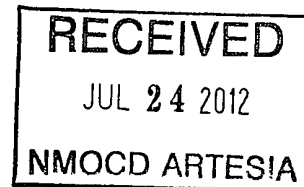


30-015-39946



COG Operating LLC

Eddy County, NM (NAD27 NME)

Dodd Federal Unit #612

Dodd Federal Unit #612

OH - Job #32D0412477

Design: Actual

SDI Standard Survey Report

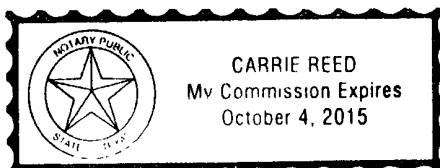
This survey is correct to the best of my knowledge and is supported by actual field data.

Kubacki

Notarized this date 14th of May, 2012.

Carrie Reed

Notary Signature
County of Midland
State of Texas





Scientific Drilling International, Inc.
SDI Standard Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Site Dodd Federal Unit #612
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	GL Elev @ 3609 00usft
Site:	Dodd Federal Unit #612	MD Reference:	GL Elev @ 3609 00usft
Well:	Dodd Federal Unit #612	North Reference:	Grid
Wellbore:	OH - Job #32D0412477	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	Dodd Federal Unit #612				
Site Position:		Northing:	667,595 00 usft	Latitude:	32° 50' 5.951 N
From:	Map	Easting:	586,693 10 usft	Longitude:	104° 3' 3.910 W
Position Uncertainty:	0 00 usft	Slot Radius:	13-3/16"	Grid Convergence:	0 15 °

Well	Dodd Federal Unit #612					
Well Position	+N/-S	0 00 usft	Northing:	667,595 00 usft	Latitude:	32° 50' 5.951 N
	+E/-W	0 00 usft	Easting:	586,693 10 usft	Longitude:	104° 3' 3.910 W
Position Uncertainty		0 00 usft	Wellhead Elevation:	usft	Ground Level:	3,609 00 usft

Wellbore	OH - Job #32D0412477				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	12/22/11	7 79	60 66	48,877

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	348 43

Survey Program	Date	05/01/12			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
100 00	1,055 00	Gyro (OH - Job #32D0412477)	Keeper	Standard Wireline Keeper ver 1 0 2	
1,188.00	4,588 00	MWD (OH - Job #32D0412477)	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
100 00	0 10	275 77	100 00	0 01	-0 09	275 77	0 09
200 00	0 39	168 30	200 00	-0 32	-0 10	198 34	0 33
300.00	0 84	168 99	299 99	-1 37	0 10	175 64	1 37
400.00	0 50	161 44	399 99	-2 50	0 38	171 29	2 53
500 00	0 73	108 81	499 98	-3 12	1.13	160 17	3.32
600 00	1 25	96 84	599 97	-3 46	2 81	140 87	4.45
700 00	1 38	91 27	699 94	-3 61	5 10	125.32	6 25
800 00	1 28	91.19	799 91	-3 66	7 42	116 28	8 27
900 00	1 09	101 69	899 89	-3 88	9 47	112 28	10 23
1,000 00	0 76	98 31	999 88	-4 17	11 05	110 65	11 81



