

PATRIOT DRILLING, LLC

OPERATOR: COG Operating, LLC
WELL/LEASE: Nightcap 6 Federal #3H
COUNTY: Lea Co., New Mexico
Sec. 6, T 20S, R 32E

**STATE OF NEW MEXICO
DEVIATION REPORT**

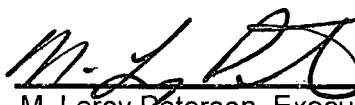
<u>Depth</u>	<u>Deviation</u>	<u>Depth</u>	<u>Deviation</u>
320	3/4	2,418	3 1/2
654	3/4	2,618	3 1/2
865	1	2,895	3/4
1,176	1/2	3,486	2 1/4
1,588	1/2	3,581	1 1/4
1,785	3/4	3,866	1 1/4
2,323	2 3/4	4,130	1 1/2

HOBBSOCD

APR 14 2015

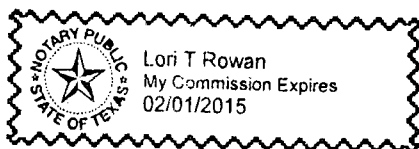
RECEIVED

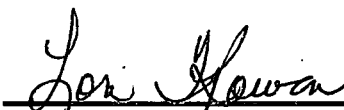
Patriot Drilling, LLC


M. Leroy Peterson, Executive Vice-
President

The foregoing instrument was acknowledged before me on this 12th day of August, 2014 by M. Leroy Peterson, Executive Vice-President of Patriot Drilling, LLC.

My Commission Expires: 02/01/2015




Lori T. Rowan
Notary Public for Ector Co., Texas

APR 21 2015



December 9, 2014

Concho Resources, Inc.
One Concho Center
600 W. Illinois Avenue
Midland, Texas 79701

HOBBS OCD
APR 14 2015
RECEIVED

Attn: Kanicia Castillo

RE: **Nightcap 6 Federal 3H**

Please find enclosed a copy of the survey from 0.00' to 4100.00' ran on the above referenced well.

If I can be of any further service, please do not hesitate to call me at 800-606-4976.

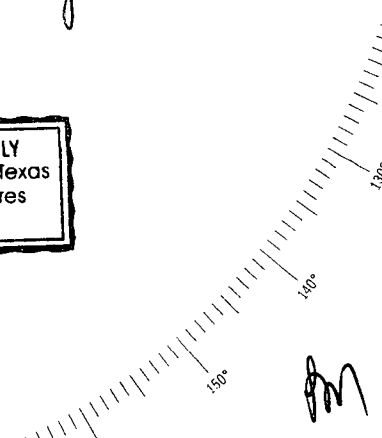
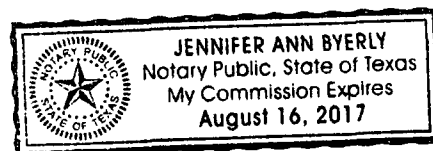
Sincerely,


Keith Havelka
Operations

STATE OF TEXAS §
 §
COUNTY OF NUECES §

This instrument was acknowledged before me on the 9 day of December A.D., 2014, by Keith Havelka.


Jennifer Ann Byerly
Notary Public, State of Texas





Company: Concho
Lease/Well: Nightcap 6 Federal/3H

Rig Name: Precision 105
State/County: New Mexico/Lea
Latitude: 32.61, Longitude: -103.81
GRID North is 0.28 Degrees East of True North
VS-Azi: 0.00 Degrees



Depth Reference : RKB=24.5 Feet

DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: gyro survey.ut
Minimum Curvature Method
Report Date/Time: 12/9/2014 / 14:00

VES Survey International
West Texas
(432) 563-5444

Surveyor: Bryan Massey
Nightcap 6 Federal 3H / API 30-025-41589

HOBBSOCD

APR 14 2015

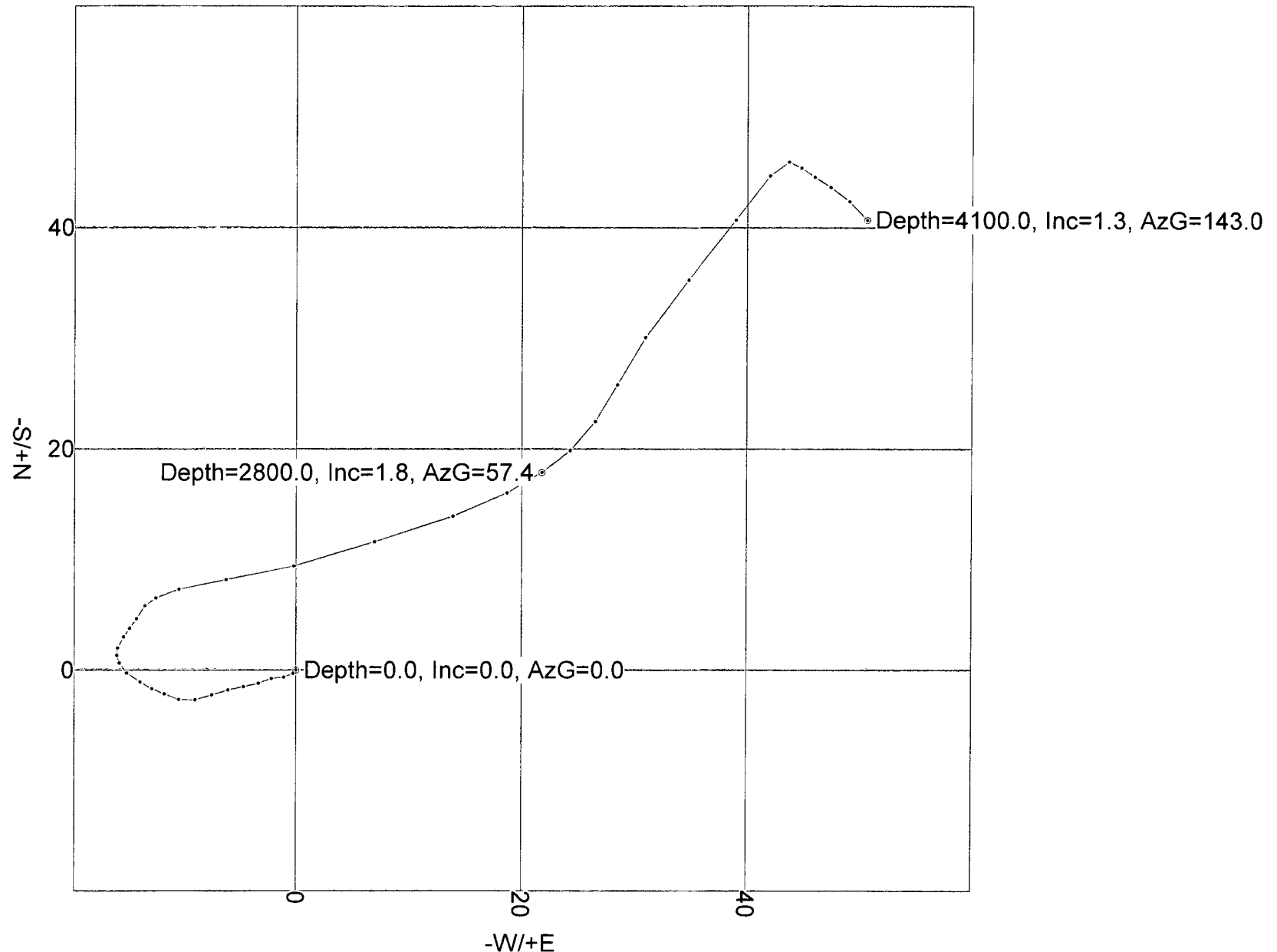
RECEIVED

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	****
100.00	0.48	222.00	100.00	-0.31	-0.28	-0.31	0.42	222.00	0.48
200.00	0.61	268.09	199.99	-0.65	-1.10	-0.65	1.28	239.59	0.45
300.00	0.65	258.86	299.99	-0.77	-2.19	-0.77	2.32	250.56	0.11
400.00	0.81	243.11	399.98	-1.20	-3.37	-1.20	3.58	250.40	0.26
500.00	0.77	270.38	499.97	-1.52	-4.68	-1.52	4.92	252.02	0.37
600.00	0.93	248.28	599.96	-1.81	-6.10	-1.81	6.37	253.44	0.36
700.00	0.84	258.04	699.95	-2.27	-7.58	-2.27	7.91	253.34	0.18
800.00	0.95	250.43	799.94	-2.70	-9.08	-2.70	9.47	253.45	0.16
900.00	0.86	294.29	899.93	-2.67	-10.54	-2.67	10.87	255.79	0.68
1000.00	0.76	286.89	999.92	-2.17	-11.86	-2.17	12.05	259.64	0.14
1100.00	0.62	301.13	1099.91	-1.69	-12.96	-1.69	13.07	262.56	0.22
1200.00	0.80	298.15	1199.90	-1.09	-14.03	-1.09	14.08	265.58	0.18
1300.00	0.89	308.56	1299.89	-0.27	-15.25	-0.27	15.25	268.97	0.18
1400.00	0.49	355.37	1399.88	0.64	-15.89	0.64	15.90	272.29	0.66
1500.00	0.35	321.24	1499.88	1.31	-16.12	1.31	16.17	274.63	0.28
1600.00	0.60	31.50	1599.88	1.99	-16.04	1.99	16.16	277.09	0.59
1700.00	0.72	25.32	1699.87	3.01	-15.50	3.01	15.79	280.99	0.14
1800.00	0.37	51.20	1799.87	3.78	-14.98	3.78	15.45	284.16	0.42

