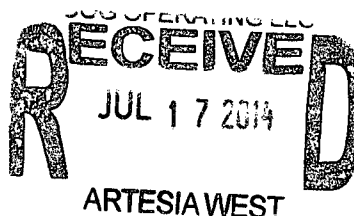


**McVAY DRILLING COMPANY**

P.O. Box 2450
Hobbs, New Mexico 88241
(575) 397-3311
FAX: 39-DRILL

30 015 42085



Well Name and Num: Darthrow State #2H
Location: Sec 19, T20S, R30E
Operator: COG
Drilling Contractor: McVay Drilling Company

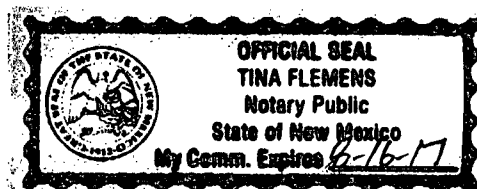
The undersigned certifies that he is an authorized representative of the drilling contractor who drilled the above described well and that he has conducted deviation tests and obtained the following results:

<u>Degrees @</u>	<u>Depth</u>	<u>Degrees @</u>	<u>Depth</u>	<u>Degrees @</u>	<u>Depth</u>
0.70	384	1.30	5222	89.60	10168
0.80	649	1.60	5770	89.50	10551
2.90	951	2.30	6278	88.70	10838
3.50	1254	2.60	6689	88.00	11030
2.70	1326	2.60	6884	89.60	11604
2.60	1621	3.00	7372	90.50	12081
2.50	1705	2.80	7563	88.70	12461
0.70	2075	1.20	7754		
1.20	2297	8.10	7945		
1.30	2772	29.10	8169		
1.10	3246	45.30	8328		
1.50	3341	53.20	8391		
1.40	3422	74.10	8551		
1.80	3704	90.60	8764		
1.80	3958	90.20	9115		
1.60	4202	92.10	9498		
1.10	4620	88.20	9785		

By: Hunter Crum

Subscribed and sworn to before me this 15th day of July, 2014

Tina Flemens
Notary Public, Lea County, New Mexico





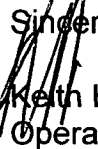
July 22, 2014

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

Attn: Kanicia Castillo

RE: **Darthrow State No. 002H**

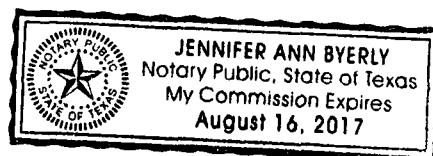
Please find enclosed a copy of the survey from 0.00' to 7250.00' ran on the above referenced well.

Sincerely,

Keith Havelka
Operations

STATE OF TEXAS §
 §
COUNTY OF NUECES §

This instrument was acknowledged before me on the 22 day of July, A.D., 2014, by Keith Havelka.


Jennifer Ann Byerly
Notary Public, State of Texas



Company: COG Operating, LLC (Concho)

