



COG Operating L L C
 Project: Lea County, NM (NAD27 NME)
 Site: Sec. 31, T 25 S., R 35 E
 Well: Square Bill Federal Com 1H
 Wellbore: Wellbore #1
 Plan: Plan #1 (Square Bill Federal Com 1H/Wellbore #1)
 McVay 8



Square Bill Federal Com 22H/Plan #1

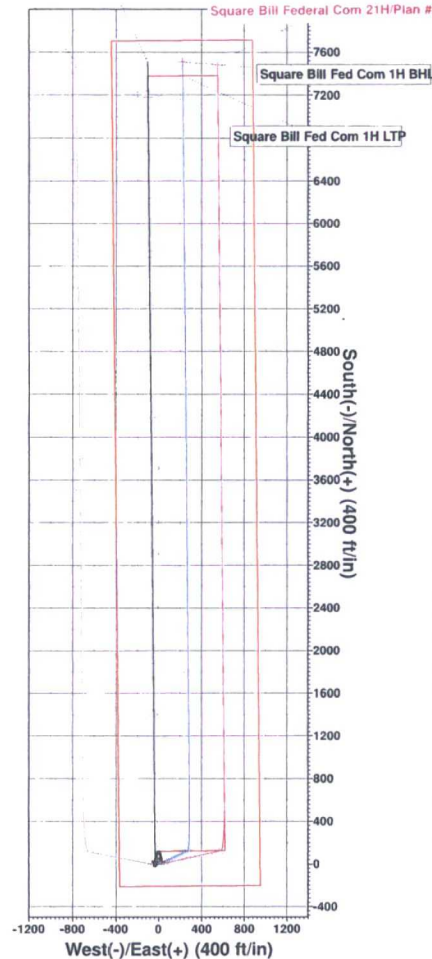
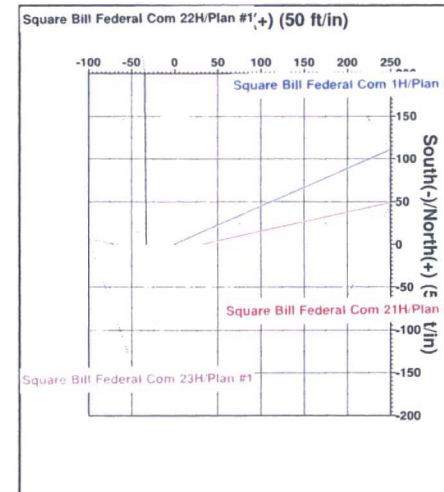
Square Bill Federal Com 23H/Plan #1

Square Bill Federal Com 1H/Plan #1

WELL DETAILS: Square Bill Federal Com 1H
 Ground Elevation:: 3274.40
 RKB Elevation: KB=26' @ 3300.40ft (McVay 8)
 Rig Name: McVay 8

Northing	Easting	Latitude	Longitude
394105.0000	788874.1000	32° 4' 48.279 N	103° 24' 2.419 W

