

Results of Directional Survey

API number:	30-025-41291		
OGRID:		Operator:	COG OPERATING LLC
		Property:	LUSK DEEP UNIT A # 28H

surface	ULSTR:	M	18	T 19S	R 32E
				430 FSL	300 FWL

BH Loc	ULSTR:	P	18	T 19S	R 32E
13510	MD	9246.9	TVD	382 FSL	338 FEL
					4942 FWL

Top Perf/OH	ULSTR:	M	18	T 19S	R 32E
9407	MD	9238.8	TVD	512 FSL	845 FWL

Bot Perf/OH	ULSTR:	P	18	T 19S	R 32E
13410	MD	9249.5	TVD	393 FSL	437 FEL
					4843 FWL

	MD	N/S	E/W	VD
	9403	82.25	541.55	9237.97
TOP PERFS/OH	9407	82.45	545.46	9238.81
	9435	83.81	572.81	9244.65
	13328	-28.26	4461.03	9251.74
BOT PERFS/OH	13410	-36.98	4542.53	9249.54
	13510	-47.62	4641.93	9246.85

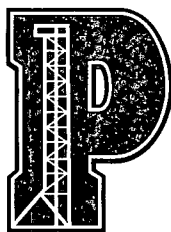
NEXT TO LAST	13328	-28.26	4461.03	9251.74
LAST READING	13510	-47.62	4641.93	9246.85
TD	13510	-47.62	4641.93	9246.85

Surface Location	430	FS	300	FW
Projected BHL	382	FS	4942	FW
Location of				
Top Perfs/OH	512	FS	845	FW
Bottom Perfs/OH	393	FS	4843	FW

SUMMARY of Subsurface Locations

Surface Location	M-18-19S-32E	430	FS	300	FW	Vert. Depth
Top Perfs/OH	M-18-19S-32E	512	FS	845	FW	9238.81
Bottom Perfs/OH	P-18-19S-32E	393	FS	4843	FW	9249.54
Projected TD	P-18-19S-32E	382	FS	4942	FW	9246.85

APR 07 2014



PATRIOT DRILLING, LLC

OPERATOR: COG Operating, LLC
WELL/LEASE: Lusk Deep Unit A Fed # 28
COUNTY: Lea Co., New Mexico
Sec. 18, T19S, R32E

HOBBS OCD

JAN 22 2014

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**STATE OF NEW MEXICO
DEVIATION REPORT**

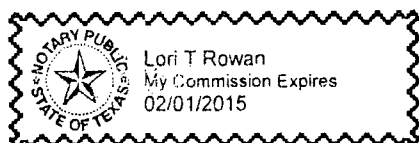
<u>Depth</u>	<u>Deviation</u>	<u>Depth</u>	<u>Deviation</u>
350	1/4	5,219	1/2
781	1/4	5,501	1 1/2
1,281	1 3/4	8,570	1 1/4
1,813	2 1/2	6,101	1 1/4
2,070	1 3/4	6,408	1
2,259	3	6,693	2 1/4
3,481	3 1/2	6,860	1 1/4
3,643	1 1/2	7,177	1/2
3,738	1 3/4	7,421	2 1/4
3,927	2 1/4	7,738	2 1/2
4,021	1 1/4	8,190	2
4,555	1 1/2	8,475	1/2
4,924	1/4	8,706	1 1/2
4,219	1/2	8,738	2 1/4

Patriot Drilling, LLC

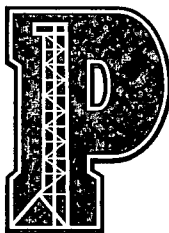
M. Leroy Peterson, Executive Vice-
President

The foregoing instrument was acknowledged before me on this 11th day of
November, 2013 by M. Leroy Peterson, Executive Vice-President of Patriot Drilling,

My Commission Expires: 02/01/2015



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



PATRIOT DRILLING, LLC

OPERATOR: COG Operating, LLC
WELL/LEASE: Lusk Deep Unit A Fed # 28
COUNTY: Lea Co., New Mexico
Sec. 18, T19S, R32E

**STATE OF NEW MEXICO
DEVIATION REPORT**

HOBBS OCD

JAN 22 2014

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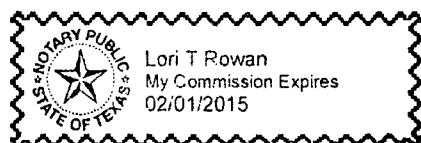
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Patriot Drilling, LLC

M. Leroy Peterson, Executive Vice-
President

The foregoing instrument was acknowledged before me on this 11th day of
November, 2013 by M. Leroy Peterson, Executive Vice-President of Patriot Drilling,

My Commission Expires: 02/01/2015



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



P.O. Box 261021
Corpus Christi, Texas 78426
(361) 767-0602 • (800) 606-GYRO • Fax (361) 767-0612

November 14, 2013

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

HOBBS OCD

JAN 22 2014

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Attn: Kanicia Castillo

RE: Lusk Deep Unit A No. 028H

Please find enclosed a copy of the survey from 0.00' to 8638.00' ran on the
above referenced well.

Sincerely,

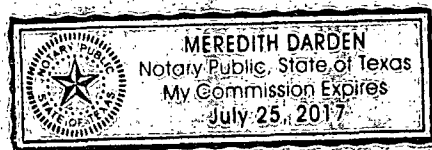

Keith Havelka
Operations

STATE OF TEXAS

COUNTY OF NUECES

§
§
§
§
§

This instrument was acknowledged before me on the 14th day of November
A.D., 2013, by Keith Havelka.