Lease/Well: Darthrow State/No. 002H



Rig Name: McVay 6

State/County: New Mexico/Eddy

Latitude: 32.56, Longitude: -104.02

GRID North is 0.17 Degrees East of True North

VS-Azi: 177.58 Degrees



Depth Reference : 17 Feet

DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: gyro survey.ut

Minimum Curvature Method

Report Date/Time: 7/22/2014 / 11:49

VES Survey International

West Texas

(432) 563-5444

Surveyor: Bryan Massey

Darthrow State No. 002H / API 30-015-42085

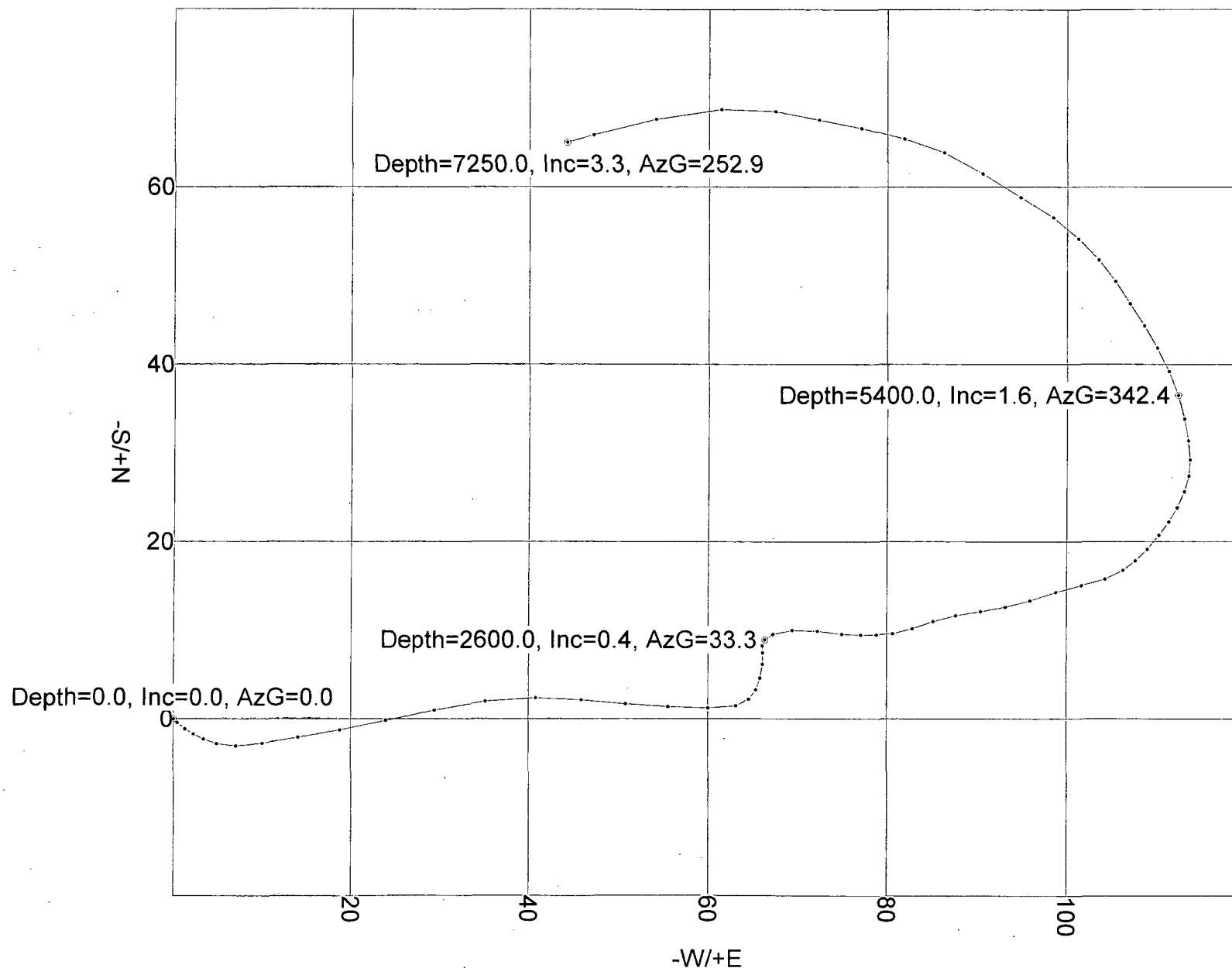
Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	****
100.00	0.03	146.93	100.00	-0.02	0.02	0.03	0.03	146.93	0.03
200.00	0.65	132.81	200.00	-0.43	0.45	0.45	0.62	134.12	0.62
300.00	0.61	127.68	299.99	-1.15	1.29	1.20	1.72	131.70	0.07
400.00	0.68	114.74	399.99	-1.72	2.25	1.82	2.83	127.43	0.16
500.00	0.77	117.68	499.98	-2.28	3.39	2.43	4.09	123.99	0.10
600.00	1.05	104.40	599.96	-2.83	4.87	3.03	5.63	120.11	0.35
700.00	1.43	91.11	699.94	-3.08	7.01	3.37	7.66	113.70	0.48
800.00	2.08	78.81	799.89	-2.75	10.04	3.17	10.41	105.31	0.74
900.00	2.55	82.00	899.81	-2.09	14.03	2.68	14.18	98.46	0.49
1000.00	2.93	78.51	999.70	-1.27	18.74	2.06	18.78	93.87	0.41
1100.00	3.18	77.80	1099.56	-0.17	23.95	1.18	23.95	90.41	0.26
1200.00	3.28	78.34	1199.40	0.99	29.47	0.25	29.48	88.07	0.10
1300.00	3.35	81.53	1299.23	2.00	35.15	-0.51	35.21	86.74	0.20
1400.00	3.15	91.27	1399.07	2.37	40.79	-0.64	40.86	86.68	0.58
1500.00	2.74	94.49	1498.94	2.12	45.92	-0.18	45.97	87.36	0.45
1600.00	2.89	95.47	1598.82	1.69	50.81	0.45	50.84	88.09	0.17
1700.00	2.54	92.46	1698.70	1.36	55.54	0.99	55.56	88.60	0.38
1800.00	2.57	90.77	1798.60	1.23	59.99	1.30	60.01	88.82	0.08

