



NM OIL CONSERVATION
ARTESIA DISTRICT

SEP 08 2017

RECEIVED

COG OPERATING, LLC

**Eddy /Lea County, NM (NAD27) NMEZ
Dodd Federal Unit #920H #920H DFU920H
SL 2310 FSL, 195 FEL Sec14**

PP - 682'FEL, 2290'FSL Sec14

Lateral

**Planned BHL 10'FWL, 2290'FSL Sec 14
Platted BHL 130'FWL, 2310'FSL Sec14**



Planning Report

Database: VON_EDM
Company: COG OPERATING, LLC
Project: Eddy /Lea County, NM (NAD27) NMEZ
Site: Dodd Federal Unit #920H
Well: #920H
Wellbore: Lateral
Design: Plan #2

Local Co-ordinate Reference: Well #920H - Slot DFU920H
TVD Reference: 3621+18 @ 3639.00ft (SO3)
MD Reference: 3621+18 @ 3639.00ft (SO3)
North Reference: Grid
Survey Calculation Method: Minimum Curvature

Project	Eddy /Lea County, NM (NAD27) NMEZ		
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	Dodd Federal Unit #920H				
Site Position:		Northing:	667,074.40 ft	Latitude:	32° 50' 0.669 N
From:	Map	Easting:	591,028.00 ft	Longitude:	104° 2' 13.135 W
Position Uncertainty:	0.00 ft	Slot Radius:	13.20 in	Grid Convergence:	0.16 °

Well	#920H - Slot DFU920H					
Well Position	+N/-S	0.00 ft	Northing:	667,074.40 ft	Latitude:	32° 50' 0.669 N
	+E/-W	0.00 ft	Easting:	591,028.00 ft	Longitude:	104° 2' 13.135 W
Position Uncertainty		0.00 ft	Wellhead Elevation:		Ground Level:	3,621.00 ft

Wellbore	Lateral				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	08/24/17	7.20	60.54	48,229

Design	Plan #2			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.00	0.00	0.00	269.96

Plan Sections										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,120.00	0.00	0.00	1,120.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,557.90	4.38	96.12	1,557.48	-1.78	16.63	1.00	1.00	0.00	96.12	
3,556.57	4.38	96.12	3,550.31	-18.06	168.37	0.00	0.00	0.00	0.00	
3,994.48	0.00	0.00	3,987.79	-19.84	185.00	1.00	-1.00	0.00	180.00	
4,194.48	0.00	0.00	4,187.79	-19.84	185.00	0.00	0.00	0.00	0.00	
4,603.57	45.00	269.96	4,556.10	-19.95	32.44	11.00	11.00	0.00	269.96	
4,803.57	45.00	269.96	4,697.52	-20.04	-108.98	0.00	0.00	0.00	0.00	
5,221.73	91.00	269.95	4,850.00	-20.35	-486.37	11.00	11.00	0.00	-0.01	
9,814.38	91.00	269.95	4,770.00	-24.40	-5,078.31	0.00	0.00	0.00	0.00	BKU 920H PBHL p2



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MD Reference: 3621+18 @ 3639.00ft (SO3)
North Reference: Grid
Survey Calculation Method: Minimum Curvature

