



PO Box 1370
Artesia, NM 88211-1370
(575) 748-1288

30-015-40454

September 4, 2012

COG, LLC
One Concho Center
600 W. Illinois Ave.
Midland, TX 79701

RE: Dodd Federal Unit #600
930' FNL & 75' FWL
Sec. 14, T17S, R29E
Eddy County, New Mexico



Dear Sir,

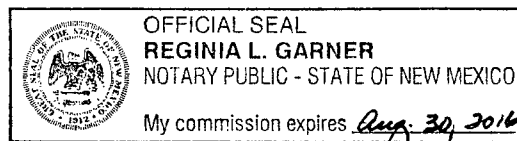
The attached is the Deviation Survey for the above captioned well.

Very truly yours,

Eddie LaRue
Operations Manager

State of New Mexico }
County of Eddy }

The foregoing was acknowledged before me this 4th day of September, 2012.

Notary Public

Dodd Federal Unit #600

Date	Depth	Deviation	Direction
8/27/2012	114	0.60	
8/28/2012	277	0.60	
8/29/2012	490	0.40	
8/29/2012	939	1.00	
8/31/2012	1045	0.88	51.68
8/31/2012	1108	1.32	12.74
8/31/2012	1172	2.11	6.85
8/31/2012	1234	2.23	349.70
8/31/2012	1297	3.96	347.52
8/31/2012	1360	4.57	350.50
8/31/2012	1612	5.89	336.70
8/31/2012	1713	6.24	336.62
8/31/2012	1808	5.74	335.30
8/31/2012	1997	5.36	346.70
8/31/2012	2092	5.89	347.20
8/31/2012	2186	5.45	3464.00
8/31/2012	2282	6.60	345.80
8/31/2012	2376	6.50	347.10
8/31/2012	2472	6.60	347.50
8/31/2012	2567	5.40	338.80
9/1/2012	2756	5.63	347.80
9/1/2012	2851	5.45	343.50
9/1/2012	2946	5.72	343.30
9/1/2012	3040	5.75	344.30
9/1/2012	3135	5.34	344.20
9/1/2012	3229	5.54	342.30
9/1/2012	3323	5.60	345.94
9/1/2012	3418	5.45	346.90
9/1/2012	3513	5.33	345.80
9/1/2012	3607	5.45	347.52
9/1/2012	3702	5.36	346.20
9/1/2012	3796	5.28	344.70
9/1/2012	3859	4.90	348.80
9/1/2012	3922	3.90	350.10
9/1/2012	3984	3.00	339.50
9/1/2012	4047	1.70	333.60
9/1/2012	4142	0.00	369.10
9/1/2012	4237	0.40	202.80
9/2/2012	4427	0.88	257.00
9/2/2012	4556	0.97	253.50



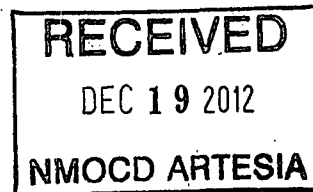
COG Operating LLC

Eddy County, NM (NAD27 NME)

Dodd Federal Unit

#600

OH - Job #32D08121086



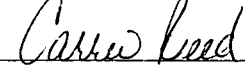
Design: OH

SDI Standard Survey Report

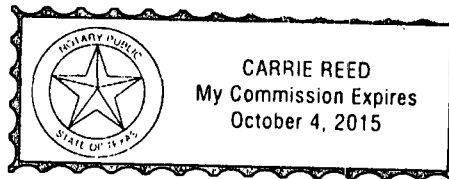
This survey is correct to the best of my knowledge and is supported by actual field data.



Notarized this date 8th of October, 2012.