Meredith Darden
Notary Public, State of Texas

Company: COG Operating, LLC (Concho)

Lease/Well: Lusk Deep Unit A/No. 028H



Rig Name: Patriot 6

State/County: New Mexico/Lea

Latitude: 32.65, Longitude: -103.81

GRID North is 0.28 Degrees East of True North

VS-Azi: 0.00 Degrees



Depth Reference : RKB: 17'

DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: gyro survey.ut

Minimum Curvature Method

Report Date/Time: 11/14/2013 / 09:26

Vaughn Energy Services

Midland, Texas

432-563-5444

Surveyor: Tim Dillon

Lusk Deep Unit A No. 028H / API 30-025-41291

HOBBS OCD

JAN 22 2014

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Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W 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	****
100.00	0.15	351.31	100.00	0.13	-0.02	0.13	351.31	0.15
200.00	0.19	348.62	200.00	0.43	-0.07	0.43	350.28	0.04
300.00	0.30	311.38	300.00	0.76	-0.30	0.82	338.38	0.19
400.00	0.41	274.14	400.00	0.96	-0.86	1.29	318.32	0.25
500.00	0.25	288.99	500.00	1.06	-1.42	1.77	306.74	0.18
600.00	0.08	303.83	599.99	1.17	-1.68	2.05	304.80	0.17
700.00	0.21	292.51	699.99	1.28	-1.91	2.30	303.80	0.13
800.00	0.34	281.20	799.99	1.41	-2.37	2.75	300.71	0.14
900.00	0.61	48.45	899.99	1.81	-2.26	2.89	308.78	0.85
1000.00	0.88	95.70	999.98	2.09	-1.10	2.36	332.27	0.64
1100.00	1.24	113.19	1099.97	1.59	0.66	1.72	22.60	0.48
1200.00	1.61	130.67	1199.94	0.25	2.72	2.73	84.83	0.56
1300.00	1.60	128.47	1299.90	-1.54	4.88	5.11	107.49	0.06
1400.00	1.62	126.27	1399.86	-3.24	7.11	7.81	114.52	0.06
1500.00	1.77	113.09	1499.81	-4.69	9.67	10.75	115.85	0.42
1600.00	1.93	99.91	1599.76	-5.58	12.75	13.92	113.64	0.45
1700.00	2.27	95.78	1699.70	-6.07	16.38	17.47	110.34	0.38
1800.00	2.62	91.64	1799.60	-6.34	20.64	21.59	107.06	0.39

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
1900.00	2.46	84.90	1899.51	-6.21	25.07	25.82	103.91	0.34
2000.00	2.29	78.15	1999.42	-5.61	29.16	29.69	100.89	0.33
2100.00	2.65	74.62	2099.33	-4.58	33.35	33.66	97.83	0.39
2200.00	3.01	71.10	2199.20	-3.12	38.06	38.19	94.69	0.40
2300.00	3.52	74.95	2299.04	-1.48	43.50	43.53	91.94	0.55
2400.00	4.02	78.80	2398.83	0.00	49.90	49.90	90.00	0.57
2500.00	4.36	81.16	2498.56	1.27	57.10	57.11	88.73	0.38
2600.00	4.69	83.53	2598.25	2.31	64.91	64.95	87.96	0.38
2700.00	4.67	90.15	2697.91	2.76	73.05	73.10	87.83	0.54
2800.00	4.66	96.77	2797.58	2.27	81.16	81.19	88.40	0.54
2900.00	4.95	88.32	2897.23	1.92	89.51	89.53	88.77	0.77
3000.00	5.25	79.88	2996.84	2.85	98.33	98.37	88.34	0.81
3100.00	4.64	81.80	3096.47	4.23	106.83	106.91	87.73	0.63
3200.00	1.94	91.69	3196.29	4.76	112.53	112.63	87.58	2.74
3300.00	0.97	98.18	3296.26	4.59	115.06	115.15	87.72	0.99
3400.00	1.22	85.58	3396.24	4.55	116.96	117.05	87.77	0.35
3500.00	0.64	71.94	3496.23	4.81	118.55	118.65	87.68	0.62
3600.00	0.81	37.80	3596.22	5.54	119.51	119.64	87.35	0.46
3700.00	1.12	47.21	3696.21	6.76	120.66	120.85	86.79	0.34
3800.00	2.09	51.73	3796.16	8.55	122.81	123.10	86.02	0.98
3900.00	2.12	33.44	3896.10	11.22	125.25	125.75	84.88	0.67
4000.00	1.94	31.60	3996.04	14.20	127.16	127.95	83.63	0.19
4100.00	1.39	27.35	4095.99	16.72	128.61	129.69	82.59	0.56
4200.00	1.17	45.70	4195.97	18.51	129.89	131.20	81.89	0.46
4300.00	1.24	46.13	4295.95	19.97	131.40	132.91	81.36	0.07
4400.00	1.62	35.74	4395.92	21.86	133.00	134.78	80.67	0.46
4500.00	1.63	30.40	4495.88	24.23	134.54	136.71	79.79	0.15
4600.00	1.31	21.09	4595.84	26.53	135.67	138.24	78.94	0.40
4700.00	1.23	3.02	4695.82	28.66	136.14	139.13	78.11	0.41
4800.00	0.39	339.38	4795.81	30.06	136.08	139.36	77.54	0.89
4900.00	0.26	233.83	4895.81	30.24	135.77	139.10	77.44	0.53
5000.00	0.28	261.15	4995.81	30.07	135.34	138.64	77.47	0.13
5100.00	0.26	194.75	5095.80	29.81	135.04	138.29	77.55	0.30
5200.00	0.31	208.48	5195.80	29.35	134.85	138.01	77.72	0.09
5300.00	0.78	127.19	5295.80	28.70	135.26	138.27	78.02	0.80
5400.00	1.00	118.75	5395.79	27.86	136.57	139.39	78.47	0.25
5500.00	0.99	69.47	5495.77	27.75	138.15	140.91	78.64	0.83
5600.00	1.12	63.69	5595.76	28.49	139.84	142.72	78.49	0.17
5700.00	1.21	56.54	5695.74	29.50	141.60	144.64	78.23	0.17