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	1.09	73.27	1898.55	1.48	63.14	1.19	63.16	88.66	1.56
2000.00	0.79	47.45	1998.54	2.22	64.56	0.51	64.60	88.03	0.51
2100.00	0.76	26.72	2098.53	3.28	65.37	-0.52	65.46	87.13	0.28
2200.00	0.84	11.66	2198.52	4.60	65.82	-1.81	65.98	86.00	0.22
2300.00	0.99	8.62	2298.51	6.17	66.10	-3.38	66.39	84.66	0.16
2400.00	0.50	345.76	2398.50	7.46	66.12	-4.66	66.54	83.57	0.57
2500.00	0.43	9.54	2498.49	8.25	66.08	-5.45	66.59	82.88	0.20
2600.00	0.43	33.26	2598.49	8.93	66.34	-6.12	66.94	82.33	0.18
2700.00	0.89	67.27	2698.49	9.54	67.26	-6.70	67.94	81.92	0.58
2800.00	1.62	84.48	2798.46	9.98	69.39	-7.04	70.10	81.82	0.82
2900.00	1.68	98.08	2898.42	9.91	72.25	-6.85	72.93	82.19	0.40
3000.00	1.47	95.81	2998.38	9.57	74.98	-6.40	75.59	82.72	0.22
3100.00	0.98	87.70	3098.36	9.48	77.11	-6.21	77.69	82.99	0.52
3200.00	0.95	91.26	3198.34	9.49	78.80	-6.16	79.37	83.13	0.07
3300.00	1.19	81.14	3298.33	9.63	80.66	-6.22	81.23	83.19	0.30
3400.00	1.37	70.88	3398.30	10.19	82.81	-6.68	83.43	82.99	0.29
3500.00	1.44	70.91	3498.27	10.99	85.13	-7.38	85.84	82.64	0.07
3600.00	1.56	78.94	3598.24	11.66	87.66	-7.95	88.43	82.42	0.24
3700.00	1.65	81.04	3698.20	12.15	90.42	-8.32	91.23	82.35	0.10
3800.00	1.54	78.96	3798.16	12.63	93.15	-8.68	94.00	82.28	0.12
3900.00	1.71	72.17	3898.12	13.34	95.89	-9.28	96.81	82.08	0.26
4000.00	1.76	71.37	3998.07	14.29	98.77	-10.11	99.80	81.77	0.06
4100.00	1.67	79.05	4098.03	15.06	101.66	-10.75	102.77	81.57	0.25
4200.00	1.47	69.28	4197.99	15.79	104.29	-11.37	105.48	81.39	0.33
4300.00	1.11	55.90	4297.97	16.79	106.29	-12.28	107.61	81.03	0.47
4400.00	0.89	49.43	4397.95	17.83	107.68	-13.27	109.15	80.60	0.24
4500.00	1.23	42.39	4497.93	19.13	108.99	-14.51	110.66	80.04	0.36
4600.00	1.13	36.41	4597.91	20.71	110.30	-16.04	112.23	79.36	0.16
4700.00	0.99	34.72	4697.90	22.22	111.38	-17.49	113.57	78.72	0.14
4800.00	1.14	26.58	4797.88	23.81	112.31	-19.05	114.81	78.03	0.21
4900.00	1.15	20.67	4897.86	25.64	113.11	-20.84	115.98	77.23	0.12
5000.00	0.96	10.00	4997.84	27.40	113.61	-22.58	116.87	76.44	0.27
5100.00	1.15	359.49	5097.83	29.22	113.74	-24.39	117.44	75.59	0.27
5200.00	1.35	351.26	5197.80	31.39	113.56	-26.56	117.81	74.55	0.27
5300.00	1.54	348.03	5297.77	33.86	113.10	-29.06	118.06	73.33	0.20
5400.00	1.62	342.43	5397.73	36.52	112.40	-31.74	118.18	72.00	0.17
5500.00	1.67	335.53	5497.69	39.19	111.37	-34.45	118.06	70.61	0.20
5600.00	1.70	334.20	5597.65	41.85	110.12	-37.16	117.80	69.19	0.05
5700.00	1.66	325.62	5697.61	44.38	108.66	-39.75	117.37	67.79	0.25

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	1.71	328.13	5797.56	46.84	107.05	-42.28	116.85	66.37	0.09
5900.00	1.72	326.68	5897.52	49.37	105.43	-44.87	116.42	64.91	0.04
6000.00	1.78	317.93	5997.47	51.78	103.57	-47.36	115.79	63.44	0.27
6100.00	2.02	314.15	6097.42	54.16	101.26	-49.84	114.83	61.86	0.26
6200.00	2.25	305.83	6197.35	56.53	98.41	-52.33	113.49	60.12	0.38
6300.00	2.68	299.00	6297.25	58.81	94.78	-54.76	111.54	58.18	0.52
6400.00	3.05	304.63	6397.13	61.45	90.55	-57.58	109.43	55.84	0.46
6500.00	2.55	292.89	6497.01	63.83	86.31	-60.13	107.35	53.51	0.75
6600.00	2.84	286.55	6596.90	65.40	81.88	-61.89	104.79	51.38	0.41
6700.00	2.83	281.26	6696.78	66.59	77.08	-63.28	101.86	49.18	0.26
6800.00	2.73	281.10	6796.66	67.53	72.32	-64.42	98.95	46.96	0.10
6900.00	2.98	280.95	6896.53	68.49	67.42	-65.58	96.10	44.55	0.25
7000.00	4.01	265.43	6996.35	68.70	61.38	-66.05	92.13	41.78	1.39
7100.00	4.49	257.50	7096.08	67.58	54.08	-65.23	86.55	38.67	0.76
7200.00	3.70	254.08	7195.82	65.84	47.16	-63.79	80.99	35.61	0.83
7250.00	3.32	252.90	7245.73	64.98	44.23	-63.05	78.60	34.24	0.78



VES Survey International
West Texas
(432) 563-5444
Surveyor: Bryan Massey
Darthrow State No. 002H / API 30-015-42085



VES Survey Date: 07/02/2014

Archer

Survey Report

Company:	COG OPERATING, LLC	Local Co-ordinate Reference:	Well 2H
Project:	Eddy County, NM	TVD Reference:	3318'GL+19'KB @ 3337.00usft (Planning)
Site:	Darthrow State 2H	MD Reference:	3318'GL+19'KB @ 3337.00usft (Planning)
Well:	2H	North Reference:	Grid
Wellbore:	Lateral	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	EDM R5000.1 MULTI

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

Site	Darthrow State 2H		
Site Position:		Northing:	569,365.30 usft
From:	Map	Easting:	596,899.50 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13.200 in
		Latitude:	32° 33' 53.64 N
		Longitude:	104° 1' 7.70 W
		Grid Convergence:	0.17 °

Well	2H		
Well Position	+N/-S	0.00 usft	Northing: 569,365.30 usft
	+E/-W	0.00 usft	Easting: 596,899.50 usft
Position Uncertainty	0.00 usft	Wellhead Elevation:	usft
		Latitude:	32° 33' 53.64 N
		Longitude:	104° 1' 7.70 W
		Ground Level:	3,318.00 usft

