

**McVAY DRILLING COMPANY**

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

30-025-43856

HOBBS OCD

NOV 13 2017

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Well Name and Num: Becknell State Com #4H
Location: Sec 5, T21S, R33E
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>	<u>Degrees @</u>	<u>Depth</u>
0.40	227	1.10	5954	33.20	11365	90.74	19369
0.50	650	1.10	6362	57.84	11539	90.99	19653
0.40	1019	0.80	6710	75.70	11701	88.87	20033
1.00	1380	0.30	7089	89.65	13609	89.25	20413
1.25	1521	0.30	7465	89.80	14084	90.90	20687
1.00	1647	0.40	7655	88.30	14465	89.60	21069
0.20	1847	0.60	8038	92.23	14941	90.69	21445
1.80	2325	1.30	8421	91.84	15226	90.77	21457
2.70	2703	1.20	8804	91.10	15703		
3.30	3080	1.20	9187	85.75	16178		
0.60	3457	0.70	9570	86.62	16654		
0.90	3834	0.30	9953	89.15	17034		
0.40	4212	0.80	10336	89.40	17510		
1.00	4589	0.90	10719	91.00	17985		
0.80	4967	1.80	10911	91.30	18036		
1.00	5345	6.10	11106	90.01	18423		
0.90	5593	13.10	11203	87.21	18990		

By: *Mark A. Brown*Subscribed and sworn to before me this 17th day of August, 2017*Tina Flemens*
Notary Public, Lea County, New Mexico

July 18, 2017

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

Attn: Kanicia Castillo

RE: **Becknell State Com 004H**

Please find enclosed a copy of the survey from 0' to 10,860' 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.

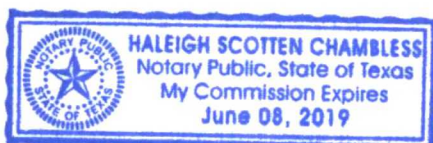
Sincerely,



Keith Havelka
Operations

STATE OF TEXAS §
 §
COUNTY OF NUECES §

This instrument was acknowledged before me on the 18th day of July, A.D., 2017, by Keith Havelka.




Haleigh Chambless
Notary Public, State of Texas

Company: COG OPERATING
Lease/Well: BECKNELL STATE COM/004H



Rig Name: MCVAY 8
State/County: NEW MEXICO/LEA
VS-Azi: 0.00 Degrees
Latitude: 32.50724, Longitude: -103.60163
Grid North = True North -0.39 degs (NAD 27)
Grid Correction Applied = -0.39 degs



Service Company : RKB 26

DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: eline gyro-de_01.ut
Minimum Curvature Method
Report Date/Time: 7/18/2017 / 16:18

VES SURVEY INTERNATIONAL

Midland, Texas
(432) 563-5444

Surveyor: Dustin Byers
Becknell State Com 004H / API: 30-025-43856

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	0.66	199.59	100.00	-0.54	-0.19	-0.54	0.58	199.59	0.66
200.00	0.57	208.64	199.99	-1.53	-0.63	-1.53	1.65	202.31	0.13
300.00	0.54	303.29	299.99	-1.71	-1.26	-1.71	2.12	216.40	0.82
400.00	0.24	237.95	399.99	-1.56	-1.83	-1.56	2.41	229.55	0.49
500.00	0.70	296.32	499.98	-1.40	-2.56	-1.40	2.92	241.28	0.61
600.00	0.15	287.24	599.98	-1.09	-3.24	-1.09	3.42	251.37	0.55
700.00	0.66	354.11	699.98	-0.48	-3.42	-0.48	3.46	262.03	0.62
800.00	0.29	52.17	799.97	0.25	-3.28	0.25	3.29	274.36	0.56
900.00	0.65	359.79	899.97	0.98	-3.08	0.98	3.23	287.59	0.53
1000.00	0.13	273.49	999.97	1.55	-3.19	1.55	3.55	295.93	0.66
1100.00	0.21	352.42	1099.97	1.74	-3.33	1.74	3.75	297.57	0.22
1200.00	0.65	318.90	1199.97	2.34	-3.72	2.34	4.40	302.18	0.49
1300.00	0.60	279.67	1299.96	2.86	-4.62	2.86	5.43	301.77	0.42
1400.00	0.62	305.71	1399.96	3.26	-5.58	3.26	6.46	300.34	0.28
1500.00	0.91	272.03	1499.95	3.61	-6.82	3.61	7.71	297.91	0.52
1600.00	0.65	275.75	1599.94	3.70	-8.18	3.70	8.98	294.31	0.26
1700.00	0.91	296.94	1699.93	4.11	-9.46	4.11	10.31	293.51	0.38
1800.00	0.59	282.17	1799.92	4.58	-10.66	4.58	11.61	293.24	0.37
1900.00	0.31	355.42	1899.92	4.96	-11.19	4.96	12.24	293.89	0.58

