

30-015-39913

CAVALOZ DRILLING

P.O. BOX 1500 (575) 3910699 FAX (575) 391- 3824 HOBBS, NEW MEXICO 88241

INCLINATION REPORT

DATE: 3/23/12

WELL NAME AND NUMBER DODD FED UNIT #662
LOCATION EDDY COUNTY
OPERATOR: COG LLC
DRILLING CONTRACTOR: CAVALOZ DRILLING RIG #1

THE UNDERSIGNED HEREBY CERTIFIES THAT HE IS AN AUTHORIZED REPRESENTATIVE OF THE DRILLING CONTRACTOR WHO DRILLED THE ABOVE DESCRIBED WELL AND THAT HE HAS CONDUCTED DEVIATION TEST AND OBTAINED THE FOLLOWING RESULTS:

DEGREE	DEPTH	DEGREE	DEPTH	DEGREE	DEPTH
0.9	171				
1.4	266				
1.1	703				
1.4	971				

DRILLING CONTRACTOR:
CAVALOZ DRILLING

BY: Bob Wegner
BOB WEGNER
DRILLING SUPERINTENDENT

SUBSCRIBED AND SWORN TO BEFORE ME ON THE 23rd DAY OF March, 2012

MY COMMISSION EXPIRES: 03/01/15

Jessica Bueno



OFFICIAL SEAL
JESSICA BUENO
NOTARY PUBLIC - STATE OF NEW MEXICO
My commission expires: 03/01/15

COG Operating LLC

New Mexico

Eddy County, New Mexico

Dodd Federal Unit #662

SL:795'FNL 195'FEL BHL:380'FNL 380'FEL

Survey: Survey #1

Standard Survey Report

21 March, 2012

Gyrodata Survey Report

Company:	COG Operating LLC	Local Co-ordinate Reference:	Site Eddy County, New Mexico
Project:	New Mexico	TVD Reference:	WELL @ 0.0usft (Original Well Elev)
Site:	Eddy County, New Mexico	MD Reference:	WELL @ 0.0usft (Original Well Elev)
Well:	Dodd Federal Unit #662	North Reference:	Grid
Wellbore:	SL 795'FNL 195'FEL BHL 380'FNL 380'FEL	Survey Calculation Method:	Minimum Curvature
Design:	SL 795'FNL 195'FEL BHL 380'FNL 380'FEL	Database:	EDM 5000.1 Single User Db

Project:	New Mexico		
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: Eddy County, New Mexico						
Site Position:		Northing:	674,527.60 usft	Latitude:	32° 51' 14.434 N	
From:	Map	Easting:	591,008.40 usft	Longitude:	104° 2' 13.105 W	
Position Uncertainty:		0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.16 °

Well: Dodd Federal Unit #662, Top of Paddock 4000'TVD						
Well Position	+N/-S	0.0 usft	Northing:	674,527.60 usft	Latitude:	32° 51' 14.434 N
	+E/-W	0.0 usft	Easting:	591,008.40 usft	Longitude:	104° 2' 13.105 W
Position Uncertainty		0.0 usft	Wellhead Elevation:	usft	Ground Level:	0.0 usft

Wellbore	SL 795'FNL 195'FEL BHL 380'FNL 380'FEL				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF200510	2012/03/05	7.75	60.70	48,936

Design:		SL:795'FNL 195'FEL BHL:380'FNL 380'FEL			
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	335.77

Survey Program		Date: 2012/03/21		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
100.0	4,603.0	Survey #1 (SL 795'FNL 195'FEL BHL 380'	MWD	MWD

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	0.46	236.86	100.0	-0.2	-0.3	-0.1	0.46	0.46	0.00
200.0	0.75	255.78	200.0	-0.6	-1.3	0.0	0.35	0.29	18.92
300.0	0.83	269.49	300.0	-0.8	-2.7	0.4	0.20	0.08	13.71
400.0	0.83	292.99	400.0	-0.5	-4.1	1.2	0.34	0.00	23.50
500.0	0.92	301.29	500.0	0.2	-5.4	2.4	0.16	0.09	8.30
600.0	0.95	307.99	599.9	1.1	-6.7	3.8	0.11	0.03	6.70
700.0	0.80	328.09	699.9	2.2	-7.8	5.2	0.34	-0.15	20.10
800.0	0.86	344.14	799.9	3.6	-8.3	6.7	0.24	0.06	16.05
900.0	0.98	12.20	899.9	5.1	-8.4	8.1	0.46	0.12	28.06