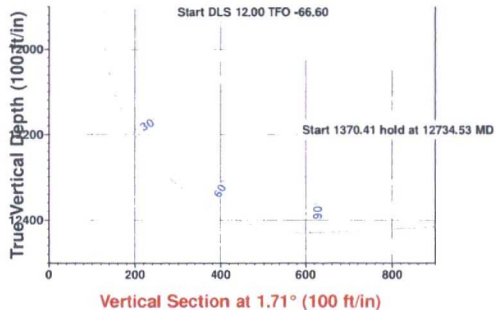
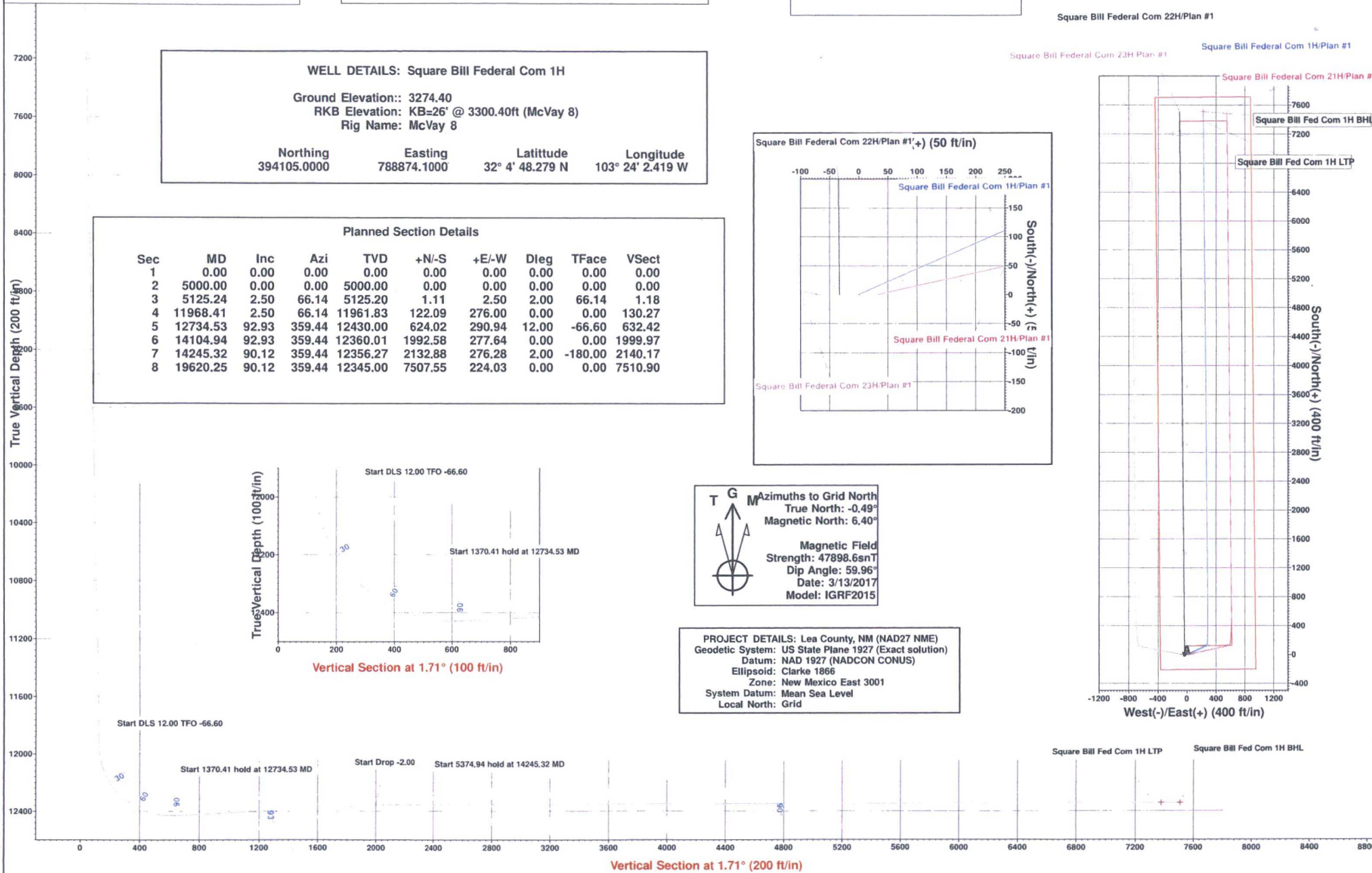
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	Vsect
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	5000.00	0.00	0.00	5000.00	0.00	0.00	0.00	0.00	0.00
3	5125.24	2.50	66.14	5125.20	1.11	2.50	2.00	66.14	1.18
4	11968.41	2.50	66.14	11961.83	122.09	276.00	0.00	0.00	130.27
5	12734.53	92.93	359.44	12430.00	624.02	290.94	12.00	-66.60	632.42
6	14104.94	92.93	359.44	12360.01	1992.58	277.64	0.00	0.00	1999.97
7	14245.32	90.12	359.44	12356.27	2132.88	276.28	2.00	-180.00	2140.17
8	19620.25	90.12	359.44	12345.00	7507.55	224.03	0.00	0.00	7510.90



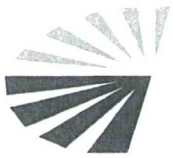
TM Azimuths to Grid North
 True North: -0.49°
 Magnetic North: 6.40°

Magnetic Field
 Strength: 47898.6snT
 Dip Angle: 59.96°
 Date: 3/13/2017
 Model: IGRF2015

PROJECT DETAILS: Lea County, NM (NAD27 NME)
 Geodetic 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



Vertical Section at 1.71° (200 ft/in)