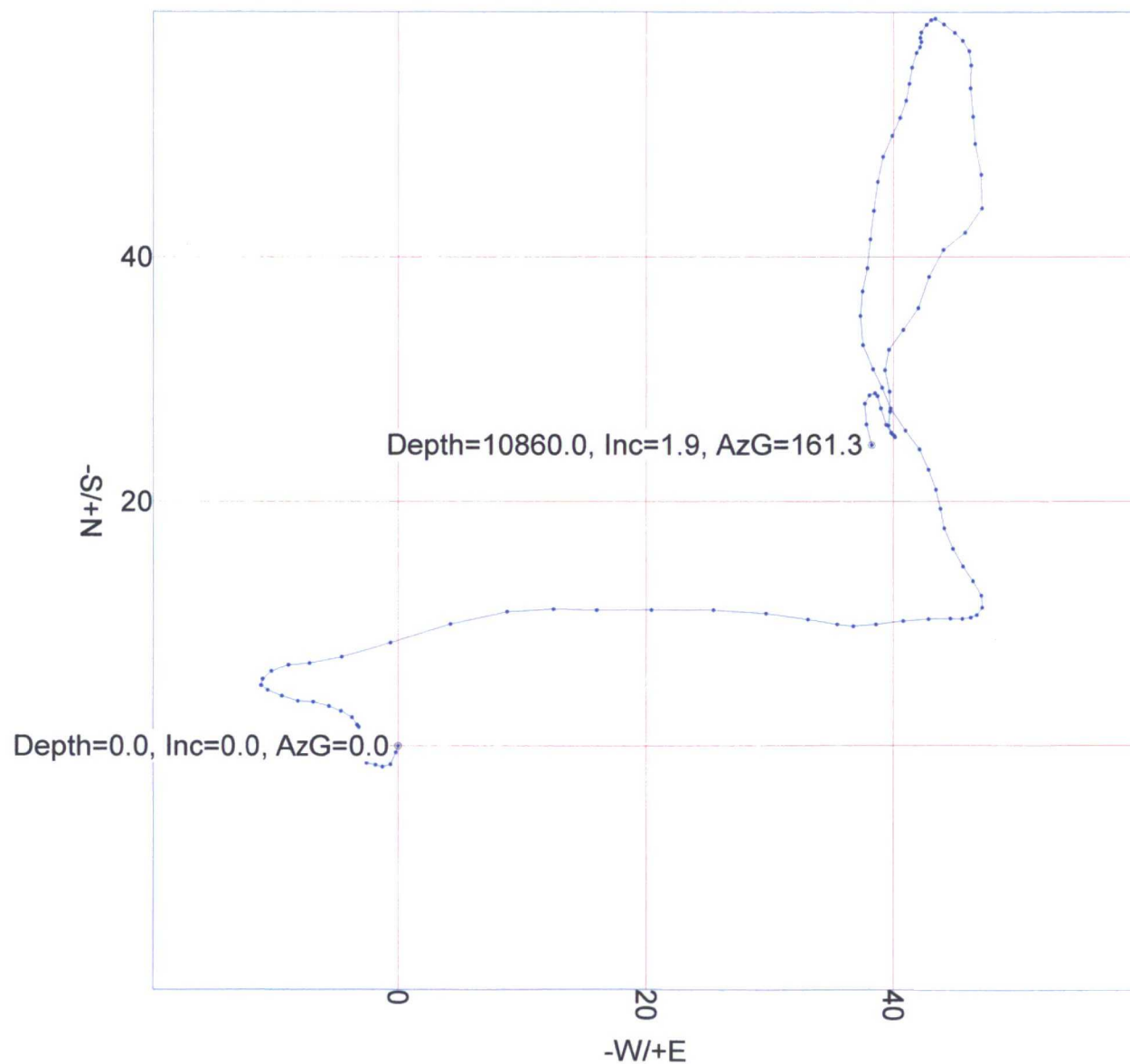
Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
2000.00	0.34	28.94	1999.92	5.48	-11.07	5.48	12.35	296.35	0.19
2100.00	0.80	54.78	2099.91	6.14	-10.35	6.14	12.04	300.68	0.52
2200.00	0.94	83.56	2199.90	6.64	-8.96	6.64	11.15	306.54	0.46
2300.00	1.17	87.08	2299.88	6.78	-7.12	6.78	9.84	313.61	0.23
2400.00	1.86	72.94	2399.85	7.31	-4.55	7.31	8.61	328.12	0.78
2500.00	2.84	74.14	2499.76	8.47	-0.62	8.47	8.49	355.84	0.97
2600.00	2.97	71.14	2599.63	9.98	4.22	9.98	10.83	22.91	0.20
2700.00	2.43	85.27	2699.52	10.99	8.78	10.99	14.07	38.61	0.85
2800.00	1.90	88.87	2799.45	11.20	12.55	11.20	16.82	48.25	0.54
2900.00	2.08	93.20	2899.39	11.13	16.02	11.13	19.50	55.20	0.24
3000.00	2.98	87.77	2999.29	11.13	20.43	11.13	23.26	61.42	0.93
3100.00	2.79	92.28	3099.17	11.13	25.46	11.13	27.79	66.38	0.30
3200.00	2.10	95.84	3199.07	10.85	29.71	10.85	31.63	69.94	0.71
3300.00	1.83	100.84	3299.02	10.36	33.10	10.36	34.69	72.62	0.32
3400.00	0.92	97.65	3398.99	9.96	35.47	9.96	36.84	74.32	0.92
3500.00	0.60	95.70	3498.98	9.80	36.78	9.80	38.06	75.08	0.32
3600.00	1.52	80.70	3598.96	9.96	38.60	9.96	39.87	75.53	0.96
3700.00	1.01	85.49	3698.93	10.25	40.79	10.25	42.06	75.90	0.52
3800.00	1.32	85.88	3798.91	10.40	42.82	10.40	44.07	76.35	0.31
3900.00	0.70	94.34	3898.90	10.44	44.58	10.44	45.79	76.83	0.64
4000.00	0.42	86.47	3998.89	10.41	45.55	10.41	46.73	77.12	0.29
4100.00	0.36	75.09	4098.89	10.52	46.22	10.52	47.40	77.18	0.10
4200.00	0.26	57.79	4198.89	10.72	46.71	10.72	47.93	77.08	0.13
4300.00	0.62	26.77	4298.89	11.32	47.15	11.32	48.49	76.50	0.42
4400.00	0.66	328.20	4398.88	12.30	47.09	12.30	48.67	75.36	0.63
4500.00	0.91	331.38	4498.87	13.49	46.40	13.49	48.33	73.79	0.25
4600.00	0.76	319.55	4598.86	14.69	45.59	14.69	47.90	72.14	0.23
4700.00	1.16	338.18	4698.85	16.13	44.79	16.13	47.61	70.19	0.50
4800.00	0.92	336.19	4798.83	17.81	44.09	17.81	47.55	68.01	0.23
4900.00	0.97	1.81	4898.82	19.40	43.79	19.40	47.89	66.11	0.42
5000.00	0.95	330.69	4998.80	20.97	43.41	20.97	48.21	64.22	0.52
5100.00	1.08	348.96	5098.79	22.61	42.83	22.61	48.43	62.17	0.35
5200.00	1.05	323.82	5198.77	24.27	42.11	24.27	48.60	60.04	0.46
5300.00	1.13	322.78	5298.75	25.79	40.97	25.79	48.41	57.81	0.09
5400.00	1.37	330.56	5398.73	27.62	39.79	27.62	48.43	55.23	0.29
5500.00	0.76	350.47	5498.71	29.32	39.09	29.32	48.86	53.13	0.70
5600.00	1.20	324.31	5598.70	30.82	38.37	30.82	49.22	51.22	0.62
5700.00	1.30	349.09	5698.67	32.79	37.54	32.79	49.84	48.87	0.54
5800.00	1.46	0.11	5798.65	35.17	37.33	35.17	51.29	46.71	0.31
5900.00	0.88	13.09	5898.62	37.19	37.51	37.19	52.82	45.25	0.63
6000.00	1.34	10.55	5998.61	39.08	37.89	39.08	54.44	44.12	0.46