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
1900.00	0.88	28.71	1899.86	4.66	-14.35	4.66	15.09	287.98	0.56
2000.00	0.72	36.64	1999.85	5.84	-13.61	5.84	14.81	293.22	0.20
2100.00	0.74	72.42	2099.84	6.54	-12.62	6.54	14.21	297.39	0.45
2200.00	1.80	67.64	2199.82	7.33	-10.55	7.33	12.85	304.78	1.06
2300.00	3.22	84.68	2299.72	8.19	-6.31	8.19	10.33	322.39	1.59
2400.00	3.94	73.60	2399.53	9.41	-0.22	9.41	9.42	358.68	0.99
2500.00	4.74	72.78	2499.24	11.61	7.02	11.61	13.56	31.17	0.80
2600.00	3.65	69.77	2598.97	13.93	13.95	13.93	19.72	45.05	1.10
2700.00	2.31	60.45	2698.83	16.03	18.70	16.03	24.63	49.40	1.42
2800.00	1.81	57.43	2798.77	17.87	21.78	17.87	28.18	50.63	0.51
2900.00	1.86	46.54	2898.72	19.84	24.30	19.84	31.37	50.76	0.35
3000.00	2.14	34.90	2998.65	22.49	26.54	22.49	34.79	49.73	0.49
3100.00	2.30	26.47	3098.58	25.81	28.50	25.81	38.46	47.84	0.36
3200.00	3.36	33.15	3198.46	30.06	31.00	30.06	43.19	45.88	1.12
3300.00	4.07	39.07	3298.25	35.28	34.84	35.28	49.58	44.65	0.80
3400.00	3.75	35.88	3398.01	40.68	39.00	40.68	56.35	43.79	0.39
3500.00	1.99	39.15	3497.88	44.67	42.01	44.67	61.32	43.24	1.77
3600.00	0.67	100.26	3597.86	45.91	43.67	45.91	63.37	43.57	1.76
3700.00	0.78	129.92	3697.85	45.37	44.77	45.37	63.74	44.61	0.38
3800.00	0.88	119.67	3797.84	44.56	45.95	44.56	64.01	45.88	0.18
3900.00	1.06	125.61	3897.83	43.64	47.37	43.64	64.41	47.34	0.20
4000.00	1.36	129.85	3997.80	42.35	49.03	42.35	64.79	49.18	0.31
4100.00	1.30	142.96	4097.78	40.68	50.62	40.68	64.94	51.21	0.31



VES Survey International
West Texas
(432) 563-5444
Surveyor: Bryan Massey
Nightcap 6 Federal 3H / API 30-025-41589



VES Survey Date: 11/19/2014



December 2, 2014

Concho Resources, Inc.
One Concho Center
600 W. Illinois Avenue
Midland, Texas 79701

HOBBSOCD

APR 14 2015

RECEIVED

Attn: Kanicia Castillo

RE: **Nightcap 6 Federal Com 3H**

Please find enclosed a copy of the survey from 0.00' to 8700.00' ran on the above referenced well.

If I can be of any further service, please do not hesitate to call me at 800-606-4976.

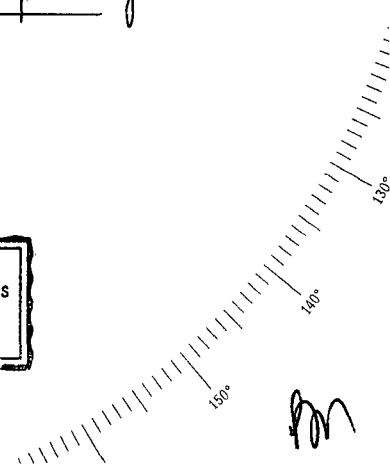
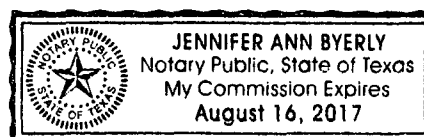
Sincerely,

Keith Havelka
Operations

STATE OF TEXAS §
 §
COUNTY OF NUECES §

This instrument was acknowledged before me on the 2 day of December A.D., 2014, by Keith Havelka.

Jennifer Ann Byerly
Notary Public, State of Texas





Company: COG Operating
Lease/Well: Nightcap 6 Federal Com/3H
Location: Sec 6 T20S R32E
Rig Name: Precision 105
State/County: New Mexico/Lea
Latitude: 32.61, Longitude: -103.81
GRID North is 0.28 Degrees East of True North
VS-Azi: 0.00 Degrees



Depth Reference : RKB=28 Feet

DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: ...eral #3h gyro survey-de_01.ut

Minimum Curvature Method

Report Date/Time: 12/2/2014 / 13:13

VES Survey International

West Texas

(432) 563-5444

Surveyor: Chris Bankson

Nightcap 6 Federal Com 3H / API 30-025-41589

HOBBSOCD
APR 14 2015
RECEIVED

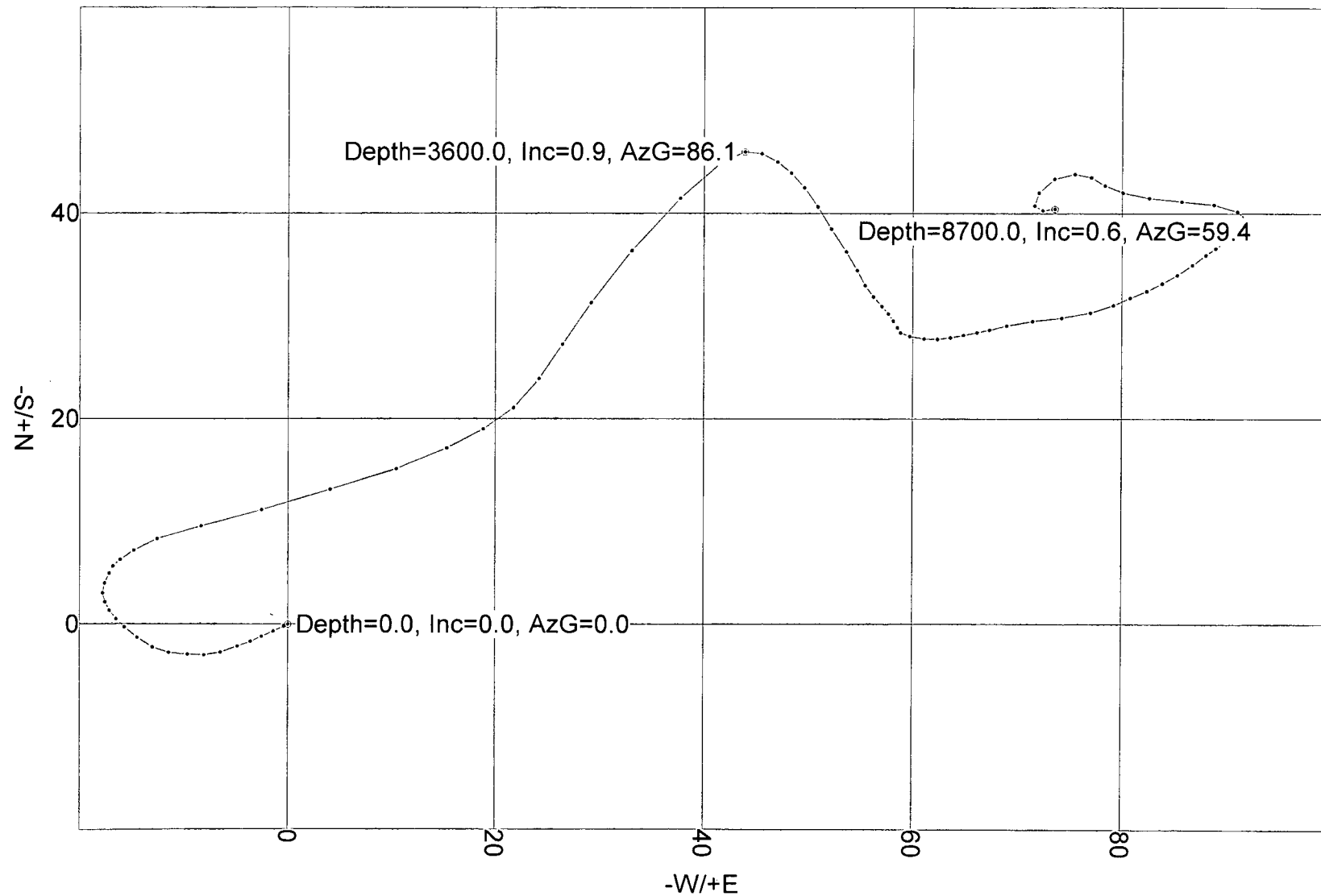
Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	****
100.00	0.53	243.07	100.00	-0.21	-0.41	-0.21	0.46	243.07	0.53
200.00	0.76	247.54	199.99	-0.67	-1.44	-0.67	1.58	244.94	0.23
300.00	0.69	243.28	299.98	-1.19	-2.58	-1.19	2.85	245.19	0.09
400.00	0.67	248.16	399.98	-1.68	-3.67	-1.68	4.04	245.34	0.06
500.00	0.86	249.94	499.97	-2.16	-4.92	-2.16	5.37	246.29	0.19
600.00	1.15	250.96	599.95	-2.74	-6.57	-2.74	7.12	247.33	0.29
700.00	0.76	273.64	699.94	-3.03	-8.17	-3.03	8.72	249.67	0.53
800.00	1.04	270.89	799.93	-2.97	-9.74	-2.97	10.18	253.03	0.29
900.00	1.04	280.42	899.91	-2.79	-11.55	-2.79	11.88	256.40	0.17
1000.00	0.87	298.76	999.90	-2.26	-13.11	-2.26	13.30	260.20	0.35
1100.00	1.13	306.57	1099.88	-1.31	-14.56	-1.31	14.62	264.85	0.29
1200.00	0.67	314.81	1199.87	-0.31	-15.77	-0.31	15.77	268.87	0.47
1300.00	0.63	317.65	1299.86	0.51	-16.56	0.51	16.56	271.76	0.06
1400.00	0.55	328.42	1399.86	1.32	-17.17	1.32	17.22	274.39	0.13
1500.00	0.52	337.69	1499.85	2.15	-17.60	2.15	17.73	276.96	0.09
1600.00	0.51	354.98	1599.85	3.01	-17.81	3.01	18.06	279.60	0.16
1700.00	0.65	22.80	1699.84	3.98	-17.63	3.98	18.07	282.73	0.31
1800.00	0.56	25.91	1799.84	4.95	-17.19	4.95	17.89	286.05	0.10

