

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 July 18, 2013

NM OIL CONSERVATION
ARTESIA DISTRICT

NOV 22 2016

RECEIVED

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

Operator Name and Address COG Operating LLC 2208 West Main Street Artesia, NM 88210		OGRID Number 229137
Property Code 317119		API Number 30-015-43967
Property Name Switchback State		Well No 21H

7. Surface Location

UL - Lot P	Section	Township	Range	Lot Idn	Feet from	N/S Line	Feet From	E/W Line	County
	10	24S	27E		380'	South	312'	East	Eddy

*** Proposed Bottom Hole Location**

UL - Lot P	Section	Township	Range	Lot Idn	Feet from	N/S Line	Feet From	E/W Line	County
	11	24S	27E		380'	South	50'	East	Eddy

*** Pool Information**

Wildcat: Wolfcamp	Pool Name <i>Black River; WC, East (Gas)</i>	Pool Code 97742
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Additional Well Information

11 Work Type New Well	12 Well Type Oil G	13 Cable/Rotary	14 Lease Type State	15 Ground Level Elevation 3169.8'
16 Multiple N	17 Proposed Depth 14734'	18 Formation Wolfcamp	19 Contractor	20 Spud Date 11-31-2016
Depth to Ground water		Distance from nearest fresh water well		Distance to nearest surface water

☒ We will be using a closed-loop system in lieu of lined pits

21. Proposed Casing and Cement Program

Type	Hole Size	Casing Size	Casing Weight/ft	Setting Depth	Sacks of Cement	Estimated TOC
Surface	17.5	13.375	54.5	775'	550	
Intemd 1	12.25	9.625	40	2490'	700	
Production	6.75	5.5	17	14734'	2300	2290'

Casing/Cement Program: Additional Comments

Plan to drill a 17-1/2" hole to 775' with Fresh Water. Run 13-3/8", 54.58#, J-55 csg and cmt to surface. Drill 12-1/4" hole to 2,490' with Brine, and run 9-5/8", 40# J55 and cement to surface. Drill 8-3/4" vertical & curve. Drill 8-3/4" lateral with cut brine to approximately 14,734' MD. Run 5-1/2", 17#, P-110 csg and cement to 2290'.

22. Proposed Blowout Prevention Program

Type	Working Pressure	Test Pressure	Manufacturer
Annular	3000	3000	Horn

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

I further certify that I have complied with 19.15.14.9 (A) NMAC ☒ and/or 19.15.14.9 (B) NMAC ☒. If applicable

Signature: *Mayte Reyes*

Printed name: Mayte Reyes

Title: Regulatory Analyst

E-mail Address: mreyes1@concho.com

Date: 11/18/2016

Phone: 575-748-6945

OIL CONSERVATION DIVISION

Approved By: *Karen Sharp*

Title: *Bus Oper Spec - Adv*

Approved Date: *11-22-16*

Expiration Date: *11-22-18*

Conditions of Approval Attached

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State of New Mexico
Energy, Minerals & Natural Resources Department
OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-102
Revised August 1, 2011
Submit one copy to appropriate
District Office
☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

15 API Number 30-025- 43967		Pool Code 97442		Well Name Black River; wc, East (Gas)	
Property Code 317119		Property Name SWITCHBACK STATE			Well Number 21H
OGRID No. 229137		Operator Name COG OPERATING, LLC.			Elevation 3169.8

10 Surface Location									
UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
P	10	24 S	27 E		380	SOUTH	312	EAST	EDDY

11 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
P	11	24 S	27 E		380	SOUTH	50	EAST	EDDY

12 Dedicated Acres 160.320	13 Joint or Infill	14 Consolidation Code	15 Order No.
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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.