CONCHO

HOBBS OCD

SEP 26 2017

RECEIVED

COG Operating L L C

Lea County, NM (NAD27 NME)

Sec. 31, T 25 S., R 35 E

Square Bill Federal Com 1H

Wellbore #1

Plan: Plan #1

Standard Survey Report

13 March, 2017





Integrity Directional Services, LLC

Survey Report



Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Square Bill Federal Com 1H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=26' @ 3300.40ft (McVay 8)
Site:	Sec. 31, T 25 S., R 35 E	MD Reference:	KB=26' @ 3300.40ft (McVay 8)
Well:	Square Bill Federal Com 1H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Plan #1	Database:	EDM 5000.1 Multi User Db

Project	Lea County, NM (NAD27 NME)	System Datum:	Mean Sea Level
Map System:	US State Plane 1927 (Exact solution)		
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	New Mexico East 3001		

Site	Sec. 31, T 25 S., R 35 E				
Site Position:		Northing:	394,105.2000 usft	Latitude:	32° 4' 48.278 N
From:	Map	Easting:	788,907.2000 usft	Longitude:	103° 24' 2.035 W
Position Uncertainty:	0.00 ft	Slot Radius:	13-3/16 "	Grid Convergence:	0.50 °

Well	Square Bill Federal Com 1H					
Well Position	+N/-S	0.00 ft	Northing:	394,105.0000 usft	Latitude:	32° 4' 48.279 N
	+E/-W	0.00 ft	Easting:	788,874.1000 usft	Longitude:	103° 24' 2.419 W
Position Uncertainty		0.00 ft	Wellhead Elevation:	0.00 ft	Ground Level:	3,274.40 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	3/13/2017	6.89	59.96	47,899

Design	Plan #1				
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		1.71

Survey Tool Program	Date	3/13/2017			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
0.00	19,620.00	Plan #1 (Wellbore #1)	MWD	MWD - Standard	

