

COG OPERATING LLC

LEA COUNTY, NM

LUDEMAN

SKULL CAP FEDERAL COM #2H

LATERAL 01

Plan: DWD Plan 1

Standard Planning Report

28 January, 2016

COG Operating LLC

Planning Report

Database:	EDM_Users	Local Co-ordinate Reference:	Well SKULL CAP FEDERAL COM #2H
Company:	COG OPERATING LLC	TVD Reference:	RKB=3286+26 @ 3312.0usft (Original Well Elev)
Project:	LEA COUNTY, NM	MD Reference:	RKB=3286+26 @ 3312.0usft (Original Well Elev)
Site:	LUDEMAN	North Reference:	Grid
Well:	SKULL CAP FEDERAL COM #2H	Survey Calculation Method:	Minimum Curvature
Wellbore:	LATERAL 01		
Design:	DWD Plan 1		

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		LUDEMAN			
Site Position:		Northing:	409,564.70 usft	Latitude:	32° 7' 20.696 N
From:	Map	Easting:	795,348.70 usft	Longitude:	103° 22' 45.584 W
Position Uncertainty:	0.0 usft	Slot Radius:	17-1/2 "	Grid Convergence:	0.51 °

Well	SKULL CAP FEDERAL COM #2H					
Well Position	+N/-S	18,643.1 usft	Northing:	428,207.80 usft	Latitude:	32° 10' 25.391 N
	+E/-W	-2,509.8 usft	Easting:	792,838.90 usft	Longitude:	103° 23' 12.860 W
Position Uncertainty		3.0 usft	Wellhead Elevation:	0.0 usft	Ground Level:	3,286.0 usft

Wellbore	LATERAL 01				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	WMM2015	1/27/2016	7.03	60.06	48,064

Design	DWD Plan 1			
Audit Notes:				
Version:	Phase:	PROTOTYPE	Tie On Depth:	10,000.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.0	0.0	0.0	179.61

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
10,000.0	0.00	0.00	10,000.0	0.0	0.0	0.00	0.00	0.00	0.00	
11,914.5	0.00	0.00	11,914.5	0.0	0.0	0.00	0.00	0.00	0.00	
12,663.6	89.89	179.61	12,392.0	-476.5	3.3	12.00	12.00	0.00	179.61	
19,748.4	89.89	179.61	12,405.6	-7,561.2	52.0	0.00	0.00	0.00	0.00	Skull Cap Federal Coi

