



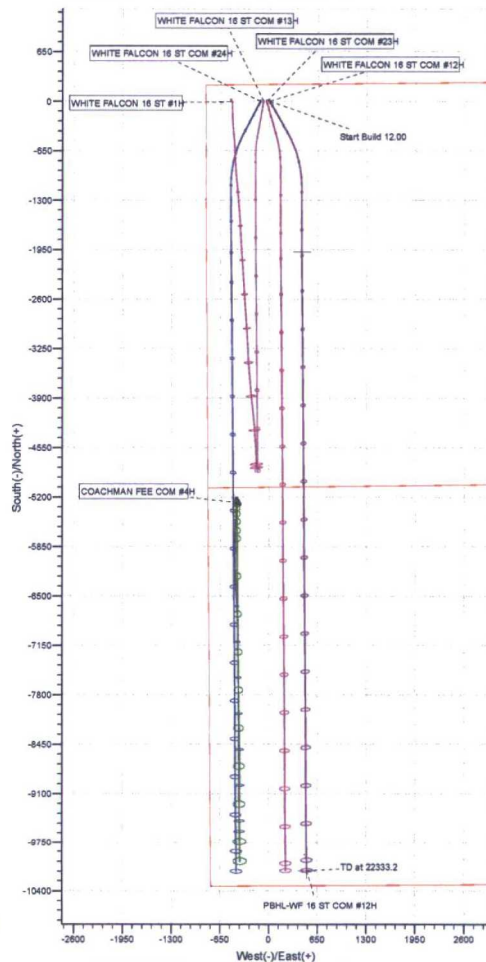
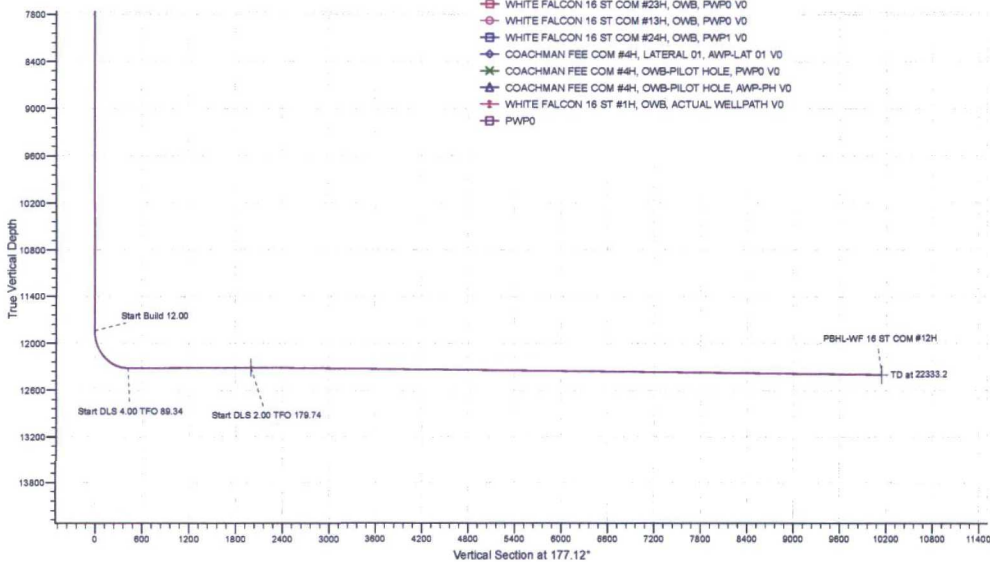
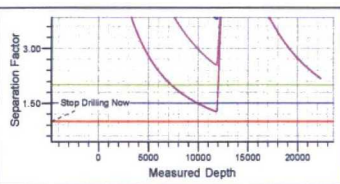
WELL DETAILS: WHITE FALCON 16 ST COM #12H
3258.0
+N/-S +E/-W Northing Easting Latitude Longitude Slot
0.0 0.0 414834.60 795773.90 32° 8' 12.805 N 103° 22' 40.097 W

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Diag	TFace	VSeet	Annotation
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	11834.5	0.00	0.00	11834.5	0.0	0.0	0.00	0.00	0.0	
3	12584.6	90.00	150.00	12312.0	-413.5	238.8	12.00	150.00	425.0	
4	13322.0	90.32	179.50	12309.9	-1117.2	430.6	4.00	89.34	1137.4	
5	14185.4	90.32	179.50	12305.0	-1980.5	438.2	0.00	0.00	2000.0	
6	14233.0	89.37	179.50	12305.1	-2028.1	438.6	2.00	179.74	2047.6	
7	22333.2	89.37	179.50	12394.0	-10127.5	509.2	0.00	0.00	10140.3	