Gyrodata Survey Report

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Site:	Eddy County, New Mexico	MD Reference:	WELL @ 0.0usft (Original Well Elev)
Well:	Dodd Federal Unit #662	North Reference:	Grid
Wellbore:	SL 795'FNL 195'FEL BHL 380'FNL 380'FEL	Survey Calculation Method:	Minimum Curvature
Design:	SL 795'FNL 195'FEL BHL 380'FNL 380'FEL	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)	
955.0	1.54	13.80	954.9	6.3	-8.1	9.1	1.02	1.02	2.91	
VES Gyro Tie-In at 955' MD										
1,047.0	1.30	38.00	1,046.9	8.3	-7.2	10.5	0.70	-0.26	26.30	
1,111.0	1.40	26.60	1,110.9	9.6	-6.4	11.3	0.45	0.16	-17.81	
1,173.0	1.40	29.10	1,172.8	10.9	-5.7	12.3	0.10	0.00	4.03	
1,235.0	1.20	29.70	1,234.8	12.1	-5.0	13.1	0.32	-0.32	0.97	
1,306.0	1.00	15.30	1,305.8	13.4	-4.4	14.0	0.48	-0.28	-20.28	
1,368.0	1.90	342.10	1,367.8	14.9	-4.6	15.5	1.93	1.45	-53.55	
1,430.0	3.00	338.30	1,429.7	17.4	-5.5	18.1	1.79	1.77	-6.13	
1,493.0	3.90	336.70	1,492.6	20.9	-7.0	21.9	1.44	1.43	-2.54	
1,588.0	5.50	334.00	1,587.3	27.9	-10.2	29.7	1.70	1.68	-2.84	
1,684.0	6.60	335.00	1,682.8	37.1	-14.6	39.8	1.15	1.15	1.04	
1,777.0	7.80	336.30	1,775.0	47.7	-19.4	51.5	1.30	1.29	1.40	
1,871.0	8.20	334.80	1,868.1	59.6	-24.8	64.5	0.48	0.43	-1.60	
1,965.0	8.60	335.20	1,961.1	72.0	-30.6	78.3	0.43	0.43	0.43	
2,060.0	8.60	333.30	2,055.0	84.8	-36.8	92.5	0.30	0.00	-2.00	
2,155.0	8.70	331.10	2,149.0	97.5	-43.4	106.7	0.36	0.11	-2.32	
2,249.0	8.80	327.30	2,241.9	109.8	-50.8	120.9	0.62	0.11	-4.04	
2,343.0	9.00	327.80	2,334.7	122.0	-58.6	135.3	0.23	0.21	0.53	
2,436.0	9.00	332.10	2,426.6	134.6	-65.9	149.8	0.72	0.00	4.62	
2,530.0	10.00	332.00	2,519.3	148.3	-73.1	165.3	1.06	1.06	-0.11	
2,623.0	9.60	335.20	2,610.9	162.5	-80.2	181.1	0.73	-0.43	3.44	
2,716.0	9.30	338.30	2,702.7	176.5	-86.2	196.3	0.64	-0.32	3.33	
2,810.0	8.90	340.90	2,795.5	190.4	-91.4	211.2	0.61	-0.43	2.77	
2,903.0	8.50	340.60	2,887.4	203.7	-96.0	225.2	0.43	-0.43	-0.32	
2,998.0	8.10	339.10	2,981.4	216.6	-100.7	238.9	0.48	-0.42	-1.58	
3,091.0	8.40	338.30	3,073.5	229.0	-105.6	252.2	0.35	0.32	-0.86	
3,186.0	9.30	336.00	3,167.3	242.5	-111.3	266.8	1.02	0.95	-2.42	
3,280.0	8.90	338.60	3,260.1	256.2	-117.0	281.6	0.61	-0.43	2.77	
3,374.0	8.70	340.50	3,353.0	269.7	-122.0	296.0	0.38	-0.21	2.02	
3,467.0	8.30	337.50	3,445.0	282.5	-127.0	309.7	0.64	-0.43	-3.23	
3,560.0	8.00	337.60	3,537.1	294.7	-132.0	322.9	0.32	-0.32	0.11	
3,655.0	8.10	338.40	3,631.1	307.0	-137.0	336.2	0.16	0.11	0.84	
3,750.0	7.70	336.20	3,725.2	319.1	-142.0	349.2	0.53	-0.42	-2.32	
3,845.0	8.00	337.00	3,819.4	331.0	-147.2	362.2	0.34	0.32	0.84	
3,940.0	7.90	334.60	3,913.4	342.9	-152.6	375.3	0.36	-0.11	-2.53	
4,034.0	8.40	336.30	4,006.5	355.1	-158.1	388.7	0.59	0.53	1.81	
4,128.0	8.00	332.50	4,099.5	367.2	-163.9	402.1	0.72	-0.43	-4.04	
4,222.0	7.70	334.80	4,192.6	378.7	-169.6	414.9	0.46	-0.32	2.45	
4,317.0	8.40	335.90	4,286.7	390.8	-175.1	428.2	0.75	0.74	1.16	
4,411.0	7.80	334.90	4,379.8	402.8	-180.6	441.4	0.66	-0.64	-1.06	
4,504.0	7.50	337.60	4,471.9	414.1	-185.6	453.8	0.50	-0.32	2.90	
4,559.0	7.80	336.90	4,526.5	420.9	-188.4	461.1	0.57	0.55	-1.27	
4,603.0	7.80	336.90	4,570.1	426.4	-190.8	467.1	0.00	0.00	0.00	

Gyrodata Survey Report

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Projected Bottom Hole Location 4603' MD									

Survey Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
955.0	954.9	6.3	-8.1	VES Gyro Tie-In at 955' MD
4,603.0	4,570.1	426.4	-190.8	Projected Bottom Hole Location 4603' MD

Checked By: _____	Approved By: _____	Date: _____
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