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
1900.00	0.34	26.49	1899.83	5.65	-16.85	5.65	17.77	288.53	0.22
2000.00	0.78	53.86	1999.83	6.31	-16.17	6.31	17.35	291.33	0.51
2100.00	1.01	55.57	2099.82	7.21	-14.89	7.21	16.54	295.85	0.23
2200.00	1.85	67.80	2199.79	8.32	-12.67	8.32	15.16	303.30	0.89
2300.00	3.18	76.61	2299.69	9.57	-8.47	9.57	12.79	318.48	1.38
2400.00	3.82	73.80	2399.50	11.14	-2.58	11.14	11.44	346.96	0.66
2500.00	4.16	73.17	2499.26	13.12	4.09	13.12	13.75	17.30	0.35
2600.00	3.53	71.77	2599.03	15.14	10.48	15.14	18.41	34.71	0.64
2700.00	2.54	61.59	2698.89	17.15	15.36	17.15	23.02	41.84	1.12
2800.00	2.02	62.61	2798.81	19.02	18.87	19.02	26.79	44.78	0.52
2900.00	2.06	46.77	2898.75	21.06	21.74	21.06	30.27	45.92	0.56
3000.00	2.27	35.95	2998.68	23.90	24.22	23.90	34.02	45.38	0.46
3100.00	2.35	32.39	3098.60	27.23	26.48	27.23	37.98	44.20	0.16
3200.00	3.28	35.34	3198.48	31.30	29.23	31.30	42.82	43.05	0.94
3300.00	4.07	39.32	3298.27	36.37	33.13	36.37	49.20	42.33	0.83
3400.00	3.79	45.20	3398.04	41.45	37.73	41.45	56.04	42.31	0.49
3500.00	2.11	54.62	3497.90	44.84	41.57	44.84	61.15	42.83	1.74
3600.00	0.93	86.11	3597.86	45.96	43.88	45.96	63.55	43.67	1.41
3700.00	0.95	107.55	3697.85	45.77	45.48	45.77	64.52	44.82	0.35
3800.00	1.01	127.42	3797.84	44.98	46.97	44.98	65.04	46.24	0.34
3900.00	0.94	132.30	3897.82	43.90	48.27	43.90	65.25	47.72	0.11
4000.00	1.25	142.16	3997.80	42.49	49.55	42.49	65.27	49.39	0.37
4100.00	1.33	147.60	4097.78	40.64	50.84	40.64	65.09	51.36	0.15
4200.00	1.58	150.10	4197.75	38.47	52.15	38.47	64.80	53.59	0.25
4300.00	1.43	143.29	4297.71	36.27	53.58	36.27	64.71	55.90	0.23
4400.00	1.04	158.78	4397.69	34.43	54.65	34.43	64.60	57.79	0.51
4500.00	0.85	144.34	4497.68	32.99	55.41	32.99	64.49	59.24	0.30
4600.00	0.72	143.75	4597.67	31.87	56.22	31.87	64.63	60.45	0.13
4700.00	0.69	134.10	4697.66	30.95	57.02	30.95	64.88	61.51	0.12
4800.00	0.43	145.79	4797.65	30.22	57.67	30.22	65.10	62.34	0.28
4900.00	0.54	144.40	4897.65	29.53	58.15	29.53	65.22	63.08	0.10
5000.00	0.34	156.79	4997.65	28.87	58.54	28.87	65.27	63.75	0.22
5100.00	0.33	139.44	5097.65	28.38	58.84	28.38	65.33	64.25	0.10
5200.00	0.82	100.99	5197.64	28.03	59.73	28.03	65.98	64.86	0.60
5300.00	0.78	98.41	5297.63	27.79	61.11	27.79	67.13	65.54	0.05
5400.00	0.71	84.75	5397.62	27.75	62.40	27.75	68.29	66.03	0.19
5500.00	0.72	80.37	5497.61	27.91	63.64	27.91	69.49	66.32	0.06
5600.00	0.75	78.89	5597.61	28.14	64.90	28.14	70.74	66.56	0.04
5700.00	0.74	78.30	5697.60	28.40	66.18	28.40	72.02	66.77	0.01

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
5800.00	0.67	78.49	5797.59	28.65	67.39	28.65	73.22	66.97	0.08
5900.00	1.27	73.67	5897.58	29.07	69.02	29.07	74.89	67.16	0.61
6000.00	1.60	85.04	5997.54	29.51	71.47	29.51	77.32	67.57	0.43
6100.00	1.61	81.84	6097.51	29.83	74.25	29.83	80.02	68.11	0.09
6200.00	1.60	77.72	6197.47	30.32	77.00	30.32	82.75	68.51	0.12
6300.00	1.08	62.64	6297.44	31.05	79.19	31.05	85.06	68.59	0.62
6400.00	0.97	69.93	6397.42	31.77	80.82	31.77	86.85	68.54	0.17
6500.00	0.97	65.07	6497.41	32.42	82.39	32.42	88.54	68.52	0.08
6600.00	0.94	60.23	6597.39	33.19	83.87	33.19	90.20	68.41	0.09
6700.00	0.93	61.81	6697.38	33.98	85.30	33.98	91.82	68.28	0.03
6800.00	1.10	50.55	6797.37	34.97	86.76	34.97	93.54	68.04	0.26
6900.00	0.76	57.41	6897.35	35.94	88.05	35.94	95.11	67.80	0.36
7000.00	0.56	54.71	6997.35	36.58	89.01	36.58	96.23	67.66	0.20
7100.00	0.75	51.35	7097.34	37.27	89.92	37.27	97.34	67.49	0.20
7200.00	0.73	49.98	7197.33	38.09	90.93	38.09	98.58	67.27	0.03
7300.00	0.44	45.42	7297.33	38.78	91.69	38.78	99.56	67.08	0.29
7400.00	0.43	355.49	7397.32	39.43	91.94	39.43	100.04	66.79	0.37
7500.00	1.05	294.22	7497.32	40.18	91.07	40.18	99.54	66.19	0.93
7600.00	1.65	281.11	7597.29	40.84	88.82	40.84	97.76	65.31	0.67
7700.00	1.93	271.32	7697.24	41.15	85.72	41.15	95.09	64.36	0.41
7800.00	1.70	281.36	7797.19	41.49	82.58	41.49	92.42	63.33	0.39
7900.00	1.22	282.69	7897.16	42.01	80.09	42.01	90.44	62.32	0.48
8000.00	0.96	303.77	7997.14	42.71	78.35	42.71	89.24	61.41	0.48
8100.00	0.77	298.36	8097.13	43.49	77.07	43.49	88.49	60.56	0.20
8200.00	1.13	269.30	8197.11	43.80	75.49	43.80	87.28	59.88	0.59
8300.00	1.23	246.37	8297.09	43.36	73.53	43.36	85.36	59.47	0.48
8400.00	1.20	207.82	8397.07	42.00	72.05	42.00	83.40	59.76	0.80
8500.00	0.40	169.84	8497.06	40.73	71.62	40.73	82.39	60.37	0.92
8600.00	0.83	98.20	8597.06	40.29	72.40	40.29	82.85	60.91	0.80
8700.00	0.59	59.43	8697.05	40.44	73.56	40.44	83.94	61.20	0.52



VES Survey International
West Texas
(432) 563-5444
Surveyor: Chris Bankson
Nightcap 6 Federal Com 3H / API 30-025-41589



VES Survey Date: 11/22/2014



COG Operating LLC

Lea County, NM (NAD83)

Nightcap 6 Federal

#3H

OH

Design: OH

Survey Report - Geographic

08 December, 2014





TDS
Survey Report - Geographic



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #3H
Project:	Lea County, NM (NAD83)	TVD Reference:	KB @ 3540.2usft
Site:	Nightcap 6 Federal	MD Reference:	KB @ 3540.2usft
Well:	#3H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.1 Single User Db

Project	Lea County, NM (NAD83)		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Eastern Zone		