16 OPERATOR CERTIFICATION I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or undivided mineral interest in the land including the proposed bottom hole location or has a right to drill this well or this location pursuant to a contract with an owner of such a mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division. Signature: <u>Mayte Reyes</u> Date: <u>11-8-16</u> Printed Name: <u>Mayte Reyes</u> E-mail Address: <u>mreyes1@concho.com</u>	
17 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. SEPTEMBER 7 2016 Date of Survey: <u>SEPTEMBER 7 2016</u> Signature and Seal of Professional Surveyor: <u>[Signature]</u> Certificate Number: <u>12787</u> SURVEY NO. 4874	

Switchback State 21H

	Hole Size	Casing	Wt	Depth	Cmt	TOC
Surface	17.5	13.375	54.5	775'	550	0
Intrmd	12.25	9.625	40	2490'	700	0
Prod	8.75	5.5	17	14,734'	2300	2290'

Plan to drill a 17-1/2" hole to 775' with Fresh Water. Run 13-3/8", 54.58#, J-55 csg and cmt to surface. Drill 12-1/4" hole to 2,490' with Brine, and run 9-5/8", 40# J55 and cement to surface. Drill 8-3/4" vertical & curve. Drill 8-3/4" lateral with cut brine to approximately 14,734' MD. Run 5-1/2", 17#, P-110 csg and cement to 2290'.

Well Control

Type	Pressure	Test	Manufacture
Double Ram	3000	3000	Horn



COG Operating L L C

Eddy County, NM (NAD 27 NME)

Sec. 10, T 24 S. , R 27 E

Switchback State 21H

Wellbore #1

Plan: Plan #1

Standard Survey Report

23 September, 2016





Integrity Directional Services, LLC
Survey Report



Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Switchback State 21H
Project:	Eddy County, NM (NAD 27 NME)	TVD Reference:	KB=20' @ 3189.80ft (Patriot 2)
Site:	Sec. 10, T 24 S., R 27 E	MD Reference:	KB=20' @ 3189.80ft (Patriot 2)
Well:	Switchback State 21H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Plan #1	Database:	EDM 5000.1 Multi User Db

Project	Eddy County, NM (NAD 27 NME)		
Map System:	US State Plane 1927 (Exact solution)	System Datum:	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	New Mexico East 3001		

Site	Sec. 10, T 24 S., R 27 E		
Site Position:		Northing:	445,721.72 usft
From:	Map	Easting:	550,355.66 usft
Position Uncertainty:	0.00 ft	Slot Radius:	13-3/16 "
		Latitude:	32° 13' 31.084 N
		Longitude:	104° 10' 13.777 W
		Grid Convergence:	0.09 °

Well	Switchback State 21H		
Well Position	+N/-S	0.00 ft	Northing:
	+E/-W	0.00 ft	Easting:
Position Uncertainty	0.00 ft	Wellhead Elevation:	0.00 ft
		Latitude:	32° 13' 31.084 N
		Longitude:	104° 10' 13.777 W
		Ground Level:	3,169.80 ft

Wellbore	Wellbore #1		
Magnetics	Model Name	Sample Date	Declination
	IGRF2015	9/23/2016	7.31
			Dip Angle
			59.98
			Field Strength
			47,951

Design	Plan #1		
Audit Notes:			
Version:	Phase:	PLAN	Tie On Depth:
			0.00
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W
	(ft)	(ft)	(ft)
	0.00	0.00	0.00
			87.84

Survey Tool Program	Date 9/23/2016		
From	To	Survey (Wellbore)	Tool Name
(ft)	(ft)		
0.00	14,734.63	Plan #1 (Wellbore #1)	MWD
			Description
			MWD - Standard

Planned Survey									
Measured	Inclination	Azimuth	Vertical	+N/-S	+E/-W	Vertical	Dogleg	Build	Turn
Depth	(°)	(°)	Depth	(ft)	(ft)	Section	Rate	Rate	Rate
(ft)			(ft)			(ft)	(°/100usft)	(°/100usft)	(°/100usft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00



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Well:	Switchback State 21H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Plan #1	Database:	EDM:5000.1 Multi User Db