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)
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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MD Reference: KB=26' @ 3300.40ft (McVay 8)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
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
Start Build 2.00									
5,100.00	2.00	66.14	5,099.98	0.71	1.60	0.75	2.00	2.00	0.00
5,125.24	2.50	66.14	5,125.20	1.11	2.50	1.18	2.00	2.00	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 (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
Start 6843.17 hold at 5125.24 MD									
5,200.00	2.50	66.14	5,199.89	2.43	5.49	2.59	0.00	0.00	0.00
5,300.00	2.50	66.14	5,299.79	4.20	9.49	4.48	0.00	0.00	0.00
5,400.00	2.50	66.14	5,399.70	5.96	13.48	6.36	0.00	0.00	0.00
5,500.00	2.50	66.14	5,499.60	7.73	17.48	8.25	0.00	0.00	0.00
5,600.00	2.50	66.14	5,599.51	9.50	21.48	10.14	0.00	0.00	0.00
5,700.00	2.50	66.14	5,699.41	11.27	25.47	12.02	0.00	0.00	0.00
5,800.00	2.50	66.14	5,799.32	13.04	29.47	13.91	0.00	0.00	0.00
5,900.00	2.50	66.14	5,899.22	14.80	33.47	15.80	0.00	0.00	0.00
6,000.00	2.50	66.14	5,999.12	16.57	37.46	17.68	0.00	0.00	0.00
6,100.00	2.50	66.14	6,099.03	18.34	41.46	19.57	0.00	0.00	0.00
6,200.00	2.50	66.14	6,198.93	20.11	45.46	21.46	0.00	0.00	0.00
6,300.00	2.50	66.14	6,298.84	21.88	49.45	23.34	0.00	0.00	0.00
6,400.00	2.50	66.14	6,398.74	23.64	53.45	25.23	0.00	0.00	0.00
6,500.00	2.50	66.14	6,498.65	25.41	57.45	27.11	0.00	0.00	0.00
6,600.00	2.50	66.14	6,598.55	27.18	61.44	29.00	0.00	0.00	0.00
6,700.00	2.50	66.14	6,698.46	28.95	65.44	30.89	0.00	0.00	0.00
6,800.00	2.50	66.14	6,798.36	30.72	69.44	32.77	0.00	0.00	0.00
6,900.00	2.50	66.14	6,898.26	32.48	73.43	34.66	0.00	0.00	0.00
7,000.00	2.50	66.14	6,998.17	34.25	77.43	36.55	0.00	0.00	0.00
7,100.00	2.50	66.14	7,098.07	36.02	81.43	38.43	0.00	0.00	0.00
7,200.00	2.50	66.14	7,197.98	37.79	85.42	40.32	0.00	0.00	0.00
7,300.00	2.50	66.14	7,297.88	39.56	89.42	42.21	0.00	0.00	0.00
7,400.00	2.50	66.14	7,397.79	41.32	93.42	44.09	0.00	0.00	0.00
7,500.00	2.50	66.14	7,497.69	43.09	97.41	45.98	0.00	0.00	0.00
7,600.00	2.50	66.14	7,597.60	44.86	101.41	47.87	0.00	0.00	0.00
7,700.00	2.50	66.14	7,697.50	46.63	105.41	49.75	0.00	0.00	0.00
7,800.00	2.50	66.14	7,797.40	48.40	109.40	51.64	0.00	0.00	0.00
7,900.00	2.50	66.14	7,897.31	50.16	113.40	53.52	0.00	0.00	0.00
8,000.00	2.50	66.14	7,997.21	51.93	117.40	55.41	0.00	0.00	0.00
8,100.00	2.50	66.14	8,097.12	53.70	121.39	57.30	0.00	0.00	0.00
8,200.00	2.50	66.14	8,197.02	55.47	125.39	59.18	0.00	0.00	0.00
8,300.00	2.50	66.14	8,296.93	57.24	129.39	61.07	0.00	0.00	0.00
8,400.00	2.50	66.14	8,396.83	59.00	133.38	62.96	0.00	0.00	0.00
8,500.00	2.50	66.14	8,496.74	60.77	137.38	64.84	0.00	0.00	0.00
8,600.00	2.50	66.14	8,596.64	62.54	141.38	66.73	0.00	0.00	0.00
8,700.00	2.50	66.14	8,696.54	64.31	145.37	68.62	0.00	0.00	0.00
8,800.00	2.50	66.14	8,796.45	66.08	149.37	70.50	0.00	0.00	0.00
8,900.00	2.50	66.14	8,896.35	67.84	153.37	72.39	0.00	0.00	0.00
9,000.00	2.50	66.14	8,996.26	69.61	157.36	74.27	0.00	0.00	0.00
9,100.00	2.50	66.14	9,096.16	71.38	161.36	76.16	0.00	0.00	0.00
9,200.00	2.50	66.14	9,196.07	73.15	165.36	78.05	0.00	0.00	0.00
9,300.00	2.50	66.14	9,295.97	74.92	169.35	79.93	0.00	0.00	0.00