Site	Nightcap 6 Federal		
Site Position:		Northing:	585,593.93 usft
From:	Map	Easting:	703,231.57 usft
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 36' 31.496 N
		Longitude:	103° 48' 27.267 W
		Grid Convergence:	0.28 °

Well	#3H		
Well Position	+N/-S	0.0 usft	Northing:
	+E/-W	0.0 usft	Easting:
Position Uncertainty	0.0 usft	Wellhead Elevation:	0.0 usft
		Latitude:	32° 36' 31.496 N
		Longitude:	103° 48' 27.267 W
		Ground Level:	3,514.2 usft

Wellbore	OH		
Magnetics	Model Name	Sample Date	Declination
			(°)
	IGRF2010	10/30/2014	7.31
			Dip Angle
			(°)
			60.42
			Field Strength
			(nT)
			48,484

Design	OH		
Audit Notes:			
Version:	1.0	Phase:	ACTUAL
		Tie On Depth:	0.0
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W
	(usft)	(usft)	(usft)
	0.0	0.0	0.0
			Direction
			(°)
			179.99

Survey Program	Date 12/8/2014		
From	To	Survey (Wellbore)	Tool Name
(usft)	(usft)		
100.0	8,700.0	GYRO #1 (OH)	Good_gyro
8,822.0	19,060.0	MWD #1 (OH)	MWD
			Description
			Good Gyro
			MWD - Standard

Survey									
Measured	Inclination	Azimuth	Vertical	+N/-S	+E/-W	Map	Map	Latitude	Longitude
Depth	(°)	(°)	Depth	(usft)	(usft)	Northing	Easting		
(usft)			(usft)			(usft)	(usft)		
0.0	0.00	0.00	0.0	0.0	0.0	585,593.93	703,231.57	32° 36' 31.496 N	103° 48' 27.267 W
100.0	0.53	243.07	100.0	-0.2	-0.4	585,593.72	703,231.15	32° 36' 31.494 N	103° 48' 27.271 W
200.0	0.76	247.54	200.0	-0.7	-1.4	585,593.26	703,230.13	32° 36' 31.490 N	103° 48' 27.283 W
300.0	0.69	243.28	300.0	-1.2	-2.6	585,592.74	703,228.98	32° 36' 31.485 N	103° 48' 27.297 W
400.0	0.67	248.16	400.0	-1.7	-3.7	585,592.25	703,227.90	32° 36' 31.480 N	103° 48' 27.310 W
500.0	0.86	249.94	500.0	-2.2	-4.9	585,591.77	703,226.65	32° 36' 31.475 N	103° 48' 27.324 W
600.0	1.15	250.96	600.0	-2.7	-6.6	585,591.19	703,225.00	32° 36' 31.469 N	103° 48' 27.344 W
700.0	0.76	273.64	699.9	-3.0	-8.2	585,590.90	703,223.39	32° 36' 31.467 N	103° 48' 27.362 W
800.0	1.04	270.89	799.9	-3.0	-9.7	585,590.96	703,221.82	32° 36' 31.467 N	103° 48' 27.381 W
900.0	1.04	280.42	899.9	-2.8	-11.5	585,591.14	703,220.02	32° 36' 31.469 N	103° 48' 27.402 W
1,000.0	0.87	298.76	999.9	-2.3	-13.1	585,591.67	703,218.46	32° 36' 31.474 N	103° 48' 27.420 W



TDS
Survey Report - Geographic



Company: COG Operating LLC
Project: Lea County, NM (NAD83)
Site: Nightcap 6 Federal
Well: #3H
Wellbore: OH
Design: OH

Local Co-ordinate Reference: Well #3H
TVD Reference: KB @ 3540.2usft
MD Reference: KB @ 3540.2usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Single User Db

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	1.13	306.57	1,099.9	-1.3	-14.6	585,592.62	703,217.00	32° 36' 31.484 N	103° 48' 27.437 W
1,200.0	0.67	314.81	1,199.9	-0.3	-15.8	585,593.62	703,215.79	32° 36' 31.494 N	103° 48' 27.451 W
1,300.0	0.63	317.65	1,299.9	0.5	-16.6	585,594.44	703,215.01	32° 36' 31.502 N	103° 48' 27.460 W
1,400.0	0.55	328.42	1,399.9	1.3	-17.2	585,595.25	703,214.39	32° 36' 31.510 N	103° 48' 27.467 W
1,500.0	0.52	337.69	1,499.9	2.1	-17.6	585,596.08	703,213.96	32° 36' 31.518 N	103° 48' 27.472 W
1,600.0	0.51	354.98	1,599.8	3.0	-17.8	585,596.95	703,213.75	32° 36' 31.527 N	103° 48' 27.475 W
1,700.0	0.65	22.80	1,699.8	4.0	-17.6	585,597.91	703,213.93	32° 36' 31.536 N	103° 48' 27.473 W
1,800.0	0.56	25.91	1,799.8	4.9	-17.2	585,598.87	703,214.37	32° 36' 31.546 N	103° 48' 27.467 W
1,900.0	0.34	26.49	1,899.8	5.6	-16.9	585,599.58	703,214.71	32° 36' 31.553 N	103° 48' 27.463 W
2,000.0	0.78	53.86	1,999.8	6.3	-16.2	585,600.25	703,215.39	32° 36' 31.559 N	103° 48' 27.455 W
2,100.0	1.01	55.57	2,099.8	7.2	-14.9	585,601.15	703,216.67	32° 36' 31.568 N	103° 48' 27.440 W
2,200.0	1.85	67.80	2,199.8	8.3	-12.7	585,602.25	703,218.89	32° 36' 31.579 N	103° 48' 27.414 W
2,300.0	3.18	76.61	2,299.7	9.6	-8.5	585,603.51	703,223.09	32° 36' 31.591 N	103° 48' 27.365 W
2,400.0	3.82	73.80	2,399.5	11.1	-2.6	585,605.08	703,228.98	32° 36' 31.607 N	103° 48' 27.296 W
2,500.0	4.16	73.17	2,499.3	13.1	4.1	585,607.06	703,235.65	32° 36' 31.626 N	103° 48' 27.218 W
2,600.0	3.53	71.77	2,599.0	15.1	10.5	585,609.07	703,242.05	32° 36' 31.645 N	103° 48' 27.143 W
2,700.0	2.54	61.59	2,698.9	17.2	15.4	585,611.09	703,246.92	32° 36' 31.665 N	103° 48' 27.086 W
2,800.0	2.02	62.61	2,798.8	19.0	18.9	585,612.95	703,250.44	32° 36' 31.683 N	103° 48' 27.045 W
2,900.0	2.06	46.77	2,898.7	21.1	21.7	585,614.99	703,253.31	32° 36' 31.704 N	103° 48' 27.011 W
3,000.0	2.27	35.95	2,998.7	23.9	24.2	585,617.83	703,255.78	32° 36' 31.731 N	103° 48' 26.982 W
3,100.0	2.35	32.39	3,098.6	27.2	26.5	585,621.16	703,258.04	32° 36' 31.764 N	103° 48' 26.955 W
3,200.0	3.28	35.34	3,198.5	31.3	29.2	585,625.23	703,260.80	32° 36' 31.804 N	103° 48' 26.923 W
3,300.0	4.07	39.32	3,298.3	36.4	33.1	585,630.31	703,264.70	32° 36' 31.855 N	103° 48' 26.877 W
3,400.0	3.79	45.20	3,398.0	41.4	37.7	585,635.38	703,269.29	32° 36' 31.905 N	103° 48' 26.823 W
3,500.0	2.11	54.62	3,497.9	44.8	41.6	585,638.78	703,273.14	32° 36' 31.938 N	103° 48' 26.778 W
3,600.0	0.93	86.11	3,597.9	46.0	43.9	585,639.90	703,275.45	32° 36' 31.949 N	103° 48' 26.751 W
3,700.0	0.95	107.55	3,697.9	45.8	45.5	585,639.70	703,277.05	32° 36' 31.947 N	103° 48' 26.732 W
3,800.0	1.01	127.42	3,797.8	45.0	47.0	585,638.92	703,278.54	32° 36' 31.939 N	103° 48' 26.715 W
3,900.0	0.94	132.30	3,897.8	43.9	48.3	585,637.83	703,279.85	32° 36' 31.928 N	103° 48' 26.700 W
4,000.0	1.25	142.16	3,997.8	42.5	49.6	585,636.42	703,281.12	32° 36' 31.914 N	103° 48' 26.685 W
4,100.0	1.33	147.60	4,097.8	40.6	50.8	585,634.57	703,282.41	32° 36' 31.896 N	103° 48' 26.670 W
4,200.0	1.58	150.10	4,197.7	38.5	52.2	585,632.40	703,283.72	32° 36' 31.874 N	103° 48' 26.655 W
4,300.0	1.43	143.29	4,297.7	36.3	53.6	585,630.20	703,285.16	32° 36' 31.853 N	103° 48' 26.638 W
4,400.0	1.04	158.78	4,397.7	34.4	54.7	585,628.36	703,286.23	32° 36' 31.834 N	103° 48' 26.626 W
4,500.0	0.85	144.34	4,497.7	33.0	55.4	585,626.91	703,286.99	32° 36' 31.820 N	103° 48' 26.617 W
4,600.0	0.72	143.75	4,597.7	31.9	56.2	585,625.80	703,287.80	32° 36' 31.809 N	103° 48' 26.607 W
4,700.0	0.69	134.10	4,697.7	30.9	57.0	585,624.87	703,288.60	32° 36' 31.800 N	103° 48' 26.598 W
4,800.0	0.43	145.79	4,797.7	30.2	57.7	585,624.15	703,289.24	32° 36' 31.792 N	103° 48' 26.591 W
4,900.0	0.54	144.40	4,897.6	29.5	58.2	585,623.45	703,289.73	32° 36' 31.785 N	103° 48' 26.585 W
5,000.0	0.34	156.79	4,997.6	28.9	58.6	585,622.80	703,290.12	32° 36' 31.779 N	103° 48' 26.580 W
5,100.0	0.33	139.44	5,097.6	28.4	58.9	585,622.30	703,290.42	32° 36' 31.774 N	103° 48' 26.577 W
5,200.0	0.82	100.99	5,197.6	28.0	59.7	585,621.95	703,291.31	32° 36' 31.771 N	103° 48' 26.566 W
5,300.0	0.78	98.41	5,297.6	27.8	61.1	585,621.71	703,292.69	32° 36' 31.768 N	103° 48' 26.550 W
5,400.0	0.71	84.75	5,397.6	27.7	62.4	585,621.67	703,293.98	32° 36' 31.768 N	103° 48' 26.535 W
5,500.0	0.72	80.37	5,497.6	27.9	63.7	585,621.83	703,295.22	32° 36' 31.769 N	103° 48' 26.521 W
5,600.0	0.75	78.89	5,597.6	28.1	64.9	585,622.06	703,296.48	32° 36' 31.771 N	103° 48' 26.506 W
5,700.0	0.74	78.30	5,697.6	28.4	66.2	585,622.32	703,297.75	32° 36' 31.774 N	103° 48' 26.491 W
5,800.0	0.67	78.49	5,797.6	28.6	67.4	585,622.57	703,298.96	32° 36' 31.776 N	103° 48' 26.477 W
5,900.0	1.27	73.67	5,897.6	29.1	69.0	585,623.00	703,300.59	32° 36' 31.780 N	103° 48' 26.458 W
6,000.0	1.60	85.04	5,997.5	29.5	71.5	585,623.43	703,303.05	32° 36' 31.785 N	103° 48' 26.429 W
6,100.0	1.61	81.84	6,097.5	29.8	74.3	585,623.75	703,305.83	32° 36' 31.788 N	103° 48' 26.397 W
6,200.0	1.60	77.72	6,197.5	30.3	77.0	585,624.24	703,308.58	32° 36' 31.792 N	103° 48' 26.364 W
6,300.0	1.08	62.64	6,297.4	31.0	79.2	585,624.98	703,310.79	32° 36' 31.800 N	103° 48' 26.339 W
6,400.0	0.97	69.93	6,397.4	31.8	80.9	585,625.70	703,312.42	32° 36' 31.807 N	103° 48' 26.320 W
6,500.0	0.97	65.07	6,497.4	32.4	82.4	585,626.35	703,313.98	32° 36' 31.813 N	103° 48' 26.301 W