Wellbore	Lateral		
Magnetics	Model Name	Sample Date	Declination
			(°)
	IGRF2010	6/25/2014	7.45
			Dip Angle (°)
			60.35
			Field Strength (nT)
			48,471

Design	Surveys		
Audit Notes:			
Version:	1.0	Phase:	ACTUAL
		Tie On Depth:	0.00
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W
	(usft)	(usft)	(usft)
	0.00	0.00	0.00
			Direction
			(°)
			177.58

Survey Program	Date	7/9/2014		
From	To	Survey (Wellbore)	Tool Name	Description
(usft)	(usft)			
100.00	7,250.00	Survey #2 (Lateral)	Gyroscope	Gyroscope
7,372.00	12,651.00	Survey #3 (Lateral)	MWD - Std	MWD - Standard
12,779.00	12,779.00	Survey #4 (Lateral)	Project	Projection

Survey									
Measured	Inclination	Azimuth	Vertical	+N/-S	+E/-W	Vertical	Dogleg	Build	Turn
Depth	(°)	(°)	Depth	(usft)	(usft)	Section	Rate	Rate	Rate
(usft)			(usft)			(usft)	(°/100usft)	(°/100usft)	(°/100usft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.03	146.93	100.00	-0.02	0.01	0.02	0.03	0.03	0.00
200.00	0.65	132.81	200.00	-0.43	0.44	0.45	0.62	0.62	-14.12
300.00	0.61	127.68	299.99	-1.14	1.28	1.19	0.07	-0.04	-5.13
400.00	0.68	114.74	399.99	-1.71	2.24	1.81	0.16	0.07	-12.94
500.00	0.77	117.68	499.98	-2.27	3.38	2.41	0.10	0.09	2.94
600.00	1.05	104.40	599.96	-2.81	4.86	3.02	0.35	0.28	-13.28
700.00	1.43	91.11	699.94	-3.07	6.99	3.36	0.47	0.38	-13.29
800.00	2.08	78.81	799.89	-2.74	10.02	3.16	0.75	0.65	-12.30

Archer

Survey Report

Company:	COG OPERATING, LLC	Local Co-ordinate Reference:	Well 2H
Project:	Eddy County, NM	TVD Reference:	3318'GL+19'KB @ 3337.00usft (Planning)
Site:	Darthrow State 2H	MD Reference:	3318'GL+19'KB @ 3337.00usft (Planning)
Well:	2H	North Reference:	Grid
Wellbore:	Lateral	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	EDM R5000.1 MULTI

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
900.00	2.55	82.00	899.81	-2.08	14.00	2.66	0.49	0.47	3.19	
1,000.00	2.93	78.51	999.70	-1.26	18.71	2.05	0.41	0.38	-3.49	
1,100.00	3.18	77.80	1,099.56	-0.16	23.93	1.17	0.25	0.25	-0.71	
1,200.00	3.28	78.34	1,199.40	1.00	29.44	0.24	0.10	0.10	0.54	
1,300.00	3.35	81.53	1,299.23	2.01	35.13	-0.53	0.20	0.07	3.19	
1,400.00	3.15	91.27	1,399.07	2.38	40.77	-0.66	0.59	-0.20	9.74	
1,500.00	2.74	94.49	1,498.94	2.13	45.90	-0.20	0.44	-0.41	3.22	
1,600.00	2.89	95.47	1,598.82	1.70	50.79	0.44	0.16	0.15	0.98	
1,700.00	2.54	92.46	1,698.70	1.37	55.51	0.97	0.38	-0.35	-3.01	
1,800.00	2.57	90.77	1,798.60	1.24	59.97	1.28	0.08	0.03	-1.69	
1,900.00	1.09	73.27	1,898.55	1.49	63.12	1.17	1.57	-1.48	-17.50	
2,000.00	0.79	47.45	1,998.54	2.23	64.54	0.49	0.51	-0.30	-25.82	
2,100.00	0.76	26.72	2,098.53	3.29	65.35	-0.53	0.28	-0.03	-20.73	
2,200.00	0.84	11.66	2,198.52	4.60	65.79	-1.82	0.22	0.08	-15.06	
2,300.00	0.99	8.62	2,298.51	6.17	66.07	-3.38	0.16	0.15	-3.04	
2,400.00	0.50	345.76	2,398.50	7.45	66.09	-4.65	0.56	-0.49	-22.86	
2,500.00	0.43	9.54	2,498.50	8.24	66.05	-5.45	0.20	-0.07	23.78	
2,600.00	0.43	33.26	2,598.49	8.92	66.32	-6.12	0.18	0.00	23.72	
2,700.00	0.89	67.27	2,698.49	9.54	67.24	-6.69	0.59	0.46	34.01	
2,800.00	1.62	84.48	2,798.46	9.97	69.36	-7.04	0.81	0.73	17.21	
2,900.00	1.68	98.08	2,898.42	9.90	72.22	-6.85	0.40	0.06	13.60	
3,000.00	1.47	95.81	2,998.38	9.57	74.95	-6.40	0.22	-0.21	-2.27	
3,100.00	0.98	87.70	3,098.36	9.47	77.08	-6.21	0.52	-0.49	-8.11	
3,200.00	0.95	91.26	3,198.35	9.49	78.76	-6.16	0.07	-0.03	3.56	
3,300.00	1.19	81.14	3,298.33	9.63	80.62	-6.22	0.30	0.24	-10.12	
3,400.00	1.37	70.88	3,398.30	10.18	82.77	-6.68	0.29	0.18	-10.26	
3,500.00	1.44	70.91	3,498.27	10.98	85.09	-7.39	0.07	0.07	0.03	
3,600.00	1.56	78.94	3,598.24	11.65	87.61	-7.95	0.24	0.12	8.03	
3,700.00	1.65	81.04	3,698.20	12.14	90.37	-8.32	0.11	0.09	2.10	
3,800.00	1.54	78.96	3,798.16	12.62	93.11	-8.69	0.12	-0.11	-2.08	
3,900.00	1.71	72.17	3,898.12	13.34	95.85	-9.28	0.26	0.17	-6.79	
4,000.00	1.76	71.37	3,998.08	14.28	98.73	-10.11	0.06	0.05	-0.80	
4,100.00	1.67	79.05	4,098.03	15.05	101.61	-10.76	0.25	-0.09	7.68	
4,200.00	1.47	69.28	4,197.99	15.78	104.24	-11.37	0.33	-0.20	-9.77	
4,300.00	1.11	55.90	4,297.97	16.78	106.24	-12.29	0.47	-0.36	-13.38	
4,400.00	0.89	49.43	4,397.95	17.83	107.64	-13.27	0.25	-0.22	-6.47	
4,500.00	1.23	42.39	4,497.94	19.12	108.95	-14.52	0.36	0.34	-7.04	
4,600.00	1.13	36.41	4,597.91	20.71	110.26	-16.05	0.16	-0.10	-5.98	
4,700.00	0.99	34.72	4,697.90	22.21	111.34	-17.50	0.14	-0.14	-1.69	
4,800.00	1.14	26.58	4,797.88	23.81	112.27	-19.06	0.21	0.15	-8.14	
4,900.00	1.15	20.67	4,897.86	25.64	113.07	-20.85	0.12	0.01	-5.91	
5,000.00	0.96	10.00	4,997.84	27.41	113.57	-22.60	0.27	-0.19	-10.67	
5,100.00	1.15	359.49	5,097.83	29.23	113.71	-24.42	0.27	0.19	-10.51	