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00
1,300.00	0.00	0.00	1,300.00	0.00	0.00	0.00	0.00	0.00	0.00
1,400.00	0.00	0.00	1,400.00	0.00	0.00	0.00	0.00	0.00	0.00
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	0.00	0.00
1,600.00	0.00	0.00	1,600.00	0.00	0.00	0.00	0.00	0.00	0.00
1,700.00	0.00	0.00	1,700.00	0.00	0.00	0.00	0.00	0.00	0.00
1,800.00	0.00	0.00	1,800.00	0.00	0.00	0.00	0.00	0.00	0.00
1,900.00	0.00	0.00	1,900.00	0.00	0.00	0.00	0.00	0.00	0.00
2,000.00	0.00	0.00	2,000.00	0.00	0.00	0.00	0.00	0.00	0.00
2,100.00	0.00	0.00	2,100.00	0.00	0.00	0.00	0.00	0.00	0.00
2,200.00	0.00	0.00	2,200.00	0.00	0.00	0.00	0.00	0.00	0.00
2,300.00	0.00	0.00	2,300.00	0.00	0.00	0.00	0.00	0.00	0.00
2,400.00	0.00	0.00	2,400.00	0.00	0.00	0.00	0.00	0.00	0.00
2,500.00	0.00	0.00	2,500.00	0.00	0.00	0.00	0.00	0.00	0.00
2,600.00	0.00	0.00	2,600.00	0.00	0.00	0.00	0.00	0.00	0.00
2,700.00	0.00	0.00	2,700.00	0.00	0.00	0.00	0.00	0.00	0.00
2,800.00	0.00	0.00	2,800.00	0.00	0.00	0.00	0.00	0.00	0.00
2,900.00	0.00	0.00	2,900.00	0.00	0.00	0.00	0.00	0.00	0.00
3,000.00	0.00	0.00	3,000.00	0.00	0.00	0.00	0.00	0.00	0.00
3,100.00	0.00	0.00	3,100.00	0.00	0.00	0.00	0.00	0.00	0.00
3,200.00	0.00	0.00	3,200.00	0.00	0.00	0.00	0.00	0.00	0.00
3,300.00	0.00	0.00	3,300.00	0.00	0.00	0.00	0.00	0.00	0.00
3,400.00	0.00	0.00	3,400.00	0.00	0.00	0.00	0.00	0.00	0.00
3,500.00	0.00	0.00	3,500.00	0.00	0.00	0.00	0.00	0.00	0.00
3,600.00	0.00	0.00	3,600.00	0.00	0.00	0.00	0.00	0.00	0.00
3,700.00	0.00	0.00	3,700.00	0.00	0.00	0.00	0.00	0.00	0.00
3,800.00	0.00	0.00	3,800.00	0.00	0.00	0.00	0.00	0.00	0.00
3,900.00	0.00	0.00	3,900.00	0.00	0.00	0.00	0.00	0.00	0.00
4,000.00	0.00	0.00	4,000.00	0.00	0.00	0.00	0.00	0.00	0.00
4,100.00	0.00	0.00	4,100.00	0.00	0.00	0.00	0.00	0.00	0.00
4,200.00	0.00	0.00	4,200.00	0.00	0.00	0.00	0.00	0.00	0.00
4,300.00	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
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



Integrity Directional Services, LLC
Survey Report



Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Switchback State 21H
Project:	Eddy County, NM (NAD 27 NME)	TVD Reference:	KB=20' @ 3189.80ft (Patriot 2)
Site:	Sec. 10, T 24 S., R 27 E	MD Reference:	KB=20' @ 3189.80ft (Patriot 2)
Well:	Switchback State 21H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Plan #1	Database:	EDM 5000.1 Multi User Db