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
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
382.00	0.00	0.00	382.00	0.00	0.00	0.00	0.00	0.00	0.00
Top of Salt									
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
901.00	0.00	0.00	901.00	0.00	0.00	0.00	0.00	0.00	0.00
Tansill									
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00
1,008.00	0.00	0.00	1,008.00	0.00	0.00	0.00	0.00	0.00	0.00
Yates									
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00
1,120.00	0.00	0.00	1,120.00	0.00	0.00	0.00	0.00	0.00	0.00
1,200.00	0.80	96.12	1,200.00	-0.06	0.56	-0.56	1.00	1.00	0.00
1,283.02	1.63	96.12	1,283.00	-0.25	2.31	-2.31	1.00	1.00	0.00
Seven Rivers									
1,300.00	1.80	96.12	1,299.97	-0.30	2.81	-2.81	1.00	1.00	0.00
1,400.00	2.80	96.12	1,399.89	-0.73	6.80	-6.80	1.00	1.00	0.00
1,500.00	3.80	96.12	1,499.72	-1.34	12.52	-12.52	1.00	1.00	0.00
1,557.90	4.38	96.12	1,557.48	-1.78	16.63	-16.63	1.00	1.00	0.00
1,600.00	4.38	96.12	1,599.45	-2.13	19.83	-19.83	0.00	0.00	0.00
1,700.00	4.38	96.12	1,699.16	-2.94	27.42	-27.42	0.00	0.00	0.00
1,800.00	4.38	96.12	1,798.87	-3.75	35.01	-35.01	0.00	0.00	0.00
1,899.42	4.38	96.12	1,898.00	-4.56	42.56	-42.56	0.00	0.00	0.00
Queen									
1,900.00	4.38	96.12	1,898.58	-4.57	42.60	-42.60	0.00	0.00	0.00
2,000.00	4.38	96.12	1,998.28	-5.38	50.19	-50.19	0.00	0.00	0.00
2,100.00	4.38	96.12	2,097.99	-6.20	57.79	-57.78	0.00	0.00	0.00
2,200.00	4.38	96.12	2,197.70	-7.01	65.38	-65.37	0.00	0.00	0.00
2,300.00	4.38	96.12	2,297.41	-7.83	72.97	-72.96	0.00	0.00	0.00
2,303.60	4.38	96.12	2,301.00	-7.85	73.24	-73.24	0.00	0.00	0.00
Grayburg									
2,400.00	4.38	96.12	2,397.12	-8.64	80.56	-80.56	0.00	0.00	0.00
2,500.00	4.38	96.12	2,496.82	-9.45	88.15	-88.15	0.00	0.00	0.00
2,597.46	4.38	96.12	2,594.00	-10.25	95.55	-95.55	0.00	0.00	0.00
San Andres									
2,600.00	4.38	96.12	2,596.53	-10.27	95.75	-95.74	0.00	0.00	0.00
2,700.00	4.38	96.12	2,696.24	-11.08	103.34	-103.33	0.00	0.00	0.00
2,800.00	4.38	96.12	2,795.95	-11.90	110.93	-110.92	0.00	0.00	0.00
2,900.00	4.38	96.12	2,895.66	-12.71	118.52	-118.51	0.00	0.00	0.00
3,000.00	4.38	96.12	2,995.36	-13.52	126.11	-126.10	0.00	0.00	0.00
3,100.00	4.38	96.12	3,095.07	-14.34	133.70	-133.69	0.00	0.00	0.00
3,200.00	4.38	96.12	3,194.78	-15.15	141.30	-141.29	0.00	0.00	0.00
3,300.00	4.38	96.12	3,294.49	-15.97	148.89	-148.88	0.00	0.00	0.00
3,400.00	4.38	96.12	3,394.20	-16.78	156.48	-156.47	0.00	0.00	0.00
3,500.00	4.38	96.12	3,493.90	-17.60	164.07	-164.06	0.00	0.00	0.00
3,556.57	4.38	96.12	3,550.31	-18.06	168.37	-168.35	0.00	0.00	0.00