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	Degleg Severity Deg/100
6100.00	1.39	1.50	6098.58	41.44	38.14	41.44	56.32	42.63	0.22
6200.00	1.32	12.31	6198.55	43.78	38.42	43.78	58.24	41.27	0.26
6300.00	1.42	2.79	6298.52	46.14	38.72	46.14	60.23	40.01	0.25
6400.00	1.01	24.48	6398.50	48.17	39.15	48.17	62.07	39.10	0.61
6500.00	1.13	22.30	6498.48	49.89	39.89	49.89	63.87	38.64	0.13
6600.00	0.69	24.22	6598.47	51.35	40.51	51.35	65.41	38.27	0.45
6700.00	1.03	16.08	6698.46	52.76	41.00	52.76	66.82	37.85	0.36
6800.00	0.59	1.68	6798.45	54.13	41.27	54.13	68.07	37.32	0.48
6900.00	0.97	12.90	6898.44	55.47	41.47	55.47	69.26	36.78	0.41
7000.00	0.47	25.25	6998.43	56.66	41.83	56.66	70.43	36.44	0.52
7100.00	0.19	47.26	7098.43	57.15	42.13	57.15	71.00	36.40	0.31
7200.00	0.35	356.89	7198.43	57.56	42.23	57.56	71.39	36.26	0.28
7300.00	0.11	296.98	7298.43	57.92	42.13	57.92	71.62	36.03	0.32
7400.00	0.49	25.17	7398.42	58.35	42.23	58.35	72.03	35.90	0.50
7500.00	0.38	43.52	7498.42	58.98	42.64	58.98	72.78	35.87	0.18
7600.00	0.22	44.66	7598.42	59.35	43.00	59.35	73.30	35.92	0.15
7700.00	0.24	95.51	7698.42	59.47	43.35	59.47	73.60	36.09	0.20
7800.00	0.76	132.77	7798.42	59.00	44.05	59.00	73.63	36.74	0.58
7900.00	0.52	122.27	7898.41	58.31	44.92	58.31	73.61	37.61	0.26
8000.00	0.53	149.13	7998.41	57.67	45.55	57.67	73.49	38.30	0.24
8100.00	0.63	147.64	8098.40	56.81	46.07	56.81	73.15	39.04	0.11
8200.00	0.84	191.34	8198.39	55.63	46.23	55.63	72.33	39.72	0.58
8300.00	1.32	175.03	8298.38	53.77	46.18	53.77	70.88	40.66	0.57
8400.00	1.36	175.27	8398.35	51.44	46.38	51.44	69.26	42.04	0.04
8500.00	1.19	175.69	8498.32	49.23	46.55	49.23	67.76	43.40	0.17
8600.00	1.78	164.42	8598.29	46.71	47.05	46.71	66.29	45.21	0.65
8700.00	1.49	195.71	8698.25	43.96	47.11	43.96	64.44	46.98	0.92
8800.00	1.41	234.34	8798.22	41.99	45.76	41.99	62.11	47.46	0.96
8900.00	1.19	226.93	8898.20	40.56	44.00	40.56	59.85	47.33	0.27
9000.00	1.75	194.61	8998.16	38.38	42.86	38.38	57.53	48.16	0.98
9100.00	1.35	203.68	9098.13	35.82	42.00	35.82	55.20	49.54	0.47
9200.00	1.18	225.51	9198.10	34.03	40.80	34.03	53.12	50.17	0.51
9300.00	1.11	206.15	9298.08	32.43	39.63	32.43	51.21	50.71	0.39
9400.00	0.95	171.96	9398.07	30.75	39.32	30.75	49.91	51.98	0.63
9500.00	1.09	165.05	9498.05	29.01	39.68	29.01	49.15	53.83	0.19
9600.00	0.86	195.52	9598.04	27.36	39.73	27.36	48.24	55.45	0.56
9700.00	0.47	169.47	9698.03	26.23	39.60	26.23	47.50	56.48	0.49
9800.00	0.41	141.31	9798.03	25.54	39.90	25.54	47.37	57.37	0.22
9900.00	0.01	152.00	9898.03	25.26	40.13	25.26	47.41	57.81	0.40
10000.00	0.16	327.45	9998.03	25.36	40.06	25.36	47.41	57.66	0.17
10100.00	0.24	310.76	10098.03	25.62	39.82	25.62	47.35	57.24	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 .
10200.00	0.64	335.38	10198.02	26.27	39.43	26.27	47.38	56.33	0.43
10300.00	0.99	346.72	10298.01	27.62	39.00	27.62	47.78	54.69	0.38
10400.00	0.22	336.43	10398.01	28.63	38.72	28.63	48.16	53.52	0.78
10500.00	0.16	296.67	10498.01	28.87	38.52	28.87	48.13	53.15	0.14
10600.00	0.47	233.47	10598.01	28.69	38.06	28.69	47.66	52.99	0.42
10700.00	0.51	185.01	10698.00	28.00	37.69	28.00	46.95	53.40	0.41
10800.00	1.43	172.01	10797.99	26.31	37.83	26.31	46.08	55.18	0.94
10860.00	1.93	161.30	10857.96	24.61	38.25	24.61	45.49	57.24	0.97



VES SURVEY INTERNATIONAL
Midland, Texas
(432) 563-5444
Surveyor: Dustin Byers
Becknell State Com 004H / API: 30-025-43856



VES Survey Date: 7/10/2017