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
5800.00	1.39	70.05	5795.71	30.50	143.62	146.83	78.01	0.36
5900.00	1.36	68.94	5895.68	31.34	145.87	149.20	77.88	0.05
6000.00	1.11	72.32	5995.66	32.06	147.89	151.33	77.77	0.26
6100.00	0.93	45.61	6095.64	32.92	149.39	152.98	77.57	0.50
6200.00	0.83	41.18	6195.63	34.03	150.45	154.25	77.26	0.12
6300.00	1.35	49.74	6295.61	35.33	151.82	155.88	76.90	0.54
6400.00	0.82	27.31	6395.60	36.72	153.05	157.39	76.51	0.67
6500.00	0.67	36.93	6495.59	37.83	153.73	158.31	76.18	0.19
6600.00	1.12	60.53	6595.58	38.78	154.93	159.71	75.95	0.57
6700.00	1.34	19.97	6695.55	40.35	156.18	161.31	75.51	0.88
6800.00	1.24	55.86	6795.53	42.06	157.47	162.99	75.05	0.80
6900.00	1.36	58.89	6895.50	43.28	159.38	165.15	74.81	0.14
7000.00	1.19	55.90	6995.48	44.47	161.25	167.27	74.58	0.18
7100.00	1.26	74.05	7095.46	45.36	163.18	169.36	74.47	0.39
7200.00	0.41	65.27	7195.45	45.81	164.56	170.82	74.44	0.86
7300.00	1.90	130.50	7295.43	44.88	166.15	172.11	74.88	1.77
7400.00	2.26	164.52	7395.36	41.90	167.94	173.09	75.99	1.26
7500.00	1.80	144.26	7495.30	38.73	169.38	173.76	77.12	0.85
7600.00	2.18	101.72	7595.25	37.07	172.16	176.11	77.85	1.48
7700.00	1.57	75.95	7695.19	37.02	175.35	179.21	78.08	1.03
7800.00	2.55	66.37	7795.13	38.24	178.71	182.76	77.92	1.04
7900.00	3.16	63.73	7895.00	40.35	183.23	187.62	77.58	0.62
8000.00	3.16	75.52	7994.85	42.26	188.37	193.05	77.35	0.65
8100.00	1.64	80.70	8094.76	43.18	192.45	197.23	77.35	1.54
8200.00	1.69	92.02	8194.72	43.36	195.33	200.08	77.48	0.33
8300.00	0.99	97.31	8294.69	43.20	197.66	202.33	77.67	0.71
8400.00	0.67	112.01	8394.68	42.87	199.07	203.63	77.85	0.39
8500.00	0.20	144.69	8494.68	42.51	199.71	204.18	77.98	0.51
8600.00	0.48	134.02	8594.68	42.08	200.11	204.48	78.12	0.29
8638.00	1.09	162.36	8632.67	41.62	200.33	204.61	78.26	1.86



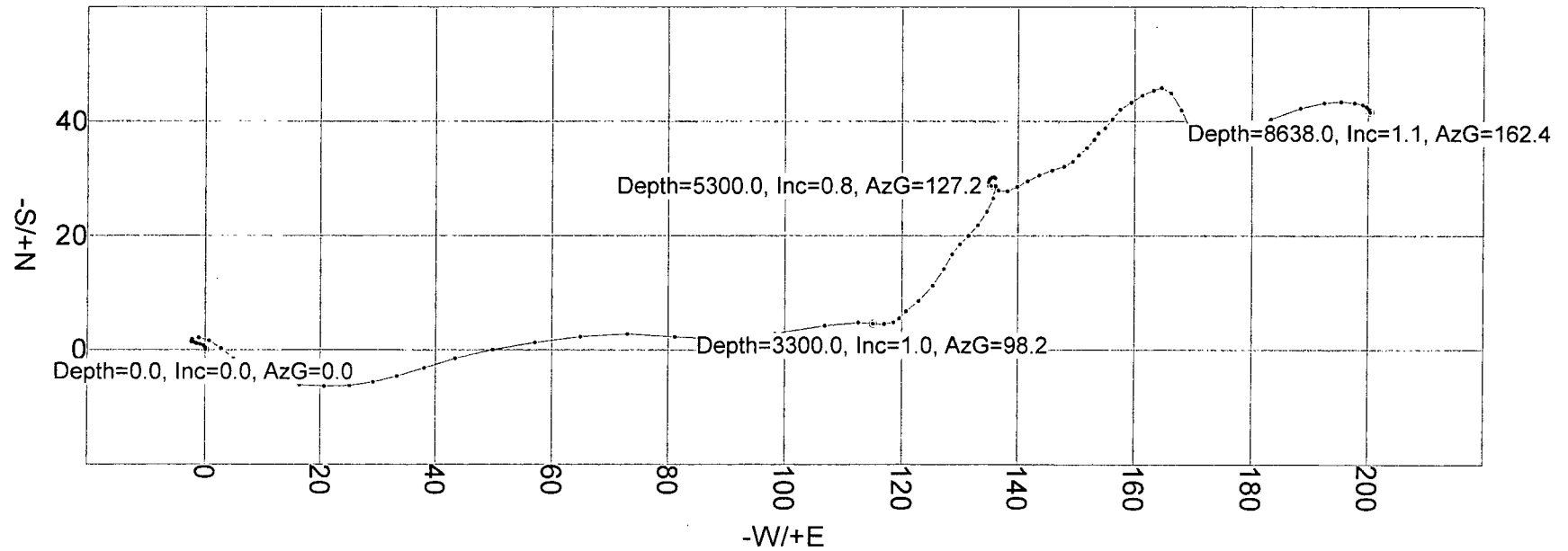
Vaughn Energy Services
Midland, Texas
432-563-5444
Surveyor: Tim Dillon
Lusk Deep Unit A No. 028H / API 30-025-41291



HOBBS OCD

JAN 22 2014

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VES Survey Date: 11/03/2013



COG Lusk Deep A Unit 28H Gyro+MWD from 0ft to 13510ft MD Survey
Geodetic Report
(Non-Def Survey)



Report Date: November 18, 2013 - 10:24 AM
Client: COG Operating, LLC
Field: NM Lea County (NAD 27)
Structure / Slot: COG Lusk Deep A Unit 28H / COG Lusk Deep A Unit 28H
Well: COG Lusk Deep A Unit 28H
Borehole: Original Borehole
UWI / API#: Unknown / 30-025-41291
Survey Name: COG Lusk Deep A Unit 28H Gyro+MWD from 0ft to 13510ft MD
Survey Date: November 04, 2013
Tort / AHD / DCM / ERD Ratio: 190.292' / 1.6091' / 199 ft / 6.114 / 0.506
Coordinate Reference System: NAD27 New Mexico State Plane, Eastern Zone, US Feet
Location Lat / Long: N 32° 39' 15.55689", W 103° 48' 45.57369"
Location Grid N/E Y/X: N 602146 200 RUS, E 660250 400 RUS
CRS Grid Convergence Angle: 0.2809°
Grid Scale Factor: 0.9999365

Survey / DLS Computation: Minimum Curvature / Lubinski
Vertical Section Azimuth: 90.529° (Grid North)
Vertical Section Origin: 0 000 ft, 0 000 ft
TVD Reference Datum: RKB
TVD Reference Elevation: 3597.000 ft above
Seabed / Ground Elevation: 3579.000 ft above
Magnetic Declination: 7.548°
Total Gravity Field Strength: 998.5058mg (9.80665 Based)
Total Magnetic Field Strength: 48561.622 nT
Magnetic Dip Angle: 80.441°
Declination Date: November 04, 2013
Magnetic Declination Model: BGGM 2012
North Reference: Grid North
Grid Convergence Used: 0.2809°
Total Corr Mag North->Grid North: 7.2671°
Local Coord Referenced To: Structure Reference Point