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Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
3,600.00	3.94	96.12	3,593.62	-18.39	171.50	-171.49	1.00	-1.00	0.00
3,700.00	2.94	96.12	3,693.44	-19.03	177.48	-177.46	1.00	-1.00	0.00
3,800.00	1.94	96.12	3,793.35	-19.49	181.72	-181.70	1.00	-1.00	0.00
3,900.00	0.94	96.12	3,893.32	-19.76	184.22	-184.21	1.00	-1.00	0.00
3,994.48	0.00	0.00	3,987.79	-19.84	185.00	-184.98	1.00	-1.00	0.00
4,000.00	0.00	0.00	3,993.31	-19.84	185.00	-184.98	0.00	0.00	0.00
4,035.69	0.00	0.00	4,029.00	-19.84	185.00	-184.98	0.00	0.00	0.00
Glorieta									
4,100.00	0.00	0.00	4,093.31	-19.84	185.00	-184.98	0.00	0.00	0.00
4,105.69	0.00	0.00	4,099.00	-19.84	185.00	-184.98	0.00	0.00	0.00
Paddock									
4,194.48	0.00	0.00	4,187.79	-19.84	185.00	-184.98	0.00	0.00	0.00
4,200.00	0.61	269.96	4,193.31	-19.84	184.97	-184.96	11.00	11.00	0.00
4,250.00	6.11	269.96	4,243.21	-19.84	182.04	-182.03	11.00	11.00	0.00
4,300.00	11.61	269.96	4,292.59	-19.85	174.35	-174.33	11.00	11.00	0.00
4,350.00	17.11	269.96	4,341.01	-19.86	161.95	-161.94	11.00	11.00	0.00
4,400.00	22.61	269.96	4,388.02	-19.87	144.97	-144.96	11.00	11.00	0.00
4,450.00	28.11	269.96	4,433.19	-19.88	123.57	-123.56	11.00	11.00	0.00
4,500.00	33.61	269.96	4,476.09	-19.90	97.93	-97.92	11.00	11.00	0.00
4,550.00	39.11	269.96	4,516.34	-19.92	68.30	-68.29	11.00	11.00	0.00
4,582.63	42.70	269.96	4,541.00	-19.94	46.94	-46.93	11.00	11.00	0.00
Blinebry									
4,603.57	45.00	269.96	4,556.10	-19.95	32.44	-32.42	11.00	11.00	0.00
4,700.00	45.00	269.96	4,624.29	-19.99	-35.75	35.76	0.00	0.00	0.00
4,803.57	45.00	269.96	4,697.52	-20.04	-108.98	109.00	0.00	0.00	0.00
4,850.00	50.11	269.96	4,728.85	-20.07	-143.23	143.25	11.00	11.00	0.00
4,900.00	55.61	269.96	4,759.03	-20.10	-183.08	183.09	11.00	11.00	0.00
4,950.00	61.11	269.96	4,785.25	-20.13	-225.63	225.64	11.00	11.00	0.00
5,000.00	66.61	269.95	4,807.27	-20.17	-270.49	270.51	11.00	11.00	0.00
5,050.00	72.11	269.95	4,824.89	-20.20	-317.27	317.28	11.00	11.00	0.00
5,100.00	77.61	269.95	4,837.95	-20.25	-365.51	365.53	11.00	11.00	0.00
5,150.00	83.11	269.95	4,846.32	-20.29	-414.79	414.80	11.00	11.00	0.00
5,200.00	88.61	269.95	4,849.93	-20.33	-464.64	464.65	11.00	11.00	0.00
5,221.73	91.00	269.95	4,850.00	-20.35	-486.37	486.38	11.00	11.00	0.00
5,300.00	91.00	269.95	4,848.64	-20.42	-564.62	564.64	0.00	0.00	0.00
5,400.00	91.00	269.95	4,846.90	-20.51	-664.61	664.62	0.00	0.00	0.00
5,500.00	91.00	269.95	4,845.16	-20.59	-764.59	764.61	0.00	0.00	0.00
5,600.00	91.00	269.95	4,843.41	-20.68	-864.58	864.59	0.00	0.00	0.00
5,700.00	91.00	269.95	4,841.67	-20.77	-964.56	964.58	0.00	0.00	0.00
5,800.00	91.00	269.95	4,839.93	-20.86	-1,064.55	1,064.56	0.00	0.00	0.00
5,900.00	91.00	269.95	4,838.19	-20.95	-1,164.53	1,164.55	0.00	0.00	0.00
6,000.00	91.00	269.95	4,836.45	-21.04	-1,264.52	1,264.53	0.00	0.00	0.00
6,100.00	91.00	269.95	4,834.70	-21.12	-1,364.50	1,364.52	0.00	0.00	0.00
6,200.00	91.00	269.95	4,832.96	-21.21	-1,464.49	1,464.50	0.00	0.00	0.00
6,300.00	91.00	269.95	4,831.22	-21.30	-1,564.47	1,564.48	0.00	0.00	0.00
6,400.00	91.00	269.95	4,829.48	-21.39	-1,664.46	1,664.47	0.00	0.00	0.00
6,500.00	91.00	269.95	4,827.74	-21.48	-1,764.44	1,764.45	0.00	0.00	0.00
6,600.00	91.00	269.95	4,825.99	-21.57	-1,864.42	1,864.44	0.00	0.00	0.00
6,700.00	91.00	269.95	4,824.25	-21.65	-1,964.41	1,964.42	0.00	0.00	0.00
6,800.00	91.00	269.95	4,822.51	-21.74	-2,064.39	2,064.41	0.00	0.00	0.00
6,900.00	91.00	269.95	4,820.77	-21.83	-2,164.38	2,164.39	0.00	0.00	0.00
7,000.00	91.00	269.95	4,819.03	-21.92	-2,264.36	2,264.38	0.00	0.00	0.00
7,100.00	91.00	269.95	4,817.28	-22.01	-2,364.35	2,364.36	0.00	0.00	0.00