Notary Signature
County of Midland
State of Texas





Scientific Drilling International, Inc.
SDI Standard Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #600
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	RF @ 3630.00usft (SO #8)
Site:	Dodd Federal Unit	MD Reference:	RF @ 3630.00usft (SO #8)
Well:	#600	North Reference:	Grid
Wellbore:	OH - Job #32D08121086	Survey Calculation Method:	Minimum Curvature
Design:	OH	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		
Site Position:		Northing:	669,114.80 usft
From:	Map	Easting:	586,009.50 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16"
		Latitude:	32° 50' 21.008 N
		Longitude:	104° 3' 11.875 W
		Grid Convergence:	0.15 °

Well	#600		
Well Position	+N/-S	0.00 usft	Northing:
	+E/-W	0.00 usft	Easting:
Position Uncertainty	0.00 usft	Wellhead Elevation:	usft
		Latitude:	32° 50' 21.008 N
		Longitude:	104° 3' 11.875 W
		Ground Level:	3,613.00 usft

Wellbore	OH - Job #32D08121086				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	08/30/12	7.71	60.64	48,811

Design	OH			
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	346.34

Survey Program	Date 09/22/12				
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
100.46	912.00	Gyro (OH - Job #32D08121086)	Keeper	Standard Wireline Keeper ver 1.0.2	
1,045.00	4,606.00	MWD (OH - Job #32D08121086)	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	
100.46	0.07	260.08	100.46	-0.01	-0.06	260.08	0.06	
200.31	0.10	319.45	200.31	0.05	-0.18	284.29	0.18	
300.08	0.53	25.76	300.08	0.53	-0.03	356.39	0.53	
400.15	0.58	26.65	400.14	1.40	0.40	15.80	1.45	
500.33	0.24	34.77	500.32	2.02	0.74	20.16	2.15	
600.40	0.48	13.50	600.39	2.60	0.96	20.25	2.77	
700.46	0.96	40.75	700.44	3.64	1.60	23.76	3.98	
800.01	0.70	42.52	799.98	4.72	2.56	28.45	5.37	
900.01	0.70	46.61	899.97	5.59	3.42	31.42	6.55	



Scientific Drilling International, Inc.
SDI Standard Survey Report



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Site:	Dodd Federal Unit	MD Reference:	RF @ 3630.00usft (SO #8)
Well:	#600	North Reference:	Grid
Wellbore:	OH - Job #32D08121086	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM-Regulatory

Survey							
Measured Depth (usft)	Inclination (°)	Azimuth (°)	True Vertical Depth	North/South (usft)	East/West (usft)	Closure Azimuth (°)	Closure Distance (usft)
912.00	0.87	38.71	911.96	5.72	3.53	31.68	6.72
Gyro Tie-in							