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9,400.00	2.50	66.14	9,395.88	76.68	173.35	81.82	0.00	0.00	0.00
9,500.00	2.50	66.14	9,495.78	78.45	177.35	83.71	0.00	0.00	0.00
9,600.00	2.50	66.14	9,595.69	80.22	181.34	85.59	0.00	0.00	0.00
9,700.00	2.50	66.14	9,695.59	81.99	185.34	87.48	0.00	0.00	0.00
9,800.00	2.50	66.14	9,795.49	83.76	189.34	89.37	0.00	0.00	0.00
9,900.00	2.50	66.14	9,895.40	85.52	193.33	91.25	0.00	0.00	0.00
10,000.00	2.50	66.14	9,995.30	87.29	197.33	93.14	0.00	0.00	0.00
10,100.00	2.50	66.14	10,095.21	89.06	201.33	95.03	0.00	0.00	0.00
10,200.00	2.50	66.14	10,195.11	90.83	205.32	96.91	0.00	0.00	0.00
10,300.00	2.50	66.14	10,295.02	92.60	209.32	98.80	0.00	0.00	0.00
10,400.00	2.50	66.14	10,394.92	94.36	213.32	100.68	0.00	0.00	0.00
10,500.00	2.50	66.14	10,494.83	96.13	217.31	102.57	0.00	0.00	0.00
10,600.00	2.50	66.14	10,594.73	97.90	221.31	104.46	0.00	0.00	0.00
10,700.00	2.50	66.14	10,694.63	99.67	225.31	106.34	0.00	0.00	0.00
10,800.00	2.50	66.14	10,794.54	101.44	229.30	108.23	0.00	0.00	0.00
10,900.00	2.50	66.14	10,894.44	103.20	233.30	110.12	0.00	0.00	0.00
11,000.00	2.50	66.14	10,994.35	104.97	237.30	112.00	0.00	0.00	0.00
11,100.00	2.50	66.14	11,094.25	106.74	241.29	113.89	0.00	0.00	0.00
11,200.00	2.50	66.14	11,194.16	108.51	245.29	115.78	0.00	0.00	0.00
11,300.00	2.50	66.14	11,294.06	110.28	249.29	117.66	0.00	0.00	0.00
11,400.00	2.50	66.14	11,393.97	112.04	253.28	119.55	0.00	0.00	0.00
11,500.00	2.50	66.14	11,493.87	113.81	257.28	121.43	0.00	0.00	0.00
11,600.00	2.50	66.14	11,593.77	115.58	261.28	123.32	0.00	0.00	0.00
11,700.00	2.50	66.14	11,693.68	117.35	265.27	125.21	0.00	0.00	0.00
11,800.00	2.50	66.14	11,793.58	119.12	269.27	127.09	0.00	0.00	0.00
11,900.00	2.50	66.14	11,893.49	120.88	273.27	128.98	0.00	0.00	0.00
11,968.41	2.50	66.14	11,961.83	122.09	276.00	130.27	0.00	0.00	0.00
Start DLS 12.00 TFO -66.60									
12,000.00	5.31	25.15	11,993.35	123.70	277.25	131.91	12.00	8.88	-129.73
12,100.00	16.94	7.13	12,091.33	142.41	281.04	150.73	12.00	11.63	-18.02
12,200.00	28.87	3.74	12,183.28	181.09	284.44	189.50	12.00	11.93	-3.40
12,300.00	40.84	2.22	12,265.19	238.06	287.29	246.53	12.00	11.97	-1.51
12,400.00	52.82	1.31	12,333.48	310.83	289.47	319.33	12.00	11.98	-0.92
12,500.00	64.81	0.64	12,385.17	396.21	290.89	404.71	12.00	11.99	-0.66
12,600.00	76.80	0.10	12,417.99	490.48	291.49	498.95	12.00	11.99	-0.54
12,700.00	88.79	359.61	12,430.52	589.50	291.23	597.93	12.00	11.99	-0.49
12,734.53	92.93	359.44	12,430.00	624.02	290.94	632.42	12.00	11.99	-0.48
Start 1370.41 hold at 12734.53 MD									
12,800.00	92.93	359.44	12,426.66	689.40	290.31	697.75	0.00	0.00	0.00
12,900.00	92.93	359.44	12,421.55	789.27	289.34	797.55	0.00	0.00	0.00
13,000.00	92.93	359.44	12,416.44	889.13	288.37	897.34	0.00	0.00	0.00
13,100.00	92.93	359.44	12,411.33	989.00	287.40	997.13	0.00	0.00	0.00
13,200.00	92.93	359.44	12,406.23	1,088.86	286.42	1,096.92	0.00	0.00	0.00
13,300.00	92.93	359.44	12,401.12	1,188.73	285.45	1,196.71	0.00	0.00	0.00



Company: COG Operating L L C
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Design: Plan #1