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Wellbore:	LATERAL 01		
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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)	
10,000.0	0.00	0.00	10,000.0	0.0	0.0	0.0	0.00	0.00	0.00	
10,100.0	0.00	0.00	10,100.0	0.0	0.0	0.0	0.00	0.00	0.00	
10,200.0	0.00	0.00	10,200.0	0.0	0.0	0.0	0.00	0.00	0.00	
10,300.0	0.00	0.00	10,300.0	0.0	0.0	0.0	0.00	0.00	0.00	
10,400.0	0.00	0.00	10,400.0	0.0	0.0	0.0	0.00	0.00	0.00	
10,500.0	0.00	0.00	10,500.0	0.0	0.0	0.0	0.00	0.00	0.00	
10,600.0	0.00	0.00	10,600.0	0.0	0.0	0.0	0.00	0.00	0.00	
10,700.0	0.00	0.00	10,700.0	0.0	0.0	0.0	0.00	0.00	0.00	
10,800.0	0.00	0.00	10,800.0	0.0	0.0	0.0	0.00	0.00	0.00	
10,900.0	0.00	0.00	10,900.0	0.0	0.0	0.0	0.00	0.00	0.00	
11,000.0	0.00	0.00	11,000.0	0.0	0.0	0.0	0.00	0.00	0.00	
11,100.0	0.00	0.00	11,100.0	0.0	0.0	0.0	0.00	0.00	0.00	
11,200.0	0.00	0.00	11,200.0	0.0	0.0	0.0	0.00	0.00	0.00	
11,300.0	0.00	0.00	11,300.0	0.0	0.0	0.0	0.00	0.00	0.00	
11,400.0	0.00	0.00	11,400.0	0.0	0.0	0.0	0.00	0.00	0.00	
11,500.0	0.00	0.00	11,500.0	0.0	0.0	0.0	0.00	0.00	0.00	
11,600.0	0.00	0.00	11,600.0	0.0	0.0	0.0	0.00	0.00	0.00	
11,700.0	0.00	0.00	11,700.0	0.0	0.0	0.0	0.00	0.00	0.00	
11,800.0	0.00	0.00	11,800.0	0.0	0.0	0.0	0.00	0.00	0.00	
11,900.0	0.00	0.00	11,900.0	0.0	0.0	0.0	0.00	0.00	0.00	
11,914.5	0.00	0.00	11,914.5	0.0	0.0	0.0	0.00	0.00	0.00	
12,000.0	10.26	179.61	11,999.5	-7.6	0.1	7.6	12.00	12.00	0.00	
12,100.0	22.26	179.61	12,095.4	-35.6	0.2	35.6	12.00	12.00	0.00	
12,200.0	34.26	179.61	12,183.3	-82.8	0.6	82.8	12.00	12.00	0.00	
12,300.0	46.26	179.61	12,259.5	-147.3	1.0	147.4	12.00	12.00	0.00	
12,400.0	58.26	179.61	12,320.6	-226.3	1.6	226.3	12.00	12.00	0.00	
12,500.0	70.26	179.61	12,363.9	-316.2	2.2	316.2	12.00	12.00	0.00	
12,600.0	82.26	179.61	12,387.6	-413.2	2.8	413.2	12.00	12.00	0.00	
12,663.6	89.89	179.61	12,392.0	-476.5	3.3	476.5	12.00	12.00	0.00	
12,700.0	89.89	179.61	12,392.0	-513.0	3.5	513.0	0.00	0.00	0.00	
12,800.0	89.89	179.61	12,392.2	-613.0	4.2	613.0	0.00	0.00	0.00	
12,900.0	89.89	179.61	12,392.4	-712.9	4.9	713.0	0.00	0.00	0.00	
13,000.0	89.89	179.61	12,392.6	-812.9	5.6	813.0	0.00	0.00	0.00	
13,100.0	89.89	179.61	12,392.8	-912.9	6.3	913.0	0.00	0.00	0.00	
13,200.0	89.89	179.61	12,393.0	-1,012.9	7.0	1,013.0	0.00	0.00	0.00	
13,300.0	89.89	179.61	12,393.2	-1,112.9	7.7	1,113.0	0.00	0.00	0.00	
13,400.0	89.89	179.61	12,393.4	-1,212.9	8.3	1,213.0	0.00	0.00	0.00	
13,500.0	89.89	179.61	12,393.6	-1,312.9	9.0	1,313.0	0.00	0.00	0.00	
13,600.0	89.89	179.61	12,393.8	-1,412.9	9.7	1,413.0	0.00	0.00	0.00	
13,700.0	89.89	179.61	12,394.0	-1,512.9	10.4	1,513.0	0.00	0.00	0.00	
13,800.0	89.89	179.61	12,394.1	-1,612.9	11.1	1,613.0	0.00	0.00	0.00	
13,900.0	89.89	179.61	12,394.3	-1,712.9	11.8	1,713.0	0.00	0.00	0.00	
14,000.0	89.89	179.61	12,394.5	-1,812.9	12.5	1,813.0	0.00	0.00	0.00	
14,100.0	89.89	179.61	12,394.7	-1,912.9	13.2	1,913.0	0.00	0.00	0.00	
14,200.0	89.89	179.61	12,394.9	-2,012.9	13.8	2,013.0	0.00	0.00	0.00	
14,300.0	89.89	179.61	12,395.1	-2,112.9	14.5	2,113.0	0.00	0.00	0.00	
14,400.0	89.89	179.61	12,395.3	-2,212.9	15.2	2,213.0	0.00	0.00	0.00	
14,500.0	89.89	179.61	12,395.5	-2,312.9	15.9	2,313.0	0.00	0.00	0.00	
14,600.0	89.89	179.61	12,395.7	-2,412.9	16.6	2,413.0	0.00	0.00	0.00	
14,700.0	89.89	179.61	12,395.9	-2,512.9	17.3	2,513.0	0.00	0.00	0.00	
14,800.0	89.89	179.61	12,396.1	-2,612.9	18.0	2,613.0	0.00	0.00	0.00	
14,900.0	89.89	179.61	12,396.3	-2,712.9	18.7	2,713.0	0.00	0.00	0.00	