Project: LEA COUNTY, NM
Site: BULLDOG
Well: WHITE FALCON 16 ST COM #12H
Wellbore: OWB
Design: PWPO

LEGEND

- WHITE FALCON 16 ST COM #23H, OWB, PWPO V0
- WHITE FALCON 16 ST COM #13H, OWB, PWPO V0
- WHITE FALCON 16 ST COM #24H, OWB, PWPO V0
- COACHMAN FEE COM #4H, LATERAL D1, AWP-LAT D1 V0
- COACHMAN FEE COM #4H, OMB-PILOT HOLE, PWPO V0
- COACHMAN FEE COM #4H, OMB-PILOT HOLE, AWP-PH V0
- WHITE FALCON 16 ST #1H, OWB, ACTUAL WELLPATH V0
- PWPO





COG OPERATING LLC

LEA COUNTY, NM

BULLDOG

WHITE FALCON 16 ST COM #12H

OWB

Plan: PWP0

Survey Report - Geographic

13 March, 2017



COG Operating LLC

Survey Report - Geographic

Company:	COG OPERATING LLC	Local Co-ordinate Reference:	Well WHITE FALCON 16 ST COM #12H
Project:	LEA COUNTY, NM	TVD Reference:	RKB=3258+29 @ 3287.0usft (NORAM 23)
Site:	BULLDOG	MD Reference:	RKB=3258+29 @ 3287.0usft (NORAM 23)
Well:	WHITE FALCON 16 ST COM #12H	North Reference:	Grid
Wellbore:	OWB	Survey Calculation Method:	Minimum Curvature
Design:	PWP0	Database:	EDM_Users

Project	LEA COUNTY, NM		
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		BULLDOG			
Site Position:		Northing:	398,637.10 usft	Latitude:	32° 5' 36.820 N
From:	Map	Easting:	741,887.40 usft	Longitude:	103° 33' 8.116 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.42 °

Well	WHITE FALCON 16 ST COM #12H					
Well Position	+N/-S	0.0 usft	Northing:	414,834.60 usf	Latitude:	32° 8' 12.805 N
	+E/-W	0.0 usft	Easting:	795,773.90 usf	Longitude:	103° 22' 40.097 W
Position Uncertainty		3.0 usft	Wellhead Elevation:	usf	Ground Level:	3,258.0 usf

Wellbore	OWB				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	WMM2015	3/13/2017	6.90	60.01	47,924.40230577

Design	PWP0			
Audit Notes:				
Version:	Phase:	PROTOTYPE	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.0	0.0	0.0	177.12

Survey Tool Program	Date	3/13/2017		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.0	11,800.0	PWP0 (OWB)	Standard Keeper 104	Standard Wireline Keeper ver 1.0.4
11,800.0	22,333.2	PWP0 (OWB)	MWD+IFR1+MS	OWSG MWD + IFR1 + Multi-Station Correction

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
0.0	0.00	0.00	0.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
100.0	0.00	0.00	100.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
200.0	0.00	0.00	200.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
300.0	0.00	0.00	300.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
400.0	0.00	0.00	400.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
500.0	0.00	0.00	500.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
600.0	0.00	0.00	600.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
700.0	0.00	0.00	700.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
800.0	0.00	0.00	800.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
900.0	0.00	0.00	900.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
1,000.0	0.00	0.00	1,000.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W



COG Operating LLC

Survey Report - Geographic

Company: COG OPERATING LLC
Project: LEA COUNTY, NM
Site: BULLDOG
Well: WHITE FALCON 16 ST COM #12H
Wellbore: OWB
Design: PWP0

Local Co-ordinate Reference: Well WHITE FALCON 16 ST COM #12H
TVD Reference: RKB=3258+29 @ 3287.0usft (NORAM 23)
MD Reference: RKB=3258+29 @ 3287.0usft (NORAM 23)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM_Users