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	TVDSS (ft)	VSEC (ft)	NS (ft)	EW (ft)	Closure (ft)	Closure Azimuth (°)	DLS (ft/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")	TF (°)
SHL	0.00	0.00	0.00	0.00	-3597.00	0.00	0.00	0.00	0.00	0.00	N/A	602146.20	660250.40	N 32 39 15.56	W 103 48 45.57	351.31M
	100.00	0.15	351.31	100.00	-3497.00	-0.02	0.13	-0.02	0.13	351.31	0.15	602146.33	660250.38	N 32 39 15.56	W 103 48 45.57	348.62M
	200.00	0.19	348.62	200.00	-3397.00	-0.08	0.42	-0.07	0.43	350.27	0.04	602146.62	660250.33	N 32 39 15.56	W 103 48 45.57	311.38M
	300.00	0.30	311.38	300.00	-3297.00	-0.31	0.78	-0.30	0.81	338.29	0.19	602146.96	660250.10	N 32 39 15.56	W 103 48 45.58	274.14M
	400.00	0.41	274.14	400.00	-3197.00	-0.86	0.96	-0.85	1.28	318.20	0.25	602147.16	660249.95	N 32 39 15.57	W 103 48 45.58	288.99M
	500.00	0.25	288.99	500.00	-3097.00	-1.43	1.05	-1.42	1.77	306.59	0.18	602147.25	660248.98	N 32 39 15.57	W 103 48 45.59	303.83M
	600.00	0.08	303.83	599.99	-2997.01	-1.69	1.16	-1.68	2.04	304.65	0.17	602147.36	660248.72	N 32 39 15.57	W 103 48 45.59	292.51M
	700.00	0.21	292.51	699.99	-2897.01	-1.92	1.27	-1.91	2.29	303.66	0.13	602147.47	660248.49	N 32 39 15.57	W 103 48 45.60	281.2M
	800.00	0.34	281.20	799.99	-2797.01	-2.38	1.40	-2.37	2.75	300.56	0.14	602147.60	660248.03	N 32 39 15.57	W 103 48 45.60	48.45M
	900.00	0.61	48.45	899.99	-2697.01	-2.28	1.81	-2.28	2.90	308.66	0.86	602148.01	660248.14	N 32 39 15.57	W 103 48 45.60	95.7M
1000.00	0.88	95.70	999.98	-2597.02	-1.12	2.09	-1.10	2.36	332.21	0.65	602148.29	660249.30	N 32 39 15.58	W 103 48 45.59	113.19M	
1100.00	1.24	113.19	1099.97	-2497.03	0.64	1.58	0.68	1.72	22.58	0.48	602147.78	660251.06	N 32 39 15.57	W 103 48 45.57	130.67M	
1200.00	1.61	130.67	1199.94	-2397.06	2.72	0.24	2.72	2.73	84.89	0.57	602146.44	660253.12	N 32 39 15.56	W 103 48 45.54	128.47M	
1300.00	1.80	128.47	1299.90	-2297.10	4.89	-1.54	4.88	5.12	107.54	0.06	602144.66	660255.28	N 32 39 15.54	W 103 48 45.52	126.27M	
1400.00	1.62	128.27	1399.86	-2197.14	7.14	-3.25	7.11	7.82	114.54	0.06	602142.95	660257.51	N 32 39 15.52	W 103 48 45.49	113.09M	
1500.00	1.77	113.09	1499.81	-2097.19	9.71	-4.89	9.67	10.75	115.86	0.42	602141.51	660260.07	N 32 39 15.51	W 103 48 45.45	99.91M	
1600.00	1.93	99.91	1599.76	-1997.24	12.80	-5.58	12.75	13.92	113.65	0.45	602140.62	660263.15	N 32 39 15.50	W 103 48 45.42	95.78M	
1700.00	2.27	95.78	1699.69	-1897.31	16.43	-6.07	16.38	17.47	110.34	0.37	602140.13	660266.76	N 32 39 15.50	W 103 48 45.38	91.64M	
1800.00	2.62	91.64	1799.60	-1797.40	20.69	-6.34	20.63	21.59	107.07	0.39	602139.86	660271.03	N 32 39 15.49	W 103 48 45.33	84.9M	
1900.00	2.46	84.90	1899.51	-1697.49	25.11	-6.21	25.06	25.81	103.92	0.34	602139.99	660275.45	N 32 39 15.49	W 103 48 45.28	78.15M	
2000.00	2.28	78.15	1999.42	-1597.58	29.20	-5.61	29.15	29.68	100.90	0.33	602140.59	660279.55	N 32 39 15.50	W 103 48 45.23	74.62M	
2100.00	2.65	74.62	2099.33	-1497.67	33.37	-4.59	33.33	33.85	97.84	0.39	602141.61	660283.73	N 32 39 15.51	W 103 48 45.18	71.11M	
2200.00	3.01	71.10	2199.20	-1397.80	38.07	-3.12	38.05	38.17	94.69	0.40	602143.08	660286.44	N 32 39 15.52	W 103 48 45.13	74.95M	
2300.00	3.52	74.95	2299.04	-1297.96	43.51	-1.48	43.49	43.52	91.94	0.55	602144.72	660293.89	N 32 39 15.54	W 103 48 45.07	78.8M	
2400.00	4.02	78.80	2398.83	-1198.17	49.90	0.00	49.90	49.90	90.00	0.56	602146.20	660300.29	N 32 39 15.55	W 103 48 44.99	81.16M	
2500.00	4.38	81.16	2498.56	-1098.44	57.08	1.27	57.09	57.11	88.73	0.38	602147.47	660307.49	N 32 39 15.57	W 103 48 44.91	83.53M	
2600.00	4.69	83.53	2598.25	-998.75	64.89	2.31	64.91	64.95	87.96	0.38	602148.51	660315.31	N 32 39 15.58	W 103 48 44.81	90.15M	
2700.00	4.67	90.15	2697.91	-898.09	73.02	2.76	73.04	73.10	87.83	0.54	602148.96	660323.44	N 32 39 15.58	W 103 48 44.72	96.77M	
2800.00	4.66	96.77	2797.58	-798.42	81.12	2.27	81.15	81.18	88.40	0.54	602148.47	660331.54	N 32 39 15.58	W 103 48 44.62	95.82M	
2900.00	4.95	88.32	2897.23	-698.77	89.47	1.92	89.49	89.52	88.77	0.76	602148.12	660339.89	N 32 39 15.57	W 103 48 44.53	79.88M	
3000.00	5.25	79.88	2996.84	-600.16	98.28	2.85	98.31	98.35	88.34	0.81	602149.05	660348.71	N 32 39 15.58	W 103 48 44.42	81.8M	
3100.00	4.64	81.80	3096.47	-500.53	106.78	4.23	106.82	106.90	87.73	0.83	602150.43	660357.21	N 32 39 15.59	W 103 48 44.32	91.69M	
3200.00	1.94	91.69	3196.29	-400.71	112.47	4.76	112.52	112.62	87.58	2.75	602150.96	660362.91	N 32 39 15.60	W 103 48 44.26	88.18M	
3300.00	0.97	98.18	3296.26	-300.74	115.00	4.59	115.05	115.14	87.72	0.98	602150.79	660365.44	N 32 39 15.60	W 103 48 44.23	85.58M	
3400.00	1.22	85.58	3396.24	-200.76	116.90	4.55	116.94	117.03	87.77	0.35	602150.75	660367.34	N 32 39 15.60	W 103 48 44.21	71.94M	
3500.00	0.64	71.94	3496.23	-100.77	118.49	4.80	118.54	118.63	87.68	0.62	602151.00	660368.93	N 32 39 15.60	W 103 48 44.19	37.8M	
3600.00	0.81	37.80	3596.22	-0.78	119.44	5.54	119.50	119.63	87.35	0.46	602151.74	660369.89	N 32 39 15.61	W 103 48 44.18	47.21M	
3700.00	1.12	47.21	3696.21	99.21	120.58	6.76	120.65	120.84	86.79	0.35	602152.96	660371.04	N 32 39 15.62	W 103 48 44.16	51.73M	
3800.00	2.09	51.73	3796.17	199.17	122.72	8.55	122.80	123.10	86.02	0.98	602154.75	660373.19	N 32 39 15.64	W 103 48 44.14	33.44M	
3900.00	2.12	33.44	3896.10	299.10	125.14	11.22	125.25	125.75	84.88	0.67	602157.42	660375.64	N 32 39 15.66	W 103 48 44.11	31.6M	
4000.00	1.94	31.60	3996.04	399.04	127.02	14.21	127.18	127.95	83.82	0.19	602160.41	660377.55	N 32 39 15.68	W 103 48 44.09	27.35M	
4100.00	1.39	27.35	4095.99	498.99	128.44	16.73	128.60	129.68	82.59	0.56	602162.93	660378.99	N 32 39 15.72	W 103 48 44.07	45.7M	
4200.00	1.17	45.70	4195.97	598.97	129.71	18.52	129.89	131.20	81.89	0.48	602164.72	660380.28	N 32 39 15.73	W 103 48 44.05	46.13M	
4300.00	1.24	46.13	4295.95	698.95	131.21	19.98	131.40	132.91	81.35	0.07	602166.18	660381.79	N 32 39 15.75	W 103 48 44.04	35.74M	
4400.00	1.62	35.74	4395.92	798.92	132.80	21.88	133.01	134.79	80.66	0.46	602168.08	660383.40	N 32 39 15.77	W 103 48 44.02	30.4M	
4500.00	1.63	30.40	4495.88	898.88	134.32	24.25	134.55	136.72	79.78	0.15	602170.45	660384.94	N 32 39 15.79	W 103 48 44.00	21.09M	
4600.00	1.31	21.09	4595.84	998.84	135.43	26.55	135.68	138.25	78.83	0.40	602172.74	660386.07	N 32 39 15.81	W 103 48 43.99	3.02M	
4700.00	1.23	3.02	4695.82	1098.82	136.88	28.68	136.15	139.14	78.10	0.41	602174.68	660386.54	N 32 39 15.83	W 103 48 43.98	339.38M	
4800.00	0.39	339.38	4795.81	1198.81	135.90	30.08	136.09	139.37	77.54	0.69	602176.27	660388.48	N 32 39 15.85	W 103 48 43.96	233.83M	
4900.00	0.26	233.83	4895.81	1298.81	135.50	30.26	135.78	139.11	77.44	0.52	602178.46	660386.18	N 32 39 15.85	W 103 48 43.98	261.15M	
5000.00	0.28	261.15	4995.81	1398.81	135.08	30.09	135.36	138.66	77.47	0.13	602178.29	660385.75	N 32 39 15.85	W 103 48 43.99	194.75M	
5100.00	0.26	194.75	5095.81	1498.81	134.78	29.33	135.06	138.32	77.54	0.30	602178.03	660385.45	N 32 39 15.85	W 103 48 43.99	208.48M	
5200.00	0.31	208.48	5195.80	1598.80	134.60	29.37	134.87	138.03	77.71	0.08	602178.02	660385.26	N 32 39 15.84	W 103 48 43.99	127.19M	
5300.00	0.78	127.19	5295.80	1698.80	135.02	28.72	135.29	138.30	78.01	0.79	602174.92	660385.68	N 32 39 15.83	W 103 48 43.99	118.75M	
5400.00	1.00	118.75	5395.79	1798.79	136.33	27.89	136.59	139.41	78.46	0.28	602174.09	660386.98	N 32 39 15.83	W 103 48 43.97	69.47M	
5500.00	0.99	69.47	5495.77	1898.77	137.91	27.78	138.17									

