



NM OIL CONSERVATION
ARTESIA DISTRICT

JUN 15 2015

RECEIVED

April 22, 2015

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

Attn: Kanicia Castillo

RE: **Dodd Federal Unit 913H**

Please find enclosed a copy of the survey from 0' to 4208' ran on the above referenced well.

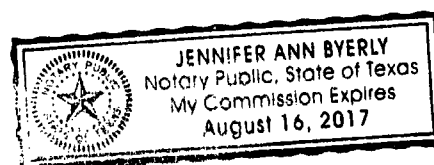
Sincerely,

Keith Havelka
Operations

STATE OF TEXAS §
 §
COUNTY OF NUECES §

This instrument was acknowledged before me on the 22 day of April,
A.D., 2015, by Keith Havelka.


Jennifer Ann Byerly
Notary Public, State of Texas





Company: COG Operating
Lease/Well: Dodd Federal Unit/913H
Location: S11 T17S R29E
Rig Name: United 43
State/County: New Mexico/Eddy
Latitude: 32.85, Longitude: -104.05
GRID North is 0.15 Degrees East of True North
VS-Azi: 89.86 Degrees



Depth Reference : RKB = 12.5 Feet

DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: gyro survey.ut
Minimum Curvature Method
Report Date/Time: 4/22/2015 / 09:45

VES Survey International
Midland, TX
432-563-5444

Surveyor: Andrew Askew
Dodd Federal Unit 913H / API 30-015-42722

NM OIL CONSERVATION

ARTESIA DISTRICT

JUN 15 2015

RECEIVED

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	****
100.00	0.35	315.61	100.00	0.22	-0.21	-0.21	0.30	315.61	0.35
200.00	0.51	308.65	200.00	0.71	-0.77	-0.77	1.05	312.66	0.17
300.00	0.98	282.56	299.99	1.18	-1.96	-1.96	2.29	301.04	0.57
400.00	1.79	257.58	399.96	1.03	-4.32	-4.32	4.44	283.40	0.99
500.00	1.26	269.34	499.92	0.68	-6.95	-6.95	6.98	275.59	0.61
600.00	0.53	297.48	599.91	0.88	-8.47	-8.46	8.51	275.95	0.83
700.00	0.59	330.99	699.91	1.55	-9.13	-9.12	9.26	279.63	0.33
800.00	0.53	33.49	799.90	2.39	-9.12	-9.12	9.43	284.66	0.58
900.00	0.56	8.49	899.90	3.25	-8.80	-8.79	9.38	290.30	0.24
1000.00	0.72	40.24	999.89	4.22	-8.32	-8.31	9.33	296.88	0.38
1100.00	0.65	17.11	1099.88	5.24	-7.74	-7.73	9.35	304.09	0.28
1200.00	0.39	28.54	1199.88	6.09	-7.41	-7.40	9.59	309.38	0.28
1300.00	0.19	46.42	1299.88	6.50	-7.13	-7.11	9.65	312.38	0.21
1400.00	0.34	10.10	1399.88	6.91	-6.95	-6.94	9.80	314.82	0.21
1500.00	0.20	11.73	1499.88	7.37	-6.87	-6.85	10.07	317.04	0.14
1600.00	0.21	357.09	1599.88	7.72	-6.84	-6.82	10.32	318.48	0.05
1700.00	0.14	355.96	1699.88	8.02	-6.86	-6.84	10.55	319.48	0.07
1800.00	0.14	20.76	1799.88	8.26	-6.82	-6.80	10.71	320.44	0.06

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
1900.00	0.23	35.20	1899.88	8.53	-6.66	-6.64	10.83	322.02	0.10
2000.00	0.17	39.23	1999.87	8.81	-6.45	-6.43	10.92	323.78	0.06
2100.00	0.22	66.94	2099.87	9.00	-6.18	-6.16	10.92	325.55	0.11
2200.00	0.42	332.20	2199.87	9.41	-6.17	-6.15	11.25	326.74	0.49
2300.00	0.33	57.54	2299.87	9.88	-6.10	-6.07	11.61	328.33	0.51
2400.00	0.11	346.12	2399.87	10.13	-5.88	-5.86	11.71	329.87	0.31
2500.00	0.09	355.59	2499.87	10.31	-5.91	-5.88	11.88	330.17	0.02
2600.00	0.26	347.93	2599.87	10.61	-5.96	-5.94	12.18	330.67	0.17
2700.00	0.19	327.86	2699.87	10.98	-6.10	-6.07	12.56	330.95	0.11
2800.00	0.03	224.42	2799.87	11.10	-6.20	-6.18	12.71	330.79	0.20
2900.00	0.34	311.59	2899.87	11.27	-6.45	-6.42	12.99	330.24	0.34
3000.00	0.12	68.18	2999.87	11.51	-6.57	-6.54	13.25	330.29	0.41
3100.00	0.17	310.57	3099.87	11.65	-6.58	-6.55	13.38	330.53	0.25
3200.00	0.11	350.55	3199.87	11.84	-6.71	-6.68	13.61	330.45	0.11
3300.00	0.66	20.65	3299.86	12.47	-6.52	-6.49	14.07	332.39	0.57
3400.00	0.76	18.33	3399.86	13.64	-6.11	-6.07	14.95	335.88	0.10
3500.00	0.50	118.53	3499.85	14.07	-5.52	-5.48	15.11	338.59	0.98
3600.00	0.35	127.17	3599.85	13.67	-4.89	-4.85	14.52	340.33	0.16
3700.00	0.58	300.53	3699.85	13.75	-5.08	-5.05	14.65	339.72	0.94
3800.00	0.39	342.57	3799.85	14.33	-5.62	-5.59	15.40	338.58	0.39
3900.00	0.19	137.59	3899.85	14.54	-5.61	-5.58	15.58	338.89	0.57
4000.00	0.13	112.45	3999.84	14.37	-5.40	-5.36	15.35	339.42	0.09
4100.00	0.06	219.71	4099.84	14.29	-5.32	-5.29	15.25	339.56	0.16
4208.00	0.31	301.24	4207.84	14.39	-5.61	-5.57	15.45	338.71	0.28