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
1,100.0	0.00	0.00	1,100.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
1,200.0	0.00	0.00	1,200.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
1,300.0	0.00	0.00	1,300.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
1,400.0	0.00	0.00	1,400.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
1,500.0	0.00	0.00	1,500.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
1,600.0	0.00	0.00	1,600.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
1,700.0	0.00	0.00	1,700.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
1,800.0	0.00	0.00	1,800.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
1,900.0	0.00	0.00	1,900.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
2,000.0	0.00	0.00	2,000.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
2,100.0	0.00	0.00	2,100.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
2,200.0	0.00	0.00	2,200.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
2,300.0	0.00	0.00	2,300.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
2,400.0	0.00	0.00	2,400.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
2,500.0	0.00	0.00	2,500.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
2,600.0	0.00	0.00	2,600.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
2,700.0	0.00	0.00	2,700.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
2,800.0	0.00	0.00	2,800.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
2,900.0	0.00	0.00	2,900.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
3,000.0	0.00	0.00	3,000.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
3,100.0	0.00	0.00	3,100.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
3,200.0	0.00	0.00	3,200.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
3,300.0	0.00	0.00	3,300.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
3,400.0	0.00	0.00	3,400.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
3,500.0	0.00	0.00	3,500.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
3,600.0	0.00	0.00	3,600.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
3,700.0	0.00	0.00	3,700.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
3,800.0	0.00	0.00	3,800.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
3,900.0	0.00	0.00	3,900.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
4,000.0	0.00	0.00	4,000.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
4,100.0	0.00	0.00	4,100.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
4,200.0	0.00	0.00	4,200.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
4,300.0	0.00	0.00	4,300.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
4,400.0	0.00	0.00	4,400.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
4,500.0	0.00	0.00	4,500.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
4,600.0	0.00	0.00	4,600.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
4,700.0	0.00	0.00	4,700.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
4,800.0	0.00	0.00	4,800.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
4,900.0	0.00	0.00	4,900.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
5,000.0	0.00	0.00	5,000.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
5,100.0	0.00	0.00	5,100.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
5,200.0	0.00	0.00	5,200.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
5,300.0	0.00	0.00	5,300.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
5,400.0	0.00	0.00	5,400.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
5,500.0	0.00	0.00	5,500.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
5,600.0	0.00	0.00	5,600.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
5,700.0	0.00	0.00	5,700.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
5,800.0	0.00	0.00	5,800.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
5,900.0	0.00	0.00	5,900.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
6,000.0	0.00	0.00	6,000.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
6,100.0	0.00	0.00	6,100.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
6,200.0	0.00	0.00	6,200.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
6,300.0	0.00	0.00	6,300.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
6,400.0	0.00	0.00	6,400.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
6,500.0	0.00	0.00	6,500.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W



COG Operating LLC

Survey Report - Geographic

Company: COG OPERATING LLC
Project: LEA COUNTY, NM
Site: BULLDOG
Well: WHITE FALCON 16 ST COM #12H
Wellbore: OWB
Design: PWP0

Local Co-ordinate Reference: Well WHITE FALCON 16 ST COM #12H
TVD Reference: RKB=3258+29 @ 3287.0usft (NORAM 23)
MD Reference: RKB=3258+29 @ 3287.0usft (NORAM 23)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM_Users