Archer

Survey Report

Company:	COG OPERATING, LLC	Local Co-ordinate Reference:	Well 2H
Project:	Eddy County, NM	TVD Reference:	3318'GL+19'KB @ 3337.00usft (Planning)
Site:	Darthrow State 2H	MD Reference:	3318'GL+19'KB @ 3337.00usft (Planning)
Well:	2H	North Reference:	Grid
Wellbore:	Lateral	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	EDM R5000.1 MULTI

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
5,200.00	1.35	351.26	5,197.80	31.40	113.52	-26.59	0.27	0.20	-8.23
5,300.00	1.54	348.03	5,297.77	33.88	113.06	-29.09	0.21	0.19	-3.23
5,400.00	1.62	342.43	5,397.73	36.54	112.36	-31.78	0.17	0.08	-5.60
5,500.00	1.67	335.53	5,497.69	39.22	111.33	-34.49	0.20	0.05	-6.90
5,600.00	1.70	334.20	5,597.65	41.88	110.08	-37.20	0.05	0.03	-1.33
5,700.00	1.66	325.62	5,697.61	44.41	108.61	-39.79	0.25	-0.04	-8.58
5,800.00	1.71	328.13	5,797.56	46.87	107.01	-42.32	0.09	0.05	2.51
5,900.00	1.72	326.68	5,897.52	49.39	105.40	-44.91	0.04	0.01	-1.45
6,000.00	1.78	317.93	5,997.47	51.80	103.53	-47.39	0.27	0.06	-8.75
6,100.00	2.02	314.15	6,097.42	54.18	101.23	-49.87	0.27	0.24	-3.78
6,200.00	2.25	305.83	6,197.35	56.56	98.37	-52.36	0.39	0.23	-8.32
6,300.00	2.68	299.00	6,297.25	58.84	94.73	-54.80	0.52	0.43	-6.83
6,400.00	3.05	304.63	6,397.13	61.48	90.50	-57.62	0.46	0.37	5.63
6,500.00	2.55	292.89	6,497.01	63.86	86.26	-60.17	0.76	-0.50	-11.74
6,600.00	2.84	286.55	6,596.90	65.43	81.84	-61.93	0.42	0.29	-6.34
6,700.00	2.83	281.26	6,696.78	66.62	77.04	-63.32	0.26	-0.01	-5.29
6,800.00	2.73	281.10	6,796.66	67.56	72.28	-64.46	0.10	-0.10	-0.16
6,900.00	2.98	280.95	6,896.54	68.51	67.39	-65.61	0.25	0.25	-0.15
7,000.00	4.01	265.43	6,996.35	68.73	61.36	-66.08	1.39	1.03	-15.52
7,100.00	4.49	257.50	7,096.08	67.60	54.05	-65.27	0.76	0.48	-7.93
7,200.00	3.70	254.08	7,195.82	65.87	47.13	-63.83	0.83	-0.79	-3.42
7,250.00	3.32	252.90	7,245.73	65.00	44.19	-63.08	0.77	-0.76	-2.36
7,372.00	3.00	255.60	7,367.54	63.17	37.72	-61.52	0.29	-0.26	2.21
7,467.00	3.00	257.00	7,462.41	61.99	32.89	-60.55	0.08	0.00	1.47
7,563.00	2.80	268.00	7,558.29	61.35	28.10	-60.11	0.61	-0.21	11.46
7,658.00	2.10	266.58	7,653.20	61.16	24.04	-60.09	0.74	-0.74	-1.49
7,722.00	1.10	238.80	7,717.18	60.77	22.35	-59.78	1.93	-1.56	-43.41
7,754.00	1.20	216.10	7,749.17	60.34	21.89	-59.37	1.45	0.31	-70.94
7,786.00	1.70	194.10	7,781.16	59.61	21.57	-58.65	2.31	1.56	-68.75
7,818.00	2.50	175.10	7,813.14	58.46	21.52	-57.50	3.28	2.50	-59.38
7,850.00	3.60	172.30	7,845.09	56.76	21.71	-55.80	3.47	3.44	-8.75
7,881.00	4.80	168.20	7,876.01	54.53	22.11	-53.55	3.99	3.87	-13.23
7,913.00	5.90	166.50	7,907.87	51.62	22.77	-50.62	3.47	3.44	-5.31
7,945.00	8.10	166.90	7,939.63	47.82	23.66	-46.79	6.88	6.88	1.25
7,976.00	11.60	168.60	7,970.17	42.64	24.77	-41.56	11.33	11.29	5.48
8,008.00	15.60	171.70	8,001.26	35.23	26.03	-34.10	12.70	12.50	9.69
8,040.00	19.70	170.70	8,031.75	25.64	27.52	-24.46	12.85	12.81	-3.13
8,072.00	23.60	168.40	8,061.49	14.04	29.68	-12.78	12.47	12.19	-7.19
8,104.00	27.20	165.70	8,090.39	0.67	32.78	0.71	11.82	11.25	-8.44
8,136.00	29.50	161.80	8,118.55	-13.90	37.05	15.45	9.22	7.19	-12.19
8,168.00	29.10	161.90	8,146.46	-28.78	41.93	30.52	1.26	-1.25	0.31
8,200.00	30.50	164.80	8,174.23	-44.02	46.47	45.94	6.28	4.38	9.06
8,232.00	34.20	167.00	8,201.26	-60.62	50.63	62.70	12.13	11.56	6.88