JUN 15 2015

1 of 2

WELL NAME AND NUMBER Dodd Federal Unit No. 913H
LOCATION Section 11, T17S, R29E, Unit L, 1510 FSL, 70 FWL, Eddy County
OPERATOR COG Operating LLC
DRILLING CONTRACTOR United Drilling, Inc.

RECEIVED

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

Degrees @ Depth	Degrees @ Depth	Degrees @ Depth
.5° @ 333'	14.3° @ 4472'	72.4° @ 5039'
2.0° @ 500'	18.7° @ 4504'	76.7° @ 5070'
.9° @ 748'	23.1° @ 4535'	80.2° @ 5102'
.6° @ 1021'	26.6° @ 4567'	83.2° @ 5133'
.5° @ 1266'	29.1° @ 4598'	86.9° @ 5165'
.3° @ 1581'	31.6° @ 4630'	88.5° @ 5196'
.4° @ 1925'	34.2° @ 4661'	89.3° @ 5286'
.1° @ 2334'	37.3° @ 4693'	88.9° @ 5380'
.1° @ 2715'	41.0° @ 4744'	88.8° @ 5474'
.4° @ 3124'	44.7° @ 4756'	89.5° @ 5569'
.3° @ 3502'	47.6° @ 4787'	90.5° @ 5663'
.4° @ 3881'	50.5° @ 4819'	90.5° @ 5757'
.4° @ 4237'	53.3° @ 4850'	91.6° @ 5851'
.4° @ 4315'	56.0° @ 4881'	91.5° @ 5946'
.2° @ 4346'	58.5° @ 4913'	91.1° @ 6039'
2.1° @ 4378'	61.3° @ 4944'	91.5° @ 6133'
5.5° @ 4409'	64.5° @ 4976'	91.2° @ 6228'
9.9° @ 4441'	68.4° @ 5007'	91.2° @ 6322'

Drilling Contractor- UNITED DRILLING, INC.

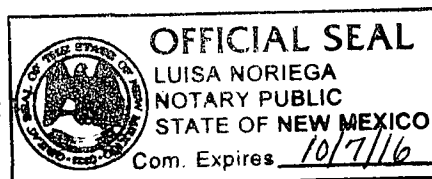
By: Angel Salazar
(Angel Salazar)

Title: Vice President

Subscribed and sworn to before me this 29th day of April 2015.

Luisa Noriega
Notary Public
Chaves NM
County State

My Commission Expires:



JUN 15 2015

2 of 2

WELL NAME AND NUMBER Dodd Federal Unit No. 913H RECEIVED
 LOCATION Section 11, T17S, R29E, Unit L, 1510 FSL, 70 FWL, Eddy County
 OPERATOR COG Operating LLC
 DRILLING CONTRACTOR United Drilling, Inc.

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

Degrees @ Depth	Degrees @ Depth	Degrees @ Depth
91.2° @ 6416'	89.1° @ 8305'	
91.2° @ 6511'	90.1° @ 8400'	
91.2° @ 6605'	91.0° @ 8495'	
91.6° @ 6699'	90.5° @ 8590'	
91.8° @ 6794'	91.6° @ 8684'	
91.8° @ 6889'	91.0° @ 8779'	
91.8° @ 6983'	92.0° @ 8968'	
91.6° @ 7077'	90.8° @ 9062'	
91.6° @ 7171'	91.8° @ 9155'	
91.2° @ 7266'	91.6° @ 9250'	
91.3° @ 7361'	91.8° @ 9344'	
91.4° @ 7455'	92.0° @ 9438'	
90.1° @ 7644'		
89.5° @ 7739'		
90.6° @ 7833'		
90.8° @ 7928'		
90.5° @ 8022'		
90.3° @ 8116'		

Drilling Contractor- UNITED DRILLING, INC.