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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)
15,000.0	89.89	179.61	12,396.4	-2,812.9	19.3	2,813.0	0.00	0.00	0.00
15,100.0	89.89	179.61	12,396.6	-2,912.9	20.0	2,913.0	0.00	0.00	0.00
15,200.0	89.89	179.61	12,396.8	-3,012.9	20.7	3,013.0	0.00	0.00	0.00
15,300.0	89.89	179.61	12,397.0	-3,112.9	21.4	3,113.0	0.00	0.00	0.00
15,400.0	89.89	179.61	12,397.2	-3,212.9	22.1	3,213.0	0.00	0.00	0.00
15,500.0	89.89	179.61	12,397.4	-3,312.9	22.8	3,313.0	0.00	0.00	0.00
15,600.0	89.89	179.61	12,397.6	-3,412.9	23.5	3,413.0	0.00	0.00	0.00
15,700.0	89.89	179.61	12,397.8	-3,512.9	24.2	3,513.0	0.00	0.00	0.00
15,800.0	89.89	179.61	12,398.0	-3,612.9	24.8	3,613.0	0.00	0.00	0.00
15,900.0	89.89	179.61	12,398.2	-3,712.9	25.5	3,713.0	0.00	0.00	0.00
16,000.0	89.89	179.61	12,398.4	-3,812.9	26.2	3,813.0	0.00	0.00	0.00
16,100.0	89.89	179.61	12,398.6	-3,912.9	26.9	3,913.0	0.00	0.00	0.00
16,200.0	89.89	179.61	12,398.8	-4,012.9	27.6	4,013.0	0.00	0.00	0.00
16,300.0	89.89	179.61	12,398.9	-4,112.9	28.3	4,113.0	0.00	0.00	0.00
16,400.0	89.89	179.61	12,399.1	-4,212.9	29.0	4,213.0	0.00	0.00	0.00
16,500.0	89.89	179.61	12,399.3	-4,312.9	29.7	4,313.0	0.00	0.00	0.00
16,600.0	89.89	179.61	12,399.5	-4,412.9	30.3	4,413.0	0.00	0.00	0.00
16,700.0	89.89	179.61	12,399.7	-4,512.9	31.0	4,513.0	0.00	0.00	0.00
16,800.0	89.89	179.61	12,399.9	-4,612.8	31.7	4,613.0	0.00	0.00	0.00
16,900.0	89.89	179.61	12,400.1	-4,712.8	32.4	4,713.0	0.00	0.00	0.00
17,000.0	89.89	179.61	12,400.3	-4,812.8	33.1	4,813.0	0.00	0.00	0.00
17,100.0	89.89	179.61	12,400.5	-4,912.8	33.8	4,913.0	0.00	0.00	0.00
17,200.0	89.89	179.61	12,400.7	-5,012.8	34.5	5,013.0	0.00	0.00	0.00
17,300.0	89.89	179.61	12,400.9	-5,112.8	35.2	5,113.0	0.00	0.00	0.00
17,400.0	89.89	179.61	12,401.1	-5,212.8	35.8	5,213.0	0.00	0.00	0.00
17,500.0	89.89	179.61	12,401.2	-5,312.8	36.5	5,313.0	0.00	0.00	0.00
17,600.0	89.89	179.61	12,401.4	-5,412.8	37.2	5,413.0	0.00	0.00	0.00
17,700.0	89.89	179.61	12,401.6	-5,512.8	37.9	5,513.0	0.00	0.00	0.00
17,800.0	89.89	179.61	12,401.8	-5,612.8	38.6	5,613.0	0.00	0.00	0.00
17,900.0	89.89	179.61	12,402.0	-5,712.8	39.3	5,713.0	0.00	0.00	0.00
18,000.0	89.89	179.61	12,402.2	-5,812.8	40.0	5,813.0	0.00	0.00	0.00
18,100.0	89.89	179.61	12,402.4	-5,912.8	40.7	5,913.0	0.00	0.00	0.00
18,200.0	89.89	179.61	12,402.6	-6,012.8	41.3	6,013.0	0.00	0.00	0.00
18,300.0	89.89	179.61	12,402.8	-6,112.8	42.0	6,113.0	0.00	0.00	0.00
18,400.0	89.89	179.61	12,403.0	-6,212.8	42.7	6,213.0	0.00	0.00	0.00
18,500.0	89.89	179.61	12,403.2	-6,312.8	43.4	6,313.0	0.00	0.00	0.00
18,600.0	89.89	179.61	12,403.4	-6,412.8	44.1	6,413.0	0.00	0.00	0.00
18,700.0	89.89	179.61	12,403.6	-6,512.8	44.8	6,513.0	0.00	0.00	0.00
18,800.0	89.89	179.61	12,403.7	-6,612.8	45.5	6,613.0	0.00	0.00	0.00
18,900.0	89.89	179.61	12,403.9	-6,712.8	46.2	6,713.0	0.00	0.00	0.00
19,000.0	89.89	179.61	12,404.1	-6,812.8	46.8	6,813.0	0.00	0.00	0.00
19,100.0	89.89	179.61	12,404.3	-6,912.8	47.5	6,913.0	0.00	0.00	0.00
19,200.0	89.89	179.61	12,404.5	-7,012.8	48.2	7,013.0	0.00	0.00	0.00
19,300.0	89.89	179.61	12,404.7	-7,112.8	48.9	7,113.0	0.00	0.00	0.00
19,400.0	89.89	179.61	12,404.9	-7,212.8	49.6	7,213.0	0.00	0.00	0.00
19,500.0	89.89	179.61	12,405.1	-7,312.8	50.3	7,313.0	0.00	0.00	0.00
19,600.0	89.89	179.61	12,405.3	-7,412.8	51.0	7,413.0	0.00	0.00	0.00
19,700.0	89.89	179.61	12,405.5	-7,512.8	51.7	7,513.0	0.00	0.00	0.00
19,748.4	89.89	179.61	12,405.6	-7,561.2	52.0	7,561.4	0.00	0.00	0.00