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
6,600.0	0.00	0.00	6,600.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
6,700.0	0.00	0.00	6,700.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
6,800.0	0.00	0.00	6,800.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
6,900.0	0.00	0.00	6,900.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
7,000.0	0.00	0.00	7,000.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
7,100.0	0.00	0.00	7,100.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
7,200.0	0.00	0.00	7,200.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
7,300.0	0.00	0.00	7,300.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
7,400.0	0.00	0.00	7,400.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
7,500.0	0.00	0.00	7,500.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
7,600.0	0.00	0.00	7,600.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
7,700.0	0.00	0.00	7,700.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
7,800.0	0.00	0.00	7,800.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
7,900.0	0.00	0.00	7,900.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
8,000.0	0.00	0.00	8,000.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
8,100.0	0.00	0.00	8,100.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
8,200.0	0.00	0.00	8,200.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
8,300.0	0.00	0.00	8,300.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
8,400.0	0.00	0.00	8,400.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
8,500.0	0.00	0.00	8,500.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
8,600.0	0.00	0.00	8,600.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
8,700.0	0.00	0.00	8,700.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
8,800.0	0.00	0.00	8,800.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
8,900.0	0.00	0.00	8,900.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
9,000.0	0.00	0.00	9,000.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
9,100.0	0.00	0.00	9,100.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
9,200.0	0.00	0.00	9,200.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
9,300.0	0.00	0.00	9,300.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
9,400.0	0.00	0.00	9,400.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
9,500.0	0.00	0.00	9,500.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
9,600.0	0.00	0.00	9,600.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
9,700.0	0.00	0.00	9,700.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
9,800.0	0.00	0.00	9,800.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
9,900.0	0.00	0.00	9,900.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
10,000.0	0.00	0.00	10,000.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
10,100.0	0.00	0.00	10,100.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
10,200.0	0.00	0.00	10,200.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
10,300.0	0.00	0.00	10,300.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
10,400.0	0.00	0.00	10,400.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
10,500.0	0.00	0.00	10,500.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
10,600.0	0.00	0.00	10,600.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
10,700.0	0.00	0.00	10,700.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
10,800.0	0.00	0.00	10,800.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
10,900.0	0.00	0.00	10,900.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
11,000.0	0.00	0.00	11,000.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
11,100.0	0.00	0.00	11,100.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
11,200.0	0.00	0.00	11,200.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
11,300.0	0.00	0.00	11,300.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
11,400.0	0.00	0.00	11,400.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
11,500.0	0.00	0.00	11,500.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
11,600.0	0.00	0.00	11,600.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
11,700.0	0.00	0.00	11,700.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
11,800.0	0.00	0.00	11,800.0	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
11,834.5	0.00	0.00	11,834.5	0.0	0.0	414,834.60	795,773.90	32° 8' 12.805 N	103° 22' 40.097 W
11,900.0	7.86	150.00	11,899.8	-3.9	2.2	414,830.71	795,776.14	32° 8' 12.766 N	103° 22' 40.071 W



COG Operating LLC

Survey Report - Geographic

Company: COG OPERATING LLC
Project: LEA COUNTY, NM
Site: BULLDOG
Well: WHITE FALCON 16 ST COM #12H
Wellbore: OWB
Design: PWP0

Local Co-ordinate Reference: Well WHITE FALCON 16 ST COM #12H
TVD Reference: RKB=3258+29 @ 3287.0usft (NORAM 23)
MD Reference: RKB=3258+29 @ 3287.0usft (NORAM 23)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM_Users