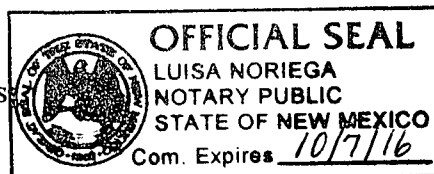
By: Angel Salazar
 (Angel Salazar)

Title: Vice President

Subscribed and sworn to before me this 29th day of April 2015.

Luisa Noriega
 Notary Public

My Commission Expires



Chaves NM
 County State

NM OIL CONSERVATION

ARTESIA DISTRICT

JUN 15 2015

RECEIVED



State of New Mexico
County of Eddy

I, Donald D. Mason, certify that I am employed by Terra Directional Services LLC, that I did on the day(s) of 04/18/2015 through 04/26/2015 conduct or supervise the taking of a MWD survey from a depth of 4315 feet to a depth of 9520 feet, that the data is true, correct, complete and within the limitations of the tool as set forth by Terra Directional Services LLC, that I am authorized and qualified to make this report, that this survey was conducted at the request of Concho Oil & Gas for the Dodd Federal Unit #913H Well API 30-015-42722 in Eddy County, New Mexico, and that I have reviewed this report and find that it conforms to the principles and procedures as set forth by Terra Directional Services LLC.

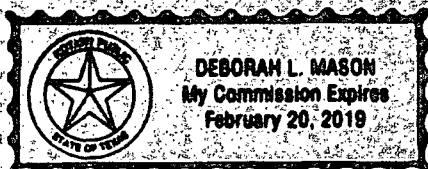
A handwritten signature of Donald D. Mason in black ink, written over a horizontal line.

Donald D. Mason
President

State of Texas

County of Burnet

Before me, a notary public, on this day personally appeared Donald D. Mason, known to me to be the person whose name is subscribed to the foregoing document and, being by me first duly sworn, declared that the statements therein contained are true and correct.



A handwritten signature of Deborah L. Mason in black ink, written over a horizontal line.

Notary Public's Signature



Customer Name: COG
Well Name: Dodd Federal Unit #913H
API Number: 30-015-42722
County / Parish: Eddy

M.W.D. Operator: Justin Campos
Directional Driller: John Overton
Total Magnetic Correction: 7.24
Job #: NM-530

Vertical Section: 89.86

Tie In Survey(s) Provided By:

VES

	Meas. Depth	Inc.	Azm.	T.V.D.	Ver. Sect.	+N / -S	+E / -W	Dist.	Angle	DLS
Tie - In										
0	4208.00	0.31	301.24	4207.84	-5.57	14.39	-5.61	15.45	338.71	0.28
1	4315.00	0.40	227.70	4314.84	-6.10	14.29	-6.13	15.55	336.77	0.40
2	4346.00	0.20	131.10	4345.84	-6.14	14.18	-6.17	15.47	336.48	1.51
3	4378.00	2.10	92.00	4377.83	-5.51	14.12	-5.54	15.17	338.56	6.09
4	4409.00	5.50	89.60	4408.76	-3.46	14.11	-3.49	14.54	346.11	10.98
5	4441.00	9.90	88.60	4440.46	0.83	14.19	0.79	14.21	3.20	13.76
6	4472.00	14.30	89.50	4470.77	7.33	14.29	7.29	16.04	27.03	14.21
7	4504.00	18.70	90.60	4501.44	16.41	14.27	16.38	21.72	48.93	13.78
8	4535.00	23.10	91.70	4530.39	27.46	14.04	27.43	30.81	62.90	14.25
9	4567.00	26.60	91.00	4559.43	40.90	13.73	40.87	43.11	71.43	10.98
10	4598.00	29.10	89.10	4586.83	55.38	13.72	55.35	57.03	76.07	8.56
11	4630.00	31.60	88.00	4614.45	71.55	14.14	71.51	72.90	78.82	8.00
12	4661.00	34.20	88.20	4640.47	88.38	14.70	88.34	89.55	80.55	8.39
13	4693.00	37.30	89.00	4666.44	107.06	15.15	107.03	108.09	81.94	9.80
14	4724.00	41.00	89.60	4690.48	126.63	15.38	126.59	127.53	83.07	12.00
15	4756.00	44.70	90.40	4713.93	148.39	15.38	148.35	149.15	84.08	11.69
16	4787.00	47.60	90.60	4735.41	170.74	15.18	170.71	171.38	84.92	9.37
17	4819.00	50.50	89.90	4756.38	194.91	15.08	194.87	195.45	85.58	9.21
18	4850.00	53.30	88.60	4775.50	219.30	15.40	219.26	219.80	85.98	9.62
19	4881.00	56.00	88.50	4793.44	244.57	16.04	244.54	245.06	86.25	8.71
20	4913.00	58.50	89.50	4810.75	271.48	16.51	271.44	271.94	86.52	8.24
21	4944.00	61.30	92.10	4826.29	298.29	16.13	298.25	298.69	86.90	11.58
22	4976.00	64.50	93.10	4840.87	326.74	14.83	326.71	327.04	87.40	10.38
23	5007.00	68.40	93.20	4853.25	355.11	13.27	355.08	355.32	87.86	12.58
24	5039.00	72.40	92.00	4863.99	385.21	11.91	385.18	385.37	88.23	12.99
25	5070.00	76.70	90.70	4872.24	415.07	11.21	415.05	415.20	88.45	14.45
26	5102.00	80.20	89.70	4878.65	446.42	11.10	446.39	446.53	88.58	11.36
27	5133.00	83.20	89.30	4883.12	477.09	11.37	477.06	477.20	88.64	9.76
28	5165.00	86.90	89.20	4885.89	508.96	11.78	508.94	509.07	88.67	11.57
29	5196.00	88.50	89.20	4887.13	539.94	12.22	539.91	540.05	88.70	5.16
30	5286.00	89.30	89.10	4888.86	629.91	13.55	629.88	630.03	88.77	0.90
31	5380.00	88.90	89.00	4890.33	723.89	15.11	723.86	724.01	88.80	0.44
32	5474.00	88.80	88.80	4892.22	817.86	16.91	817.82	817.99	88.82	0.24
33	5569.00	89.50	89.50	4893.63	912.84	18.32	912.80	912.98	88.85	1.04
34	5663.00	90.50	89.60	4893.63	1006.84	19.06	1006.79	1006.97	88.92	1.07
35	5757.00	90.50	89.20	4892.81	1100.83	20.05	1100.78	1100.97	88.96	0.43
36	5851.00	91.60	90.50	4891.09	1194.81	20.29	1194.76	1194.94	89.03	1.81
37	5946.00	91.50	90.20	4888.52	1289.77	19.71	1289.73	1289.88	89.12	0.33
38	6039.00	91.10	90.20	4886.41	1382.75	19.39	1382.70	1382.84	89.20	0.43
39	6133.00	91.50	89.90	4884.27	1476.72	19.31	1476.68	1476.81	89.25	0.53
40	6228.00	91.20	89.90	4882.04	1571.70	19.47	1571.65	1571.77	89.29	0.32

