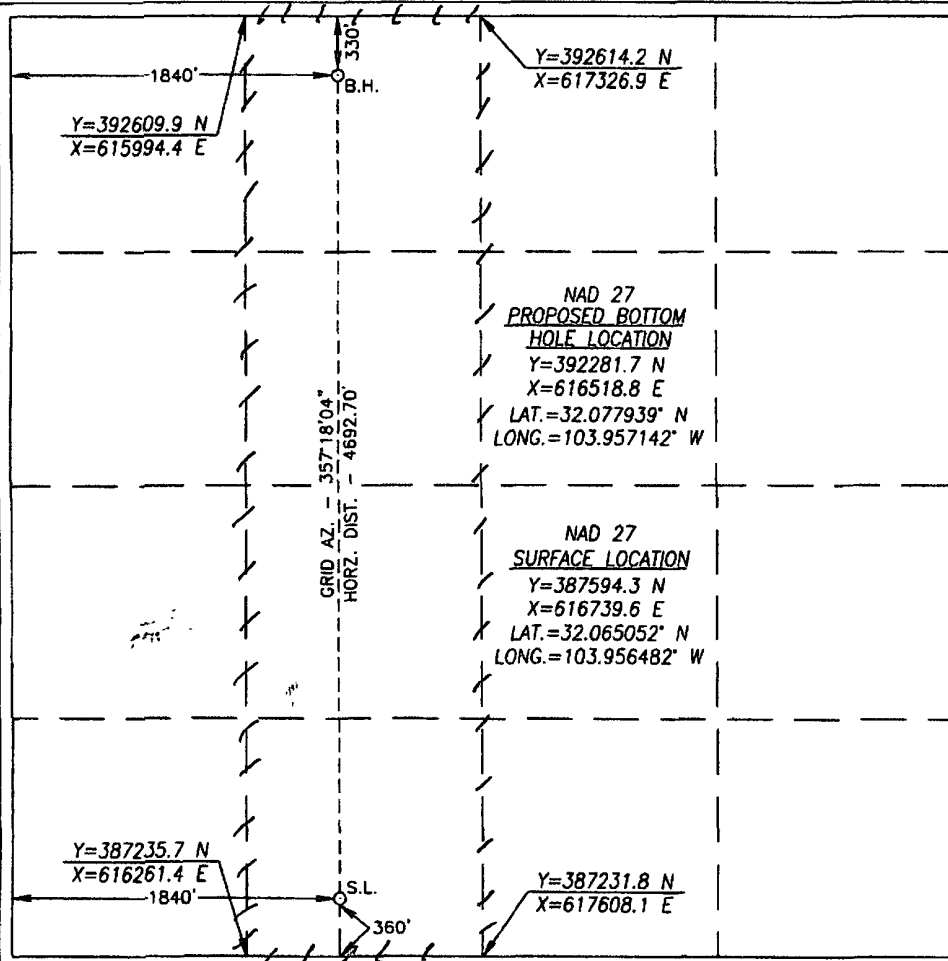
UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
N	2	26-E	29-E		360	SOUTH	1840	WEST	EDDY

Bottom Hole Location If Different From Surface

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
C	2	26-E	29-E		330	NORTH	1840	WEST	EDDY

Dedicated Acres	Joint or Infill	Consolidation Code	Order No.
160			

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

	OPERATOR CERTIFICATION I hereby certify that the information herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division. <i>Melanie Parker</i> 9/17/12 Signature Date <i>Melanie J Parker</i> Printed Name SURVEYOR CERTIFICATION I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief. AUGUST 28, 2012 Date Surveyed Signature Professional Surveyor <i>Chad L. HARCROW</i> 17773 8/30/12 12-94 Certificate No. 17777 LA 63-2012
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Reposado 2 State Com 3H