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	TVDSS (ft)	VSEC (ft)	NS (ft)	EW (ft)	Closure (ft)	Closure Azimuth (°)	DLS (ft/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ° ' °)	Longitude (E/W ° ° ' °)	TF (°)
	8500.00	0.20	144.69	8494.68	4697.68	199.33	42.55	199.73	204.21	77.97	0.51	602188.75	660450.12	N 32 39 15.97 W 103 48 43.24		134.02M
	8600.00	0.48	134.02	8594.68	4697.68	199.73	42.12	200.13	204.51	78.12	0.29	602188.31	660450.52	N 32 39 15.96 W 103 48 43.23		162.36M
	8638.00	1.09	162.36	8632.67	5035.67	199.96	41.96	200.35	204.64	78.25	1.86	602187.86	660450.74	N 32 39 15.96 W 103 48 43.23		155.86M
	8674.00	1.23	155.96	8668.67	5071.67	200.23	40.98	200.82	204.76	78.45	0.53	602187.18	660451.00	N 32 39 15.95 W 103 48 43.22		157.45M
	8706.00	1.23	157.45	8700.66	5103.66	200.51	40.35	200.89	204.90	78.64	0.10	602186.55	660451.27	N 32 39 15.95 W 103 48 43.22		118.17M
	8738.00	2.02	118.17	8732.65	5135.65	201.14	39.77	201.52	205.40	78.84	4.13	602185.97	660451.90	N 32 39 15.94 W 103 48 43.21		104.37M
	8769.00	4.40	104.37	8763.60	5168.60	202.78	39.22	203.15	206.90	79.07	8.02	602185.41	660453.54	N 32 39 15.94 W 103 48 43.20		104.89M
	8801.00	5.54	104.89	8795.47	5196.47	205.47	38.51	205.83	209.40	79.40	3.57	602184.71	660456.22	N 32 39 15.93 W 103 48 43.16		102.39M
	8833.00	6.60	102.90	8827.29	5230.29	208.76	37.71	208.12	212.49	79.78	3.38	602183.90	660459.90	N 32 39 15.92 W 103 48 43.13		101.74M
	8864.00	7.12	101.74	8858.07	5261.07	212.39	36.92	212.74	215.91	80.15	1.74	602183.12	660463.12	N 32 39 15.91 W 103 48 43.08		90.92M
	8896.00	10.11	90.92	8889.71	5292.71	217.14	36.47	217.49	220.52	80.48	10.59	602182.67	660467.87	N 32 39 15.91 W 103 48 43.03		24.39L
	8928.00	13.96	83.84	8921.00	5324.00	223.79	36.84	224.14	227.15	80.67	12.92	602183.04	660474.53	N 32 39 15.91 W 103 48 42.95		13.33L
	8959.00	18.20	80.66	8950.78	5353.78	232.28	38.03	232.64	235.73	80.72	13.90	602184.22	660483.03	N 32 39 15.92 W 103 48 42.85		4.52L
	8991.00	22.34	79.80	8980.79	5383.79	243.19	39.92	243.57	248.82	80.69	12.97	602186.11	660493.95	N 32 39 15.94 W 103 48 42.72		12.23L
	9023.00	26.47	77.80	9009.93	5412.93	256.12	42.50	256.83	260.02	80.59	13.16	602188.70	660506.91	N 32 39 15.96 W 103 48 42.57		2.57R
	9054.00	30.42	78.15	9037.18	5440.18	270.54	45.57	270.97	274.77	80.45	12.75	602191.77	660521.35	N 32 39 15.99 W 103 48 42.40		1.8R
	9086.00	34.38	78.37	9064.19	5487.19	287.29	49.06	287.75	291.90	80.32	12.38	602195.26	660538.13	N 32 39 16.03 W 103 48 42.21		4.31R
	9118.00	38.43	78.86	9089.94	5492.94	305.87	52.80	306.37	310.88	80.22	12.69	602199.00	660556.75	N 32 39 16.06 W 103 48 41.99		11.74R
	9149.00	42.47	80.10	9113.53	5516.53	325.60	56.47	326.14	330.99	80.18	13.29	602202.66	660578.52	N 32 39 16.10 W 103 48 41.76		7.48R
	9181.00	46.69	80.86	9136.32	5539.32	347.71	60.18	348.29	353.45	80.20	13.29	602206.37	660598.66	N 32 39 16.14 W 103 48 41.50		6.49R
	9213.00	51.44	81.55	9157.28	5560.28	371.56	63.87	372.17	377.61	80.28	14.93	602210.06	660622.55	N 32 39 16.17 W 103 48 41.22		4.89R
	9244.00	56.41	82.06	9175.53	5578.53	396.32	67.43	396.96	402.65	80.36	16.09	602213.63	660647.34	N 32 39 16.20 W 103 48 40.93		11.81R
	9276.00	61.20	83.20	9192.10	5595.10	423.43	70.94	424.10	429.99	80.50	15.28	602217.13	660674.47	N 32 39 16.24 W 103 48 40.81		5.32R
	9308.00	64.90	83.58	9206.60	5609.60	451.73	74.22	452.43	458.48	80.68	11.81	602220.41	660702.80	N 32 39 16.27 W 103 48 40.28		2.08R
	9338.00	68.76	83.73	9218.79	5621.79	480.02	77.37	480.75	486.94	80.86	12.46	602223.56	660731.12	N 32 39 16.30 W 103 48 39.95		26.41R
	9371.00	72.46	85.65	9229.41	5632.41	510.04	80.15	510.80	517.05	81.08	12.87	602226.35	660781.17	N 32 39 16.33 W 103 48 39.59		11.97R
	9403.00	76.50	86.53	9237.97	5640.97	540.77	82.25	541.55	547.77	81.38	12.90	602228.45	660791.92	N 32 39 16.34 W 103 48 39.24		22.86R
	9435.00	79.40	87.76	9244.65	5647.65	572.01	83.81	572.81	578.91	81.68	9.81	602230.00	660823.17	N 32 39 16.36 W 103 48 38.87		22.89R
	9468.00	82.48	89.07	9249.54	5652.54	602.60	84.85	603.40	609.31	82.01	10.78	602230.85	660853.77	N 32 39 16.37 W 103 48 38.51		20.19R