41	6322.00	91.20	89.60	4880.07	1665.67	19.88	1665.63	1665.75	89.32	0.32
42	6416.00	91.20	89.60	4878.10	1759.65	20.54	1759.61	1759.73	89.33	0.00
43	6511.00	91.20	89.30	4876.11	1854.63	21.45	1854.58	1854.71	89.34	0.32
44	6605.00	91.20	90.50	4874.14	1948.61	21.61	1948.56	1948.68	89.36	1.28
45	6699.00	91.60	90.30	4871.84	2042.57	20.96	2042.53	2042.64	89.41	0.48
46	6794.00	91.80	89.90	4869.03	2137.53	20.79	2137.49	2137.59	89.44	0.47
47	6889.00	91.80	90.20	4866.04	2232.48	20.71	2232.44	2232.54	89.47	0.32
48	6983.00	91.80	90.00	4863.09	2326.44	20.54	2326.39	2326.48	89.49	0.21
49	7077.00	91.60	90.00	4860.30	2420.40	20.54	2420.35	2420.44	89.51	0.21
50	7171.00	91.60	90.00	4857.68	2514.36	20.54	2514.32	2514.40	89.53	0.00
51	7266.00	91.20	89.40	4855.35	2609.33	21.04	2609.29	2609.37	89.54	0.76
52	7361.00	91.30	91.40	4853.28	2704.30	20.38	2704.26	2704.33	89.57	2.11
53	7455.00	91.40	91.10	4851.07	2798.24	18.33	2798.21	2798.27	89.62	0.34
54	7549.00	89.90	91.20	4850.00	2892.21	16.44	2892.18	2892.23	89.67	1.60
55	7644.00	90.10	91.90	4850.00	2987.17	13.87	2987.14	2987.18	89.73	0.77
56	7739.00	89.50	92.20	4850.33	3082.10	10.47	3082.08	3082.10	89.81	0.71
57	7833.00	90.60	91.10	4850.25	3176.05	7.77	3176.04	3176.05	89.86	1.65
58	7928.00	90.80	89.90	4849.09	3271.03	6.94	3271.03	3271.03	89.88	1.28
59	8022.00	90.50	89.70	4848.02	3365.03	7.27	3365.02	3365.03	89.88	0.38
60	8116.00	90.30	89.70	4847.37	3459.03	7.76	3459.02	3459.03	89.87	0.21
61	8210.00	89.70	89.70	4847.37	3553.02	8.25	3553.02	3553.02	89.87	0.64
62	8305.00	89.10	89.50	4848.36	3648.02	8.91	3648.01	3648.02	89.86	0.67
63	8400.00	90.10	89.90	4849.03	3743.01	9.41	3743.00	3743.01	89.86	1.13
64	8495.00	91.00	90.20	4848.11	3838.01	9.33	3838.00	3838.01	89.86	1.00
65	8590.00	90.50	90.10	4846.87	3933.00	9.08	3932.99	3933.00	89.87	0.54
66	8684.00	91.60	90.30	4845.15	4026.98	8.75	4026.97	4026.98	89.88	1.19
67	8779.00	91.00	90.00	4842.99	4121.95	8.50	4121.94	4121.95	89.88	0.71
68	8873.00	91.30	89.90	4841.11	4215.93	8.59	4215.93	4215.93	89.88	0.34
69	8968.00	92.00	90.10	4838.37	4310.89	8.59	4310.89	4310.89	89.89	0.77
70	9062.00	90.80	90.50	4836.07	4404.86	8.09	4404.85	4404.86	89.89	1.35
71	9155.00	91.80	89.70	4833.96	4497.83	7.93	4497.83	4497.84	89.90	1.38
72	9250.00	91.60	89.80	4831.15	4592.79	8.35	4592.79	4592.79	89.90	0.24
73	9344.00	91.80	90.00	4828.36	4686.75	8.51	4686.74	4686.75	89.90	0.30
74	9438.00	92.00	90.50	4825.24	4780.70	8.10	4780.69	4780.70	89.90	0.57
PTB	9520.00	92.00	90.50	4822.38	4862.64	7.38	4862.64	4862.64	89.91	0.00