I Dustin Byers certify that I am employed by VES Survey International. That I did on the day(s) of 07/10/17 through 07/10/17 conduct or supervise the taking of a Rate Gyro survey from a depth of 0.00 feet to a depth of 10,860.00 feet; that the data is true, correct, complete and within the limitations of the tool as set forth by Vaughn Energy Services, that I am authorized and qualified to make this report; that this survey was conducted at the request of COG Operating for the Becknell State Com Well # 4H API # 30-025-43856 in Lea County / Parish New Mexico; and that I have reviewed this report and find that it conforms to the principles and procedures as set forth by VES Survey International.

A handwritten signature in blue ink, appearing to read "Dustin Byers", is written over a horizontal line.

Dustin Byers
Service Technician
VES Survey International



CONCHO

NORTHERN DELAWARE BASIN

LEA COUNTY, NM

ZEUS

BECKNELL STATE COM #4H

OWB

Design: ACTUAL WELLPATH

Survey Report - Geographic

02 November, 2017

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COG Operating LLC
Survey Report - Geographic

Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well BECKNELL STATE COM #4H
Project:	LEA COUNTY, NM	TVD Reference:	RKB=3790.6+26 @ 3816.6usft (MCVAY 8)
Site:	ZEUS	MD Reference:	RKB=3790.6+26 @ 3816.6usft (MCVAY 8)
Well:	BECKNELL STATE COM #4H	North Reference:	Grid
Wellbore:	OWB	Survey Calculation Method:	Minimum Curvature
Design:	ACTUAL WELLPATH	Database:	EDM_Users

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

Site	ZEUS		
Site Position:		Northing:	597,166.40 usft
From:	Map	Easting:	692,087.80 usft
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 38' 24.583 N
		Longitude:	103° 42' 33.536 W
		Grid Convergence:	0.34 °

Well	BECKNELL STATE COM #4H		
Well Position	+N-S	0.0 usft	Northing:
	+E-W	0.0 usft	Easting:
Position Uncertainty	3.0 usft	Wellhead Elevation:	usft
		Latitude:	32° 30' 26.081 N
		Longitude:	103° 36' 5.869 W
		Ground Level:	3,790.6 usft

Wellbore	OWB		
Magnetics	Model Name	Sample Date	Declination
			(°)
	WMM2015	6/8/2017	7.01
			Dip Angle
			(°)
			60.30
			Field Strength
			(nT)
			48,092.10356462

Design	ACTUAL WELLPATH		
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
			(°)
			179.61

Survey Program	Date 7/31/2017		
From	To	Survey (Wellbore)	Tool Name
(usft)	(usft)		
100.0	10,860.0	GYRO (OWB)	VES GyroFlex
11,013.0	21,510.0	MWD 2 - CURVE/LATERAL (OWB)	MWD+IFR1+MS
			Description
			OWSG MWD + IFR1 + Multi-Station Correction

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	549,022.40	725,569.10	32° 30' 26.081 N	103° 36' 5.869 W
100.0	0.66	199.59	100.0	-0.5	-0.2	549,021.86	725,568.90	32° 30' 26.076 N	103° 36' 5.871 W
200.0	0.57	208.64	200.0	-1.5	-0.6	549,020.88	725,568.47	32° 30' 26.066 N	103° 36' 5.876 W
300.0	0.54	303.29	300.0	-1.7	-1.3	549,020.70	725,567.84	32° 30' 26.065 N	103° 36' 5.884 W
400.0	0.24	237.95	400.0	-1.6	-1.8	549,020.85	725,567.27	32° 30' 26.066 N	103° 36' 5.891 W
500.0	0.70	296.32	500.0	-1.4	-2.6	549,021.01	725,566.54	32° 30' 26.068 N	103° 36' 5.899 W
600.0	0.15	287.24	600.0	-1.1	-3.2	549,021.32	725,565.87	32° 30' 26.071 N	103° 36' 5.907 W
700.0	0.66	354.11	700.0	-0.5	-3.4	549,021.93	725,565.69	32° 30' 26.077 N	103° 36' 5.909 W
800.0	0.29	52.17	800.0	0.3	-3.3	549,022.66	725,565.83	32° 30' 26.084 N	103° 36' 5.907 W
900.0	0.65	359.79	900.0	1.0	-3.1	549,023.38	725,566.02	32° 30' 26.091 N	103° 36' 5.905 W
1,000.0	0.13	273.49	1,000.0	1.6	-3.2	549,023.96	725,565.91	32° 30' 26.097 N	103° 36' 5.906 W



COG Operating LLC
Survey Report - Geographic

Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well BECKNELL STATE COM #4H
Project:	LEA COUNTY, NM	TVD Reference:	RKB=3790.6+26 @ 3816.6usft (MCVAY 8)
Site:	ZEUS	MD Reference:	RKB=3790.6+26 @ 3816.6usft (MCVAY 8)
Well:	BECKNELL STATE COM #4H	North Reference:	Grid
Wellbore:	OWB	Survey Calculation Method:	Minimum Curvature
Design:	ACTUAL WELLPATH	Database:	EDM_Users