	9498.00	85.82	90.30	9252.80	5655.80	634.42	84.83	635.23	640.87	82.39	11.12	602231.02	660885.59	N 32 39 16.37 W 103 48 38.14		29.6R
	9530.00	89.08	92.15	9254.22	5657.22	666.38	84.14	667.19	672.47	82.81	11.71	602230.34	660917.54	N 32 39 16.36 W 103 48 37.77		45.47R
	9561.00	89.69	92.77	9254.55	5657.55	697.36	82.81	698.16	703.05	83.24	2.81	602229.01	660948.51	N 32 39 16.34 W 103 48 37.40		45L
	9598.00	90.92	91.54	9254.05	5657.05	782.32	79.24	793.08	797.03	84.29	1.83	602225.44	661043.43	N 32 39 16.30 W 103 48 36.29		46.74L
	9751.00	92.33	90.04	9251.35	5654.35	887.27	77.93	888.03	891.44	84.98	2.17	602224.13	661136.28	N 32 39 16.28 W 103 48 35.25		30.55L
	9846.00	92.77	89.78	9247.13	5650.13	982.17	78.08	982.94	986.03	85.48	0.54	602224.26	661233.27	N 32 39 16.28 W 103 48 34.07		172.97R
	9941.00	90.66	90.04	9244.28	5647.28	1077.12	78.23	1077.89	1080.72	85.85	2.24	602224.43	661328.22	N 32 39 16.28 W 103 48 32.96		127.13R
	10038.00	90.13	90.74	9243.63	5646.63	1172.12	77.58	1172.88	1175.45	86.22	0.92	602223.78	661423.21	N 32 39 16.27 W 103 48 31.85		68.08L
	10131.00	90.48	89.87	9243.12	5646.12	1267.11	77.08	1267.88	1270.22	86.52	0.99	602223.27	661518.20	N 32 39 16.26 W 103 48 30.74		LS
	10228.00	89.60	89.87	9243.06	5646.06	1362.11	77.29	1362.88	1365.07	86.75	0.93	602223.49	661613.19	N 32 39 16.26 W 103 48 29.63		178.04L
	10321.00	86.97	89.78	9245.90	5648.90	1457.05	77.58	1457.83	1459.89	86.95	2.77	602223.78	661706.14	N 32 39 16.25 W 103 48 28.52		LS
	10416.00	86.53	89.78	9251.29	5654.29	1551.89	77.95	1552.67	1554.63	87.13	0.48	602224.14	661802.98	N 32 39 16.25 W 103 48 27.41		2.02R
	10511.00	89.08	89.87	9254.92	5657.92	1646.80	78.24	1647.60	1649.45	87.28	2.69	602224.43	661897.89	N 32 39 16.25 W 103 48 26.30		5.84L
	10606.00	89.68	89.78	9255.72	5658.72	1741.79	78.53	1742.59	1744.36	87.42	0.93	602224.72	661992.88	N 32 39 16.25 W 103 48 25.19		32.15L
	10701.00	90.68	89.34	9255.21	5658.21	1836.78	79.26	1837.59	1839.29	87.53	0.87	602225.45	662087.87	N 32 39 16.25 W 103 48 24.08		116.78R
	10796.00	90.13	90.39	9254.55	5657.55	1931.77	79.48	1932.58	1934.22	87.64	1.24	602225.68	662182.86	N 32 39 16.25 W 103 48 22.87		123.76R
	10891.00	88.72	92.50	9255.50	5658.50	2026.74	77.09	2027.54	2029.00	87.82	2.67	602223.28	662277.81	N 32 39 16.22 W 103 48 21.86		151.12R
	10986.00	87.76	93.03	9258.42	5661.42	2121.62	72.51	2122.38	2123.62	88.04	1.15	602218.70	662372.65	N 32 39 16.17 W 103 48 20.75		99.86R
	11081.00	87.87	93.56	9262.21	5665.21	2216.44	67.05	2217.15	2218.16	88.27	0.57	602213.25	662467.41	N 32 39 16.11 W 103 48 19.64		60.55L
	11176.00	88.02	92.84	9265.78	5668.78	2311.26	61.87	2311.93	2312.75	88.47	0.75	602207.66	662562.18	N 32 39 16.05 W 103 48 18.53		6.47L
	11271.00	89.52	92.77	9267.82	5670.82	2406.16	58.94	2406.79	2407.46	88.64	1.59	602203.13	662657.03	N 32 39 16.00 W 103 48 17.42		19.68L
	11368.00	90.75	92.33	9267.60	5670.60	2501.10	52.71	2501.89	2502.25	88.79	1.38	602198.91	662751.93	N 32 39 15.96 W 103 48 16.31		21.05L
	11461.00	91.45	92.06	9265.77	5668.77	2596.04	49.07	2596.80	2597.07	88.92	0.79	602195.27	662846.84	N 32 39 15.92 W 103 48 15.20		LS
	11555.00	91.01	92.06	9263.76	5666.76	2689.98	45.69	2690.52	2690.91	89.03	0.47	602191.89	662940.75	N 32 39 15.88 W 103 48 14.10		149.43L
	11650.00	89.52	91.18	9263.32	5666.32	2784.96	43.01	2785.48	2785.81	89.12	1.82	602189.21	663035.70	N 32 39 15.85 W 103 48 12.99		153.86L
	11745.00	88.46	90.66	9264.99	5667.99	2879.94	41.48	2880.45	2880.75	89.17	1.24	602187.68	663130.67	N 32 39 15.83 W 103 48 11.88		37.96R
	11840.00	89.69	91.82	9266.52	5669.52	2974.92	39.59	2975.41	2975.68	89.24	1.84	602185.79	663225.63	N 32 39 15.80 W 103 48 10.77		31.54R
	11935.00	90.13	91.89	9266.67	5669.67	3069.90	36.68	3070.37	3070.59	89.32	0.54	602182.88	663320.57	N 32 39 15.77 W 103 48 9.88		5.25R
	12030.00	91.98	92.06	9264.92	5667.92	3164.85	33.41	3165.29	3165.47	89.40	1.96	602179.61	663415.49	N 32 39 15.73 W 103 48 8.55		26.52L
	12125.00	93.74	91.18	9260.18	5663.18	3259.71	30.73	3260.13	3260.28	89.46	2.07	602176.93	663510.32	N 32 39 15.70 W 103 48 7.44		162.55L
	12252.00	91.80	90.57	9254.05	5657.05	3386.55	28.79	3386.96	3387.08	89.51	1.60	602174.99	663637.15	N 32 39 15.68 W 103 48 5.96		90R