NM OIL CONSERVATION
ARTESIA DISTRICT

JUN 15 2015

RECEIVED

COG Operating LLC

Eddy County, NM

Dodd Federal Unit #913H

SHL: 1510' FSL, 70' FWL, Sec 11, T17S, R29E, Unit L

EOC: 5206.9' MD, 4900.0' TVD, 1.3' N, 530.4' E, 530.4' VS

BHL: 1525' FSL, 350' FEL, Sec 11, T17S, R29E, Unit I

Design: BHL: 1525' FSL, 350' FEL, Sec 11, T17S, R29E, Unit I

Standard Survey Report

27 April, 2015





TDS
Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Site Dodd Federal Unit #913H
Project:	Eddy County, NM	TVD Reference:	KB @ 3640.0usft (United 43)
Site:	Dodd Federal Unit #913H	MD Reference:	KB @ 3640.0usft (United 43)
Well:	SHL 1510' FSL, 70' FWL, Sec 11, T17S, R29E, Unit L	North Reference:	Grid
Wellbore:	BHL 1525' FSL, 350' FEL, Sec 11, T17S, R29E, Unit I	Survey Calculation Method:	Minimum Curvature
Design:	BHL 1525' FSL, 350' FEL, Sec 11, T17S, R29E, Unit I	Database:	EDM 5000.1 Single User Db

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		Dodd Federal Unit #913H			
Site Position:		Northing:	671,554.40 usft	Latitude:	32° 50' 45.149 N
From:	Map	Easting:	585,995.20 usft	Longitude:	104° 3' 11.967 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.15 °

Well	SHL 1510' FSL, 70' FWL, Sec 11, T17S, R29E, Unit L					
Well Position	+N/-S	0.0 usft	Northing:	671,554.40 usft	Latitude:	32° 50' 45.149 N
	+E/-W	0.0 usft	Easting:	585,995.20 usft	Longitude:	104° 3' 11.967 W
Position Uncertainty	0.0 usft	Wellhead Elevation:	0.0 usft	Ground Level:	3,628.0 usft	

Wellbore	BHL 1525' FSL, 350' FEL, Sec 11, T17S, R29E, Unit I				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	4/2/2015	7.39	60.58	48,556

Design:		BHL 1525' FSL 350' FEL, Sec.11, T17S, R29E, Unit I			
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W	Direction	
	(usft)	(usft)	(usft)	(°)	
	0.0	0.0	0.0	89.86	

Survey Program		Date	4/27/2015	
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
100.0	4,208.0	GYRO #1 (BHL: 1525' FSL, 350' FEL, Sec	Good_gyro	Good Gyro
4,315.0	9,520.0	MWD #2 (BHL: 1525' FSL, 350' FEL, Sec 1	MWD	MWD - Standard

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)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
100.0	0.35	315.61	100.0	0.2	-0.2	-0.2	0.35	0.35	0.00
200.0	0.51	308.65	200.0	0.7	-0.8	-0.8	0.17	0.16	-6.96
300.0	0.98	282.56	300.0	1.2	-2.0	-2.0	0.57	0.47	-26.09
400.0	1.79	257.58	400.0	1.0	-4.3	-4.3	0.99	0.81	-24.98
500.0	1.26	269.34	499.9	0.7	-6.9	-6.9	0.61	-0.53	11.76
600.0	0.53	297.48	599.9	0.9	-8.5	-8.4	0.83	-0.73	28.14



TDS
Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Site: Dodd Federal Unit #913H
Project:	Eddy County NM	TVD Reference:	KB @ 3640.0usft (United 43)
Site:	Dodd Federal Unit #913H	MD Reference:	KB @ 3640.0usft (United 43)
Well:	SHL-1510-FSL-70-FWL- Sec 11- T17S- R29E Unit L	North Reference:	Grid
Wellbore:	BHL-1525-FSL-350-FEL- Sec 11- T17S- R29E Unit I	Survey Calculation Method:	Minimum Curvature
Design:	BHL-1525-FSL-350-FEL- Sec 11- T17S- R29E Unit I	Database:	EDM-5000-1 Single User Db