L Avalon Shale & 2nd Bone Spring Sand

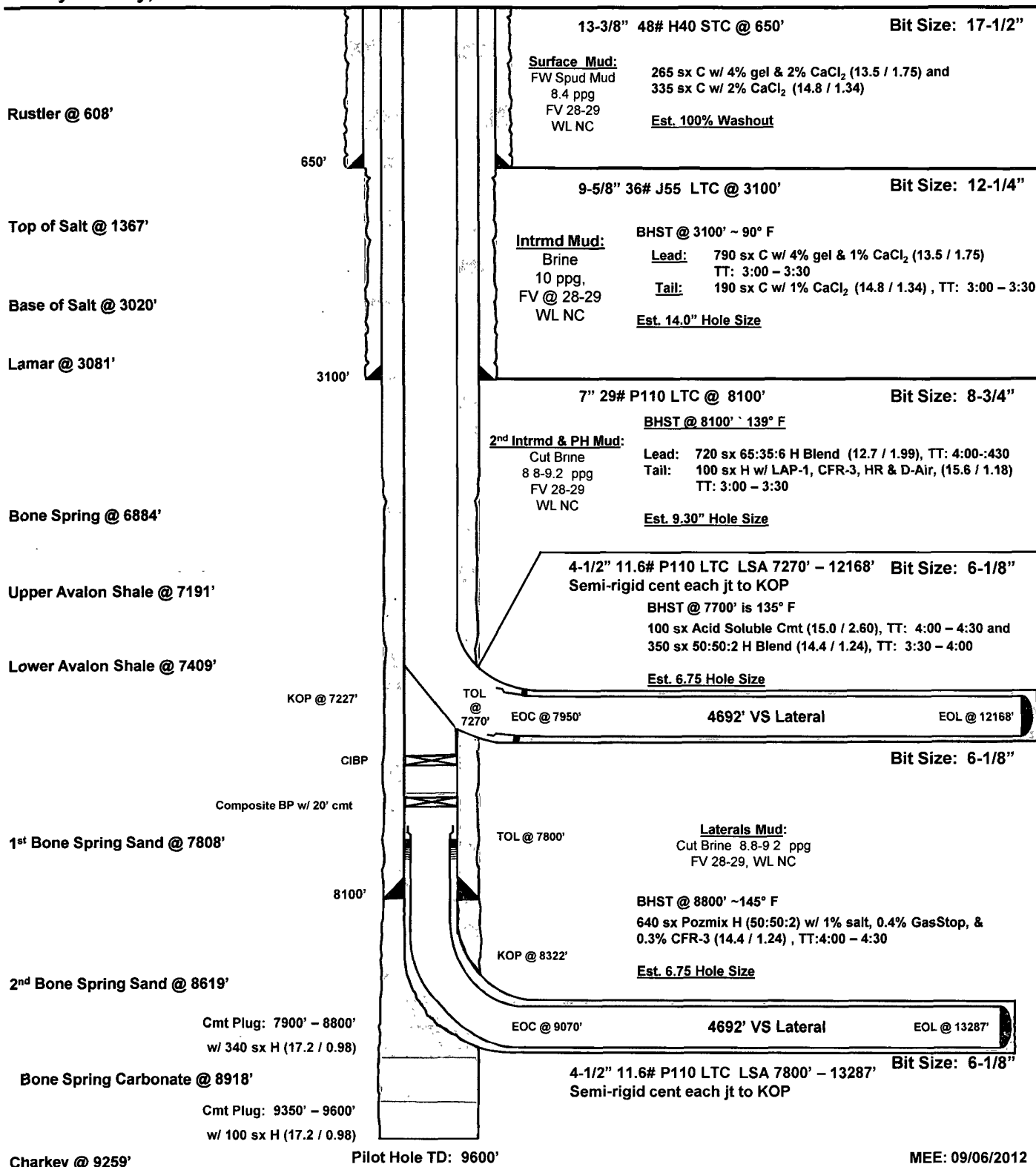
Proposed Dual Lateral Wellbore

API: 30-015-TBD

Rig: Patriot 3
Cmt: Halliburton
Mud: Nova
Dir Drig: DDC
W/S: Weatherford
Liner Eqpt: Halliburton
WH: AFS

SHL
360' FSL & 1840' FWL
BHL
330' FNL & 1840' FWL
S2, T26S, R29E
Eddy County, NM

KB: 3034'
GL: 3017'





COG Operating, LLC

Eddy County, NM (NAD 27)