Local Co-ordinate Reference: Well Square Bill Federal Com 1H
TVD Reference: KB=26' @ 3300.40ft (McVay 8)
MD Reference: KB=26' @ 3300.40ft (McVay 8)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
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)
13,400.00	92.93	359.44	12,396.01	1,288.59	284.48	1,296.50	0.00	0.00	0.00
13,500.00	92.93	359.44	12,390.90	1,388.46	283.51	1,396.29	0.00	0.00	0.00
13,600.00	92.93	359.44	12,385.80	1,488.32	282.54	1,496.09	0.00	0.00	0.00
13,700.00	92.93	359.44	12,380.69	1,588.19	281.57	1,595.88	0.00	0.00	0.00
13,800.00	92.93	359.44	12,375.58	1,688.05	280.60	1,695.67	0.00	0.00	0.00
13,900.00	92.93	359.44	12,370.47	1,787.92	279.63	1,795.46	0.00	0.00	0.00
14,000.00	92.93	359.44	12,365.37	1,887.78	278.66	1,895.25	0.00	0.00	0.00
14,100.00	92.93	359.44	12,360.26	1,987.64	277.69	1,995.04	0.00	0.00	0.00
14,104.94	92.93	359.44	12,360.01	1,992.58	277.64	1,999.97	0.00	0.00	0.00
Start Drop -2.00									
14,200.00	91.03	359.44	12,356.73	2,087.57	276.72	2,094.90	2.00	-2.00	0.00
14,245.32	90.12	359.44	12,356.27	2,132.88	276.28	2,140.17	2.00	-2.00	0.00
Start 5374.94 hold at 14245.32 MD									
14,300.00	90.12	359.44	12,356.16	2,187.56	275.74	2,194.82	0.00	0.00	0.00
14,400.00	90.12	359.44	12,355.95	2,287.56	274.77	2,294.74	0.00	0.00	0.00
14,500.00	90.12	359.44	12,355.74	2,387.56	273.80	2,394.66	0.00	0.00	0.00
14,600.00	90.12	359.44	12,355.53	2,487.55	272.83	2,494.58	0.00	0.00	0.00
14,700.00	90.12	359.44	12,355.32	2,587.55	271.86	2,594.50	0.00	0.00	0.00
14,800.00	90.12	359.44	12,355.11	2,687.54	270.88	2,694.42	0.00	0.00	0.00
14,900.00	90.12	359.44	12,354.90	2,787.54	269.91	2,794.35	0.00	0.00	0.00
15,000.00	90.12	359.44	12,354.69	2,887.53	268.94	2,894.27	0.00	0.00	0.00
15,100.00	90.12	359.44	12,354.48	2,987.53	267.97	2,994.19	0.00	0.00	0.00
15,200.00	90.12	359.44	12,354.27	3,087.52	266.99	3,094.11	0.00	0.00	0.00
15,300.00	90.12	359.44	12,354.06	3,187.52	266.02	3,194.03	0.00	0.00	0.00
15,400.00	90.12	359.44	12,353.85	3,287.51	265.05	3,293.95	0.00	0.00	0.00
15,500.00	90.12	359.44	12,353.64	3,387.51	264.08	3,393.88	0.00	0.00	0.00
15,600.00	90.12	359.44	12,353.43	3,487.50	263.11	3,493.80	0.00	0.00	0.00
15,700.00	90.12	359.44	12,353.22	3,587.50	262.13	3,593.72	0.00	0.00	0.00
15,800.00	90.12	359.44	12,353.01	3,687.49	261.16	3,693.64	0.00	0.00	0.00
15,900.00	90.12	359.44	12,352.80	3,787.49	260.19	3,793.56	0.00	0.00	0.00
16,000.00	90.12	359.44	12,352.59	3,887.48	259.22	3,893.48	0.00	0.00	0.00
16,100.00	90.12	359.44	12,352.38	3,987.48	258.25	3,993.40	0.00	0.00	0.00
16,200.00	90.12	359.44	12,352.17	4,087.47	257.27	4,093.33	0.00	0.00	0.00
16,300.00	90.12	359.44	12,351.96	4,187.47	256.30	4,193.25	0.00	0.00	0.00
16,400.00	90.12	359.44	12,351.75	4,287.46	255.33	4,293.17	0.00	0.00	0.00
16,500.00	90.12	359.44	12,351.54	4,387.46	254.36	4,393.09	0.00	0.00	0.00
16,600.00	90.12	359.44	12,351.33	4,487.45	253.39	4,493.01	0.00	0.00	0.00
16,700.00	90.12	359.44	12,351.12	4,587.45	252.41	4,592.93	0.00	0.00	0.00
16,800.00	90.12	359.44	12,350.91	4,687.44	251.44	4,692.86	0.00	0.00	0.00
16,900.00	90.12	359.44	12,350.71	4,787.44	250.47	4,792.78	0.00	0.00	0.00
17,000.00	90.12	359.44	12,350.50	4,887.43	249.50	4,892.70	0.00	0.00	0.00
17,100.00	90.12	359.44	12,350.29	4,987.43	248.52	4,992.62	0.00	0.00	0.00
17,200.00	90.12	359.44	12,350.08	5,087.42	247.55	5,092.54	0.00	0.00	0.00
17,300.00	90.12	359.44	12,349.87	5,187.42	246.58	5,192.46	0.00	0.00	0.00



Integrity Directional Services, LLC

Survey Report



Company: COG Operating L L C
Project: Lea County, NM (NAD27 NME)
Site: Sec. 31, T 25 S., R 35 E
Well: Square Bill Federal Com 1H
Wellbore: Wellbore #1
Design: Plan #1