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)	
700.0	0.59	330.99	699.9	1.5	-9.1	-9.1	0.33	0.06	33.51	
800.0	0.53	33.49	799.9	2.4	-9.1	-9.1	0.58	-0.06	62.50	
900.0	0.56	8.49	899.9	3.2	-8.8	-8.8	0.24	0.03	-25.00	
1,000.0	0.72	40.24	999.9	4.2	-8.3	-8.3	0.38	0.16	31.75	
1,100.0	0.65	17.11	1,099.9	5.2	-7.7	-7.7	0.28	-0.07	-23.13	
1,200.0	0.39	28.54	1,199.9	6.1	-7.4	-7.4	0.28	-0.26	11.43	
1,300.0	0.19	46.42	1,299.9	6.5	-7.1	-7.1	0.22	-0.20	17.88	
1,400.0	0.34	10.10	1,399.9	6.9	-6.9	-6.9	0.22	0.15	-36.32	
1,500.0	0.20	11.73	1,499.9	7.4	-6.9	-6.8	0.14	-0.14	1.63	
1,600.0	0.21	357.09	1,599.9	7.7	-6.8	-6.8	0.05	0.01	-14.64	
1,700.0	0.14	355.96	1,699.9	8.0	-6.8	-6.8	0.07	-0.07	-1.13	
1,800.0	0.14	20.76	1,799.9	8.3	-6.8	-6.8	0.06	0.00	24.80	
1,900.0	0.23	35.20	1,899.9	8.5	-6.7	-6.6	0.10	0.09	14.44	
2,000.0	0.17	39.23	1,999.9	8.8	-6.4	-6.4	0.06	-0.06	4.03	
2,100.0	0.22	66.94	2,099.9	9.0	-6.2	-6.2	0.11	0.05	27.71	
2,200.0	0.42	332.20	2,199.9	9.4	-6.2	-6.1	0.49	0.20	-94.74	
2,300.0	0.33	57.54	2,299.9	9.9	-6.1	-6.1	0.51	-0.09	85.34	
2,400.0	0.11	346.12	2,399.9	10.1	-5.9	-5.9	0.31	-0.22	-71.42	
2,500.0	0.09	355.59	2,499.9	10.3	-5.9	-5.9	0.03	-0.02	9.47	
2,600.0	0.26	347.93	2,599.9	10.6	-6.0	-5.9	0.17	0.17	-7.66	
2,700.0	0.19	327.86	2,699.9	11.0	-6.1	-6.1	0.10	-0.07	-20.07	
2,800.0	0.03	224.42	2,799.9	11.1	-6.2	-6.2	0.20	-0.16	-103.44	
2,900.0	0.34	311.59	2,899.9	11.3	-6.4	-6.4	0.34	0.31	87.17	
3,000.0	0.12	68.18	2,999.9	11.5	-6.6	-6.5	0.41	-0.22	116.59	
3,100.0	0.17	310.57	3,099.9	11.6	-6.6	-6.6	0.25	0.05	-117.61	
3,200.0	0.11	350.55	3,199.9	11.8	-6.7	-6.7	0.11	-0.06	39.98	
3,300.0	0.66	20.65	3,299.9	12.5	-6.5	-6.5	0.57	0.55	30.10	
3,400.0	0.76	18.33	3,399.9	13.6	-6.1	-6.1	0.10	0.10	-2.32	
3,500.0	0.50	118.53	3,499.9	14.0	-5.5	-5.5	0.98	-0.26	100.20	
3,600.0	0.35	127.17	3,599.9	13.7	-4.9	-4.9	0.16	-0.15	8.64	
3,700.0	0.58	300.53	3,699.8	13.7	-5.1	-5.1	0.93	0.23	173.36	
3,800.0	0.39	342.57	3,799.8	14.3	-5.6	-5.6	0.39	-0.19	42.04	
3,900.0	0.19	137.59	3,899.8	14.5	-5.6	-5.6	0.57	-0.20	155.02	
4,000.0	0.13	112.45	3,999.8	14.3	-5.4	-5.4	0.09	-0.06	-25.14	
4,100.0	0.06	219.71	4,099.8	14.3	-5.3	-5.3	0.16	-0.07	107.26	
4,208.0	0.31	301.24	4,207.8	14.4	-5.6	-5.6	0.28	0.23	75.49	
TIE-IN to VES Gyro										
4,315.0	0.40	227.70	4,314.8	14.3	-6.1	-6.1	0.40	0.08	-68.73	
4,346.0	0.20	131.10	4,345.8	14.2	-6.2	-6.1	1.51	-0.65	-311.61	
4,378.0	2.10	92.00	4,377.8	14.1	-5.5	-5.5	6.09	5.94	-122.19	
4,409.0	5.50	89.60	4,408.8	14.1	-3.5	-3.5	10.98	10.97	-7.74	
4,441.0	9.90	88.60	4,440.5	14.2	0.8	0.8	13.76	13.75	-3.13	



