



APR 18 2016
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COG Operating, LLC

Lea County, NM

Sec 27, T22S, R34E

Squints Federal Com #2H

Wellbore #1

Plan: Design #1

DDC Well Planning Report

08 June, 2015



APR 22 2016



HP
Well Planning Report



Database:	Compass	Local Co-ordinate Reference:	Well Squints Federal Com #2H
Company:	COG Operating, LLC	TVD Reference:	Well @ 3439.0usft (Ensign #772)
Project:	Lea County, NM	MD Reference:	Well @ 3439.0usft (Ensign #772)
Site:	Sec 27, T22S, R34E	North Reference:	Grid
Well:	Squints Federal Com #2H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #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	Sec 27, T22S, R34E		
Site Position:		Northing:	494,272.80 usft
From:	Map	Easting:	770,960.20 usft
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16"
		Latitude:	32° 21' 20.947 N
		Longitude:	103° 27' 21.105 W
		Grid Convergence:	0.47°

Well	Squints Federal Com #2H		
Well Position	+N/-S	0.0 usft	Northing: 494,272.80 usft
	+E/-W	0.0 usft	Easting: 770,960.20 usft
Position Uncertainty	0.0 usft	Wellhead Elevation:	0.0 usft
		Latitude:	32° 21' 20.947 N
		Longitude:	103° 27' 21.105 W
		Ground Level:	3,408.0 usft

Wellbore	Wellbore #1		
Magnetics	Model Name	Sample Date	Declination
	IGRF2015	5/28/2015	(°)
			7.13
			Dip Angle (°)
			60.23
			Field Strength (nT)
			48,241

Design	Design #1		
Audit Notes:			
Version:	Phase:	PLAN	Tie On Depth: 0.0
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W
	(usft)	(usft)	(usft)
	0.0	0.0	0.0
			Direction (°)
			359.67

Plan Sections										
Measured	Inclination	Azimuth	Vertical	+N/-S	+E/-W	Dogleg	Build	Turn	TFO	Target
Depth	(°)	(°)	Depth	(usft)	(usft)	Rate	Rate	Rate	(°)	
(usft)			(usft)			(°/100usft)	(°/100usft)	(°/100usft)		
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
10,762.6	0.00	0.00	10,762.6	0.0	0.0	0.00	0.00	0.00	0.00	
11,519.3	90.80	359.67	11,240.0	484.2	-2.8	12.00	12.00	-0.04	359.67	
15,796.3	90.80	359.67	11,180.0	4,760.7	-27.5	0.00	0.00	0.00	0.00	PBHL Squints Federa