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SDI Standard Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Site Dodd Federal Unit #612
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	GL Elev @ 3609 00usft
Site:	Dodd Federal Unit #612	MD Reference:	GL Elev @ 3609 00usft
Well:	Dodd Federal Unit #612	North Reference:	Grid
Wellbore:	OH - Job #32D0412477	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)
1,055 00	0 79	107 83	1,054 87	-4 34	11 78	110 21	12 55
Gyro Tie-In							
1,188 00	0 26	117.99	1,187.87	-4 76	12 92	110 22	13 76
1,252 00	0 53	61 56	1,251.87	-4 69	13 30	109 40	14 10
1,315.00	0 97	33 88	1,314.86	-4 10	13 86	106 50	14 45
1,379.00	1 76	23 51	1,378.84	-2 75	14 55	100 71	14 81
1,442 00	2 73	21 57	1,441 79	-0 47	15 49	91 74	15 50
1,506 00	3 78	23 24	1,505.69	2 89	16 88	80 30	17 13
1,570.00	4 84	21 40	1,569 51	7 34	18 70	68 57	20 09
1,634 00	5 54	20 43	1,633.24	12 75	20.76	58 45	24 36
1,697.00	6 33	19 64	1,695.91	18 87	22 99	50 63	29 74
1,768 00	7 03	19 81	1,766.42	26 64	25 78	44 06	37.07
1,832 00	7 83	17 09	1,829.89	34 49	28 39	39 45	44 67
1,895 00	8 62	12 61	1,892 24	43 20	30 68	35 38	52 99
1,959.00	8 97	5 31	1,955 49	52 85	32.19	31 34	61 88
2,023.00	9 32	358 63	2,018.68	63 00	32 53	27 31	70.90
2,087 00	9 67	352 66	2,081 80	73 51	31 72	23 34	80.06
2,150 00	9 50	345 45	2,143 92	83 79	29 73	19.54	88 91
2,214 00	9 23	339 74	2,207.07	93 72	26 63	15 86	97 43
2,278.00	9 15	339 30	2,270 25	103 30	23 05	12 58	105.84
2,341 00	9 23	339 12	2,332 44	112 70	19 48	9 81	114 37
2,437 00	9 41	338 94	2,427 17	127 22	13 92	6 24	127 98
2,532 00	9 50	338 68	2,520 88	141 77	8 28	3 34	142 01
2,628 00	9 23	337 10	2,615 60	156 24	2 40	0 88	156.26
2,723 00	9 58	336 31	2,709 33	170 50	-3 74	358 74	170 54
2,819 00	9 50	334 90	2,804 00	184 99	-10 31	356.81	185.28
2,914 00	9 06	332 88	2,897 76	198 75	-17 05	355 10	199 48
3,010 00	9 32	333 58	2,992 52	212 44	-23 95	353 57	213 78
3,106 00	9 58	333 58	3,087 22	226 55	-30 96	352 22	228 66
3,201 00	9 41	335 17	3,180 92	240 68	-37 74	351 09	243 62
3,297 00	8 62	338 42	3,275 73	254 49	-43 68	350 26	258 21
3,392 00	8 97	338 77	3,369 62	268 02	-48 98	349 64	272 46
3,488 00	9 06	340 00	3,464.43	282 10	-54 28	349 11	287 27
3,583 00	9 23	341 58	3,558.22	296 35	-59 24	348 69	302 22
3,679 00	9 32	342 20	3,652 97	311 06	-64 05	348 36	317 59
3,774 00	9 58	342 72	3,746 68	325 93	-68 75	348 09	333 10
3,870 00	8 79	343.16	3,841 45	340 58	-73 25	347 86	348 37
3,966 00	9 15	344 57	3,936 27	354 96	-77 41	347 70	363 30
4,061 00	9 23	345 80	4,030.05	369 63	-81 29	347 60	378 46
4,157.00	9 36	346 71	4,124 79	384 69	-84 97	347 54	393 96
4,253 00	9 86	346 61	4,219 45	400 28	-88 67	347 51	409 98
4,348 00	9 23	348.16	4,313 13	415 65	-92 11	347 50	425 73
4,444 00	9 45	348 71	4,407 86	430 91	-95 24	347 54	441 31
4,538 00	9 57	350 15	4,500 57	446 18	-98 08	347 60	456 83
Last MWD Survey							



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SDI Standard Survey Report



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Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	GL Elev @ 3609 00usft
Site:	Dodd Federal Unit #612	MD Reference:	GL Elev @ 3609.00usft
Well:	Dodd Federal Unit #612	North Reference:	Grid
Wellbore:	OH - Job #32D0412477	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)
4,588 00	9 57	350 15	4,549 87	454 37	-99 51	347.65	465 14
Projection to Bit - PBHL-Dodd #612							

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
1,055.00	1,054 87	-4.34	11 78	Gyro Tie-In
4,538.00	4,500 57	446 18	-98 08	Last MWD Survey
4,588 00	4,549 87	454 37	-99 51	Projection to Bit

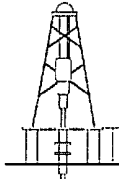


To convert a Magnetic Direction to a Grid Direction Add 7.64°
To convert a True Direction to a Grid Direction Subtract 0.15°