TDS
Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Site Dodd Federal Unit #913H
Project:	Eddy County, NM	TVD Reference:	KB @ 3640.0usft (United 43)
Site:	Dodd Federal Unit #913H	MD Reference:	KB @ 3640.0usft (United 43)
Well:	SHL 1510 FSL 70 FWL Sec 11 T17S R29E	North Reference:	Grid
Wellbore:	BHL 1525 FSL 350 FEL Sec 11 T17S R29E	Survey Calculation Method:	Minimum Curvature
Design:	BHL 1525 FSL 350 FEL Sec 11 T17S R29E	Database:	EDM 5000.1 Single User Db

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)	
4,472.0	14.30	89.50	4,470.8	14.3	7.3	7.3	14.21	14.19	2.90	
4,504.0	18.70	90.60	4,501.4	14.2	16.4	16.4	13.78	13.75	3.44	
4,535.0	23.10	91.70	4,530.4	14.0	27.4	27.5	14.25	14.19	3.55	
4,567.0	26.60	91.00	4,559.4	13.7	40.9	40.9	10.98	10.94	-2.19	
4,598.0	29.10	89.10	4,586.8	13.7	55.3	55.4	8.56	8.06	-6.13	
4,630.0	31.60	88.00	4,614.5	14.1	71.5	71.5	8.00	7.81	-3.44	
4,661.0	34.20	88.20	4,640.5	14.7	88.3	88.4	8.39	8.39	0.65	
4,693.0	37.30	89.00	4,666.4	15.1	107.0	107.1	9.80	9.69	2.50	
4,724.0	41.00	89.60	4,690.5	15.4	126.6	126.6	12.00	11.94	1.94	
4,756.0	44.70	90.40	4,713.9	15.4	148.4	148.4	11.69	11.56	2.50	
4,787.0	47.60	90.60	4,735.4	15.2	170.7	170.7	9.37	9.35	0.65	
4,819.0	50.50	89.90	4,756.4	15.1	194.9	194.9	9.21	9.06	-2.19	
4,850.0	53.30	88.60	4,775.5	15.4	219.3	219.3	9.62	9.03	-4.19	
4,881.0	56.00	88.50	4,793.4	16.0	244.5	244.6	8.71	8.71	-0.32	
4,913.0	58.50	89.50	4,810.8	16.5	271.4	271.5	8.24	7.81	3.13	
4,944.0	61.30	92.10	4,826.3	16.1	298.3	298.3	11.58	9.03	8.39	
4,976.0	64.50	93.10	4,840.9	14.8	326.7	326.7	10.38	10.00	3.13	
5,007.0	68.40	93.20	4,853.3	13.2	355.1	355.1	12.58	12.58	0.32	
5,039.0	72.40	92.00	4,864.0	11.9	385.2	385.2	12.99	12.50	-3.75	
5,070.0	76.70	90.70	4,872.2	11.2	415.0	415.1	14.45	13.87	-4.19	
5,102.0	80.20	89.70	4,878.7	11.1	446.4	446.4	11.36	10.94	-3.13	
5,133.0	83.20	89.30	4,883.1	11.3	477.1	477.1	9.76	9.68	-1.29	
5,165.0	86.90	89.20	4,885.9	11.8	508.9	509.0	11.57	11.56	-0.31	
5,196.0	88.50	89.20	4,887.1	12.2	539.9	539.9	5.16	5.16	0.00	
5,286.0	89.30	89.10	4,888.9	13.5	629.9	629.9	0.90	0.89	-0.11	
5,380.0	88.90	89.00	4,890.3	15.1	723.9	723.9	0.44	-0.43	-0.11	
5,474.0	88.80	88.80	4,892.2	16.9	817.8	817.9	0.24	-0.11	-0.21	
5,569.0	89.50	89.50	4,893.6	18.3	912.8	912.8	1.04	0.74	0.74	
5,663.0	90.50	89.60	4,893.6	19.0	1,006.8	1,006.8	1.07	1.06	0.11	
5,757.0	90.50	89.20	4,892.8	20.0	1,100.8	1,100.8	0.43	0.00	-0.43	
5,851.0	91.60	90.50	4,891.1	20.3	1,194.8	1,194.8	1.81	1.17	1.38	
5,946.0	91.50	90.20	4,888.5	19.7	1,289.7	1,289.8	0.33	-0.11	-0.32	
6,039.0	91.10	90.20	4,886.4	19.4	1,382.7	1,382.7	0.43	-0.43	0.00	
6,133.0	91.50	89.90	4,884.3	19.3	1,476.7	1,476.7	0.53	0.43	-0.32	
6,228.0	91.20	89.90	4,882.0	19.4	1,571.7	1,571.7	0.32	-0.32	0.00	
6,322.0	91.20	89.60	4,880.1	19.9	1,665.6	1,665.7	0.32	0.00	-0.32	
6,416.0	91.20	89.60	4,878.1	20.5	1,759.6	1,759.7	0.00	0.00	0.00	
6,511.0	91.20	89.30	4,876.1	21.4	1,854.6	1,854.6	0.32	0.00	-0.32	
6,605.0	91.20	90.50	4,874.1	21.6	1,948.6	1,948.6	1.28	0.00	1.28	
6,699.0	91.60	90.30	4,871.8	20.9	2,042.5	2,042.6	0.48	0.43	-0.21	
6,794.0	91.80	89.90	4,869.0	20.8	2,137.5	2,137.5	0.47	0.21	-0.42	
6,889.0	91.80	90.20	4,866.0	20.7	2,232.4	2,232.5	0.32	0.00	0.32	