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
12,000.0	19.86	150.00	11,996.7	-24.6	14.2	414,810.01	795,788.10	32° 8' 12.560 N	103° 22' 39.934 W
12,100.0	31.86	150.00	12,086.5	-62.3	36.0	414,772.31	795,809.86	32° 8' 12.185 N	103° 22' 39.685 W
12,200.0	43.86	150.00	12,165.3	-115.3	66.6	414,719.26	795,840.49	32° 8' 11.657 N	103° 22' 39.334 W
12,300.0	55.86	150.00	12,229.7	-181.4	104.7	414,653.18	795,878.64	32° 8' 11.000 N	103° 22' 38.897 W
12,400.0	67.86	150.00	12,276.8	-257.6	148.8	414,576.95	795,922.65	32° 8' 10.242 N	103° 22' 38.393 W
12,500.0	79.85	150.00	12,304.5	-340.7	196.7	414,493.92	795,970.59	32° 8' 9.416 N	103° 22' 37.845 W
12,584.6	90.00	150.00	12,312.0	-413.5	238.7	414,421.07	796,012.65	32° 8' 8.692 N	103° 22' 37.363 W
12,600.0	90.01	150.62	12,312.0	-426.9	246.4	414,407.66	796,020.30	32° 8' 8.558 N	103° 22' 37.275 W
12,700.0	90.05	154.62	12,311.9	-515.7	292.4	414,318.88	796,066.28	32° 8' 7.676 N	103° 22' 36.750 W
12,800.0	90.10	158.62	12,311.8	-607.5	332.1	414,227.11	796,105.96	32° 8' 6.764 N	103° 22' 36.298 W
12,900.0	90.14	162.62	12,311.6	-701.8	365.2	414,132.80	796,139.14	32° 8' 5.828 N	103° 22' 35.922 W
13,000.0	90.19	166.62	12,311.3	-798.2	391.8	414,036.40	796,165.66	32° 8' 4.872 N	103° 22' 35.623 W
13,100.0	90.23	170.62	12,310.9	-896.2	411.5	413,938.39	796,185.40	32° 8' 3.900 N	103° 22' 35.404 W
13,200.0	90.27	174.62	12,310.5	-995.4	424.3	413,839.24	796,198.24	32° 8' 2.918 N	103° 22' 35.265 W
13,300.0	90.31	178.62	12,310.0	-1,095.2	430.2	413,739.43	796,204.15	32° 8' 1.930 N	103° 22' 35.207 W
13,322.0	90.32	179.50	12,309.9	-1,117.2	430.6	413,717.43	796,204.51	32° 8' 1.712 N	103° 22' 35.205 W
13,400.0	90.32	179.50	12,309.4	-1,195.2	431.3	413,639.44	796,205.19	32° 8' 0.941 N	103° 22' 35.205 W
13,500.0	90.32	179.50	12,308.9	-1,295.2	432.2	413,539.45	796,206.07	32° 7' 59.951 N	103° 22' 35.205 W
13,600.0	90.32	179.50	12,308.3	-1,395.1	433.1	413,439.45	796,206.95	32° 7' 58.961 N	103° 22' 35.205 W
13,700.0	90.32	179.50	12,307.7	-1,495.1	433.9	413,339.46	796,207.83	32° 7' 57.972 N	103° 22' 35.205 W
13,800.0	90.32	179.50	12,307.2	-1,595.1	434.8	413,239.46	796,208.71	32° 7' 56.982 N	103° 22' 35.205 W
13,900.0	90.32	179.50	12,306.6	-1,695.1	435.7	413,139.47	796,209.59	32° 7' 55.993 N	103° 22' 35.205 W
14,000.0	90.32	179.50	° 7'	-1,795.1	436.6	413,039.47	796,210.47	32° 7' 55.003 N	103° 22' 35.205 W
14,100.0	90.32	179.50	12,305.5	-1,895.1	437.4	412,939.48	796,211.35	32° 7' 54.014 N	103° 22' 35.205 W
14,185.4	90.32	179.50	12,305.0	-1,980.5	438.2	412,854.10	796,212.10	32° 7' 53.169 N	103° 22' 35.206 W
14,200.0	90.03	179.50	12,305.0	-1,995.1	438.3	412,839.48	796,212.23	32° 7' 53.024 N	103° 22' 35.206 W
14,233.0	89.37	179.50	12,305.1	-2,028.1	438.6	412,806.50	796,212.51	32° 7' 52.698 N	103° 22' 35.206 W