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	0.21	352.42	1,100.0	1.7	-3.3	549,024.14	725,565.77	32° 30' 26.099 N	103° 36' 5.908 W
1,200.0	0.65	318.90	1,200.0	2.4	-3.7	549,024.75	725,565.37	32° 30' 26.105 N	103° 36' 5.912 W
1,300.0	0.60	279.67	1,300.0	2.9	-4.6	549,025.27	725,564.49	32° 30' 26.110 N	103° 36' 5.923 W
1,400.0	0.62	305.71	1,400.0	3.3	-5.6	549,025.67	725,563.53	32° 30' 26.114 N	103° 36' 5.934 W
1,500.0	0.91	272.03	1,499.9	3.6	-6.8	549,026.02	725,562.30	32° 30' 26.118 N	103° 36' 5.948 W
1,600.0	0.65	275.75	1,599.9	3.7	-8.2	549,026.10	725,560.94	32° 30' 26.119 N	103° 36' 5.964 W
1,700.0	0.91	296.94	1,699.9	4.1	-9.4	549,026.52	725,559.67	32° 30' 26.123 N	103° 36' 5.979 W
1,800.0	0.59	282.17	1,799.9	4.6	-10.6	549,026.99	725,558.46	32° 30' 26.128 N	103° 36' 5.993 W
1,900.0	0.31	355.42	1,899.9	5.0	-11.2	549,027.36	725,557.93	32° 30' 26.131 N	103° 36' 5.999 W
2,000.0	0.34	28.94	1,999.9	5.5	-11.0	549,027.89	725,558.05	32° 30' 26.137 N	103° 36' 5.998 W
2,100.0	0.80	54.78	2,099.9	6.2	-10.3	549,028.56	725,558.77	32° 30' 26.143 N	103° 36' 5.989 W
2,200.0	0.94	83.56	2,199.9	6.6	-8.9	549,029.05	725,560.15	32° 30' 26.148 N	103° 36' 5.973 W
2,300.0	1.17	87.08	2,299.9	6.8	-7.1	549,029.19	725,561.99	32° 30' 26.149 N	103° 36' 5.952 W
2,400.0	1.86	72.94	2,399.8	7.3	-4.5	549,029.72	725,564.56	32° 30' 26.154 N	103° 36' 5.921 W
2,500.0	2.84	74.14	2,499.8	8.5	-0.6	549,030.88	725,568.49	32° 30' 26.165 N	103° 36' 5.875 W
2,600.0	2.97	71.14	2,599.6	10.0	4.2	549,032.39	725,573.33	32° 30' 26.180 N	103° 36' 5.819 W
2,700.0	2.43	85.27	2,699.5	11.0	8.8	549,033.40	725,577.89	32° 30' 26.190 N	103° 36' 5.765 W
2,800.0	1.90	88.87	2,799.5	11.2	12.6	549,033.61	725,581.66	32° 30' 26.191 N	103° 36' 5.721 W
2,900.0	2.08	93.20	2,899.4	11.1	16.0	549,033.54	725,585.13	32° 30' 26.191 N	103° 36' 5.681 W
3,000.0	2.98	87.77	2,999.3	11.1	20.4	549,033.54	725,589.54	32° 30' 26.190 N	103° 36' 5.629 W
3,100.0	2.79	92.28	3,099.2	11.1	25.5	549,033.55	725,594.57	32° 30' 26.190 N	103° 36' 5.571 W
3,200.0	2.10	95.84	3,199.1	10.9	29.7	549,033.26	725,598.82	32° 30' 26.187 N	103° 36' 5.521 W
3,300.0	1.83	100.84	3,299.0	10.4	33.1	549,032.78	725,602.22	32° 30' 26.182 N	103° 36' 5.482 W
3,400.0	0.92	97.65	3,399.0	10.0	35.5	549,032.37	725,604.58	32° 30' 26.178 N	103° 36' 5.454 W
3,500.0	0.60	95.70	3,499.0	9.8	36.8	549,032.21	725,605.90	32° 30' 26.176 N	103° 36' 5.439 W
3,600.0	1.52	80.70	3,599.0	10.0	38.6	549,032.37	725,607.73	32° 30' 26.177 N	103° 36' 5.417 W
3,700.0	1.01	85.49	3,698.9	10.3	40.8	549,032.66	725,609.91	32° 30' 26.180 N	103° 36' 5.392 W
3,800.0	1.32	85.88	3,798.9	10.4	42.8	549,032.81	725,611.94	32° 30' 26.181 N	103° 36' 5.368 W
3,900.0	0.70	94.34	3,898.9	10.4	44.6	549,032.84	725,613.70	32° 30' 26.182 N	103° 36' 5.347 W
4,000.0	0.42	86.47	3,998.9	10.4	45.6	549,032.82	725,614.67	32° 30' 26.181 N	103° 36' 5.336 W
4,100.0	0.36	75.09	4,098.9	10.5	46.2	549,032.92	725,615.34	32° 30' 26.182 N	103° 36' 5.328 W
4,200.0	0.26	57.79	4,198.9	10.7	46.7	549,033.13	725,615.84	32° 30' 26.184 N	103° 36' 5.322 W
4,300.0	0.62	26.77	4,298.9	11.3	47.2	549,033.73	725,616.27	32° 30' 26.190 N	103° 36' 5.317 W
4,400.0	0.66	328.20	4,398.9	12.3	47.1	549,034.70	725,616.21	32° 30' 26.200 N	103° 36' 5.318 W
4,500.0	0.91	331.38	4,498.9	13.5	46.4	549,035.89	725,615.53	32° 30' 26.212 N	103° 36' 5.326 W
4,600.0	0.76	319.55	4,598.9	14.7	45.6	549,037.09	725,614.72	32° 30' 26.224 N	103° 36' 5.335 W
4,700.0	1.16	338.18	4,698.8	16.1	44.8	549,038.54	725,613.91	32° 30' 26.238 N	103° 36' 5.344 W
4,800.0	0.92	336.19	4,798.8	17.8	44.1	549,040.21	725,613.21	32° 30' 26.255 N	103° 36' 5.353 W
4,900.0	0.97	1.81	4,898.8	19.4	43.8	549,041.79	725,612.92	32° 30' 26.270 N	103° 36' 5.356 W
5,000.0	0.95	330.69	4,998.8	21.0	43.4	549,043.36	725,612.54	32° 30' 26.286 N	103° 36' 5.360 W
5,100.0	1.08	348.96	5,098.8	22.6	42.9	549,045.01	725,611.95	32° 30' 26.302 N	103° 36' 5.367 W
5,200.0	1.05	323.82	5,198.8	24.3	42.1	549,046.67	725,611.23	32° 30' 26.319 N	103° 36' 5.375 W
5,300.0	1.13	322.78	5,298.8	25.8	41.0	549,048.20	725,610.09	32° 30' 26.334 N	103° 36' 5.388 W
5,400.0	1.37	330.56	5,398.7	27.6	39.8	549,050.02	725,608.91	32° 30' 26.352 N	103° 36' 5.402 W
5,500.0	0.76	350.47	5,498.7	29.3	39.1	549,051.72	725,608.21	32° 30' 26.369 N	103° 36' 5.410 W
5,600.0	1.20	324.31	5,598.7	30.8	38.4	549,053.22	725,607.49	32° 30' 26.384 N	103° 36' 5.418 W
5,700.0	1.30	349.09	5,698.7	32.8	37.6	549,055.19	725,606.66	32° 30' 26.403 N	103° 36' 5.428 W
5,800.0	1.46	0.11	5,798.6	35.2	37.4	549,057.57	725,606.45	32° 30' 26.427 N	103° 36' 5.430 W
5,900.0	0.88	13.09	5,898.6	37.2	37.5	549,059.60	725,606.63	32° 30' 26.447 N	103° 36' 5.428 W
6,000.0	1.34	10.55	5,998.6	39.1	37.9	549,061.49	725,607.02	32° 30' 26.466 N	103° 36' 5.423 W
6,100.0	1.39	1.50	6,098.6	41.5	38.2	549,063.86	725,607.26	32° 30' 26.489 N	103° 36' 5.420 W
6,200.0	1.32	12.31	6,198.5	43.8	38.4	549,066.19	725,607.54	32° 30' 26.512 N	103° 36' 5.417 W
6,300.0	1.42	2.79	6,298.5	46.2	38.7	549,068.56	725,607.85	32° 30' 26.536 N	103° 36' 5.413 W
6,400.0	1.01	24.48	6,398.5	48.2	39.2	549,070.60	725,608.27	32° 30' 26.556 N	103° 36' 5.408 W
6,500.0	1.13	22.30	6,498.5	49.9	39.9	549,072.31	725,609.01	32° 30' 26.573 N	103° 36' 5.399 W

Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well BECKNELL STATE COM #4H
Project:	LEA COUNTY, NM	TVD Reference:	RKB=3790.6+26 @ 3816.6usft (MCVAY 8)
Site:	ZEUS	MD Reference:	RKB=3790.6+26 @ 3816.6usft (MCVAY 8)
Well:	BECKNELL STATE COM #4H	North Reference:	Grid
Wellbore:	OWB	Survey Calculation Method:	Minimum Curvature
Design:	ACTUAL WELLPATH	Database:	EDM_Users

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	0.69	24.22	6,598.5	51.4	40.5	549,073.77	725,609.63	32° 30' 26.587 N	103° 36' 5.392 W
6,700.0	1.03	16.08	6,698.5	52.8	41.0	549,075.18	725,610.13	32° 30' 26.601 N	103° 36' 5.386 W
6,800.0	0.59	1.68	6,798.4	54.2	41.3	549,076.56	725,610.39	32° 30' 26.615 N	103° 36' 5.383 W
6,900.0	0.97	12.90	6,898.4	55.5	41.5	549,077.90	725,610.60	32° 30' 26.628 N	103° 36' 5.380 W
7,000.0	0.47	25.25	6,998.4	56.7	41.9	549,079.10	725,610.96	32° 30' 26.640 N	103° 36' 5.376 W
7,100.0	0.19	47.26	7,098.4	57.2	42.2	549,079.58	725,611.26	32° 30' 26.644 N	103° 36' 5.372 W
7,200.0	0.35	356.89	7,198.4	57.6	42.3	549,080.00	725,611.36	32° 30' 26.648 N	103° 36' 5.371 W
7,300.0	0.11	296.98	7,298.4	57.9	42.2	549,080.35	725,611.26	32° 30' 26.652 N	103° 36' 5.372 W
7,400.0	0.49	25.17	7,398.4	58.4	42.3	549,080.78	725,611.36	32° 30' 26.656 N	103° 36' 5.371 W
7,500.0	0.38	43.52	7,498.4	59.0	42.7	549,081.41	725,611.77	32° 30' 26.662 N	103° 36' 5.366 W
7,600.0	0.22	44.66	7,598.4	59.4	43.0	549,081.78	725,612.13	32° 30' 26.666 N	103° 36' 5.362 W
7,700.0	0.24	95.51	7,698.4	59.5	43.4	549,081.90	725,612.47	32° 30' 26.667 N	103° 36' 5.358 W
7,800.0	0.76	132.77	7,798.4	59.0	44.1	549,081.43	725,613.17	32° 30' 26.663 N	103° 36' 5.350 W
7,900.0	0.52	122.27	7,898.4	58.3	44.9	549,080.74	725,614.04	32° 30' 26.656 N	103° 36' 5.340 W
8,000.0	0.53	149.13	7,998.4	57.7	45.6	549,080.10	725,614.66	32° 30' 26.649 N	103° 36' 5.332 W
8,100.0	0.63	147.64	8,098.4	56.8	46.1	549,079.24	725,615.19	32° 30' 26.641 N	103° 36' 5.326 W
8,200.0	0.84	191.34	8,198.4	55.7	46.2	549,078.05	725,615.34	32° 30' 26.629 N	103° 36' 5.325 W
8,300.0	1.32	175.03	8,298.4	53.8	46.2	549,076.19	725,615.30	32° 30' 26.610 N	103° 36' 5.325 W
8,400.0	1.36	175.27	8,398.3	51.5	46.4	549,073.86	725,615.49	32° 30' 26.587 N	103° 36' 5.323 W
8,500.0	1.19	175.69	8,498.3	49.2	46.6	549,071.64	725,615.67	32° 30' 26.565 N	103° 36' 5.321 W
8,600.0	1.78	164.42	8,598.3	46.7	47.1	549,069.11	725,616.17	32° 30' 26.540 N	103° 36' 5.316 W
8,700.0	1.49	195.71	8,698.2	44.0	47.1	549,066.36	725,616.23	32° 30' 26.513 N	103° 36' 5.315 W
8,800.0	1.41	234.34	8,798.2	42.0	45.8	549,064.39	725,614.88	32° 30' 26.494 N	103° 36' 5.331 W
8,900.0	1.19	226.93	8,898.2	40.6	44.0	549,062.96	725,613.12	32° 30' 26.480 N	103° 36' 5.352 W
9,000.0	1.75	194.61	8,998.2	38.4	42.9	549,060.78	725,611.98	32° 30' 26.458 N	103° 36' 5.365 W
9,100.0	1.35	203.68	9,098.1	35.8	42.0	549,058.22	725,611.12	32° 30' 26.433 N	103° 36' 5.376 W
9,200.0	1.18	225.51	9,198.1	34.0	40.8	549,056.42	725,609.91	32° 30' 26.415 N	103° 36' 5.390 W
9,300.0	1.11	206.15	9,298.1	32.4	39.7	549,054.83	725,608.75	32° 30' 26.400 N	103° 36' 5.403 W
9,400.0	0.95	171.96	9,398.1	30.7	39.3	549,053.14	725,608.44	32° 30' 26.383 N	103° 36' 5.407 W
9,500.0	1.09	165.05	9,498.1	29.0	39.7	549,051.40	725,608.80	32° 30' 26.366 N	103° 36' 5.403 W
9,600.0	0.86	195.52	9,598.0	27.4	39.7	549,049.76	725,608.84	32° 30' 26.349 N	103° 36' 5.403 W
9,700.0	0.47	169.47	9,698.0	26.2	39.6	549,048.63	725,608.72	32° 30' 26.338 N	103° 36' 5.404 W
9,800.0	0.41	141.31	9,798.0	25.5	39.9	549,047.95	725,609.02	32° 30' 26.332 N	103° 36' 5.401 W
9,900.0	0.01	152.00	9,898.0	25.3	40.1	549,047.66	725,609.24	32° 30' 26.329 N	103° 36' 5.398 W
10,000.0	0.16	327.45	9,998.0	25.4	40.1	549,047.77	725,609.17	32° 30' 26.330 N	103° 36' 5.399 W
10,100.0	0.24	310.76	10,098.0	25.6	39.8	549,048.03	725,608.94	32° 30' 26.332 N	103° 36' 5.402 W
10,200.0	0.64	335.38	10,198.0	26.3	39.5	549,048.67	725,608.55	32° 30' 26.339 N	103° 36' 5.406 W
10,300.0	0.99	346.72	10,298.0	27.6	39.0	549,050.02	725,608.12	32° 30' 26.352 N	103° 36' 5.411 W
10,400.0	0.22	336.43	10,398.0	28.6	38.7	549,051.04	725,607.84	32° 30' 26.362 N	103° 36' 5.414 W
10,500.0	0.16	296.67	10,498.0	28.9	38.5	549,051.27	725,607.64	32° 30' 26.365 N	103° 36' 5.417 W
10,600.0	0.47	233.47	10,598.0	28.7	38.1	549,051.09	725,607.19	32° 30' 26.363 N	103° 36' 5.422 W
10,700.0	0.51	185.01	10,698.0	28.0	37.7	549,050.41	725,606.82	32° 30' 26.356 N	103° 36' 5.426 W
10,800.0	1.43	172.01	10,798.0	26.3	37.9	549,048.73	725,606.95	32° 30' 26.339 N	103° 36' 5.425 W
10,860.0	1.93	161.30	10,858.0	24.6	38.3	549,047.03	725,607.38	32° 30' 26.323 N	103° 36' 5.420 W
11,013.0	2.03	165.44	11,010.9	19.6	39.8	549,041.96	725,608.89	32° 30' 26.272 N	103° 36' 5.403 W
11,060.0	6.06	172.59	11,057.7	16.3	40.3	549,038.70	725,609.42	32° 30' 26.240 N	103° 36' 5.397 W
11,107.0	9.91	175.46	11,104.3	9.8	41.0	549,032.20	725,610.06	32° 30' 26.176 N	103° 36' 5.390 W
11,145.0	11.09	181.64	11,141.6	2.9	41.1	549,025.29	725,610.21	32° 30' 26.107 N	103° 36' 5.389 W
11,203.0	13.10	187.21	11,198.4	-9.2	40.1	549,013.19	725,609.23	32° 30' 25.988 N	103° 36' 5.401 W
11,267.0	20.73	187.91	11,259.5	-27.7	37.7	548,994.75	725,606.75	32° 30' 25.805 N	103° 36' 5.432 W
11,301.0	24.80	186.33	11,290.9	-40.7	36.0	548,981.70	725,605.14	32° 30' 25.676 N	103° 36' 5.451 W
11,365.0	33.26	188.22	11,346.8	-71.5	32.0	548,950.93	725,601.14	32° 30' 25.372 N	103° 36' 5.501 W
11,397.0	37.97	187.41	11,372.8	-89.9	29.5	548,932.47	725,598.62	32° 30' 25.190 N	103° 36' 5.532 W
11,443.0	44.20	186.06	11,407.5	-119.9	26.0	548,902.46	725,595.10	32° 30' 24.893 N	103° 36' 5.575 W
11,458.6	46.48	184.77	11,418.4	-131.0	25.0	548,891.41	725,594.05	32° 30' 24.784 N	103° 36' 5.588 W