1,045.00	0.88	51.68	1,044.95	7.14	4.96	34.80	8.69
1,108.00	1.32	12.74	1,107.94	8.14	5.50	34.03	9.83
1,171.00	2.11	6.85	1,170.91	10.00	5.80	30.09	11.56
1,234.00	2.73	349.71	1,233.85	12.63	5.67	24.17	13.84
1,297.00	3.96	347.52	1,296.74	16.23	4.93	16.89	16.96
1,359.00	4.57	350.50	1,358.57	20.76	4.06	11.06	21.15
1,423.00	5.19	348.31	1,422.34	26.11	3.05	6.67	26.29
1,517.00	6.07	339.96	1,515.89	34.94	0.49	0.80	34.94
1,612.00	5.89	336.79	1,610.37	44.14	-3.15	355.91	44.25
1,713.00	6.24	336.62	1,710.80	53.94	-7.38	352.21	54.44
1,808.00	5.74	335.34	1,805.28	63.00	-11.41	349.74	64.02
1,901.00	5.10	338.73	1,897.87	71.08	-14.85	348.20	72.61
1,997.00	5.36	346.73	1,993.47	79.42	-17.42	347.63	81.30
2,092.00	5.89	347.25	2,088.01	88.49	-19.52	347.56	90.62
2,186.00	5.45	346.46	2,181.55	97.53	-21.63	347.50	99.90
2,282.00	6.60	345.85	2,277.02	107.31	-24.04	347.37	109.98
2,376.00	6.51	347.17	2,370.41	117.75	-26.55	347.29	120.70
2,471.00	6.68	347.52	2,464.78	128.39	-28.94	347.30	131.61
2,567.00	5.45	338.82	2,560.24	138.10	-31.79	347.04	141.71
2,661.00	5.45	336.36	2,653.82	146.35	-35.19	346.48	150.52
2,756.00	5.63	347.87	2,748.37	155.04	-37.98	346.23	159.62
2,851.00	5.45	343.56	2,842.93	163.92	-40.24	346.21	168.79
2,946.00	5.72	343.39	2,937.48	172.78	-42.87	346.07	178.02
3,040.00	5.75	344.34	3,031.01	181.81	-45.48	345.96	187.41
3,134.00	5.54	344.27	3,124.55	190.71	-47.98	345.88	196.65
3,229.00	5.54	346.64	3,219.11	199.58	-50.28	345.86	205.82
3,323.00	5.60	345.94	3,312.67	208.45	-52.44	345.88	214.94
3,418.00	5.45	346.90	3,407.22	217.34	-54.59	345.90	224.09
3,513.00	5.33	345.80	3,501.80	226.01	-56.70	345.92	233.01
3,607.00	5.45	347.52	3,595.39	234.60	-58.73	345.94	241.84
3,702.00	5.36	346.29	3,689.97	243.32	-60.76	345.98	250.79
3,796.00	5.28	344.71	3,783.56	251.75	-62.94	345.96	259.50
3,859.00	4.92	348.84	3,846.31	257.20	-64.23	345.98	265.10
3,922.00	3.96	350.15	3,909.12	261.99	-65.12	346.04	269.97
3,984.00	3.04	339.95	3,971.01	265.65	-66.05	346.04	273.74
4,047.00	1.77	345.29	4,033.95	268.16	-66.87	346.00	276.37
4,113.07	0.54	345.29	4,100.00	269.45	-67.21	345.99	277.70
T1-Dodd #600							
4,142.00	0.00	269.12	4,128.94	269.58	-67.25	345.99	277.84
4,237.00	0.41	202.88	4,223.93	269.27	-67.38	345.95	277.57
4,332.00	0.54	214.71	4,318.93	268.58	-67.77	345.84	277.00
4,427.00	0.88	247.67	4,413.92	267.94	-68.70	345.62	276.60
4,522.00	0.88	257.08	4,508.91	267.50	-70.08	345.32	276.53