14,300.0	89.37	179.50	12,305.9	-2,095.1	439.2	412,739.49	796,213.10	32° 7' 52.035 N	103° 22' 35.206 W
14,400.0	89.37	179.50	12,307.0	-2,195.1	440.1	412,639.50	796,213.97	32° 7' 51.045 N	103° 22' 35.206 W
14,500.0	89.37	179.50	12,308.1	-2,295.1	440.9	412,539.51	796,214.84	32° 7' 50.056 N	103° 22' 35.206 W
14,600.0	89.37	179.50	12,309.2	-2,395.1	441.8	412,439.52	796,215.71	32° 7' 49.066 N	103° 22' 35.206 W
14,700.0	89.37	179.50	12,310.3	-2,495.1	442.7	412,339.53	796,216.58	32° 7' 48.077 N	103° 22' 35.207 W
14,800.0	89.37	179.50	12,311.3	-2,595.1	443.6	412,239.54	796,217.46	32° 7' 47.087 N	103° 22' 35.207 W
14,900.0	89.37	179.50	12,312.4	-2,695.0	444.4	412,139.55	796,218.33	32° 7' 46.098 N	103° 22' 35.207 W
15,000.0	89.37	179.50	12,313.5	-2,795.0	445.3	412,039.56	796,219.20	32° 7' 45.108 N	103° 22' 35.207 W
15,100.0	89.37	179.50	12,314.6	-2,895.0	446.2	411,939.57	796,220.07	32° 7' 44.119 N	103° 22' 35.207 W
15,200.0	89.37	179.50	12,315.7	-2,995.0	447.0	411,839.58	796,220.94	32° 7' 43.129 N	103° 22' 35.208 W
15,300.0	89.37	179.50	12,316.8	-3,095.0	447.9	411,739.59	796,221.81	32° 7' 42.140 N	103° 22' 35.208 W
15,400.0	89.37	179.50	12,317.9	-3,195.0	448.8	411,639.60	796,222.68	32° 7' 41.150 N	103° 22' 35.208 W
15,500.0	89.37	179.50	12,319.0	-3,295.0	449.7	411,539.61	796,223.55	32° 7' 40.161 N	103° 22' 35.208 W
15,600.0	89.37	179.50	12,320.1	-3,395.0	450.5	411,439.62	796,224.43	32° 7' 39.171 N	103° 22' 35.208 W
15,700.0	89.37	179.50	12,321.2	-3,495.0	451.4	411,339.63	796,225.30	32° 7' 38.182 N	103° 22' 35.209 W
15,800.0	89.37	179.50	12,322.3	-3,595.0	452.3	411,239.64	796,226.17	32° 7' 37.192 N	103° 22' 35.209 W
15,900.0	89.37	179.50	12,323.4	-3,694.9	453.1	411,139.65	796,227.04	32° 7' 36.203 N	103° 22' 35.209 W
16,000.0	89.37	179.50	12,324.5	-3,794.9	454.0	411,039.66	796,227.91	32° 7' 35.213 N	103° 22' 35.209 W
16,100.0	89.37	179.50	12,325.6	-3,894.9	454.9	410,939.67	796,228.78	32° 7' 34.224 N	103° 22' 35.209 W
16,200.0	89.37	179.50	12,326.7	-3,994.9	455.8	410,839.68	796,229.65	32° 7' 33.234 N	103° 22' 35.210 W
16,300.0	89.37	179.50	12,327.8	-4,094.9	456.6	410,739.69	796,230.53	32° 7' 32.245 N	103° 22' 35.210 W
16,400.0	89.37	179.50	12,328.9	-4,194.9	457.5	410,639.70	796,231.40	32° 7' 31.255 N	103° 22' 35.210 W
16,500.0	89.37	179.50	12,330.0	-4,294.9	458.4	410,539.71	796,232.27	32° 7' 30.266 N	103° 22' 35.210 W
16,600.0	89.37	179.50	12,331.1	-4,394.9	459.2	410,439.72	796,233.14	32° 7' 29.276 N	103° 22' 35.210 W
16,700.0	89.37	179.50	12,332.2	-4,494.9	460.1	410,339.73	796,234.01	32° 7' 28.287 N	103° 22' 35.210 W
16,800.0	89.37	179.50	12,333.3	-4,594.9	461.0	410,239.74	796,234.88	32° 7' 27.297 N	103° 22' 35.211 W
16,900.0	89.37	179.50	12,334.4	-4,694.9	461.9	410,139.75	796,235.75	32° 7' 26.308 N	103° 22' 35.211 W
17,000.0	89.37	179.50	12,335.5	-4,794.8	462.7	410,039.76	796,236.63	32° 7' 25.318 N	103° 22' 35.211 W