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Wellbore:	Wellbore #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)	
KOP 12°/100'										
10,762.6	0.00	0.00	10,762.6	0.0	0.0	0.0	0.00	0.00	0.00	
10,800.0	4.49	359.67	10,800.0	1.5	0.0	1.5	12.00	12.00	0.00	
10,900.0	16.49	359.67	10,898.1	19.6	-0.1	19.6	12.00	12.00	0.00	
TBSG_sand										
10,981.9	26.32	359.67	10,974.3	49.5	-0.3	49.5	12.00	12.00	0.00	
11,000.0	28.49	359.67	10,990.3	57.8	-0.3	57.8	12.00	12.00	0.00	
11,100.0	40.49	359.67	11,072.6	114.3	-0.7	114.3	12.00	12.00	0.00	
11,200.0	52.49	359.67	11,141.3	186.7	-1.1	186.7	12.00	12.00	0.00	
11,300.0	64.49	359.67	11,193.5	271.8	-1.6	271.8	12.00	12.00	0.00	
11,400.0	76.49	359.67	11,226.8	365.9	-2.1	365.9	12.00	12.00	0.00	
11,500.0	88.49	359.67	11,239.9	464.9	-2.7	464.9	12.00	12.00	0.00	
End of Curve / 90.80° Inc / 359.67° Azm / 11240' TVD										
11,519.3	90.80	359.67	11,240.0	484.2	-2.8	484.2	12.00	12.00	0.00	
11,600.0	90.80	359.67	11,238.9	564.8	-3.3	564.9	0.00	0.00	0.00	
11,700.0	90.80	359.67	11,237.5	664.8	-3.8	664.8	0.00	0.00	0.00	
11,800.0	90.80	359.67	11,236.1	764.8	-4.4	764.8	0.00	0.00	0.00	
11,900.0	90.80	359.67	11,234.7	864.8	-5.0	864.8	0.00	0.00	0.00	
12,000.0	90.80	359.67	11,233.3	964.8	-5.6	964.8	0.00	0.00	0.00	
12,100.0	90.80	359.67	11,231.9	1,064.8	-6.2	1,064.8	0.00	0.00	0.00	
12,200.0	90.80	359.67	11,230.5	1,164.8	-6.7	1,164.8	0.00	0.00	0.00	
12,300.0	90.80	359.67	11,229.1	1,264.8	-7.3	1,264.8	0.00	0.00	0.00	
12,400.0	90.80	359.67	11,227.7	1,364.8	-7.9	1,364.8	0.00	0.00	0.00	
12,500.0	90.80	359.67	11,226.3	1,464.7	-8.5	1,464.8	0.00	0.00	0.00	
12,600.0	90.80	359.67	11,224.9	1,564.7	-9.0	1,564.8	0.00	0.00	0.00	
12,700.0	90.80	359.67	11,223.4	1,664.7	-9.6	1,664.7	0.00	0.00	0.00	
12,800.0	90.80	359.67	11,222.0	1,764.7	-10.2	1,764.7	0.00	0.00	0.00	
12,900.0	90.80	359.67	11,220.6	1,864.7	-10.8	1,864.7	0.00	0.00	0.00	
13,000.0	90.80	359.67	11,219.2	1,964.7	-11.3	1,964.7	0.00	0.00	0.00	
13,100.0	90.80	359.67	11,217.8	2,064.7	-11.9	2,064.7	0.00	0.00	0.00	
13,200.0	90.80	359.67	11,216.4	2,164.7	-12.5	2,164.7	0.00	0.00	0.00	
13,300.0	90.80	359.67	11,215.0	2,264.7	-13.1	2,264.7	0.00	0.00	0.00	
13,400.0	90.80	359.67	11,213.6	2,364.6	-13.7	2,364.7	0.00	0.00	0.00	
13,500.0	90.80	359.67	11,212.2	2,464.6	-14.2	2,464.7	0.00	0.00	0.00	
13,600.0	90.80	359.67	11,210.8	2,564.6	-14.8	2,564.7	0.00	0.00	0.00	
13,700.0	90.80	359.67	11,209.4	2,664.6	-15.4	2,664.6	0.00	0.00	0.00	
13,800.0	90.80	359.67	11,208.0	2,764.6	-16.0	2,764.6	0.00	0.00	0.00	
13,900.0	90.80	359.67	11,206.6	2,864.6	-16.5	2,864.6	0.00	0.00	0.00	
14,000.0	90.80	359.67	11,205.2	2,964.6	-17.1	2,964.6	0.00	0.00	0.00	
14,100.0	90.80	359.67	11,203.8	3,064.6	-17.7	3,064.6	0.00	0.00	0.00	
14,200.0	90.80	359.67	11,202.4	3,164.5	-18.3	3,164.6	0.00	0.00	0.00	
14,300.0	90.80	359.67	11,201.0	3,264.5	-18.9	3,264.6	0.00	0.00	0.00	
14,400.0	90.80	359.67	11,199.6	3,364.5	-19.4	3,364.6	0.00	0.00	0.00	
14,500.0	90.80	359.67	11,198.2	3,464.5	-20.0	3,464.6	0.00	0.00	0.00	
14,600.0	90.80	359.67	11,196.8	3,564.5	-20.6	3,564.6	0.00	0.00	0.00	
14,700.0	90.80	359.67	11,195.4	3,664.5	-21.2	3,664.6	0.00	0.00	0.00	
14,800.0	90.80	359.67	11,194.0	3,764.5	-21.7	3,764.5	0.00	0.00	0.00	
14,900.0	90.80	359.67	11,192.6	3,864.5	-22.3	3,864.5	0.00	0.00	0.00	
15,000.0	90.80	359.67	11,191.2	3,964.5	-22.9	3,964.5	0.00	0.00	0.00	
15,100.0	90.80	359.67	11,189.8	4,064.4	-23.5	4,064.5	0.00	0.00	0.00	
15,200.0	90.80	359.67	11,188.4	4,164.4	-24.1	4,164.5	0.00	0.00	0.00	
15,300.0	90.80	359.67	11,187.0	4,264.4	-24.6	4,264.5	0.00	0.00	0.00	
15,400.0	90.80	359.67	11,185.6	4,364.4	-25.2	4,364.5	0.00	0.00	0.00	



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Wellbore:	Wellbore #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)
15,500.0	90.80	359.67	11,184.2	4,464.4	-25.8	4,464.5	0.00	0.00	0.00
15,600.0	90.80	359.67	11,182.8	4,564.4	-26.4	4,564.5	0.00	0.00	0.00
15,700.0	90.80	359.67	11,181.4	4,664.4	-26.9	4,664.5	0.00	0.00	0.00
PBHL @ 15796' MD / 11180' TVD									
15,796.3	90.80	359.67	11,180.0	4,760.7	-27.5	4,760.8	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 Squints Federal #	0.00	0.00	11,180.0	4,760.7	-27.5	499,033.50	770,932.70	32° 22' 8.057 N	103° 27' 20.971 W
- plan hits target center									
- Point									

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,701.0	1,698.0	Rustler		-0.80	359.67
1,897.0	1,894.0	TOS		-0.80	359.67
3,637.0	3,634.0	BOS / Tansill		-0.80	359.67
3,716.0	3,713.0	Yates		-0.80	359.67
3,924.0	3,921.0	Seven Rivers		-0.80	359.67
4,045.0	4,042.0	Captain Reef		-0.80	359.67
5,313.0	5,310.0	Base of Reef (BLCN)		-0.80	359.67
5,829.0	5,826.0	CYCN		-0.80	359.67
7,222.0	7,219.0	BYCN		-0.80	359.67
8,534.0	8,531.0	Bone Spring (BSGL)		-0.80	359.67
8,842.0	8,839.0	U Avalon Sh		-0.80	359.67
8,968.0	8,965.0	L Avalon Sh		-0.80	359.67
9,616.0	9,613.0	FBSG_sand		-0.80	359.67
10,101.0	10,098.0	SBSG_sand		-0.80	359.67
10,981.9	10,971.3	TBSG_sand		-0.80	359.67

Plan Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
10,762.6	10,762.6	0.0	0.0	KOP 12°/100'
11,519.3	11,240.0	484.2	-2.8	End of Curve / 90.80° Inc / 359.67° Azm / 11240' TVD
15,796.3	11,180.0	4,760.7	-27.5	PBHL @ 15796' MD / 11180' TVD