Local Co-ordinate Reference: Well Square Bill Federal Com 1H
TVD Reference: KB=26' @ 3300.40ft (McVay 8)
MD Reference: KB=26' @ 3300.40ft (McVay 8)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
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)
17,400.00	90.12	359.44	12,349.66	5,287.41	245.61	5,292.38	0.00	0.00	0.00
17,500.00	90.12	359.44	12,349.45	5,387.41	244.64	5,392.31	0.00	0.00	0.00
17,600.00	90.12	359.44	12,349.24	5,487.40	243.66	5,492.23	0.00	0.00	0.00
17,700.00	90.12	359.44	12,349.03	5,587.40	242.69	5,592.15	0.00	0.00	0.00
17,800.00	90.12	359.44	12,348.82	5,687.39	241.72	5,692.07	0.00	0.00	0.00
17,900.00	90.12	359.44	12,348.61	5,787.39	240.75	5,791.99	0.00	0.00	0.00
18,000.00	90.12	359.44	12,348.40	5,887.38	239.78	5,891.91	0.00	0.00	0.00
18,100.00	90.12	359.44	12,348.19	5,987.38	238.80	5,991.84	0.00	0.00	0.00
18,200.00	90.12	359.44	12,347.98	6,087.37	237.83	6,091.76	0.00	0.00	0.00
18,300.00	90.12	359.44	12,347.77	6,187.37	236.86	6,191.68	0.00	0.00	0.00
18,400.00	90.12	359.44	12,347.56	6,287.36	235.89	6,291.60	0.00	0.00	0.00
18,500.00	90.12	359.44	12,347.35	6,387.36	234.92	6,391.52	0.00	0.00	0.00
18,600.00	90.12	359.44	12,347.14	6,487.35	233.94	6,491.44	0.00	0.00	0.00
18,700.00	90.12	359.44	12,346.93	6,587.35	232.97	6,591.37	0.00	0.00	0.00
18,800.00	90.12	359.44	12,346.72	6,687.34	232.00	6,691.29	0.00	0.00	0.00
18,900.00	90.12	359.44	12,346.51	6,787.34	231.03	6,791.21	0.00	0.00	0.00
19,000.00	90.12	359.44	12,346.30	6,887.33	230.05	6,891.13	0.00	0.00	0.00
19,100.00	90.12	359.44	12,346.09	6,987.33	229.08	6,991.05	0.00	0.00	0.00
19,200.00	90.12	359.44	12,345.88	7,087.32	228.11	7,090.97	0.00	0.00	0.00
19,300.00	90.12	359.44	12,345.67	7,187.32	227.14	7,190.89	0.00	0.00	0.00
19,400.00	90.12	359.44	12,345.46	7,287.31	226.17	7,290.82	0.00	0.00	0.00
19,500.00	90.12	359.44	12,345.25	7,387.31	225.19	7,390.74	0.00	0.00	0.00
19,600.00	90.12	359.44	12,345.04	7,487.30	224.22	7,490.66	0.00	0.00	0.00
19,620.25	90.12	359.44	12,345.00	7,507.55	224.03	7,510.90	0.00	0.00	0.00

TD at 19620.25

Design Targets

Target Name

- hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Square Bill Fed Com	0.00	0.00	12,345.00	7,507.55	224.03	401,612.5391	789,098.1249	32° 6' 2.549 N	103° 23' 59.060 W
- plan hits target center - Point									
Square Bill Fed Com	0.00	0.00	12,345.27	7,377.68	225.15	401,482.6685	789,099.2496	32° 6' 1.264 N	103° 23' 59.060 W
- plan misses target center by 0.14ft at 19490.38ft MD (12345.27 TVD, 7377.68 N, 225.29 E) - Point									



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North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Multi User Db

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
5000	5000	0	0	Start Build 2.00
5125	5125	1	3	Start 6843.17 hold at 5125.24 MD
11,968	11,962	122	276	Start DLS 12.00 TFO -66.60
12,735	12,430	624	291	Start 1370.41 hold at 12734.53 MD
14,105	12,360	1993	278	Start Drop -2.00
14,245	12,356	2133	276	Start 5374.94 hold at 14245.32 MD
19,620	12,345	7508	224	TD at 19620.25

Checked By: _____ Approved By: _____ Date: _____