COG Operating LLC

Survey Report - Geographic

Company: COG OPERATING LLC
Project: LEA COUNTY, NM
Site: BULLDOG
Well: WHITE FALCON 16 ST COM #12H
Wellbore: OWB
Design: PWP0

Local Co-ordinate Reference: Well WHITE FALCON 16 ST COM #12H
TVD Reference: RKB=3258+29 @ 3287.0usft (NORAM 23)
MD Reference: RKB=3258+29 @ 3287.0usft (NORAM 23)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM_Users

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
17,100.0	89.37	179.50	12,336.6	-4,894.8	463.6	409,939.77	796,237.50	32° 7' 24.329 N	103° 22' 35.211 W
17,200.0	89.37	179.50	12,337.7	-4,994.8	464.5	409,839.78	796,238.37	32° 7' 23.339 N	103° 22' 35.211 W
17,300.0	89.37	179.50	12,338.8	-5,094.8	465.3	409,739.79	796,239.24	32° 7' 22.350 N	103° 22' 35.212 W
17,400.0	89.37	179.50	12,339.9	-5,194.8	466.2	409,639.80	796,240.11	32° 7' 21.360 N	103° 22' 35.212 W
17,500.0	89.37	179.50	12,341.0	-5,294.8	467.1	409,539.81	796,240.98	32° 7' 20.371 N	103° 22' 35.212 W
17,600.0	89.37	179.50	12,342.1	-5,394.8	468.0	409,439.82	796,241.85	32° 7' 19.381 N	103° 22' 35.212 W
17,700.0	89.37	179.50	12,343.2	-5,494.8	468.8	409,339.83	796,242.73	32° 7' 18.392 N	103° 22' 35.212 W
17,800.0	89.37	179.50	12,344.3	-5,594.8	469.7	409,239.84	796,243.60	32° 7' 17.402 N	103° 22' 35.213 W
17,900.0	89.37	179.50	12,345.4	-5,694.8	470.6	409,139.85	796,244.47	32° 7' 16.413 N	103° 22' 35.213 W
18,000.0	89.37	179.50	12,346.5	-5,794.7	471.4	409,039.86	796,245.34	32° 7' 15.423 N	103° 22' 35.213 W
18,100.0	89.37	179.50	12,347.6	-5,894.7	472.3	408,939.87	796,246.21	32° 7' 14.434 N	103° 22' 35.213 W
18,200.0	89.37	179.50	12,348.7	-5,994.7	473.2	408,839.87	796,247.08	32° 7' 13.444 N	103° 22' 35.213 W
18,300.0	89.37	179.50	12,349.7	-6,094.7	474.1	408,739.88	796,247.95	32° 7' 12.455 N	103° 22' 35.214 W
18,400.0	89.37	179.50	12,350.8	-6,194.7	474.9	408,639.89	796,248.82	32° 7' 11.465 N	103° 22' 35.214 W
18,500.0	89.37	179.50	12,351.9	-6,294.7	475.8	408,539.90	796,249.70	32° 7' 10.476 N	103° 22' 35.214 W
18,600.0	89.37	179.50	12,353.0	-6,394.7	476.7	408,439.91	796,250.57	32° 7' 9.486 N	103° 22' 35.214 W
18,700.0	89.37	179.50	12,354.1	-6,494.7	477.5	408,339.92	796,251.44	32° 7' 8.497 N	103° 22' 35.214 W
18,800.0	89.37	179.50	12,355.2	-6,594.7	478.4	408,239.93	796,252.31	32° 7' 7.507 N	103° 22' 35.215 W
18,900.0	89.37	179.50	12,356.3	-6,694.7	479.3	408,139.94	796,253.18	32° 7' 6.518 N	103° 22' 35.215 W
19,000.0	89.37	179.50	12,357.4	-6,794.6	480.2	408,039.95	796,254.05	32° 7' 5.528 N	103° 22' 35.215 W
19,100.0	89.37	179.50	12,358.5	-6,894.6	481.0	407,939.96	796,254.92	32° 7' 4.539 N	103° 22' 35.215 W
19,200.0	89.37	179.50	12,359.6	-6,994.6	481.9	407,839.97	796,255.80	32° 7' 3.549 N	103° 22' 35.215 W
19,300.0	89.37	179.50	12,360.7	-7,094.6	482.8	407,739.98	796,256.67	32° 7' 2.560 N	103° 22' 35.216 W
19,400.0	89.37	179.50	12,361.8	-7,194.6	483.6	407,639.99	796,257.54	32° 7' 1.570 N	103° 22' 35.216 W
19,500.0	89.37	179.50	12,362.9	-7,294.6	484.5	407,540.00	796,258.41	32° 7' 0.581 N	103° 22' 35.216 W
19,600.0	89.37	179.50	12,364.0	-7,394.6	485.4	407,440.01	796,259.28	32° 6' 59.591 N	103° 22' 35.216 W
19,700.0	89.37	179.50	12,365.1	-7,494.6	486.3	407,340.02	796,260.15	32° 6' 58.602 N	103° 22' 35.216 W
19,800.0	89.37	179.50	12,366.2	-7,594.6	487.1	407,240.03	796,261.02	32° 6' 57.612 N	103° 22' 35.216 W
19,900.0	89.37	179.50	12,367.3	-7,694.6	488.0	407,140.04	796,261.90	32° 6' 56.623 N	103° 22' 35.217 W