Archer Survey Report

Company:	COG OPERATING, LLC	Local Co-ordinate Reference:	Well 2H
Project:	Eddy County, NM	TVD Reference:	3318'GL+19'KB @ 3337.00usft (Planning)
Site:	Darthrow State 2H	MD Reference:	3318'GL+19'KB @ 3337.00usft (Planning)
Well:	2H	North Reference:	Grid
Wellbore:	Lateral	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	EDM R5000.1 MULTI

Survey.

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
8,264.00	38.10	168.50	8,227.09	-79.07	54.62	81.30	12.50	12.19	4.69
8,296.00	41.70	168.30	8,251.64	-99.17	58.75	101.56	11.26	11.25	-0.63
8,328.00	45.30	166.50	8,274.85	-120.66	63.56	123.23	11.90	11.25	-5.63
8,360.00	49.50	165.80	8,296.50	-143.52	69.21	146.31	13.22	13.13	-2.19
8,391.00	53.20	165.90	8,315.86	-167.00	75.12	170.01	11.94	11.94	0.32
8,423.00	57.10	166.40	8,334.14	-192.49	81.40	195.75	12.25	12.19	1.56
8,455.00	61.10	166.40	8,350.57	-219.17	87.86	222.68	12.50	12.50	0.00
8,487.00	65.40	166.50	8,364.97	-246.94	94.55	250.71	13.44	13.44	0.31
8,519.00	69.60	167.00	8,377.22	-275.72	101.33	279.74	13.20	13.13	1.56
8,551.00	74.10	167.30	8,387.18	-305.35	108.09	309.64	14.09	14.06	0.94
8,583.00	78.60	167.90	8,394.73	-335.72	114.76	340.26	14.18	14.06	1.88
8,660.00	87.30	168.40	8,404.17	-410.44	130.43	415.57	11.32	11.30	0.65
8,764.00	90.60	168.50	8,406.08	-512.30	151.25	518.22	3.17	3.17	0.10
8,828.00	90.30	168.60	8,405.58	-575.02	163.95	581.42	0.49	-0.47	0.16
8,924.00	89.80	170.30	8,405.49	-669.40	181.53	676.45	1.85	-0.52	1.77
9,019.00	90.50	173.70	8,405.24	-763.46	194.75	770.98	3.65	0.74	3.58
9,115.00	90.20	173.80	8,404.66	-858.88	205.20	866.77	0.33	-0.31	0.10
9,210.00	89.70	173.40	8,404.74	-953.29	215.79	961.54	0.67	-0.53	-0.42
9,306.00	90.20	173.90	8,404.82	-1,048.70	226.41	1,057.31	0.74	0.52	0.52
9,402.00	92.50	176.00	8,402.56	-1,144.29	234.86	1,153.17	3.24	2.40	2.19
9,498.00	92.10	178.90	8,398.71	-1,240.11	239.12	1,249.08	3.05	-0.42	3.02
9,594.00	89.10	181.70	8,397.70	-1,336.08	238.62	1,344.95	4.27	-3.13	2.92
9,689.00	88.60	182.30	8,399.61	-1,431.00	235.31	1,439.65	0.82	-0.53	0.63
9,785.00	88.20	183.00	8,402.29	-1,526.86	230.87	1,535.23	0.84	-0.42	0.73
9,881.00	88.90	180.90	8,404.72	-1,622.77	227.60	1,630.92	2.31	0.73	-2.19
9,976.00	88.70	181.30	8,406.71	-1,717.73	225.78	1,725.72	0.47	-0.21	0.42
10,072.00	88.40	182.00	8,409.14	-1,813.66	223.02	1,821.45	0.79	-0.31	0.73
10,168.00	89.60	180.30	8,410.81	-1,909.62	221.09	1,917.24	2.17	1.25	-1.77
10,264.00	89.40	180.30	8,411.65	-2,005.62	220.59	2,013.13	0.21	-0.21	0.00
10,359.00	89.50	180.70	8,412.56	-2,100.61	219.76	2,108.00	0.43	0.11	0.42
10,455.00	89.50	181.00	8,413.40	-2,196.59	218.34	2,203.84	0.31	0.00	0.31
10,551.00	89.50	181.10	8,414.24	-2,292.57	216.58	2,299.66	0.10	0.00	0.10
10,647.00	89.30	181.00	8,415.24	-2,388.55	214.82	2,395.48	0.23	-0.21	-0.10
10,742.00	89.10	181.20	8,416.57	-2,483.53	212.99	2,490.29	0.30	-0.21	0.21
10,838.00	88.70	181.30	8,418.41	-2,579.48	210.90	2,586.08	0.43	-0.42	0.10
10,934.00	88.20	181.30	8,421.01	-2,675.42	208.72	2,681.84	0.52	-0.52	0.00
11,030.00	88.00	178.60	8,424.19	-2,771.36	208.81	2,777.70	2.82	-0.21	-2.81
11,125.00	89.90	178.00	8,425.94	-2,866.30	211.62	2,872.67	2.10	2.00	-0.63
11,221.00	89.80	178.20	8,426.19	-2,962.25	214.81	2,968.67	0.23	-0.10	0.21
11,317.00	89.40	178.40	8,426.86	-3,058.20	217.65	3,064.66	0.47	-0.42	0.21
11,413.00	89.10	178.90	8,428.11	-3,154.17	219.92	3,160.63	0.61	-0.31	0.52
11,508.00	88.70	179.20	8,429.94	-3,249.14	221.49	3,255.58	0.53	-0.42	0.32
11,604.00	89.60	177.50	8,431.36	-3,345.08	224.26	3,351.56	2.00	0.94	-1.77
11,699.00	89.30	178.00	8,432.27	-3,440.00	227.98	3,446.55	0.61	-0.32	0.53