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
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
7,300.00	0.00	0.00	7,300.00	0.00	0.00	0.00	0.00	0.00	0.00
7,400.00	0.00	0.00	7,400.00	0.00	0.00	0.00	0.00	0.00	0.00
7,500.00	0.00	0.00	7,500.00	0.00	0.00	0.00	0.00	0.00	0.00
7,600.00	0.00	0.00	7,600.00	0.00	0.00	0.00	0.00	0.00	0.00
7,700.00	0.00	0.00	7,700.00	0.00	0.00	0.00	0.00	0.00	0.00
7,800.00	0.00	0.00	7,800.00	0.00	0.00	0.00	0.00	0.00	0.00
7,900.00	0.00	0.00	7,900.00	0.00	0.00	0.00	0.00	0.00	0.00
8,000.00	0.00	0.00	8,000.00	0.00	0.00	0.00	0.00	0.00	0.00
8,100.00	0.00	0.00	8,100.00	0.00	0.00	0.00	0.00	0.00	0.00
8,200.00	0.00	0.00	8,200.00	0.00	0.00	0.00	0.00	0.00	0.00
8,300.00	0.00	0.00	8,300.00	0.00	0.00	0.00	0.00	0.00	0.00
8,400.00	0.00	0.00	8,400.00	0.00	0.00	0.00	0.00	0.00	0.00
8,500.00	0.00	0.00	8,500.00	0.00	0.00	0.00	0.00	0.00	0.00
8,600.00	0.00	0.00	8,600.00	0.00	0.00	0.00	0.00	0.00	0.00
8,700.00	0.00	0.00	8,700.00	0.00	0.00	0.00	0.00	0.00	0.00
8,800.00	0.00	0.00	8,800.00	0.00	0.00	0.00	0.00	0.00	0.00
8,900.00	0.00	0.00	8,900.00	0.00	0.00	0.00	0.00	0.00	0.00
8,907.69	0.00	0.00	8,907.69	0.00	0.00	0.00	0.00	0.00	0.00
9,000.00	11.08	87.84	8,999.43	0.33	8.89	8.90	12.00	12.00	0.00
9,100.00	23.08	87.84	9,094.84	1.44	38.18	38.21	12.00	12.00	0.00
9,200.00	35.08	87.84	9,182.08	3.26	86.66	86.72	12.00	12.00	0.00
9,300.00	47.08	87.84	9,257.32	5.73	152.20	152.31	12.00	12.00	0.00
9,400.00	59.08	87.84	9,317.29	8.73	231.94	232.10	12.00	12.00	0.00
9,500.00	71.08	87.84	9,359.35	12.13	322.40	322.63	12.00	12.00	0.00



Integrity Directional Services, LLC
Survey Report



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Design:	Plan #1	Database:	EDM 5000.1 Multi User Db