20,000.0	89.37	179.50	12,368.4	-7,794.5	488.9	407,040.05	796,262.77	32° 6' 55.633 N	103° 22' 35.217 W
20,100.0	89.37	179.50	12,369.5	-7,894.5	489.7	406,940.06	796,263.64	32° 6' 54.644 N	103° 22' 35.217 W
20,200.0	89.37	179.50	12,370.6	-7,994.5	490.6	406,840.07	796,264.51	32° 6' 53.654 N	103° 22' 35.217 W
20,300.0	89.37	179.50	12,371.7	-8,094.5	491.5	406,740.08	796,265.38	32° 6' 52.665 N	103° 22' 35.217 W
20,400.0	89.37	179.50	12,372.8	-8,194.5	492.4	406,640.09	796,266.25	32° 6' 51.676 N	103° 22' 35.218 W
20,500.0	89.37	179.50	12,373.9	-8,294.5	493.2	406,540.10	796,267.12	32° 6' 50.686 N	103° 22' 35.218 W
20,600.0	89.37	179.50	12,375.0	-8,394.5	494.1	406,440.11	796,268.00	32° 6' 49.697 N	103° 22' 35.218 W
20,700.0	89.37	179.50	12,376.1	-8,494.5	495.0	406,340.12	796,268.87	32° 6' 48.707 N	103° 22' 35.218 W
20,800.0	89.37	179.50	12,377.2	-8,594.5	495.8	406,240.13	796,269.74	32° 6' 47.718 N	103° 22' 35.218 W
20,900.0	89.37	179.50	12,378.3	-8,694.5	496.7	406,140.14	796,270.61	32° 6' 46.728 N	103° 22' 35.219 W
21,000.0	89.37	179.50	12,379.4	-8,794.4	497.6	406,040.15	796,271.48	32° 6' 45.739 N	103° 22' 35.219 W
21,100.0	89.37	179.50	12,380.5	-8,894.4	498.5	405,940.16	796,272.35	32° 6' 44.749 N	103° 22' 35.219 W
21,200.0	89.37	179.50	12,381.6	-8,994.4	499.3	405,840.17	796,273.22	32° 6' 43.760 N	103° 22' 35.219 W
21,300.0	89.37	179.50	12,382.7	-9,094.4	500.2	405,740.18	796,274.09	32° 6' 42.770 N	103° 22' 35.219 W
21,400.0	89.37	179.50	12,383.8	-9,194.4	501.1	405,640.19	796,274.97	32° 6' 41.781 N	103° 22' 35.220 W
21,500.0	89.37	179.50	12,384.9	-9,294.4	501.9	405,540.20	796,275.84	32° 6' 40.791 N	103° 22' 35.220 W
21,600.0	89.37	179.50	12,386.0	-9,394.4	502.8	405,440.21	796,276.71	32° 6' 39.802 N	103° 22' 35.220 W
21,700.0	89.37	179.50	12,387.1	-9,494.4	503.7	405,340.22	796,277.58	32° 6' 38.812 N	103° 22' 35.220 W
21,800.0	89.37	179.50	12,388.1	-9,594.4	504.6	405,240.23	796,278.45	32° 6' 37.823 N	103° 22' 35.220 W
21,900.0	89.37	179.50	12,389.2	-9,694.4	505.4	405,140.24	796,279.32	32° 6' 36.833 N	103° 22' 35.220 W
22,000.0	89.37	179.50	12,390.3	-9,794.4	506.3	405,040.25	796,280.19	32° 6' 35.844 N	103° 22' 35.221 W
22,100.0	89.37	179.50	12,391.4	-9,894.3	507.2	404,940.26	796,281.07	32° 6' 34.854 N	103° 22' 35.221 W
22,200.0	89.37	179.50	12,392.5	-9,994.3	508.0	404,840.27	796,281.94	32° 6' 33.865 N	103° 22' 35.221 W
22,300.0	89.37	179.50	12,393.6	-10,094.3	508.9	404,740.28	796,282.81	32° 6' 32.875 N	103° 22' 35.221 W
22,333.2	89.37	179.50	12,394.0	-10,127.5	509.2	404,707.10	796,283.10	32° 6' 32.547 N	103° 22' 35.221 W



COG Operating LLC
Survey Report - Geographic

Company: COG OPERATING LLC
Project: LEA COUNTY, NM
Site: BULLDOG
Well: WHITE FALCON 16 ST COM #12H
Wellbore: OWB
Design: PWP0

Local Co-ordinate Reference: Well WHITE FALCON 16 ST COM #12H
TVD Reference: RKB=3258+29 @ 3287.0usft (NORAM 23)
MD Reference: RKB=3258+29 @ 3287.0usft (NORAM 23)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM_Users

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
2K VS 12H - plan hits target center - Point	0.00	0.00	12,305.0	-1,980.5	438.2	412,854.10	796,212.10	32° 7' 53.169 N	103° 22' 35.206 W
PBHL-WF 16 ST COM - plan hits target center - Point	0.00	0.00	12,394.0	-10,127.5	509.2	404,707.10	796,283.10	32° 6' 32.547 N	103° 22' 35.221 W

Checked By: _____ Approved By: _____ Date: _____