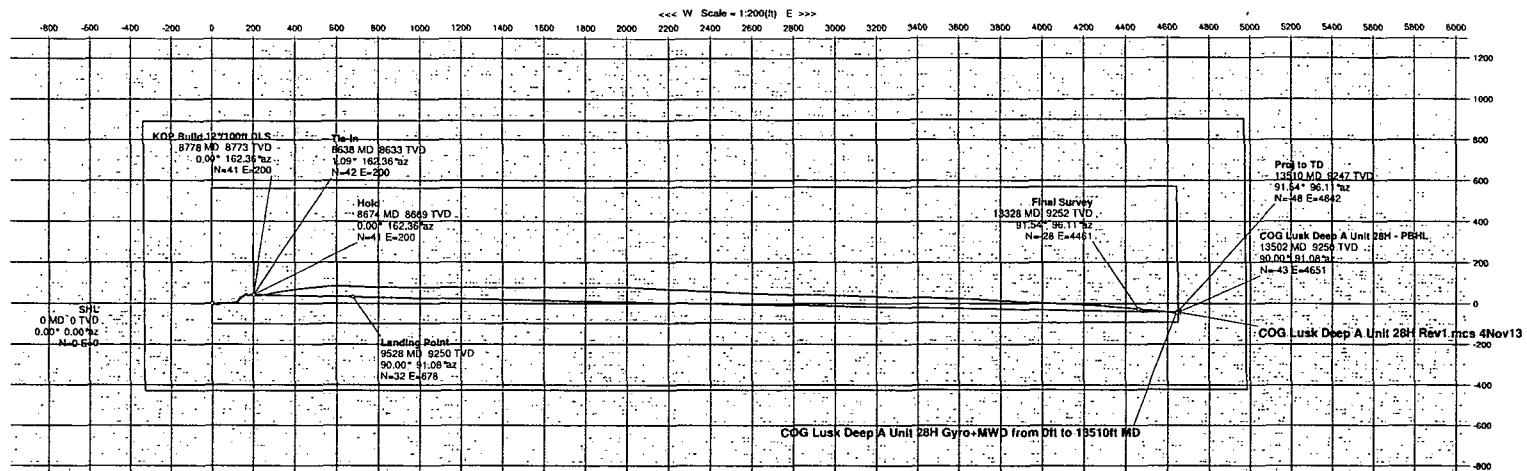
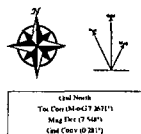
Patriot 6