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
9,600.00	83.08	87.84	9,381.67	15.79	419.62	419.91	12.00	12.00	0.00
9,669.95	91.47	87.84	9,385.00	18.42	489.37	489.72	12.00	12.00	0.00
9,700.00	91.47	87.84	9,384.23	19.55	519.40	519.76	0.00	0.00	0.00
9,800.00	91.47	87.84	9,381.66	23.31	619.29	619.73	0.00	0.00	0.00
9,900.00	91.47	87.84	9,379.09	27.07	719.19	719.70	0.00	0.00	0.00
10,000.00	91.47	87.84	9,376.53	30.83	819.08	819.66	0.00	0.00	0.00
10,100.00	91.47	87.84	9,373.96	34.59	918.98	919.63	0.00	0.00	0.00
10,200.00	91.47	87.84	9,371.39	38.35	1,018.88	1,019.60	0.00	0.00	0.00
10,300.00	91.47	87.84	9,368.83	42.11	1,118.77	1,119.57	0.00	0.00	0.00
10,400.00	91.47	87.84	9,366.26	45.87	1,218.67	1,219.53	0.00	0.00	0.00
10,500.00	91.47	87.84	9,363.69	49.63	1,318.57	1,319.50	0.00	0.00	0.00
10,600.00	91.47	87.84	9,361.13	53.39	1,418.46	1,419.47	0.00	0.00	0.00
10,700.00	91.47	87.84	9,358.56	57.15	1,518.36	1,519.43	0.00	0.00	0.00
10,800.00	91.47	87.84	9,355.99	60.91	1,618.25	1,619.40	0.00	0.00	0.00
10,900.00	91.47	87.84	9,353.43	64.67	1,718.15	1,719.37	0.00	0.00	0.00
11,000.00	91.47	87.84	9,350.86	68.43	1,818.05	1,819.33	0.00	0.00	0.00
11,100.00	91.47	87.84	9,348.29	72.19	1,917.94	1,919.30	0.00	0.00	0.00
11,200.00	91.47	87.84	9,345.73	75.95	2,017.84	2,019.27	0.00	0.00	0.00
11,300.00	91.47	87.84	9,343.16	79.71	2,117.74	2,119.24	0.00	0.00	0.00
11,400.00	91.47	87.84	9,340.59	83.47	2,217.63	2,219.20	0.00	0.00	0.00
11,500.00	91.47	87.84	9,338.03	87.23	2,317.53	2,319.17	0.00	0.00	0.00
11,600.00	91.47	87.84	9,335.46	90.99	2,417.43	2,419.14	0.00	0.00	0.00
11,700.00	91.47	87.84	9,332.89	94.75	2,517.32	2,519.10	0.00	0.00	0.00
11,800.00	91.47	87.84	9,330.33	98.51	2,617.22	2,619.07	0.00	0.00	0.00
11,900.00	91.47	87.84	9,327.76	102.27	2,717.11	2,719.04	0.00	0.00	0.00
12,000.00	91.47	87.84	9,325.19	106.03	2,817.01	2,819.01	0.00	0.00	0.00
12,100.00	91.47	87.84	9,322.63	109.78	2,916.91	2,918.97	0.00	0.00	0.00
12,200.00	91.47	87.84	9,320.06	113.55	3,016.80	3,018.94	0.00	0.00	0.00
12,300.00	91.47	87.84	9,317.49	117.31	3,116.70	3,118.91	0.00	0.00	0.00
12,400.00	91.47	87.84	9,314.92	121.07	3,216.60	3,218.87	0.00	0.00	0.00
12,500.00	91.47	87.84	9,312.36	124.83	3,316.49	3,318.84	0.00	0.00	0.00
12,600.00	91.47	87.84	9,309.79	128.59	3,416.39	3,418.81	0.00	0.00	0.00
12,700.00	91.47	87.84	9,307.22	132.35	3,516.29	3,518.77	0.00	0.00	0.00
12,800.00	91.47	87.84	9,304.66	136.11	3,616.18	3,618.74	0.00	0.00	0.00
12,900.00	91.47	87.84	9,302.09	139.87	3,716.08	3,718.71	0.00	0.00	0.00
13,000.00	91.47	87.84	9,299.52	143.63	3,815.97	3,818.68	0.00	0.00	0.00
13,100.00	91.47	87.84	9,296.96	147.39	3,915.87	3,918.64	0.00	0.00	0.00
13,200.00	91.47	87.84	9,294.39	151.15	4,015.77	4,018.61	0.00	0.00	0.00
13,300.00	91.47	87.84	9,291.82	154.91	4,115.66	4,118.58	0.00	0.00	0.00
13,400.00	91.47	87.84	9,289.26	158.67	4,215.56	4,218.54	0.00	0.00	0.00
13,500.00	91.47	87.84	9,286.69	162.43	4,315.46	4,318.51	0.00	0.00	0.00
13,600.00	91.47	87.84	9,284.12	166.19	4,415.35	4,418.48	0.00	0.00	0.00
13,700.00	91.47	87.84	9,281.56	169.95	4,515.25	4,518.45	0.00	0.00	0.00



Integrity Directional Services, LLC
Survey Report



Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Switchback State 21H
Project:	Eddy County, NM (NAD 27, NME)	TVD Reference:	KB=20' @ 3189.80ft (Patriot 2)
Site:	Sec. 10, T 24 S., R 27 E	MD Reference:	KB=20' @ 3189.80ft (Patriot 2)
Well:	Switchback State 21H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Plan #1	Database:	EDM 5000.1 Multi User Db