COG Operating LLC
Survey Report - Geographic

Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well BECKNELL STATE COM #4H
Project:	LEA COUNTY, NM	TVD Reference:	RKB=3790.6+26 @ 3816.6usft (MCVAY 8)
Site:	ZEUS	MD Reference:	RKB=3790.6+26 @ 3816.6usft (MCVAY 8)
Well:	BECKNELL STATE COM #4H	North Reference:	Grid
Wellbore:	OWB	Survey Calculation Method:	Minimum Curvature
Design:	ACTUAL WELLPATH	Database:	EDM_Users

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
11,492.0	51.41	182.32	11,440.4	-156.1	23.4	548,866.29	725,592.51	32° 30' 24.535 N	103° 36' 5.608 W	
11,539.0	57.84	180.10	11,467.6	-194.4	22.6	548,828.00	725,591.73	32° 30' 24.156 N	103° 36' 5.620 W	
11,587.0	62.40	181.45	11,491.5	-236.0	22.1	548,786.40	725,591.16	32° 30' 23.745 N	103° 36' 5.630 W	
11,634.0	68.40	182.02	11,511.0	-278.7	20.8	548,743.70	725,589.86	32° 30' 23.322 N	103° 36' 5.649 W	
11,682.0	74.63	181.26	11,526.2	-324.2	19.5	548,698.22	725,588.57	32° 30' 22.872 N	103° 36' 5.668 W	
11,701.0	75.66	180.19	11,531.1	-342.5	19.2	548,679.86	725,588.33	32° 30' 22.691 N	103° 36' 5.672 W	
11,797.0	82.43	179.27	11,549.3	-436.7	19.7	548,585.66	725,588.79	32° 30' 21.759 N	103° 36' 5.674 W	
11,893.0	88.25	180.05	11,557.1	-532.4	20.3	548,490.02	725,589.35	32° 30' 20.812 N	103° 36' 5.675 W	
11,988.0	88.64	179.51	11,559.7	-627.3	20.6	548,395.06	725,589.72	32° 30' 19.872 N	103° 36' 5.679 W	
12,084.0	88.39	180.36	11,562.2	-723.3	20.7	548,299.09	725,589.82	32° 30' 18.923 N	103° 36' 5.685 W	
12,180.0	89.03	179.95	11,564.4	-819.3	20.5	548,203.12	725,589.57	32° 30' 17.973 N	103° 36' 5.696 W	
12,275.0	88.73	180.83	11,566.2	-914.3	19.8	548,108.14	725,588.92	32° 30' 17.033 N	103° 36' 5.711 W	
12,371.0	88.67	181.28	11,568.4	-1,010.2	18.1	548,012.18	725,587.15	32° 30' 16.084 N	103° 36' 5.739 W	
12,467.0	88.92	182.48	11,570.4	-1,106.1	14.9	547,916.26	725,584.00	32° 30' 15.135 N	103° 36' 5.784 W	
12,562.0	88.67	180.74	11,572.4	-1,201.1	12.2	547,821.32	725,581.33	32° 30' 14.196 N	103° 36' 5.822 W	
12,657.0	87.97	179.36	11,575.2	-1,296.0	12.2	547,726.36	725,581.25	32° 30' 13.256 N	103° 36' 5.831 W	
12,752.0	87.97	179.05	11,578.6	-1,391.0	13.5	547,631.43	725,582.57	32° 30' 12.317 N	103° 36' 5.823 W	
12,847.0	87.63	179.29	11,582.2	-1,485.9	14.8	547,536.51	725,583.94	32° 30' 11.377 N	103° 36' 5.815 W	
12,942.0	89.68	180.05	11,584.4	-1,580.9	15.4	547,441.54	725,584.49	32° 30' 10.438 N	103° 36' 5.816 W	
13,038.0	90.27	180.19	11,584.5	-1,676.9	15.2	547,345.55	725,584.29	32° 30' 9.488 N	103° 36' 5.826 W	
13,133.0	90.32	180.33	11,584.0	-1,771.9	14.8	547,250.55	725,583.86	32° 30' 8.548 N	103° 36' 5.839 W	
13,228.0	90.27	180.20	11,583.5	-1,866.9	14.3	547,155.55	725,583.42	32° 30' 7.608 N	103° 36' 5.851 W	
13,323.0	90.57	180.24	11,582.8	-1,961.8	14.0	547,060.55	725,583.05	32° 30' 6.668 N	103° 36' 5.863 W	
13,418.0	90.57	180.10	11,581.9	-2,056.8	13.7	546,965.56	725,582.77	32° 30' 5.728 N	103° 36' 5.874 W	
13,514.0	90.32	179.85	11,581.1	-2,152.8	13.7	546,869.56	725,582.81	32° 30' 4.778 N	103° 36' 5.881 W	
13,609.0	89.65	179.32	11,581.1	-2,247.8	14.4	546,774.57	725,583.50	32° 30' 3.838 N	103° 36' 5.881 W	
13,704.0	90.66	179.13	11,580.9	-2,342.8	15.7	546,679.58	725,584.79	32° 30' 2.898 N	103° 36' 5.874 W	
13,799.0	90.27	178.71	11,580.1	-2,437.8	17.5	546,584.60	725,586.58	32° 30' 1.958 N	103° 36' 5.860 W	
13,894.0	90.27	179.04	11,579.7	-2,532.8	19.3	546,489.62	725,588.44	32° 30' 1.018 N	103° 36' 5.846 W	
13,989.0	89.85	178.70	11,579.6	-2,627.8	21.2	546,394.63	725,590.32	32° 30' 0.078 N	103° 36' 5.832 W	
14,084.0	89.87	178.57	11,579.8	-2,722.7	23.5	546,299.66	725,592.58	32° 29' 59.138 N	103° 36' 5.813 W	
14,180.0	89.51	178.51	11,580.3	-2,818.7	25.9	546,203.69	725,595.03	32° 29' 58.188 N	103° 36' 5.792 W	
14,275.0	89.34	177.96	11,581.3	-2,913.7	28.9	546,108.74	725,597.95	32° 29' 57.248 N	103° 36' 5.766 W	
14,370.0	89.15	177.92	11,582.5	-3,008.6	32.3	546,013.81	725,601.37	32° 29' 56.309 N	103° 36' 5.733 W	
14,465.0	88.36	180.09	11,584.6	-3,103.5	33.9	545,918.86	725,603.02	32° 29' 55.369 N	103° 36' 5.722 W	
14,560.0	88.42	180.51	11,587.2	-3,198.5	33.4	545,823.90	725,602.52	32° 29' 54.430 N	103° 36' 5.735 W	
14,656.0	89.65	180.28	11,588.9	-3,294.5	32.8	545,727.91	725,601.86	32° 29' 53.480 N	103° 36' 5.751 W	
14,751.0	91.44	179.20	11,588.0	-3,389.5	33.2	545,632.92	725,602.29	32° 29' 52.540 N	103° 36' 5.753 W	
14,846.0	91.33	179.25	11,585.7	-3,484.4	34.5	545,537.96	725,603.57	32° 29' 51.600 N	103° 36' 5.746 W	
14,941.0	92.23	178.53	11,582.7	-3,579.4	36.3	545,443.03	725,605.41	32° 29' 50.661 N	103° 36' 5.732 W	
15,036.0	91.02	176.43	11,580.0	-3,674.2	40.5	545,348.16	725,609.59	32° 29' 49.722 N	103° 36' 5.691 W	
15,131.0	91.95	179.78	11,577.6	-3,769.1	43.6	545,253.26	725,612.73	32° 29' 48.782 N	103° 36' 5.662 W	
15,226.0	91.84	179.71	11,574.4	-3,864.1	44.1	545,158.31	725,613.15	32° 29' 47.843 N	103° 36' 5.664 W	
15,321.0	91.58	179.58	11,571.6	-3,959.0	44.6	545,063.36	725,613.74	32° 29' 46.903 N	103° 36' 5.665 W	
15,416.0	91.64	179.20	11,568.9	-4,054.0	45.7	544,968.40	725,614.75	32° 29' 45.963 N	103° 36' 5.661 W	
15,511.0	91.92	178.52	11,566.0	-4,148.9	47.5	544,873.47	725,616.64	32° 29' 45.024 N	103° 36' 5.646 W	
15,608.0	91.53	178.84	11,563.0	-4,245.9	49.8	544,776.54	725,618.87	32° 29' 44.065 N	103° 36' 5.628 W	
15,703.0	91.13	179.22	11,560.8	-4,340.8	51.4	544,681.58	725,620.48	32° 29' 43.125 N	103° 36' 5.617 W	
15,798.0	88.33	180.27	11,561.3	-4,435.8	51.8	544,586.59	725,620.90	32° 29' 42.185 N	103° 36' 5.620 W	
15,892.0	85.64	181.33	11,566.2	-4,529.7	50.5	544,492.74	725,619.59	32° 29' 41.256 N	103° 36' 5.642 W	
15,988.0	85.39	181.79	11,573.7	-4,625.3	47.9	544,397.07	725,616.99	32° 29' 40.310 N	103° 36' 5.681 W	
16,083.0	85.84	182.33	11,581.0	-4,720.0	44.5	544,302.41	725,613.58	32° 29' 39.373 N	103° 36' 5.728 W	
16,178.0	85.75	182.99	11,588.0	-4,814.6	40.1	544,207.77	725,609.19	32° 29' 38.437 N	103° 36' 5.787 W	
16,272.0	85.39	181.45	11,595.2	-4,908.3	36.5	544,114.12	725,605.56	32° 29' 37.511 N	103° 36' 5.837 W	
16,368.0	84.77	181.05	11,603.5	-5,003.9	34.4	544,018.50	725,603.47	32° 29' 36.565 N	103° 36' 5.869 W	

Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well BECKNELL STATE COM #4H
Project:	LEA COUNTY, NM	TVD Reference:	RKB=3790.6+26 @ 3816.6usft (MCVAY 8)
Site:	ZEUS	MD Reference:	RKB=3790.6+26 @ 3816.6usft (MCVAY 8)
Well:	BECKNELL STATE COM #4H	North Reference:	Grid
Wellbore:	OWB	Survey Calculation Method:	Minimum Curvature
Design:	ACTUAL WELLPATH	Database:	EDM_Users