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Wellbore:	LATERAL 01		
Design:	DWD Plan 1		

Design Targets									
Target Name	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- hit/miss target	(°)	(°)	(usft)	(usft)	(usft)	(usft)	(usft)		
- Shape									
Skull Cap Federal Com :	0.00	0.00	0.0	0.0	0.0	428,207.80	792,838.90	32° 10' 25.391 N	103° 23' 12.860 W
- plan misses target center by 10000.0usft at 10000.0usft MD (10000.0 TVD, 0.0 N, 0.0 E)									
- Point									
Skull Cap Federal Com :	0.11	179.61	12,406.0	-7,561.2	52.0	420,646.60	792,890.90	32° 9' 10.567 N	103° 23' 13.029 W
- plan misses target center by 0.4usft at 19748.4usft MD (12405.6 TVD, -7561.2 N, 52.0 E)									
- Rectangle (sides W100.0 H7,561.4 D30.0)									



Project: LEA COUNTY, NM
 Site: SKULL CAP FEDERAL COM #2H
 Wellbore: LATERAL 01
 Design: DWD Plan 1

SECTION DETAILS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSec	Target	Annotation
10000.0	0.00	0.00	10000.0	0.0	0.0	0.0	0.00	0.0		
11914.5	0.00	0.00	11914.5	0.0	0.0	0.0	0.00	0.0		KOP: 11914.5' MD
12663.6	89.89	179.61	12392.0	-476.5	3.3	12.00	179.61	476.5		LANDING POINT: 12663.6'
19748.4	89.89	179.61	12405.6	-7561.2	52.0	0.00	0.00	7561.4		Skull Cap Federal Com #2H - BHL

LEGEND

- VIKING HELMET STATE COM #2H, OWS-PILOT HOLE, DWD Plan 1 V0
- VIKING HELMET STATE COM #2H, OWS-PILOT HOLE, ANP-PH V0
- VIKING HELMET STATE COM #2H, LATERAL 01, LATERAL 01 V0
- VIKING HELMET STATE COM #2H, LATERAL 01, DDC TO #1 - wellbore change V0
- SKULL CAP FEDERAL COM #2H, OWS-PILOT HOLE, DWD Plan 1 V0
- DWD Plan 1