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
13,800.00	91.47	87.84	9,278.99	173.71	4,615.14	4,618.41	0.00	0.00	0.00
13,900.00	91.47	87.84	9,276.42	177.47	4,715.04	4,718.38	0.00	0.00	0.00
14,000.00	91.47	87.84	9,273.86	181.23	4,814.94	4,818.35	0.00	0.00	0.00
14,100.00	91.47	87.84	9,271.29	184.99	4,914.83	4,918.31	0.00	0.00	0.00
14,200.00	91.47	87.84	9,268.72	188.75	5,014.73	5,018.28	0.00	0.00	0.00
14,300.00	91.47	87.84	9,266.16	192.51	5,114.63	5,118.25	0.00	0.00	0.00
14,400.00	91.47	87.84	9,263.59	196.27	5,214.52	5,218.21	0.00	0.00	0.00
14,500.00	91.47	87.84	9,261.02	200.03	5,314.42	5,318.18	0.00	0.00	0.00
14,600.00	91.47	87.84	9,258.46	203.79	5,414.32	5,418.15	0.00	0.00	0.00
14,700.00	91.47	87.84	9,255.89	207.55	5,514.21	5,518.12	0.00	0.00	0.00
14,734.66	91.47	87.84	9,255.00	208.85	5,548.83	5,552.76	0.00	0.00	0.00

Design Targets

Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude
- hit/miss target									
- Shape									
Switchback State 21H	0.00	0.00	9,255.00	208.85	5,548.83	445,930.57	555,904.48	32° 13' 33.063 N	104° 9' 9.176 W
- plan hits target center									
- Point									

Checked By: _____ Approved By: _____ Date: _____



COG Operating LLC
 Project: Eddy County, NM (NAD 27 NME)
 Site: Sec. 10, T 24 S., R 27 E
 Well: Switchback State 21H
 Wellbore: Wellbore #1
 Plan: Plan #1 (Switchback State 21H/Wellbore #1)
 Patriot 2

WELL DETAILS: Switchback State 21H
 Ground Elevation: 3169.80
 RKB Elevation: KB-20' @ 3189.80ft (Patriot 2)
 Rig Name: Patriot 2

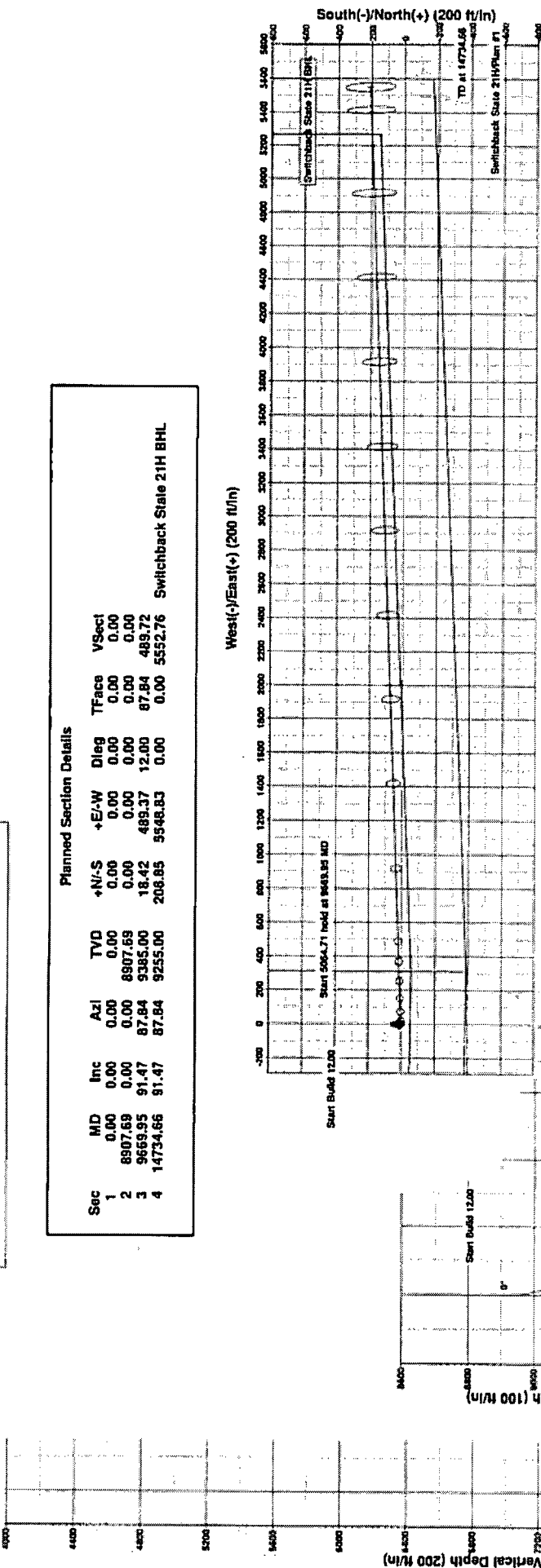
Northings 445721.72 Easting 550355.66
 Latitude 32° 13' 31.084 N Longitude 104° 10' 13.777 W