TDS
Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Site Dodd Federal Unit #913H
Project:	Eddy County, NM	TVD Reference:	KB @ 3640.0usft (United 43)
Site:	Dodd Federal Unit #913H	MD Reference:	KB @ 3640.0usft (United 43)
Well:	SHL 1510' FSL 70' FWL Sec 11 T17S R29E Unit L	North Reference:	Grid
Wellbore:	BHL 1525' FSL 350' FEL Sec 11 T17S R29E Unit I	Survey Calculation Method:	Minimum Curvature
Design:	BHL 1525' FSL 350' FEL Sec 11 T17S R29E Unit I	Database:	EDM 5000.1 Single User Db

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)
6,983.0	91.80	90.00	4,863.1	20.5	2,326.4	2,326.4	0.21	0.00	-0.21
7,077.0	91.60	90.00	4,860.3	20.5	2,420.4	2,420.4	0.21	-0.21	0.00
7,171.0	91.60	90.00	4,857.7	20.5	2,514.3	2,514.4	0.00	0.00	0.00
7,266.0	91.20	89.40	4,855.4	21.0	2,609.3	2,609.3	0.76	-0.42	-0.63
7,361.0	91.30	91.40	4,853.3	20.4	2,704.3	2,704.3	2.11	0.11	2.11
7,455.0	91.40	91.10	4,851.1	18.3	2,798.2	2,798.2	0.34	0.11	-0.32
7,549.0	89.90	91.20	4,850.0	16.4	2,892.2	2,892.2	1.60	-1.60	0.11
7,644.0	90.10	91.90	4,850.0	13.9	2,987.1	2,987.2	0.77	0.21	0.74
7,739.0	89.50	92.20	4,850.3	10.5	3,082.1	3,082.1	0.71	-0.63	0.32
7,833.0	90.60	91.10	4,850.3	7.7	3,176.0	3,176.0	1.65	1.17	-1.17
7,928.0	90.80	89.90	4,849.1	6.9	3,271.0	3,271.0	1.28	0.21	-1.26
8,022.0	90.50	89.70	4,848.0	7.2	3,365.0	3,365.0	0.38	-0.32	-0.21
8,116.0	90.30	89.70	4,847.4	7.7	3,459.0	3,459.0	0.21	-0.21	0.00
8,210.0	89.70	89.70	4,847.4	8.2	3,553.0	3,553.0	0.64	-0.64	0.00
8,305.0	89.10	89.50	4,848.4	8.9	3,648.0	3,648.0	0.67	-0.63	-0.21
8,400.0	90.10	89.90	4,849.0	9.4	3,743.0	3,743.0	1.13	1.05	0.42
8,495.0	91.00	90.20	4,848.1	9.3	3,838.0	3,838.0	1.00	0.95	0.32
8,590.0	90.50	90.10	4,846.9	9.1	3,933.0	3,933.0	0.54	-0.53	-0.11
8,684.0	91.60	90.30	4,845.2	8.7	4,027.0	4,027.0	1.19	1.17	0.21
8,779.0	91.00	90.00	4,843.0	8.5	4,121.9	4,122.0	0.71	-0.63	-0.32
8,873.0	91.30	89.90	4,841.1	8.6	4,215.9	4,215.9	0.34	0.32	-0.11
8,968.0	92.00	90.10	4,838.4	8.6	4,310.9	4,310.9	0.77	0.74	0.21
9,062.0	90.80	90.50	4,836.1	8.1	4,404.9	4,404.9	1.35	-1.28	0.43
9,155.0	91.80	89.70	4,834.0	7.9	4,497.8	4,497.8	1.38	1.08	-0.86
9,250.0	91.60	89.80	4,831.2	8.3	4,592.8	4,592.8	0.24	-0.21	0.11
9,344.0	91.80	90.00	4,828.4	8.5	4,686.7	4,686.7	0.30	0.21	0.21
9,438.0	92.00	90.50	4,825.2	8.1	4,780.7	4,780.7	0.57	0.21	0.53
Final MWD Survey									
9,520.0	92.00	90.50	4,822.4	7.4	4,862.6	4,862.6	0.00	0.00	0.00
Projection to Bit/TD									

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
4,208.0	4,207.8	14.4	-5.6	TIE-IN to VES Gyro
9,438.0	4,825.2	8.1	4,780.7	Final MWD Survey
9,520.0	4,822.4	7.4	4,862.6	Projection to Bit/TD

Checked By: _____ Approved By: _____ Date: _____