TDS
Survey Report - Geographic



Company: COG Operating LLC
Project: Lea County, NM (NAD83)
Site: Nightcap 6 Federal
Well: #3H
Wellbore: OH
Design: OH

Local Co-ordinate Reference: Well #3H
TVD Reference: KB @ 3540.2usft
MD Reference: KB @ 3540.2usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Single User Db

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	0.94	60.23	6,597.4	33.2	83.9	585,627.11	703,315.46	32° 36' 31.820 N	103° 48' 26.284 W
6,700.0	0.93	61.81	6,697.4	34.0	85.3	585,627.90	703,316.89	32° 36' 31.828 N	103° 48' 26.267 W
6,800.0	1.10	50.55	6,797.4	35.0	86.8	585,628.89	703,318.34	32° 36' 31.838 N	103° 48' 26.250 W
6,900.0	0.76	57.41	6,897.4	35.9	88.1	585,629.86	703,319.64	32° 36' 31.847 N	103° 48' 26.235 W
7,000.0	0.56	54.71	6,997.3	36.6	89.0	585,630.50	703,320.60	32° 36' 31.854 N	103° 48' 26.224 W
7,100.0	0.75	51.35	7,097.3	37.3	89.9	585,631.19	703,321.51	32° 36' 31.860 N	103° 48' 26.213 W
7,200.0	0.73	49.98	7,197.3	38.1	90.9	585,632.01	703,322.51	32° 36' 31.869 N	103° 48' 26.201 W
7,300.0	0.44	45.42	7,297.3	38.8	91.7	585,632.69	703,323.27	32° 36' 31.875 N	103° 48' 26.192 W
7,400.0	0.43	355.49	7,397.3	39.4	92.0	585,633.33	703,323.52	32° 36' 31.882 N	103° 48' 26.189 W
7,500.0	1.05	294.22	7,497.3	40.1	91.1	585,634.08	703,322.65	32° 36' 31.889 N	103° 48' 26.199 W
7,600.0	1.65	281.11	7,597.3	40.8	88.8	585,634.74	703,320.40	32° 36' 31.896 N	103° 48' 26.226 W
7,700.0	1.93	271.32	7,697.2	41.1	85.7	585,635.05	703,317.31	32° 36' 31.899 N	103° 48' 26.262 W
7,800.0	1.70	281.36	7,797.2	41.5	82.6	585,635.38	703,314.17	32° 36' 31.902 N	103° 48' 26.299 W
7,900.0	1.22	282.69	7,897.2	42.0	80.1	585,635.91	703,311.68	32° 36' 31.908 N	103° 48' 26.328 W
8,000.0	0.96	303.77	7,997.1	42.7	78.4	585,636.61	703,309.94	32° 36' 31.915 N	103° 48' 26.348 W
8,100.0	0.77	298.36	8,097.1	43.5	77.1	585,637.39	703,308.65	32° 36' 31.922 N	103° 48' 26.363 W
8,200.0	1.13	269.30	8,197.1	43.8	75.5	585,637.70	703,307.08	32° 36' 31.926 N	103° 48' 26.381 W
8,300.0	1.23	246.37	8,297.1	43.3	73.5	585,637.26	703,305.11	32° 36' 31.921 N	103° 48' 26.404 W
8,400.0	1.20	207.82	8,397.1	42.0	72.1	585,635.90	703,303.63	32° 36' 31.908 N	103° 48' 26.422 W
8,500.0	0.40	169.84	8,497.1	40.7	71.6	585,634.63	703,303.21	32° 36' 31.895 N	103° 48' 26.427 W
8,600.0	0.83	98.20	8,597.1	40.3	72.4	585,634.19	703,303.99	32° 36' 31.891 N	103° 48' 26.418 W
8,700.0	0.59	59.43	8,697.0	40.4	73.6	585,634.34	703,305.15	32° 36' 31.892 N	103° 48' 26.404 W
8,822.0	3.50	145.10	8,819.0	37.7	76.3	585,631.61	703,307.82	32° 36' 31.865 N	103° 48' 26.373 W
8,853.0	7.70	156.50	8,849.8	35.0	77.6	585,628.93	703,309.19	32° 36' 31.839 N	103° 48' 26.357 W
8,884.0	10.60	158.80	8,880.4	30.4	79.5	585,624.36	703,311.05	32° 36' 31.793 N	103° 48' 26.336 W
8,915.0	13.90	158.80	8,910.7	24.3	81.9	585,618.23	703,313.43	32° 36' 31.733 N	103° 48' 26.308 W
8,946.0	17.60	163.00	8,940.5	16.3	84.6	585,610.27	703,316.14	32° 36' 31.654 N	103° 48' 26.277 W
8,978.0	20.00	165.40	8,970.8	6.4	87.4	585,600.35	703,318.94	32° 36' 31.555 N	103° 48' 26.245 W
9,009.0	22.90	166.50	8,999.7	-4.6	90.1	585,589.35	703,321.68	32° 36' 31.446 N	103° 48' 26.213 W
9,040.0	25.50	168.40	9,028.0	-17.0	92.9	585,576.95	703,324.43	32° 36' 31.324 N	103° 48' 26.182 W
9,072.0	28.10	170.70	9,056.5	-31.2	95.5	585,562.76	703,327.04	32° 36' 31.183 N	103° 48' 26.152 W
9,104.0	31.00	173.90	9,084.4	-46.8	97.6	585,547.13	703,329.13	32° 36' 31.028 N	103° 48' 26.129 W
9,136.0	33.80	175.60	9,111.4	-63.9	99.1	585,530.05	703,330.69	32° 36' 30.859 N	103° 48' 26.111 W
9,167.0	36.30	174.80	9,136.7	-81.6	100.6	585,512.32	703,332.18	32° 36' 30.684 N	103° 48' 26.095 W
9,199.0	38.90	173.40	9,162.1	-101.0	102.6	585,492.90	703,334.20	32° 36' 30.491 N	103° 48' 26.073 W
9,230.0	42.30	171.80	9,185.6	-121.0	105.2	585,472.90	703,336.80	32° 36' 30.293 N	103° 48' 26.043 W
9,261.0	45.90	171.80	9,207.9	-142.4	108.3	585,451.55	703,339.88	32° 36' 30.082 N	103° 48' 26.009 W
9,293.0	48.80	172.10	9,229.6	-165.7	111.6	585,428.25	703,343.18	32° 36' 29.851 N	103° 48' 25.971 W
9,324.0	52.10	172.10	9,249.3	-189.4	114.9	585,404.57	703,346.46	32° 36' 29.617 N	103° 48' 25.934 W
9,356.0	55.00	171.60	9,268.3	-214.8	118.5	585,379.10	703,350.11	32° 36' 29.365 N	103° 48' 25.893 W
9,387.0	56.90	171.60	9,285.7	-240.2	122.3	585,353.69	703,353.86	32° 36' 29.113 N	103° 48' 25.851 W
9,418.0	60.00	171.60	9,301.9	-266.4	126.2	585,327.56	703,357.72	32° 36' 28.854 N	103° 48' 25.807 W
9,450.0	62.30	171.60	9,317.3	-294.1	130.3	585,299.83	703,361.82	32° 36' 28.580 N	103° 48' 25.761 W
9,481.0	65.20	172.70	9,331.0	-321.6	134.0	585,272.29	703,365.61	32° 36' 28.307 N	103° 48' 25.718 W
9,513.0	68.30	172.70	9,343.7	-350.8	137.8	585,243.13	703,369.34	32° 36' 28.018 N	103° 48' 25.676 W
9,545.0	71.20	172.50	9,354.7	-380.6	141.6	585,213.36	703,373.21	32° 36' 27.724 N	103° 48' 25.633 W
9,576.0	73.90	172.30	9,364.0	-409.9	145.6	585,184.05	703,377.12	32° 36' 27.433 N	103° 48' 25.589 W
9,607.0	76.30	172.30	9,372.0	-439.6	149.6	585,154.37	703,381.14	32° 36' 27.139 N	103° 48' 25.543 W
9,639.0	78.10	172.80	9,379.1	-470.5	153.6	585,123.43	703,385.18	32° 36' 26.833 N	103° 48' 25.498 W
9,671.0	79.80	173.90	9,385.2	-501.7	157.3	585,092.23	703,388.82	32° 36' 26.524 N	103° 48' 25.457 W
9,702.0	82.20	174.90	9,390.1	-532.2	160.2	585,061.76	703,391.80	32° 36' 26.223 N	103° 48' 25.424 W
9,735.0	83.70	174.40	9,394.1	-564.8	163.3	585,029.16	703,394.86	32° 36' 25.900 N	103° 48' 25.390 W
9,766.0	85.00	175.20	9,397.2	-595.5	166.1	584,998.44	703,397.65	32° 36' 25.596 N	103° 48' 25.359 W
9,798.0	86.50	176.10	9,399.6	-627.3	168.5	584,966.62	703,400.07	32° 36' 25.281 N	103° 48' 25.333 W
9,893.0	89.70	178.10	9,402.7	-722.1	173.3	584,871.81	703,404.88	32° 36' 24.342 N	103° 48' 25.282 W



