



30-015-39997

COG Operating LLC

Eddy County, NM (NAD27 NME)

Berry A Federal #16

#16 / As-Drilled

OH - Job #32D0612799

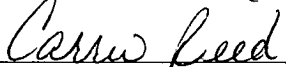
Design: Actual

SDI Standard Survey Report

This survey is correct to the best of my knowledge and is supported by actual field data.



Notarized this date 3rd of August, 2012.

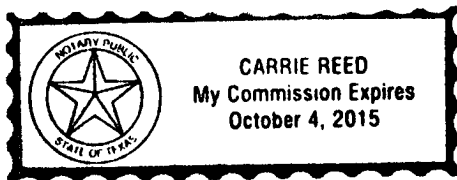


Notary Signature
County of Midland
State of Texas

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Scientific Drilling



Scientific Drilling International, Inc.
SDI Standard Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Site Berry A Federal #16
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	RF @ 3669 00usft (Basic #35)
Site:	Berry A Federal #16	MD Reference:	RF @ 3669 00usft (Basic #35)
Well:	#16 / As-Drilled	North Reference:	Grid
Wellbore:	OH - Job #32D0612799	Survey Calculation Method:	Minimum Curvature
Design:	Actual	Database:	EDM-Regulatory

Project	Eddy County, NM (NAD27 NME)		
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	Berry A Federal #16		
Site Position:	Map	Northing: 663,421 50 usft	Latitude: 32° 49' 24.030 N
From:		Easting: 607,730 00 usft	Longitude: 103° 58' 57 513 W
Position Uncertainty:	0 00 usft	Slot Radius: 0"	Grid Convergence: 0 19 °

Well	#16 / As-Drilled		
Well Position	+N/-S 0 00 usft	Northing: 663,421 50 usft	Latitude: 32° 49' 24.030 N
	+E/-W 0 00 usft	Easting: 607,730 00 usft	Longitude: 103° 58' 57 513 W
Position Uncertainty	0 00 usft	Wellhead Elevation: usft	Ground Level: 3,657 00 usft

Wellbore	OH - Job #32D0612799				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	12/13/11	7 76	60 66	48,880

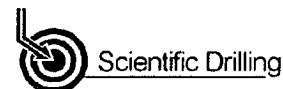
Design	Actual			
Audit Notes:				
Version:	1 0	Phase:	ACTUAL	Tie On Depth: 0 00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0 00	0 00	0 00	137 89

Survey Program	Date	08/01/12		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
100 00	1,238.00	Gyro (OH - Job #32D0612799)	Keeper	Standard Wireline Keeper ver 1 0 2
1,372 00	4,132 00	MWD (OH - Job #32D0612799)	MWD	MWD - Standard
4,189 00	6,115 00	MWD ST (OH - Job #32D0612799)	MWD	MWD - Standard

Survey							
Measured Depth (usft)	Inclination (°)	Azimuth (°)	True Vertical Depth	North/South (usft)	East/West (usft)	Closure Azimuth (°)	Closure Distance (usft)
0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00
12.12	0 06	186 47	12 12	-0 01	0 00	186 47	0 01
East HL-Berry A Fed #16							
12 95	0 06	186 47	12 95	-0 01	0 00	186 47	0 01
North HL-Berry A Fed #16							
100 00	0 48	186 47	100 00	-0 42	-0 05	186 47	0 42
200 00	0 63	202 37	199 99	-1 34	-0 30	192.76	1 37
300 00	0 75	195 62	299 99	-2 48	-0 69	195 53	2 57
400 00	0 34	189 67	399 98	-3 40	-0 92	195 06	3 52
500 00	1 05	251 39	499 98	-3 99	-1 83	204 69	4 39



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Site:	Berry A Federal #16	MD Reference:	RF @ 3669.00usft (Basic #35)
Well:	#16 / As-Drilled	North Reference:	Grid
Wellbore:	OH - Job #32D0612799	Survey Calculation Method:	Minimum Curvature
Design:	Actual	Database:	EDM-Regulatory