Planned Section Details

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	8907.69	0.00	0.00	8907.69	0.00	0.00	0.00	0.00	0.00
3	9669.95	91.47	87.84	9385.00	18.42	489.37	12.00	87.84	489.72
4	14734.66	91.47	87.84	9255.00	208.85	5548.83	0.00	0.00	5552.76

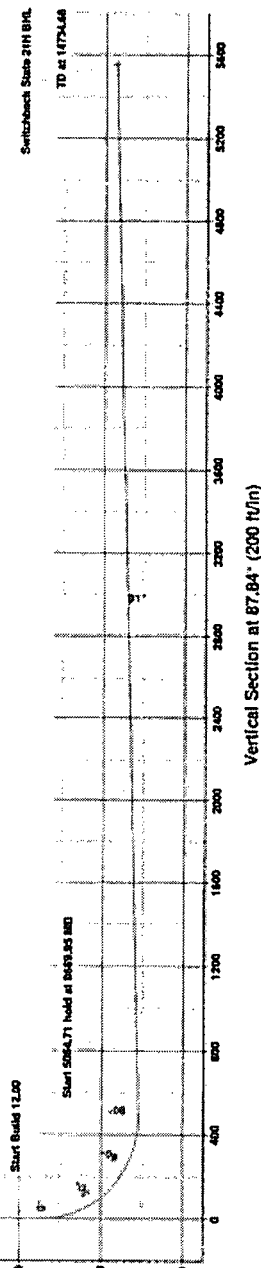
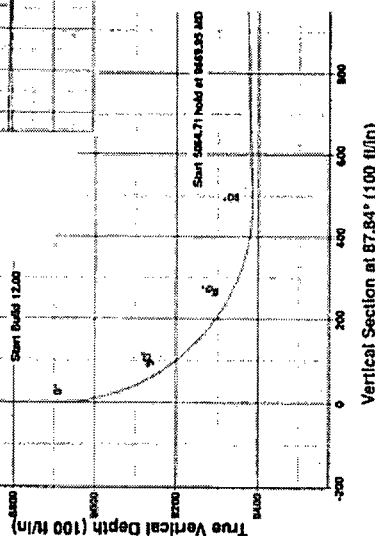
Switchback State 21H BHL



Admuths to Grid North
 True North: -0.09°
 Magnetic North: 7.22°
 Magnetic Field
 Strength: 47951.1nT
 Dip Angle: 59.98°
 Date: 9/23/2016
 Model: IGRF2015



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



NMOCD CONDITION OF APPROVAL

The *New!* Gas Capture Plan (GCP) notice is posted on the NMOCD website under Announcements. The Plan became effective May 1, 2016. A copy of the GCP form is included with the NOTICE and is also in our FORMS section under Unnumbered Forms. Please review filing dates for all applicable activities currently approved or pending and submit accordingly. Failure to file a GCP may jeopardize the operator's ability to obtain C-129 approval to flare gas after the initial 60-day completion period.

1. Operator shall notify appropriate NMOCD District office when setting conductor pipe.
2. If an APD expires and if site construction has occurred, site remediation is required.

3. The Operator is to notify NMOCD by sundry within ten (10) days of spudding a well.

4. It is the operator's responsibility to monitor cancellation dates of approved APDs.