TDS
Survey Report - Geographic



Company: COG Operating LLC
Project: Lea County, NM (NAD83)
Site: Nightcap 6 Federal
Well: #3H
Wellbore: OH
Design: OH

Local Co-ordinate Reference: Well #3H
TVD Reference: KB @ 3540.2usft
MD Reference: KB @ 3540.2usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Single User Db

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
9,987.0	88.40	178.00	9,404.3	-816.1	176.5	584,777.88	703,408.07	32° 36' 23.413 N	103° 48' 25.250 W
10,082.0	87.10	179.30	9,408.0	-911.0	178.7	584,682.98	703,410.31	32° 36' 22.474 N	103° 48' 25.230 W
10,177.0	89.00	180.20	9,411.2	-1,005.9	179.2	584,588.04	703,410.72	32° 36' 21.534 N	103° 48' 25.230 W
10,271.0	89.90	178.70	9,412.1	-1,099.9	180.1	584,494.05	703,411.63	32° 36' 20.604 N	103° 48' 25.225 W
10,366.0	91.50	178.00	9,411.0	-1,194.8	182.8	584,399.11	703,414.36	32° 36' 19.664 N	103° 48' 25.199 W
10,461.0	89.70	177.10	9,410.0	-1,289.7	186.9	584,304.20	703,418.42	32° 36' 18.725 N	103° 48' 25.157 W
10,556.0	88.40	178.90	9,411.5	-1,384.7	190.2	584,209.28	703,421.74	32° 36' 17.786 N	103° 48' 25.123 W
10,650.0	87.40	182.00	9,415.0	-1,478.6	189.4	584,115.36	703,421.00	32° 36' 16.856 N	103° 48' 25.138 W
10,745.0	89.10	184.20	9,417.9	-1,573.4	184.3	584,020.55	703,415.86	32° 36' 15.919 N	103° 48' 25.203 W
10,839.0	90.30	186.90	9,418.4	-1,666.9	175.2	583,927.00	703,406.77	32° 36' 14.993 N	103° 48' 25.315 W
10,933.0	90.70	185.80	9,417.6	-1,760.3	164.8	583,833.58	703,396.38	32° 36' 14.069 N	103° 48' 25.442 W
11,028.0	90.90	184.30	9,416.2	-1,855.0	156.5	583,738.97	703,388.02	32° 36' 13.134 N	103° 48' 25.545 W
11,123.0	91.90	183.10	9,413.9	-1,949.7	150.3	583,644.19	703,381.89	32° 36' 12.196 N	103° 48' 25.622 W
11,217.0	90.60	181.60	9,411.9	-2,043.6	146.5	583,550.30	703,378.04	32° 36' 11.267 N	103° 48' 25.673 W
11,311.0	88.60	182.00	9,412.5	-2,137.6	143.5	583,456.35	703,375.08	32° 36' 10.338 N	103° 48' 25.712 W
11,405.0	89.20	181.00	9,414.3	-2,231.5	141.1	583,362.41	703,372.62	32° 36' 9.408 N	103° 48' 25.747 W
11,500.0	89.80	181.50	9,415.2	-2,326.5	139.0	583,267.43	703,370.55	32° 36' 8.469 N	103° 48' 25.776 W
11,594.0	91.20	180.40	9,414.3	-2,420.5	137.4	583,173.45	703,368.99	32° 36' 7.539 N	103° 48' 25.800 W
11,688.0	91.80	180.40	9,411.9	-2,514.4	136.8	583,079.49	703,368.34	32° 36' 6.609 N	103° 48' 25.813 W
11,783.0	88.20	179.60	9,411.9	-2,609.4	136.8	582,984.50	703,368.34	32° 36' 5.669 N	103° 48' 25.819 W
11,877.0	87.10	180.90	9,415.7	-2,703.3	136.4	582,890.59	703,367.93	32° 36' 4.740 N	103° 48' 25.829 W
11,972.0	87.20	182.60	9,420.5	-2,798.2	133.5	582,795.75	703,365.03	32° 36' 3.802 N	103° 48' 25.868 W
12,066.0	88.30	182.80	9,424.1	-2,892.0	129.0	582,701.93	703,360.61	32° 36' 2.873 N	103° 48' 25.925 W
12,160.0	91.60	182.20	9,424.2	-2,985.9	124.9	582,608.03	703,356.51	32° 36' 1.944 N	103° 48' 25.979 W
12,254.0	91.20	181.40	9,421.9	-3,079.8	122.0	582,514.11	703,353.55	32° 36' 1.015 N	103° 48' 26.019 W
12,349.0	91.40	181.70	9,419.8	-3,174.8	119.4	582,419.17	703,350.98	32° 36' 0.076 N	103° 48' 26.054 W
12,443.0	89.70	183.00	9,418.9	-3,268.7	115.6	582,325.26	703,347.13	32° 35' 59.147 N	103° 48' 26.105 W
12,538.0	90.60	182.60	9,418.6	-3,363.6	110.9	582,230.37	703,342.49	32° 35' 58.208 N	103° 48' 26.164 W
12,632.0	91.60	182.00	9,416.8	-3,457.5	107.2	582,136.47	703,338.72	32° 35' 57.279 N	103° 48' 26.214 W
12,726.0	89.70	181.70	9,415.8	-3,551.4	104.1	582,042.53	703,335.68	32° 35' 56.350 N	103° 48' 26.255 W
12,821.0	90.50	181.40	9,415.6	-3,646.4	101.5	581,947.56	703,333.11	32° 35' 55.410 N	103° 48' 26.290 W
12,915.0	89.30	181.40	9,415.8	-3,740.3	99.3	581,853.59	703,330.82	32° 35' 54.480 N	103° 48' 26.323 W
13,010.0	91.40	181.40	9,415.2	-3,835.3	96.9	581,758.63	703,328.50	32° 35' 53.541 N	103° 48' 26.355 W
13,104.0	87.90	179.80	9,415.7	-3,929.3	95.9	581,664.65	703,327.51	32° 35' 52.611 N	103° 48' 26.372 W
13,199.0	88.20	179.00	9,419.0	-4,024.2	96.9	581,569.71	703,328.51	32° 35' 51.672 N	103° 48' 26.366 W
13,293.0	90.30	178.20	9,420.2	-4,118.2	99.2	581,475.76	703,330.80	32° 35' 50.742 N	103° 48' 26.345 W
13,388.0	89.50	179.60	9,420.4	-4,213.2	101.1	581,380.78	703,332.63	32° 35' 49.802 N	103° 48' 26.329 W
13,482.0	89.50	179.50	9,421.2	-4,307.2	101.8	581,286.78	703,333.37	32° 35' 48.872 N	103° 48' 26.326 W
13,576.0	87.80	181.20	9,423.4	-4,401.1	101.2	581,192.82	703,332.79	32° 35' 47.942 N	103° 48' 26.338 W
13,670.0	88.30	181.60	9,426.6	-4,495.0	98.9	581,098.90	703,330.50	32° 35' 47.013 N	103° 48' 26.370 W
13,765.0	89.10	181.00	9,428.8	-4,590.0	96.8	581,003.95	703,328.34	32° 35' 46.073 N	103° 48' 26.401 W
13,859.0	90.90	180.40	9,428.8	-4,684.0	95.6	580,909.96	703,327.19	32° 35' 45.143 N	103° 48' 26.420 W
13,954.0	88.00	179.20	9,429.7	-4,779.0	96.0	580,814.98	703,327.52	32° 35' 44.204 N	103° 48' 26.421 W
14,049.0	87.70	181.20	9,433.2	-4,873.9	95.6	580,720.05	703,327.19	32° 35' 43.264 N	103° 48' 26.430 W
14,144.0	88.00	180.90	9,436.8	-4,968.8	93.9	580,625.13	703,325.45	32° 35' 42.325 N	103° 48' 26.456 W
14,238.0	87.40	180.10	9,440.6	-5,062.7	93.1	580,531.21	703,324.63	32° 35' 41.396 N	103° 48' 26.471 W
14,333.0	89.40	180.90	9,443.2	-5,157.7	92.2	580,436.26	703,323.81	32° 35' 40.456 N	103° 48' 26.487 W
14,428.0	90.00	180.50	9,443.7	-5,252.7	91.1	580,341.27	703,322.64	32° 35' 39.516 N	103° 48' 26.506 W
14,522.0	90.30	179.90	9,443.5	-5,346.7	90.8	580,247.27	703,322.32	32° 35' 38.586 N	103° 48' 26.515 W
14,617.0	90.00	179.10	9,443.2	-5,441.7	91.6	580,152.28	703,323.15	32° 35' 37.646 N	103° 48' 26.511 W
14,712.0	90.40	178.70	9,442.9	-5,536.6	93.4	580,057.29	703,324.97	32° 35' 36.706 N	103° 48' 26.495 W
14,807.0	90.70	180.60	9,442.0	-5,631.6	94.0	579,962.30	703,325.55	32° 35' 35.766 N	103° 48' 26.494 W
14,902.0	91.10	182.10	9,440.5	-5,726.6	91.7	579,867.35	703,323.31	32° 35' 34.827 N	103° 48' 26.525 W
14,997.0	91.50	181.70	9,438.3	-5,821.5	88.6	579,772.42	703,320.16	32° 35' 33.888 N	103° 48' 26.567 W
15,091.0	90.80	182.50	9,436.5	-5,915.4	85.2	579,678.51	703,316.72	32° 35' 32.959 N	103° 48' 26.613 W