Survey							
Measured Depth (usft)	Inclination (°)	Azimuth (°)	True Vertical Depth	North/South (usft)	East/West (usft)	Closure Azimuth (°)	Closure Distance (usft)
600 00	0 81	231 52	599 96	-4 72	-3 26	214 59	5 73
700 00	0 28	124 13	699 96	-5 30	-3 61	214 25	6 41
800 00	0 41	261.21	799 96	-5 49	-3 76	214 40	6 65
900 00	0 48	20.06	899 96	-5 15	-3.97	217 61	6 50
1,000 00	0 74	25 77	999 95	-4 17	-3 54	220 32	5 48
1,100 00	0 47	41 46	1,099 95	-3 29	-2 99	222 31	4 44
1,200 00	0 67	47 50	1,199 94	-2 58	-2.29	221 53	3 45
1,238 00	1 11	0 83	1,237 94	-2 06	-2 12	225 74	2 96
1,372 00	0 95	15 20	1,371 91	0 30	-1 81	279 57	1 83
1,436 00	0 77	43 31	1,435.91	1 13	-1 37	309 41	1 78
1,500 00	0 87	91 74	1,499 90	1 43	-0 59	337 41	1 55
1,563 00	1 64	99 52	1,562 89	1 26	0 77	31 45	1 48
1,627 00	2 54	110 28	1,626 84	0 62	3 01	78 33	3 07
1,690 00	3 45	125 58	1,689 76	-0 97	5 86	99 36	5 94
1,753 00	4 00	129 56	1,752.62	-3.47	9 09	110 87	9 73
1,817 00	4 13	139 93	1,816.46	-6.65	12 30	118 41	13 98
1,881 00	3 82	138 65	1,880 31	-10 02	15.19	123 40	18 20
1,945 00	4 20	139 32	1,944 15	-13 40	18 13	126 46	22 54
2,007 00	4 94	138 20	2,005 96	-17 11	21 39	128 66	27 39
2,102 00	4 60	133 07	2,100 63	-22 76	26 89	130 24	35 23
2,198 00	4 01	135 36	2,196.36	-27 77	32 07	130 90	42 42
2,293 00	4 29	134 00	2,291 11	-32 61	36.96	131 42	49 28
2,389 00	4 73	140 80	2,386.81	-38.17	42 04	132 24	56 78
2,485 00	4 87	145 58	2,482 47	-44.60	46.85	133 59	64 68
2,580.00	4 53	147 36	2,577 15	-51 08	51.15	134 96	72 29
2,674 00	4.61	143 65	2,670 86	-57 25	55 39	135 95	79 66
2,770 00	4 48	141 95	2,766 55	-63 31	59 99	136 54	87 22
2,865 00	5 53	142 64	2,861 19	-69 87	65 05	137 05	95 47
2,960 00	5.58	147 88	2,955 74	-77 42	70 28	137 77	104.57
3,054 00	5 48	143 09	3,049 31	-84 88	75 41	138 38	113 54
3,150 00	5 64	145 92	3,144 86	-92 45	80 81	138 85	122 79
3,277 00	5 17	139 20	3,271 29	-101 95	88 04	139 19	134 71
3,373 00	5 05	141 19	3,366.91	-108.52	93 52	139 25	143 26
3,468 00	5 11	140 62	3,461.54	-115 05	98 82	139 34	151 66
3,563 00	5 28	139 90	3,556 15	-121 66	104 32	139 39	160 26
3,658 00	4 90	139 36	3,650 77	-128 08	109 78	139 40	168 69
3,754 00	4 99	140 76	3,746 42	-134 43	115 09	139 43	176 97
3,849 00	5 12	139 17	3,841 05	-140.84	120 48	139 46	185 34
3,944 00	4.79	140 69	3,935 69	-147 11	125 76	139 47	193 54
4,039 00	4 34	138 31	4,030 39	-152.87	130.66	139 48	201 10
4,132 00	3.75	135 36	4,123 16	-157 66	135 14	139 40	207 65
Tie-in							
4,189 00	3 23	151 34	4,180 05	-160 39	137 22	139 45	211 08



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Wellbore:	OH - Job #32D0612799	Survey Calculation Method:	Minimum Curvature
Design:	Actual	Database:	EDM-Regulatory

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	True Vertical Depth	North/South (usft)	East/West (usft)	Closure Azimuth (°)	Closure Distance (usft)
4,227.75	3 18	154 52	4,218 74	-162.32	138.21	139 59	213.19
TG1-Berry A Fed #16							
4,253 00	3 16	156 63	4,243 95	-163 60	138 79	139 69	214 53
4,316 00	3 10	153.83	4,306.86	-166 72	140 23	139 93	217 85
4,348 00	3 12	153 56	4,338 81	-168 27	141 00	140 04	219 54
4,407 00	3 09	154 71	4,397 73	-171 15	142.39	140 24	222 64
4,470 00	3 31	156 21	4,460 63	-174 35	143 85	140 48	226 03
4,597 00	3 23	160 94	4,587 42	-181 09	146 50	141 03	232 92
4,693 00	3 45	152 38	4,683 26	-186 20	148 72	141 39	238 30
4,788 00	3.57	163 49	4,778 08	-191 57	150 88	141 78	243 85
4,915.00	3 51	150 57	4,904 84	-198 75	153 92	142 24	251 38
5,011 00	3 26	160 27	5,000 67	-203.88	156 28	142 53	256 88
5,106 00	3 67	152 38	5,095.50	-209.11	158 60	142 82	262 46
5,201 00	3 84	143 72	5,190 30	-214 37	161 90	142 94	268 64
5,296 00	3 86	141 65	5,285 08	-219 44	165.76	142 93	275 01
5,392 00	3 76	143 08	5,380 87	-224 49	169 66	142 92	281 39
5,486 00	3 96	139 62	5,474 66	-229 43	173 61	142 88	287 71
5,582 00	3 79	132 88	5,570 44	-234 11	178 09	142 74	294 15
5,677 00	3 50	140 20	5,665.25	-238 48	182 24	142 61	300 14
5,772.00	4.21	140 87	5,760 03	-243 41	186.30	142 57	306 52
5,866 00	4 03	135 45	5,853 79	-248.44	190 79	142 48	313 25
5,962.00	3.60	142 00	5,949 58	-253 22	195 02	142 40	319.61
6,065 00	3 28	138 77	6,052 39	-257 99	198 95	142 36	325 79
Last MWD Survey							
6,115 00	3 28	138 77	6,102 31	-260.14	200 83	142 33	328 64
Projection to Bit - PBHL-Berry A Fed #16							

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
4,132 00	4,123 16	-157 66	135 14	Tie-in
6,065 00	6,052.39	-257 99	198 95	Last MWD Survey
6,115 00	6,102 31	-260 14	200 83	Projection to Bit