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Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	RF @ 3630.00usft (SO #8)
Site:	Dodd Federal Unit	MD Reference:	RF @ 3630.00usft (SO #8)
Well:	#600	North Reference:	Grid
Wellbore:	OH - Job #32D08121086	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM-Regulatory

Survey							
Measured Depth (usft)	Inclination (°)	Azimuth (°)	True Vertical Depth	North/South (usft)	East/West (usft)	Closure Azimuth (°)	Closure Distance (usft)
4,556.00	0.97	253.56	4,542.91	267.36	-70.61	345.21	276.53
Last MWD Survey - PBHL-Dodd #600							
4,606.00	0.97	253.56	4,592.90	267.12	-71.42	345.03	276.50
Projection to Bit							

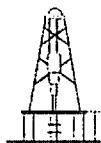
Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
4,556.00	4,542.91	267.36	-70.61	Last MWD Survey
4,606.00	4,592.90	267.12	-71.42	Projection to Bit



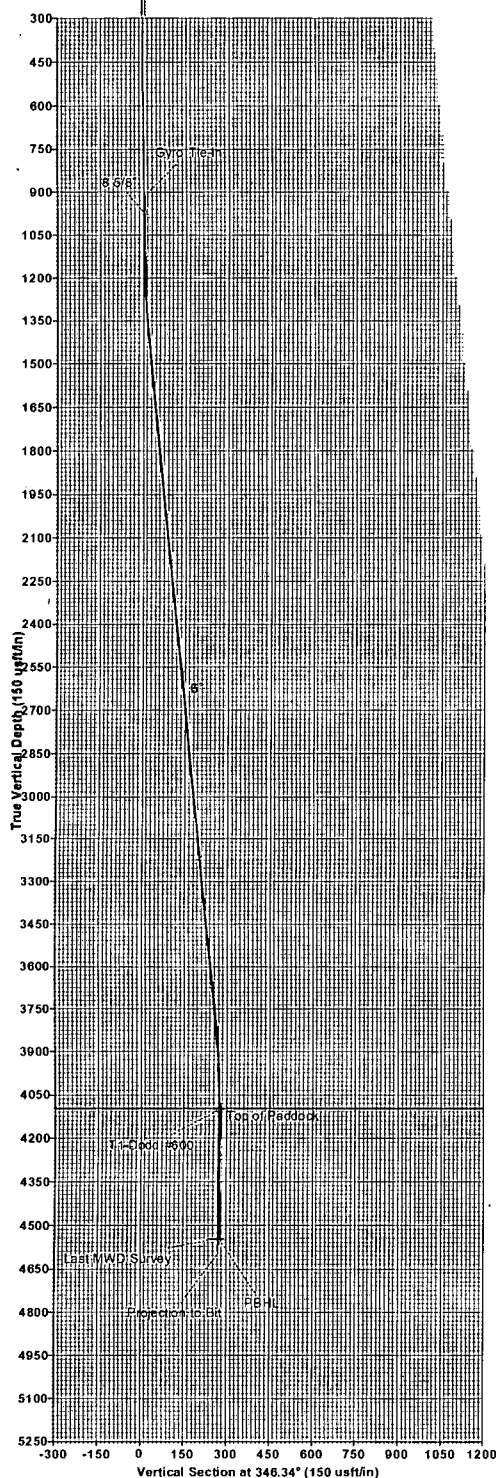
Azimuths to Grid North
True North: -0.15°
Magnetic North: 7.55°

Magnetic Field
Strength: 48810.7nT
Dip Angle: 60.64°
Date: 08/30/2012
Model: IGRF2010

Dodd Federal Unit #600
Eddy County, NM (NAN27 NME)
Northing: 669114.80
Easting: 586009.50
Plan #2 vs Actual - 7-7/8" Hole



RF @ 3630.00usft (SO #8)
Ground Level: 3613.00



WELL DETAILS:

Ground Level: 3613.00		Northing		Easting		Latitude		Longitude	
+N/-S	0.00	+E/-W	0.00	669114.80	586009.50	32° 50' 21.008 N	104° 3' 11.875 W		

SECTION DETAILS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	Vsect	Target
912.00	0.87	38.71	911.06	5.72	3.53	0.00	0.00	4.72	
1150.00	0.87	38.71	1149.93	8.54	5.79	0.00	0.00	6.93	
1415.24	5.77	344.38	1414.68	22.95	3.46	2.00	-61.96	21.48	
3824.98	5.77	344.38	3812.23	256.07	-61.70	0.00	0.00	263.40	
4113.24	0.00	0.00	4100.00	270.02	-65.61	2.00	180.00	277.88	T1
4563.24	0.00	0.00	4550.00	270.02	-65.61	0.00	0.00	277.88	PBHL

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting
T1-Dodd #600	4100.00	270.02	-65.61	669384.80	585943.90
PBHL-Dodd #600	4550.00	270.02	-65.61	669384.80	585943.90

SITE DETAILS: Dodd Federal Unit

Site Centre Northing: 669114.80
Easting: 586009.50

Positional Uncertainty: 0.00
Convergence: 0.15
Local North: Grid

PROJECT DETAILS: Eddy County, NM (NAN27 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

CASING DETAILS

TVD	MD	Name	Size
979.00	979.05	8 5/8"	8-5/8"

FORMATION TOP DETAILS

TVDPath	MDPath	Formation
4100.00	4113.24	Top of Paddock

Map System: US State Plane 1927 (Exact solution)
Datum: NAD 1927 (NADCON CONUS)

Ellipsoid: Clarke 1866
Zone Name: New Mexico East 3001

Local Origin: Well #600, Grid North

Latitude: 32° 50' 21.008 N
Longitude: 104° 3' 11.875 W

Grid East: 586009.50
Grid North: 669114.80
Scale Factor: 1.000

Geomagnetic Model: IGRF2010
Sample Date: 30-Aug-12

Magnetic Declination: 7.71°
Dip Angle from Horizontal: 60.64°
Magnetic Field Strength: 48811

To convert Magnetic North to Grid, Add 7.56°
To convert Magnetic North to True North, Add 7.71° East
To convert True North to Grid, Subtract 0.15°