Company: COG Operating LLC	Local Co-ordinate Reference: Well #3H
Project: Lea County, NM (NAD83)	TVD Reference: KB @ 3540.2usft
Site: Nightcap 6 Federal	MD Reference: KB @ 3540.2usft
Well: #3H	North Reference: Grid
Wellbore: OH	Survey Calculation Method: Minimum Curvature
Design: OH	Database: EDM 5000.1 Single User Db

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
15,186.0	90.40	183.60	9,435.5	-6,010.3	80.1	579,583.65	703,311.66	32° 35' 32.020 N	103° 48' 26.678 W
15,281.0	91.30	183.80	9,434.0	-6,105.1	74.0	579,488.86	703,305.53	32° 35' 31.083 N	103° 48' 26.755 W
15,376.0	89.10	184.50	9,433.7	-6,199.8	67.1	579,394.11	703,298.66	32° 35' 30.145 N	103° 48' 26.841 W
15,471.0	89.20	185.10	9,435.1	-6,294.5	59.1	579,299.46	703,290.71	32° 35' 29.209 N	103° 48' 26.939 W
15,566.0	89.10	182.80	9,436.5	-6,389.2	52.6	579,204.70	703,284.17	32° 35' 28.272 N	103° 48' 27.021 W
15,662.0	89.70	182.80	9,437.5	-6,485.1	47.9	579,108.82	703,279.48	32° 35' 27.323 N	103° 48' 27.081 W
15,757.0	88.50	182.10	9,439.0	-6,580.0	43.9	579,013.92	703,275.42	32° 35' 26.384 N	103° 48' 27.134 W
15,853.0	88.50	182.70	9,441.5	-6,675.9	39.8	578,918.04	703,271.40	32° 35' 25.436 N	103° 48' 27.187 W
15,947.0	88.00	182.70	9,444.4	-6,769.7	35.4	578,824.19	703,266.97	32° 35' 24.507 N	103° 48' 27.244 W
16,042.0	87.80	180.60	9,447.9	-6,864.6	32.7	578,729.30	703,264.24	32° 35' 23.569 N	103° 48' 27.281 W
16,138.0	90.50	179.50	9,449.3	-6,960.6	32.6	578,633.32	703,264.16	32° 35' 22.619 N	103° 48' 27.288 W
16,233.0	90.10	179.10	9,448.8	-7,055.6	33.8	578,538.33	703,265.32	32° 35' 21.679 N	103° 48' 27.280 W
16,328.0	89.90	178.80	9,448.8	-7,150.6	35.5	578,443.34	703,267.06	32° 35' 20.739 N	103° 48' 27.265 W
16,424.0	90.40	178.50	9,448.6	-7,246.6	37.8	578,347.37	703,269.32	32° 35' 19.789 N	103° 48' 27.244 W
16,519.0	90.80	178.00	9,447.6	-7,341.5	40.7	578,252.42	703,272.22	32° 35' 18.850 N	103° 48' 27.216 W
16,614.0	88.90	179.50	9,447.8	-7,436.5	42.7	578,157.45	703,274.29	32° 35' 17.910 N	103° 48' 27.197 W
16,709.0	89.10	179.10	9,449.5	-7,531.5	43.9	578,062.47	703,275.45	32° 35' 16.970 N	103° 48' 27.189 W
16,804.0	88.10	181.10	9,451.8	-7,626.4	43.7	577,967.51	703,275.29	32° 35' 16.030 N	103° 48' 27.196 W
16,899.0	88.90	180.70	9,454.3	-7,721.4	42.2	577,872.55	703,273.80	32° 35' 15.091 N	103° 48' 27.219 W
16,994.0	89.50	180.40	9,455.6	-7,816.4	41.3	577,777.56	703,272.89	32° 35' 14.151 N	103° 48' 27.235 W
17,089.0	90.00	179.90	9,456.0	-7,911.4	41.1	577,682.57	703,272.64	32° 35' 13.211 N	103° 48' 27.244 W
17,184.0	89.90	179.50	9,456.1	-8,006.4	41.6	577,587.57	703,273.13	32° 35' 12.271 N	103° 48' 27.243 W
17,286.0	89.70	180.30	9,456.5	-8,108.4	41.7	577,485.57	703,273.31	32° 35' 11.261 N	103° 48' 27.247 W
17,381.0	89.80	179.90	9,456.9	-8,203.4	41.6	577,390.57	703,273.15	32° 35' 10.321 N	103° 48' 27.255 W
17,476.0	90.10	179.20	9,457.0	-8,298.4	42.3	577,295.57	703,273.89	32° 35' 9.381 N	103° 48' 27.251 W
17,571.0	89.50	178.60	9,457.3	-8,393.3	44.2	577,200.59	703,275.72	32° 35' 8.441 N	103° 48' 27.236 W
17,667.0	88.60	179.90	9,458.9	-8,489.3	45.4	577,104.62	703,276.97	32° 35' 7.492 N	103° 48' 27.226 W
17,762.0	89.80	181.60	9,460.2	-8,584.3	44.2	577,009.64	703,275.73	32° 35' 6.552 N	103° 48' 27.246 W
17,857.0	90.00	181.00	9,460.4	-8,679.3	42.0	576,914.67	703,273.57	32° 35' 5.612 N	103° 48' 27.277 W
17,953.0	89.80	182.70	9,460.6	-8,775.2	38.9	576,818.72	703,270.47	32° 35' 4.663 N	103° 48' 27.319 W
18,048.0	89.60	182.40	9,461.1	-8,870.1	34.7	576,723.81	703,266.25	32° 35' 3.724 N	103° 48' 27.374 W
18,143.0	90.80	182.20	9,460.7	-8,965.0	30.9	576,628.89	703,262.44	32° 35' 2.785 N	103° 48' 27.424 W
18,238.0	91.80	181.40	9,458.6	-9,060.0	27.9	576,533.97	703,259.45	32° 35' 1.846 N	103° 48' 27.464 W
18,334.0	90.70	181.30	9,456.5	-9,155.9	25.6	576,438.02	703,257.19	32° 35' 0.897 N	103° 48' 27.496 W
18,429.0	90.30	181.20	9,455.6	-9,250.9	23.6	576,343.04	703,255.12	32° 34' 59.957 N	103° 48' 27.526 W
18,524.0	88.60	180.50	9,456.6	-9,345.9	22.1	576,248.06	703,253.71	32° 34' 59.017 N	103° 48' 27.548 W
18,619.0	90.60	181.10	9,457.2	-9,440.9	20.8	576,153.08	703,252.38	32° 34' 58.077 N	103° 48' 27.569 W
18,714.0	89.30	179.90	9,457.3	-9,535.8	20.0	576,058.09	703,251.55	32° 34' 57.137 N	103° 48' 27.584 W
18,810.0	89.70	180.80	9,458.1	-9,631.8	19.4	575,962.09	703,250.97	32° 34' 56.188 N	103° 48' 27.596 W
18,905.0	88.50	180.90	9,459.6	-9,726.8	18.0	575,867.12	703,249.56	32° 34' 55.248 N	103° 48' 27.618 W
19,002.0	87.20	180.50	9,463.3	-9,823.7	16.8	575,770.20	703,248.37	32° 34' 54.289 N	103° 48' 27.638 W
Final MWD Survey									
19,060.0	87.20	180.50	9,466.1	-9,881.7	16.3	575,712.27	703,247.87	32° 34' 53.716 N	103° 48' 27.647 W
Projection to Bit									