Archer

Survey Report

Company:	COG OPERATING, LLC	Local Co-ordinate Reference:	Well 2H
Project:	Eddy County, NM	TVD Reference:	3318'GL+19'KB @ 3337.00usft (Planning)
Site:	Darthrow State 2H	MD Reference:	3318'GL+19'KB @ 3337.00usft (Planning)
Well:	2H	North Reference:	Grid
Wellbore:	Lateral	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	EDM R5000.1 MULTI

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
11,795.00	88.90	178.00	8,433.78	-3,535.93	231.33	3,542.54	0.42	-0.42	0.00
11,891.00	90.80	176.30	8,434.03	-3,631.81	236.11	3,638.53	2.66	1.98	-1.77
11,986.00	90.80	176.30	8,432.71	-3,726.60	242.24	3,733.50	0.00	0.00	0.00
12,081.00	90.50	176.20	8,431.63	-3,821.39	248.45	3,828.46	0.33	-0.32	-0.11
12,176.00	90.20	176.40	8,431.05	-3,916.19	254.58	3,923.44	0.38	-0.32	0.21
12,271.00	90.10	176.40	8,430.80	-4,011.00	260.55	4,018.42	0.11	-0.11	0.00
12,366.00	89.10	176.50	8,431.46	-4,105.82	266.43	4,113.40	1.06	-1.05	0.11
12,461.00	88.70	176.20	8,433.29	-4,200.60	272.47	4,208.36	0.53	-0.42	-0.32
12,556.00	88.40	176.20	8,435.69	-4,295.37	278.77	4,303.30	0.32	-0.32	0.00
12,651.00	88.40	176.30	8,438.34	-4,390.13	284.98	4,398.23	0.11	0.00	0.11
12,779.00	88.40	176.30	8,441.92	-4,517.81	293.24	4,526.15	0.00	0.00	0.00

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
- hit/miss target									
- Shape									
Darthrow 2H Surface	0.00	0.00	0.00	0.00	0.00	569,365.30	596,899.50	32° 33' 53.64 N	104° 1' 7.70 W
- actual wellpath hits target center									
- Point									
Darthrow 2H BHL	0.00	0.00	8,441.92	-4,517.81	293.24	564,847.49	597,192.74	32° 33' 8.92 N	104° 1' 4.43 W
- actual wellpath hits target center									
- Point									

COG OPERATING, LLC

Field: Eddy County, NM
Site: Darthrow State 2H
Well: 2H
Wellbore: Lateral
Plan: Surveys

Surveys for offset well
are inclination only surveys.
Radius shows possible displacement



TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
Darthrow 2H Surface	0.00	0.00	0.00	569365.30	596899.50	32° 33' 53.64 N	104° 1' 7.70 W	Point
Darthrow 2H BHL	8441.92	-4517.81	293.24	564847.49	597192.74	32° 33' 8.92 N	104° 1' 4.43 W	Point