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
16,463.0	85.19	181.23	11,611.8	-5,098.5	32.5	543,923.88	725,601.59	32° 29' 35.629 N	103° 36' 5.898 W
16,558.0	85.78	179.78	11,619.3	-5,193.2	31.7	543,829.18	725,600.75	32° 29' 34.692 N	103° 36' 5.916 W
16,654.0	86.62	179.39	11,625.6	-5,289.0	32.3	543,733.40	725,601.45	32° 29' 33.744 N	103° 36' 5.915 W
16,749.0	87.27	179.92	11,630.7	-5,383.9	32.9	543,638.54	725,602.02	32° 29' 32.805 N	103° 36' 5.916 W
16,844.0	88.00	180.05	11,634.6	-5,478.8	32.9	543,543.62	725,602.04	32° 29' 31.866 N	103° 36' 5.923 W
16,939.0	88.81	178.41	11,637.2	-5,573.7	34.2	543,448.67	725,603.32	32° 29' 30.926 N	103° 36' 5.916 W
17,034.0	89.15	178.59	11,638.9	-5,668.7	36.7	543,353.71	725,605.80	32° 29' 29.987 N	103° 36' 5.895 W
17,129.0	89.82	179.04	11,639.8	-5,763.7	38.7	543,258.74	725,607.77	32° 29' 29.047 N	103° 36' 5.879 W
17,224.0	90.57	179.61	11,639.5	-5,858.7	39.8	543,163.75	725,608.89	32° 29' 28.107 N	103° 36' 5.874 W
17,320.0	88.87	179.91	11,639.9	-5,954.6	40.2	543,067.75	725,609.29	32° 29' 27.157 N	103° 36' 5.877 W
17,415.0	88.67	180.90	11,642.0	-6,049.6	39.5	542,972.78	725,608.62	32° 29' 26.217 N	103° 36' 5.892 W
17,510.0	89.40	181.76	11,643.6	-6,144.6	37.3	542,877.82	725,606.41	32° 29' 25.277 N	103° 36' 5.926 W
17,605.0	88.42	180.61	11,645.4	-6,239.5	35.4	542,782.86	725,604.45	32° 29' 24.338 N	103° 36' 5.956 W
17,700.0	88.56	181.02	11,647.9	-6,334.5	34.0	542,687.90	725,603.10	32° 29' 23.398 N	103° 36' 5.980 W
17,795.0	89.76	180.22	11,649.3	-6,429.5	33.0	542,592.92	725,602.07	32° 29' 22.459 N	103° 36' 5.999 W
17,890.0	90.27	178.75	11,649.3	-6,524.5	33.8	542,497.93	725,602.92	32° 29' 21.519 N	103° 36' 5.997 W
17,985.0	91.00	178.24	11,648.2	-6,619.4	36.3	542,402.97	725,605.42	32° 29' 20.579 N	103° 36' 5.975 W
18,044.0	91.33	178.05	11,647.0	-6,678.4	38.2	542,344.01	725,607.33	32° 29' 19.995 N	103° 36' 5.958 W
18,139.0	87.97	177.92	11,647.6	-6,773.3	41.6	542,249.08	725,610.67	32° 29' 19.056 N	103° 36' 5.926 W
18,233.0	88.36	177.66	11,650.6	-6,867.2	45.2	542,155.20	725,614.29	32° 29' 18.126 N	103° 36' 5.892 W
18,328.0	89.20	177.96	11,652.6	-6,962.1	48.8	542,060.29	725,617.92	32° 29' 17.187 N	103° 36' 5.857 W
18,423.0	90.01	178.34	11,653.3	-7,057.1	51.9	541,965.35	725,620.99	32° 29' 16.247 N	103° 36' 5.829 W
18,517.0	88.89	178.58	11,654.2	-7,151.0	54.4	541,871.39	725,623.51	32° 29' 15.317 N	103° 36' 5.807 W
18,612.0	89.17	178.98	11,655.8	-7,246.0	56.4	541,776.42	725,625.54	32° 29' 14.378 N	103° 36' 5.791 W
18,706.0	87.69	178.75	11,658.4	-7,339.9	58.3	541,682.48	725,627.40	32° 29' 13.448 N	103° 36' 5.776 W
18,801.0	88.19	178.57	11,661.8	-7,434.8	60.5	541,587.57	725,629.62	32° 29' 12.509 N	103° 36' 5.758 W
18,895.0	89.01	178.58	11,664.1	-7,528.8	62.9	541,493.62	725,631.95	32° 29' 11.579 N	103° 36' 5.738 W
18,990.0	87.21	178.66	11,667.2	-7,623.7	65.1	541,398.71	725,634.24	32° 29' 10.639 N	103° 36' 5.719 W
19,084.0	87.91	178.47	11,671.2	-7,717.6	67.5	541,304.82	725,636.59	32° 29' 9.710 N	103° 36' 5.699 W
19,179.0	88.78	178.23	11,673.9	-7,812.5	70.2	541,209.90	725,639.33	32° 29' 8.771 N	103° 36' 5.675 W
19,274.0	89.62	178.30	11,675.3	-7,907.4	73.1	541,114.96	725,642.20	32° 29' 7.831 N	103° 36' 5.649 W
19,369.0	90.74	178.04	11,675.0	-8,002.4	76.1	541,020.01	725,645.24	32° 29' 6.891 N	103° 36' 5.621 W
19,464.0	91.56	177.94	11,673.1	-8,097.3	79.5	540,925.09	725,648.57	32° 29' 5.952 N	103° 36' 5.590 W
19,558.0	90.60	178.58	11,671.3	-8,191.3	82.3	540,831.15	725,651.42	32° 29' 5.022 N	103° 36' 5.564 W
19,653.0	90.99	178.53	11,670.0	-8,286.2	84.7	540,736.19	725,653.82	32° 29' 4.082 N	103° 36' 5.544 W
19,748.0	89.99	179.92	11,669.2	-8,381.2	86.0	540,641.20	725,655.10	32° 29' 3.142 N	103° 36' 5.536 W
19,843.0	89.59	180.29	11,669.5	-8,476.2	85.8	540,546.20	725,654.93	32° 29' 2.202 N	103° 36' 5.546 W
19,937.0	88.33	181.35	11,671.2	-8,570.2	84.5	540,452.23	725,653.58	32° 29' 1.273 N	103° 36' 5.569 W
20,033.0	88.87	181.67	11,673.6	-8,666.1	82.0	540,356.29	725,651.05	32° 29' 0.323 N	103° 36' 5.606 W
20,128.0	89.68	181.91	11,674.8	-8,761.1	79.0	540,261.35	725,648.09	32° 28' 59.384 N	103° 36' 5.649 W
20,223.0	88.05	180.31	11,676.6	-8,856.0	77.2	540,166.39	725,646.25	32° 28' 58.445 N	103° 36' 5.678 W
20,317.0	88.33	179.87	11,679.6	-8,950.0	77.0	540,072.44	725,646.10	32° 28' 57.515 N	103° 36' 5.687 W
20,413.0	89.26	179.88	11,681.6	-9,045.9	77.2	539,976.46	725,646.31	32° 28' 56.565 N	103° 36' 5.692 W
20,497.0	89.93	180.09	11,682.2	-9,129.9	77.2	539,892.46	725,646.33	32° 28' 55.734 N	103° 36' 5.699 W
20,592.0	90.55	180.22	11,681.8	-9,224.9	77.0	539,797.47	725,646.07	32° 28' 54.794 N	103° 36' 5.709 W
20,687.0	90.91	180.25	11,680.6	-9,319.9	76.6	539,702.47	725,645.68	32° 28' 53.854 N	103° 36' 5.721 W
20,782.0	88.59	179.92	11,681.0	-9,414.9	76.4	539,607.48	725,645.54	32° 28' 52.914 N	103° 36' 5.731 W
20,877.0	89.12	180.15	11,682.9	-9,509.9	76.4	539,512.50	725,645.49	32° 28' 51.974 N	103° 36' 5.739 W
20,972.0	89.31	180.37	11,684.2	-9,604.9	76.0	539,417.51	725,645.05	32° 28' 51.034 N	103° 36' 5.752 W
21,067.0	89.57	180.58	11,685.2	-9,699.9	75.2	539,322.52	725,644.27	32° 28' 50.095 N	103° 36' 5.768 W
21,162.0	89.87	180.84	11,685.6	-9,794.9	74.0	539,227.53	725,643.09	32° 28' 49.155 N	103° 36' 5.790 W
21,256.0	90.27	180.98	11,685.5	-9,888.9	72.5	539,133.54	725,641.60	32° 28' 48.225 N	103° 36' 5.815 W
21,350.0	90.57	180.89	11,684.8	-9,982.8	71.0	539,039.56	725,640.06	32° 28' 47.295 N	103° 36' 5.840 W
21,391.6	90.62	180.93	11,684.4	-10,024.5	70.3	538,997.92	725,639.40	32° 28' 46.883 N	103° 36' 5.851 W
21,445.0	90.69	180.99	11,683.8	-10,077.8	69.4	538,944.57	725,638.50	32° 28' 46.355 N	103° 36' 5.866 W



COG Operating LLC
Survey Report - Geographic

Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well BECKNELL STATE COM #4H
Project:	LEA COUNTY, NM	TVD Reference:	RKB=3790.6+26 @ 3816.6usft (MCVAY 8)
Site:	ZEUS	MD Reference:	RKB=3790.6+26 @ 3816.6usft (MCVAY 8)
Well:	BECKNELL STATE COM #4H	North Reference:	Grid
Wellbore:	OWB	Survey Calculation Method:	Minimum Curvature
Design:	ACTUAL WELLPATH	Database:	EDM_Users

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
21,457.0	90.77	180.94	11,683.6	-10,089.8	69.2	538,932.58	725,638.30	32° 28' 46.236 N	103° 36' 5.869 W
21,510.0	90.77	180.94	11,682.9	-10,142.8	68.3	538,879.59	725,637.43	32° 28' 45.712 N	103° 36' 5.884 W

Checked By: _____	Approved By: _____	Date: _____
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