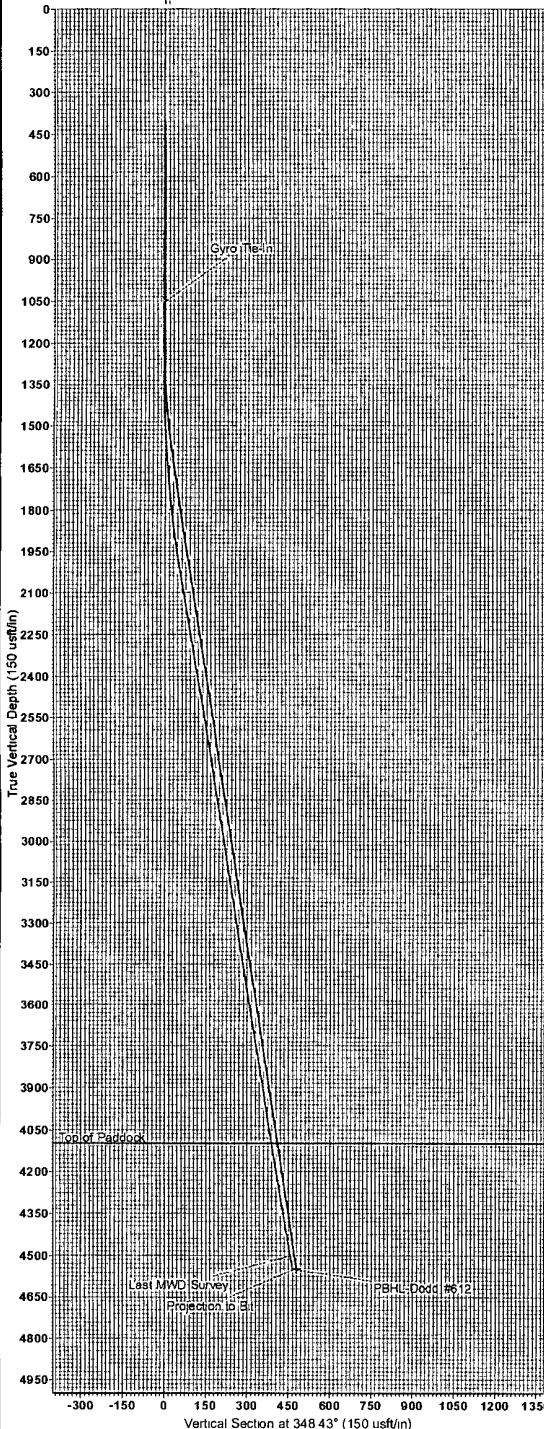
Azimuth to Grid North
True North -0.15°
Magnetic North 7.64°
Magnetic Field
Strength 488.77 4anT
Dip Angle 90.88°
Date 12/22/2011
Model IGRF2010



Dodd Federal Unit #612
Eddy County, NM (NAD27 NME)
Northing: (Y) 667595.00
Easting: (X) 586693.10
Plan #3 - 7-7/8" Hole



Ground Elev 3609.00



WELL DETAILS

Dodd Federal Unit #612
+N/S 0.00 +E/W 0.00 Northing 667595.00 Easting 586693.10 Ground Level 3609.00 Casing 586693.10 32° 50' 5.951" N 104° 3' 3.910" W Slot

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/S	+E/W	Dlog	TFace	VSect	Target
1	1055.00	0.79	107.83	1054.87	-4.34	11.78	0.00	0.00	-0.61	
2	1150.00	0.79	107.83	1149.86	-4.74	13.02	0.00	0.00	-7.25	
3	1609.85	8.77	346.72	1608.09	28.48	7.68	2.00	-125.29	26.30	
4	4588.63	8.77	346.72	4550.00	470.00	-68.20	0.00	0.00	470.74	PBHL-Dodd #612

DESIGN TARGET DETAILS

Name	TVD	+N/S	+E/W	Northing	Easting	Latitude	Longitude	Shape
PBHL-Dodd #612	4550.00	470.00	-96.20	608005.00	586596.00	32° 50' 10.604" N	104° 3' 5.023" W	Circle (Radius 10.00)
- plan hits target center								

PROJECT DETAILS

Eddy County, NM (NAD27 NME)
Geodetic System US State Plane 1927 (Exact solution)
Datum NAD 1927 (NADCON CONUS)
Ellipsoid Clarke 1866
Zone New Mexico East 3001
System Datum Mean Sea Level

SITE DETAILS

Dodd Federal Unit #612
See Centre Northing 667595.00
Easting 586693.10
Positional Uncertainty 0.00
Convergence 0.15
Local North Grid

FORMATION TOP DETAILS

TVDPath	MDPath	Formation	DipAngle	DipDir
4100.00	4131.31	Top of Peddock	0.00	

Map System US State Plane 1927 (Exact solution)
Datum NAD 1927 (NADCON CONUS)
Ellipsoid Clarke 1866
Zone Name New Mexico East 3001
Local Origin Site Dodd Federal Unit #612, Grid North
Latitude 32° 50' 5.951" N
Longitude 104° 3' 3.910" W
Grid North 667595.00
Scale Factor 1.000

Geomagnetic Model IGRF2010
Sample Date 22-Dec-11
Magnetic Declination 7.79°
Dip Angle from Horizontal 60.88°
Magnetic Field Strength 488.77
To convert a Magnetic Direction to a Grid Direction Add 7.64°
To convert a Magnetic Direction to a True Direction Add 7.64° East
To convert a True Direction to a Grid Direction Subtract 0.15°

CASING DETAILS

TVD	MD	Name	Size
1050.00		8-5/8 Casing	8-5/8