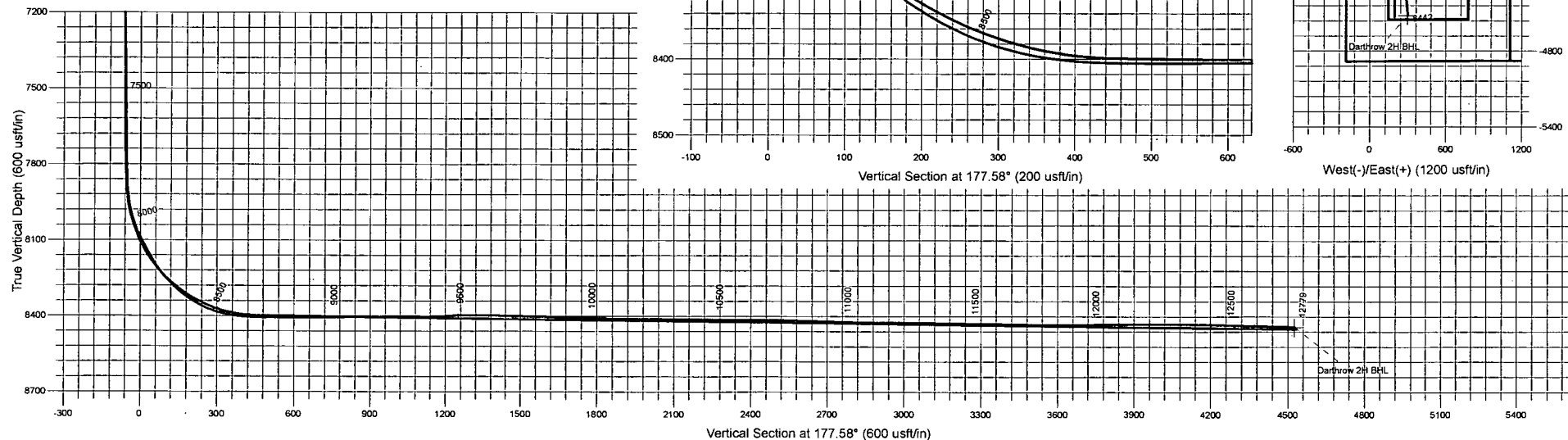
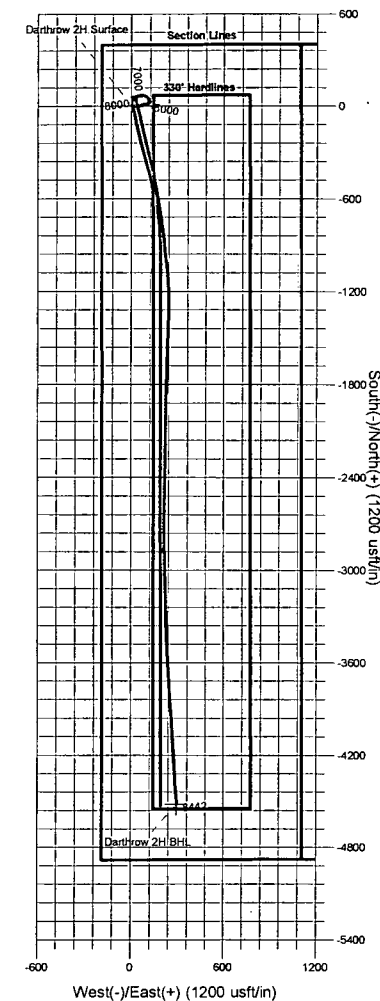
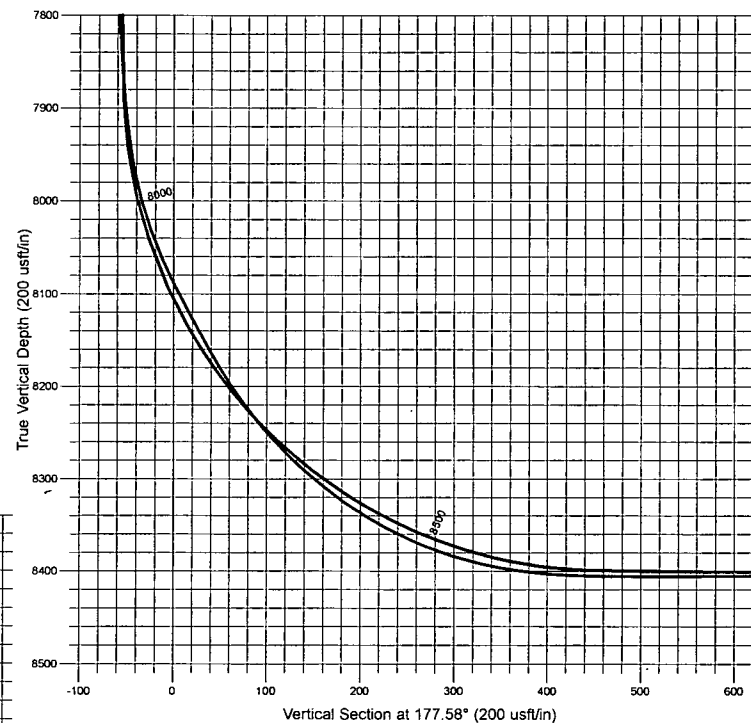


Azimuths to Grid North
True North: -0.17°
Magnetic North: 7.28°

Magnetic Field
Strength: 48470.6snT
Dip Angle: 60.35°
Date: 6/25/2014
Model: IGRF2010

LEGEND

— 2H, Lateral, Plan #4 proj V0
— Surveys



Archer

ARCHER DIRECTIONAL DRILLING SERVICES
12101 Cutten Rd. Houston, Texas 77066
Phone: 281-301-2600 Fax: 281-301-2795

Design: Surveys (2H/Lateral)
Created By: Ivonne Gonzalez
Date: 12:30, July 09 2014