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
19,002.0	9,463.3	-9,823.7	16.8	Final MWD Survey
19,060.0	9,466.1	-9,881.7	16.3	Projection to Bit

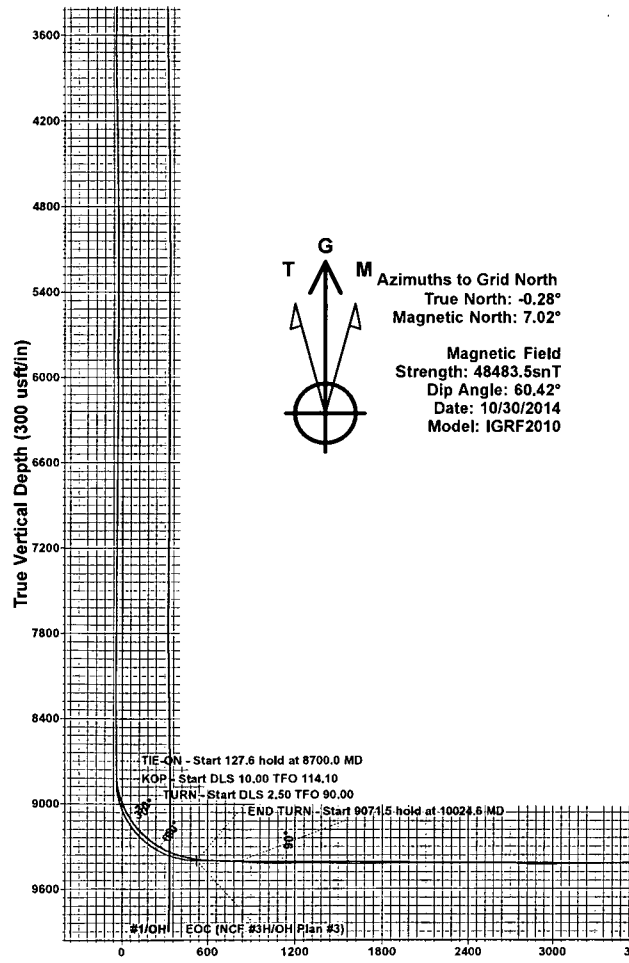


COG Operating LLC
Project: Lea County, NM (NAD83)
Site: Nightcap 6 Federal
Well: #3H
Wellbore: OH
Plan: Plan #3

WELL DETAILS: #3H

Ground Elevation:: 3514.2
RKB Elevation: KB @ 3540.2usft
Rig Name:

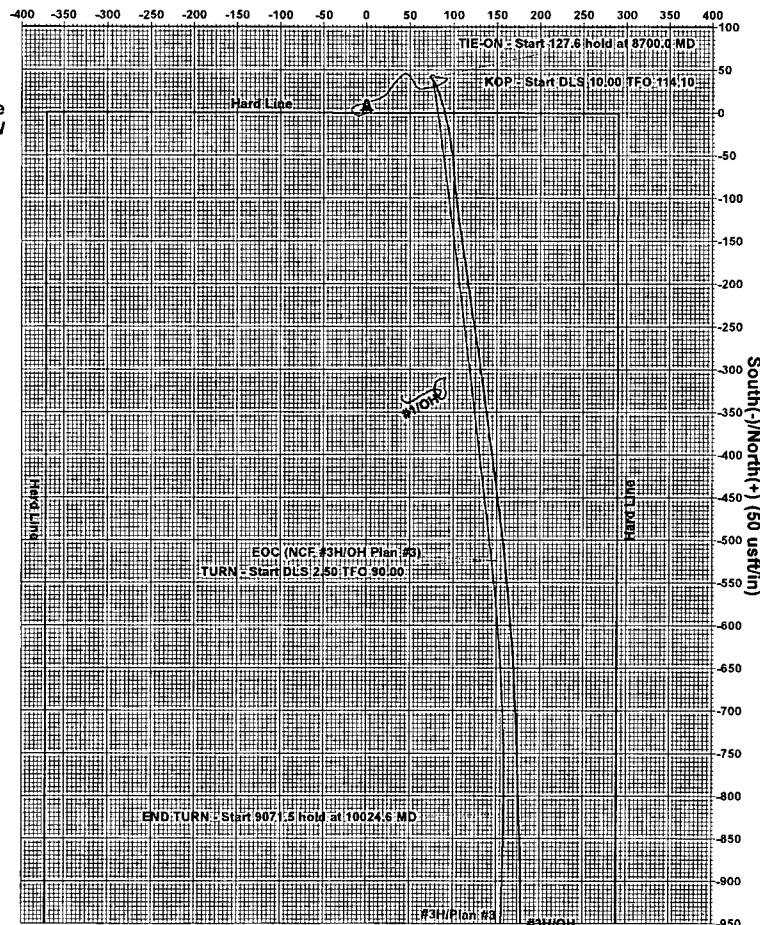
Northing 585593.93 Easting 703231.57 Latitude 32° 36' 31.496 N Longitude 103° 48' 27.267 W



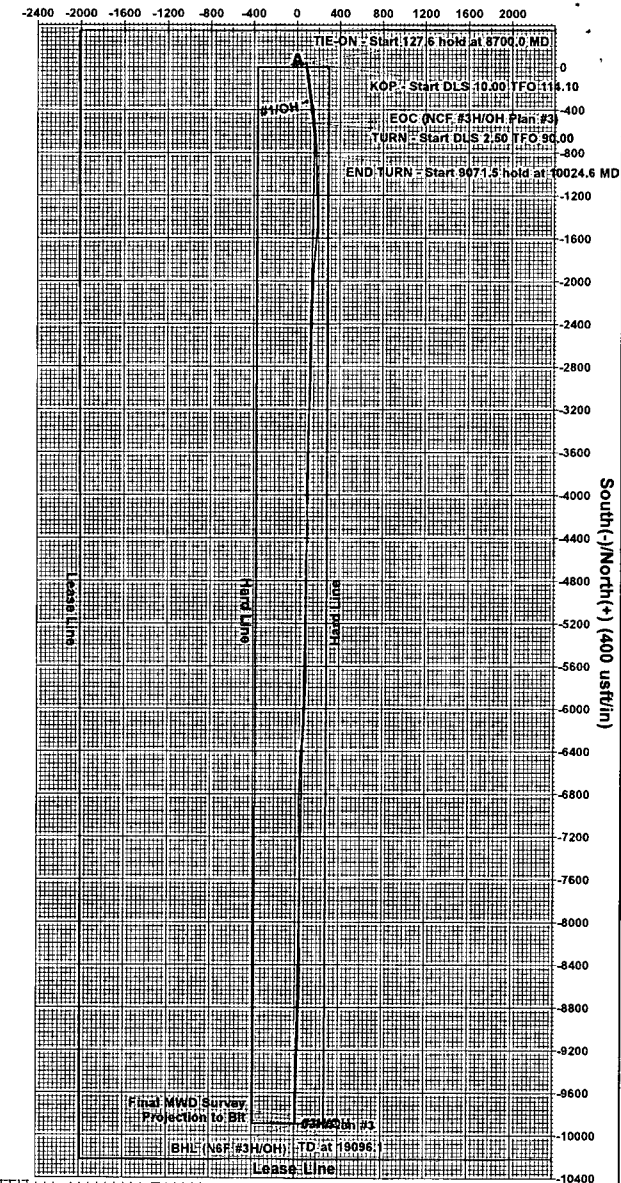
Section Details

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	Vsect	Target
1	8700.0	0.59	59.43	8697.0	40.4	73.6	0.00	0.00	-40.4	
2	8827.6	0.59	59.43	8824.6	41.1	74.7	0.00	0.00	-41.1	
3	9726.3	89.63	173.53	9400.0	-523.9	144.2	10.00	114.10	524.0	
4	10024.6	89.63	180.99	9401.9	-821.7	158.5	2.50	90.00	821.8	
5	19096.1	89.63	180.99	9460.0	-9891.6	1.9	0.00	0.00	9891.6	BHL (N6F #3H/OH)

West(-)/East(+) (50 usft/in)



West(-)/East(+) (400 usft/in)



Vertical Section at 179.99° (300 usft/in)



Terra Directional Services LLC
322 Spring Hill Drive, Suite A300, Spring, Tx 77386
Phone: 432-425-7532

PROJECT DETAILS: Lea County, NM (NAD83)
Geodetic System: US State Plane 1983
Datum: North American Datum 1983
Ellipsoid: GRS 1980
Zone: New Mexico Eastern Zone
System Datum: Mean Sea Level
Local North: Grid