Sec 2, T-26-E, R-29-E

Reposado 2 State #3H

Lateral #1

Plan: Design #1

DDC Well Planning Report

06 September, 2012



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well Reposado 2 State #3H
Company:	COG Operating, LLC	TVD Reference:	WELL @ 3034.0usft (Patriot #3)
Project:	Eddy County, NM (NAD 27)	MD Reference:	WELL @ 3034.0usft (Patriot #3)
Site:	Sec 2, T-26-E, R-29-E	North Reference:	Grid
Well:	Reposado 2 State #3H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Lateral #1		
Design:	Design #1		

Project	Eddy County, NM (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	Sec 2, T-26-E, R-29-E		
Site Position:		Northing:	387,594.30 usft
From:	Map	Easting:	616,739.60 usft
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 3' 54.186 N
		Longitude:	103° 57' 23.337 W
		Grid Convergence:	0.20 °

Well	Reposado 2 State #3H		
Well Position	+N/-S	0.0 usft	Northing: 387,594.30 usft
	+E/-W	0.0 usft	Easting: 616,739.60 usft
Position Uncertainty	0.0 usft	Wellhead Elevation:	Latitude: 32° 3' 54.186 N
			Longitude: 103° 57' 23.337 W
			Ground Level: 3,017.0 usft

Wellbore	Lateral #1		
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Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	9/6/2012	7.60	59.94	48,358

Design	Design #1		
Audit Notes:			
Version:	Phase:	PLAN	Tie On Depth: 8,322.5
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)
	0.0	0.0	0.0
			Direction (°) 357.30

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
8,322.5	0.00	0.00	8,322.5	0.0	0.0	0.00	0.00	0.00	0.00	
9,070.2	89.73	357.30	8,800.0	474.7	-22.4	12.00	12.00	-0.36	357.30	
13,287.7	89.73	357.30	8,820.0	4,687.4	-220.8	0.00	0.00	0.00	0.00	PBHL Reposado 2

Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well Reposado 2 State #3H
Company:	COG Operating, LLC	TVD Reference:	WELL @ 3034.0usft (Patriot #3)
Project:	Eddy County, NM (NAD 27)	MD Reference:	WELL @ 3034.0usft (Patriot #3)
Site:	Sec 2, T-26-E, R-29-E	North Reference:	Grid
Well:	Reposado 2 State #3H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Lateral #1		
Design:	Design #1		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
Build 12° / 100'									
8,322.5	0.00	0.00	8,322.5	0.0	0.0	0.0	0.00	0.00	0.00
8,400.0	9.30	357.30	8,399.7	6.3	-0.3	6.3	12.00	12.00	0.00
8,500.0	21.30	357.30	8,495.9	32.6	-1.5	32.6	12.00	12.00	0.00
8,600.0	33.30	357.30	8,584.6	78.3	-3.7	78.4	12.00	12.00	0.00
SBSG Sand									
8,626.6	36.49	357.30	8,606.4	93.5	-4.4	93.6	12.00	12.00	0.00
8,700.0	45.30	357.30	8,661.9	141.5	-6.7	141.6	12.00	12.00	0.00
8,800.0	57.30	357.30	8,724.3	219.3	-10.3	219.5	12.00	12.00	0.00
8,900.0	69.30	357.30	8,769.1	308.4	-14.5	308.7	12.00	12.00	0.00
9,000.0	81.30	357.30	8,794.5	404.8	-19.1	405.2	12.00	12.00	0.00
End of Curve / 89.73° Inc / 357.30° Azm / 8800' TVD									
9,070.2	89.73	357.30	8,800.0	474.7	-22.4	475.2	12.00	12.00	0.00
9,100.0	89.73	357.30	8,800.1	504.4	-23.8	505.0	0.00	0.00	0.00
9,200.0	89.73	357.30	8,800.6	604.3	-28.5	605.0	0.00	0.00	0.00
9,300.0	89.73	357.30	8,801.1	704.2	-33.2	705.0	0.00	0.00	0.00
9,400.0	89.73	357.30	8,801.5	804.1	-37.9	805.0	0.00	0.00	0.00
9,500.0	89.73	357.30	8,802.0	904.0	-42.6	905.0	0.00	0.00	0.00
9,600.0	89.73	357.30	8,802.5	1,003.8	-47.3	1,005.0	0.00	0.00	0.00
9,700.0	89.73	357.30	8,803.0	1,103.7	-52.0	1,105.0	0.00	0.00	0.00
9,800.0	89.73	357.30	8,803.4	1,203.6	-56.7	1,205.0	0.00	0.00	0.00
9,900.0	89.73	357.30	8,803.9	1,303.5	-61.4	1,305.0	0.00	0.00	0.00
10,000.0	89.73	357.30	8,804.4	1,403.4	-66.1	1,405.0	0.00	0.00	0.00
10,100.0	89.73	357.30	8,804.9	1,503.3	-70.8	1,505.0	0.00	0.00	0.00
10,200.0	89.73	357.30	8,805.3	1,603.2	-75.5	1,605.0	0.00	0.00	0.00
10,300.0	89.73	357.30	8,805.8	1,703.1	-80.2	1,705.0	0.00	0.00	0.00
10,400.0	89.73	357.30	8,806.3	1,803.0	-84.9	1,804.9	0.00	0.00	0.00
10,500.0	89.73	357.30	8,806.8	1,902.8	-89.6	1,904.9	0.00	0.00	0.00
10,600.0	89.73	357.30	8,807.2	2,002.7	-94.3	2,004.9	0.00	0.00	0.00
10,700.0	89.73	357.30	8,807.7	2,102.6	-99.0	2,104.9	0.00	0.00	0.00
10,800.0	89.73	357.30	8,808.2	2,202.5	-103.7	2,204.9	0.00	0.00	0.00
10,900.0	89.73	357.30	8,808.7	2,302.4	-108.5	2,304.9	0.00	0.00	0.00
11,000.0	89.73	357.30	8,809.1	2,402.3	-113.2	2,404.9	0.00	0.00	0.00
11,100.0	89.73	357.30	8,809.6	2,502.2	-117.9	2,504.9	0.00	0.00	0.00
11,200.0	89.73	357.30	8,810.1	2,602.1	-122.6	2,604.9	0.00	0.00	0.00
11,300.0	89.73	357.30	8,810.6	2,701.9	-127.3	2,704.9	0.00	0.00	0.00
11,400.0	89.73	357.30	8,811.0	2,801.8	-132.0	2,804.9	0.00	0.00	0.00
11,500.0	89.73	357.30	8,811.5	2,901.7	-136.7	2,904.9	0.00	0.00	0.00
11,600.0	89.73	357.30	8,812.0	3,001.6	-141.4	3,004.9	0.00	0.00	0.00
11,700.0	89.73	357.30	8,812.5	3,101.5	-146.1	3,104.9	0.00	0.00	0.00
11,800.0	89.73	357.30	8,812.9	3,201.4	-150.8	3,204.9	0.00	0.00	0.00
11,900.0	89.73	357.30	8,813.4	3,301.3	-155.5	3,304.9	0.00	0.00	0.00
12,000.0	89.73	357.30	8,813.9	3,401.2	-160.2	3,404.9	0.00	0.00	0.00
12,100.0	89.73	357.30	8,814.4	3,501.0	-164.9	3,504.9	0.00	0.00	0.00
12,200.0	89.73	357.30	8,814.8	3,600.9	-169.6	3,604.9	0.00	0.00	0.00
12,300.0	89.73	357.30	8,815.3	3,700.8	-174.3	3,704.9	0.00	0.00	0.00
12,400.0	89.73	357.30	8,815.8	3,800.7	-179.0	3,804.9	0.00	0.00	0.00
12,500.0	89.73	357.30	8,816.3	3,900.6	-183.7	3,904.9	0.00	0.00	0.00
12,600.0	89.73	357.30	8,816.7	4,000.5	-188.4	4,004.9	0.00	0.00	0.00
12,700.0	89.73	357.30	8,817.2	4,100.4	-193.1	4,104.9	0.00	0.00	0.00
12,800.0	89.73	357.30	8,817.7	4,200.3	-197.9	4,204.9	0.00	0.00	0.00
12,900.0	89.73	357.30	8,818.2	4,300.2	-202.6	4,304.9	0.00	0.00	0.00
13,000.0	89.73	357.30	8,818.6	4,400.0	-207.3	4,404.9	0.00	0.00	0.00

Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well Reposado 2 State #3H
Company:	COG Operating, LLC	TVD Reference:	WELL @ 3034.0usft (Patriot #3)
Project:	Eddy County, NM (NAD 27)	MD Reference:	WELL @ 3034.0usft (Patriot #3)
Site:	Sec 2, T-26-E, R-29-E	North Reference:	Grid
Well:	Reposado 2 State #3H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Lateral #1		
Design:	Design #1		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
13,100.0	89.73	357.30	8,819.1	4,499.9	-212.0	4,504.9	0.00	0.00	0.00
13,200.0	89.73	357.30	8,819.6	4,599.8	-216.7	4,604.9	0.00	0.00	0.00
TD @ 13288' MD / 8820' TVD									
13,287.7	89.73	357.30	8,820.0	4,687.4	-220.8	4,692.6	0.00	0.00	0.00

Design Targets

Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
- hit/miss target									
- Shape									
PBHL Reposado 2 St:	0.00	0.00	8,820.0	4,687.4	-220.8	392,281.70	616,518.80	32° 4' 40.582 N	103° 57' 25.713 W
- plan hits target center									
- Point									

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
7,178.0	7,178.0	U Avalon Shale		0.27	357.30
7,396.0	7,396.0	L Avalon Shale		0.27	357.30
7,795.0	7,795.0	FBSG Sand		0.27	357.30
8,626.6	8,606.4	SBSG Sand		0.27	357.30

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
8,322.5	8,322.5	0.0	0.0	Build 12° / 100'
9,070.2	8,800.0	474.7	-22.4	End of Curve / 89.73° Inc / 357.30° Azm / 8800' TVD
13,287.7	8,820.0	4,687.4	-220.8	TD @ 13288' MD / 8820' TVD

COG Operating, LLC

Eddy County, NM (NAD 27)

Sec 2, T-26-E, R-29-E

Reposado 2 State #3H

Lateral #2

Plan: Design #1

DDC Well Planning Report

06 September, 2012



DDC
Well Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well Reposado 2 State #3H
Company:	COG Operating, LLC	TVD Reference:	WELL @ 3034.0usft (Patriot #3)
Project:	Eddy County, NM (NAD 27)	MD Reference:	WELL @ 3034.0usft (Patriot #3)
Site:	Sec 2, T-26-E, R-29-E	North Reference:	Grid
Well:	Reposado 2 State #3H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Lateral #2		
Design:	Design #1		

Project	Eddy County, NM (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	Sec 2, T-26-E, R-29-E
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Site Position:		Northing:	387,594.30 usft	Latitude:	32° 3' 54.186 N
From:	Map	Easting:	616,739.60 usft	Longitude:	103° 57' 23.337 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.20 °

Well	Reposado 2 State #3H				
Well Position	+N/-S	0.0 usft	Northing:	387,594.30 usft	Latitude: 32° 3' 54.186 N
	+E/-W	0.0 usft	Easting:	616,739.60 usft	Longitude: 103° 57' 23.337 W
Position Uncertainty	0.0 usft		Wellhead Elevation:		Ground Level: 3,017.0 usft

Wellbore	Lateral #2
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Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	9/6/2012	7.60	59.94	48,358

Design	Design #1
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Audit Notes:				
Version:		Phase:	PLAN	Tie On Depth: 7,218.5
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.0	0.0	0.0	357.30

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
7,218.5	0.00	0.00	7,218.5	0.0	0.0	0.00	0.00	0.00	0.00	
7,227.5	3.00	357.30	7,227.5	0.2	0.0	33.22	33.22	0.00	357.30	
7,950.3	89.73	357.30	7,680.0	474.3	-22.3	12.00	12.00	0.00	0.00	
12,168.1	89.73	357.30	7,700.0	4,687.4	-220.8	0.00	0.00	0.00	0.00	PBHL Reposado 2