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Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
7,200.00	91.00	269.95	4,815.54	-22.10	-2,464.33	2,464.35	0.00	0.00	0.00
7,300.00	91.00	269.95	4,813.80	-22.18	-2,564.32	2,564.33	0.00	0.00	0.00
7,400.00	91.00	269.95	4,812.06	-22.27	-2,664.30	2,664.32	0.00	0.00	0.00
7,500.00	91.00	269.95	4,810.32	-22.36	-2,764.29	2,764.30	0.00	0.00	0.00
7,600.00	91.00	269.95	4,808.57	-22.45	-2,864.27	2,864.29	0.00	0.00	0.00
7,700.00	91.00	269.95	4,806.83	-22.54	-2,964.26	2,964.27	0.00	0.00	0.00
7,800.00	91.00	269.95	4,805.09	-22.63	-3,064.24	3,064.26	0.00	0.00	0.00
7,900.00	91.00	269.95	4,803.35	-22.71	-3,164.23	3,164.24	0.00	0.00	0.00
8,000.00	91.00	269.95	4,801.61	-22.80	-3,264.21	3,264.23	0.00	0.00	0.00
8,100.00	91.00	269.95	4,799.86	-22.89	-3,364.20	3,364.21	0.00	0.00	0.00
8,200.00	91.00	269.95	4,798.12	-22.98	-3,464.18	3,464.20	0.00	0.00	0.00
8,300.00	91.00	269.95	4,796.38	-23.07	-3,564.17	3,564.18	0.00	0.00	0.00
8,400.00	91.00	269.95	4,794.64	-23.16	-3,664.15	3,664.17	0.00	0.00	0.00
8,500.00	91.00	269.95	4,792.90	-23.24	-3,764.14	3,764.15	0.00	0.00	0.00
8,600.00	91.00	269.95	4,791.15	-23.33	-3,864.12	3,864.14	0.00	0.00	0.00
8,700.00	91.00	269.95	4,789.41	-23.42	-3,964.11	3,964.12	0.00	0.00	0.00
8,800.00	91.00	269.95	4,787.67	-23.51	-4,064.09	4,064.11	0.00	0.00	0.00
8,900.00	91.00	269.95	4,785.93	-23.60	-4,164.07	4,164.09	0.00	0.00	0.00
9,000.00	91.00	269.95	4,784.19	-23.68	-4,264.06	4,264.08	0.00	0.00	0.00
9,100.00	91.00	269.95	4,782.44	-23.77	-4,364.04	4,364.06	0.00	0.00	0.00
9,200.00	91.00	269.95	4,780.70	-23.86	-4,464.03	4,464.04	0.00	0.00	0.00
9,300.00	91.00	269.95	4,778.96	-23.95	-4,564.01	4,564.03	0.00	0.00	0.00
9,400.00	91.00	269.95	4,777.22	-24.04	-4,664.00	4,664.01	0.00	0.00	0.00
9,500.00	91.00	269.95	4,775.48	-24.13	-4,763.98	4,764.00	0.00	0.00	0.00
9,600.00	91.00	269.95	4,773.73	-24.21	-4,863.97	4,863.98	0.00	0.00	0.00
9,700.00	91.00	269.95	4,771.99	-24.30	-4,963.95	4,963.97	0.00	0.00	0.00
9,800.00	91.00	269.95	4,770.25	-24.39	-5,063.94	5,063.95	0.00	0.00	0.00
9,814.38	91.00	269.95	4,770.00	-24.40	-5,078.31	5,078.33	0.00	0.00	0.00

Design Targets

Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
- hit/miss target - Shape BKU 920H SL - plan hits target center - Point	0.00	0.00	0.00	0.00	0.00	667,074.40	591,028.00	32° 50' 0.669 N	104° 2' 13.135 W
BKU 920H Tgt p2 - plan hits target center - Point	0.00	0.00	4,000.00	-19.84	185.00	667,054.57	591,213.00	32° 50' 0.468 N	104° 2' 10.967 W
BKU 920H PBHL p2 - plan hits target center - Point	0.00	0.00	4,770.00	-24.40	-5,078.31	667,050.00	585,949.69	32° 50' 0.565 N	104° 3' 12.654 W
BKU 920H LP p2 - plan hits target center - Point	0.00	0.00	4,850.00	-20.35	-486.37	667,054.05	590,541.63	32° 50' 0.481 N	104° 2' 18.836 W



Planning Report

Database: VON_EDM
Company: COG OPERATING, LLC
Project: Eddy /Lea County, NM (NAD27) NMEZ
Site: Dodd Federal Unit #920H
Well: #920H
Wellbore: Lateral
Design: Plan #2

Local Co-ordinate Reference: Well #920H - Slot DFU920H
TVD Reference: 3621+18 @ 3639.00ft (SO3)
MD Reference: 3621+18 @ 3639.00ft (SO3)
North Reference: Grid
Survey Calculation Method: Minimum Curvature

Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
382.00	382.00	Top of Salt			
901.00	901.00	Tansill			
1,008.00	1,008.00	Yates			
1,283.02	1,283.00	Seven Rivers			
1,899.42	1,898.00	Queen			
2,303.60	2,301.00	Grayburg			
2,597.46	2,594.00	San Andres			
4,035.69	4,029.00	Glorieta			
4,105.69	4,099.00	Paddock			
4,582.63	4,541.00	Blinebry			