COG Operating, LLC

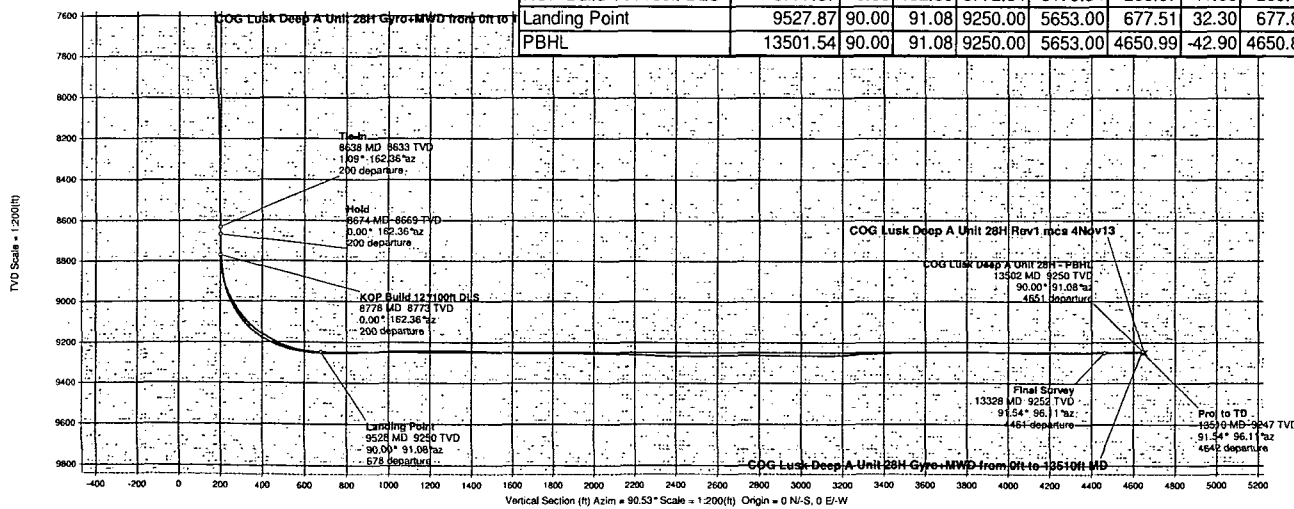
FINAL Pva



WELL					Lusk Deep A Unit 28H					FIELD					Lea County, NM (NAD 27)					STRUCTURE					Patriot 6								
Magnetic Parameters										Survey Location										MicroStation													
Model:		BOGA 2012		Dip:		60.441°		Date:		November 04, 2013		Lat:		N 12 39 15.157		Longitude:		W 103 48 45.374		NAD27 New Mexico State Plane, Everest Zone, US Feet		Grid Zone:		0 241°		Size:		Lusk Deep A Unit 28H		TVD Ref:		FKR33970 above 1	
		Mag Dec:		7.544°		PS:		4557.5mT								Heading:		60214.30 N15		Scale Feet:		0.99991450				Plan:		Rev1 mcs 4Nov13		Rev:		November 04, 2013	



Comments	Survey MD	Inc	Azim	TVD	SSTVD	VS	NS	EW	Longitude	Latitude	Easting	Northing	DLS	Tool Face
SHL	0.00	0.00	0.00	0.00	-3597.00	0.00	0.00	0.00	W 103 48 45.574	N 32 39 15.557	660250.40	602146.20		351.31
Tie-In	8638.00	1.09	162.36	8632.67	5035.67	199.96	41.66	200.35	W 103 48 43.228	N 32 39 15.959	660450.74	602187.86	1.86	162.36
Hold	8674.33	0.00	162.36	8669.00	5072.00	200.07	41.33	200.46	W 103 48 43.227	N 32 39 15.956	660450.85	602187.53	3.00	162.36
KOP Build 12°100ft DLS	8777.87	0.00	162.36	8772.54	5175.54	200.07	41.33	200.46	W 103 48 43.227	N 32 39 15.956	660450.85	602187.53	0.00	91.08
Landing Point	9527.87	90.00	91.08	9250.00	5653.00	677.51	32.30	677.84	W 103 48 37.644	N 32 39 15.844	660928.20	602178.50	12.00	80.27
PBHL	13501.54	90.00	91.08	9250.00	5653.00	4650.99	-42.90	4650.80	W 103 47 51.182	N 32 39 14.903	664900.90	602103.30	0.00	



Legend	
COG Lusk Deep A Unit 28H - PATH	
COG Lusk Deep A Unit 28H - LUSK-CP	
COG Lusk Deep A Unit 28H - PBHL	
COG Lusk Deep A Unit 28H Rev1 mcs 4Nov13	
COG Lusk Deep A Unit 28H Gyro-MWD from Off to Update	
COG Lusk Deep A Unit 28H Gyro-MWD from Off to 13510ft MD	

Drawn By: MShaffer
Data Created: November 04, 2013 08:10:06 AM
Checked By: MShaffer
Approved By: MShaffer
Approved Date: November 04, 2013