DDC
Well Planning Report



Database:	EDM 5000 1 Single User Db	Local Co-ordinate Reference:	Well Reposado 2 State #3H
Company:	COG Operating, LLC	TVD Reference:	WELL @ 3034.0usft (Patriot #3)
Project:	Eddy County, NM (NAD 27)	MD Reference:	WELL @ 3034.0usft (Patriot #3)
Site:	Sec 2, T-26-E, R-29-E	North Reference:	Grid
Well:	Reposado 2 State #3H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Lateral #2		
Design:	Design #1		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
7,218.5	0.00	0.00	7,218.5	0.0	0.0	0.0	0.00	0.00	0.00
Bottom Of WhipStock / Build 12° / 100'									
7,227.5	3.00	357.30	7,227.5	0.2	0.0	0.2	33.22	33.22	0.00
7,300.0	11.70	357.30	7,299.3	9.5	-0.4	9.5	12.00	12.00	0.00
7,400.0	23.70	357.30	7,394.4	39.8	-1.9	39.8	12.00	12.00	0.00
L Avalon Shale									
7,401.9	23.93	357.30	7,396.2	40.6	-1.9	40.6	12.00	12.00	0.00
7,500.0	35.70	357.30	7,481.1	89.2	-4.2	89.3	12.00	12.00	0.00
7,600.0	47.70	357.30	7,555.7	155.5	-7.3	155.7	12.00	12.00	0.00
7,700.0	59.70	357.30	7,614.8	235.9	-11.1	236.1	12.00	12.00	0.00
7,800.0	71.70	357.30	7,655.8	326.7	-15.4	327.1	12.00	12.00	0.00
7,900.0	83.70	357.30	7,677.1	424.2	-20.0	424.6	12.00	12.00	0.00
End of Curve / 89.73° Inc / 357.30° Azm / 7680' TVD									
7,950.3	89.73	357.30	7,680.0	474.3	-22.3	474.8	12.00	12.00	0.00
8,000.0	89.73	357.30	7,680.2	523.9	-24.7	524.5	0.00	0.00	0.00
8,100.0	89.73	357.30	7,680.7	623.8	-29.4	624.5	0.00	0.00	0.00
8,200.0	89.73	357.30	7,681.2	723.7	-34.1	724.5	0.00	0.00	0.00
8,300.0	89.73	357.30	7,681.7	823.6	-38.8	824.5	0.00	0.00	0.00
8,400.0	89.73	357.30	7,682.1	923.5	-43.5	924.5	0.00	0.00	0.00
8,500.0	89.73	357.30	7,682.6	1,023.4	-48.2	1,024.5	0.00	0.00	0.00
8,600.0	89.73	357.30	7,683.1	1,123.3	-52.9	1,124.5	0.00	0.00	0.00
8,700.0	89.73	357.30	7,683.6	1,223.2	-57.6	1,224.5	0.00	0.00	0.00
8,800.0	89.73	357.30	7,684.0	1,323.0	-62.3	1,324.5	0.00	0.00	0.00
8,900.0	89.73	357.30	7,684.5	1,422.9	-67.0	1,424.5	0.00	0.00	0.00
9,000.0	89.73	357.30	7,685.0	1,522.8	-71.7	1,524.5	0.00	0.00	0.00
9,100.0	89.73	357.30	7,685.4	1,622.7	-76.4	1,624.5	0.00	0.00	0.00
9,200.0	89.73	357.30	7,685.9	1,722.6	-81.1	1,724.5	0.00	0.00	0.00
9,300.0	89.73	357.30	7,686.4	1,822.5	-85.8	1,824.5	0.00	0.00	0.00
9,400.0	89.73	357.30	7,686.9	1,922.4	-90.6	1,924.5	0.00	0.00	0.00
9,500.0	89.73	357.30	7,687.3	2,022.3	-95.3	2,024.5	0.00	0.00	0.00
9,600.0	89.73	357.30	7,687.8	2,122.1	-100.0	2,124.5	0.00	0.00	0.00
9,700.0	89.73	357.30	7,688.3	2,222.0	-104.7	2,224.5	0.00	0.00	0.00
9,800.0	89.73	357.30	7,688.8	2,321.9	-109.4	2,324.5	0.00	0.00	0.00
9,900.0	89.73	357.30	7,689.2	2,421.8	-114.1	2,424.5	0.00	0.00	0.00
10,000.0	89.73	357.30	7,689.7	2,521.7	-118.8	2,524.5	0.00	0.00	0.00
10,100.0	89.73	357.30	7,690.2	2,621.6	-123.5	2,624.5	0.00	0.00	0.00
10,200.0	89.73	357.30	7,690.7	2,721.5	-128.2	2,724.5	0.00	0.00	0.00
10,300.0	89.73	357.30	7,691.1	2,821.4	-132.9	2,824.5	0.00	0.00	0.00
10,400.0	89.73	357.30	7,691.6	2,921.3	-137.6	2,924.5	0.00	0.00	0.00
10,500.0	89.73	357.30	7,692.1	3,021.1	-142.3	3,024.5	0.00	0.00	0.00
10,600.0	89.73	357.30	7,692.6	3,121.0	-147.0	3,124.5	0.00	0.00	0.00
10,700.0	89.73	357.30	7,693.0	3,220.9	-151.7	3,224.5	0.00	0.00	0.00
10,800.0	89.73	357.30	7,693.5	3,320.8	-156.4	3,324.5	0.00	0.00	0.00
10,900.0	89.73	357.30	7,694.0	3,420.7	-161.1	3,424.5	0.00	0.00	0.00
11,000.0	89.73	357.30	7,694.5	3,520.6	-165.8	3,524.5	0.00	0.00	0.00
11,100.0	89.73	357.30	7,694.9	3,620.5	-170.5	3,624.5	0.00	0.00	0.00
11,200.0	89.73	357.30	7,695.4	3,720.4	-175.2	3,724.5	0.00	0.00	0.00
11,300.0	89.73	357.30	7,695.9	3,820.2	-180.0	3,824.5	0.00	0.00	0.00
11,400.0	89.73	357.30	7,696.4	3,920.1	-184.7	3,924.5	0.00	0.00	0.00
11,500.0	89.73	357.30	7,696.8	4,020.0	-189.4	4,024.5	0.00	0.00	0.00
11,600.0	89.73	357.30	7,697.3	4,119.9	-194.1	4,124.5	0.00	0.00	0.00
11,700.0	89.73	357.30	7,697.8	4,219.8	-198.8	4,224.5	0.00	0.00	0.00
11,800.0	89.73	357.30	7,698.3	4,319.7	-203.5	4,324.5	0.00	0.00	0.00

DDC
Well Planning Report



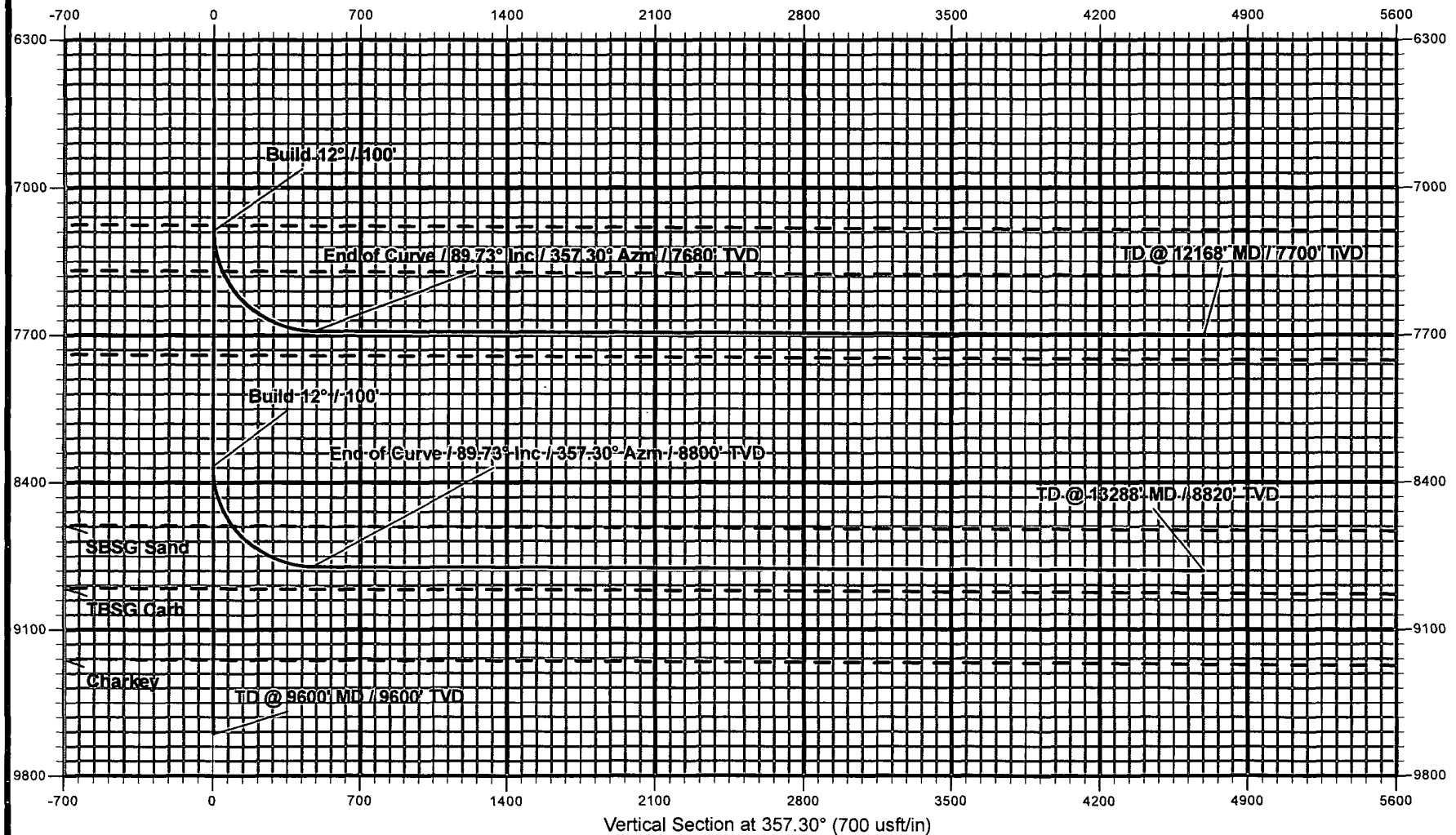
Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well Reposado 2 State #3H
Company:	COG Operating, LLC	TVD Reference:	WELL @ 3034.0usft (Patriot #3)
Project:	Eddy County, NM (NAD 27)	MD Reference:	WELL @ 3034.0usft (Patriot #3)
Site:	Sec 2, T-26-E, R-29-E	North Reference:	Grid
Well:	Reposado 2 State #3H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Lateral #2		
Design:	Design #1		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
11,900.0	89.73	357.30	7,698.7	4,419.6	-208.2	4,424.5	0.00	0.00	0.00
12,000.0	89.73	357.30	7,699.2	4,519.5	-212.9	4,524.5	0.00	0.00	0.00
12,100.0	89.73	357.30	7,699.7	4,619.3	-217.6	4,624.5	0.00	0.00	0.00
TD @ 12168' MD / 7700' TVD									
12,168.1	89.73	357.30	7,700.0	4,687.4	-220.8	4,692.6	0.00	0.00	0.00

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
- hit/miss target									
- Shape									
PBHL Reposado 2 St:	0.00	0.00	7,700.0	4,687.4	-220.8	392,281.70	616,518.80	32° 4' 40.582 N	103° 57' 25.713 W
- plan hits target center									
- Point									

Formations					
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
7,401.9	7,396.2	L Avalon Shale		0.27	357.30

Plan Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
7,218.5	7,218.5	0.0	0.0	Top of Whipstock
7,227.5	7,227.5	0.2	0.0	Bottom Of Whipstock / Build 12° / 100'
7,950.3	7,680.0	474.3	-22.3	End of Curve / 89.73° Inc / 357.30° Azm / 7680' TVD
12,168.1	7,700.0	4,687.4	-220.8	TD @ 12168' MD / 7700' TVD





Eddy County, NM (NAD 27)

Reposado 2 State #3H

Design #1

