30-015-40002

CAVALOZ DRILLING

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

INCLINATION REPORT

DATE: 5/1/12

WELL NAME AND NUMBER DODD FED UNIT # 638
LOCATION EDDY COUNTY
OPERATOR: COG LLC
DRILLING CONTRACTOR: CAVALOZ DRILLING RIG #2

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
1	116				
0.3	271				
0.8	592				

DRILLING CONTRACTOR:
CAVALOZ DRILLING

BY: Bob Wegner
BOB WEGNER
DRILLING SUPERINTENDENT

SUBSCRIBED AND SWORN TO BEFORE ME ON THE 1st **DAY OF** May **, 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

Archer
The well company

COG Operating LLC

Eddy County(NM27E)
Sec 14 T-17S-R29E
Dodd Federal 638

7-7/8" Hole

Survey: Gyro/MWD Survey

Standard Survey Report

30 April, 2012

Archer
The well company

Company:	COG Operating LLC	**Local Co-ordinate Reference:**	Well Dodd Federal 638
Project:	Eddy County(NM27E)	**TVD Reference:**	WELL @ 3607.0usft (Original Well Elev)
Site:	Sec 14 T-17S-R29E	**MD Reference:**	WELL @ 3607.0usft (Original Well Elev)
Well:	Dodd Federal 638	**North Reference:**	Grid
Wellbore:	7-7/8" Hole	**Survey Calculation Method:**	Minimum Curvature
Design:	7-7/8" Hole	**Database:**	EDM 5000 1-Single User Db

Project Eddy County(NM27E)

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 Sec 14 T-17S-R29E

Site Position:		**Northing:**	665,092 80 usft	**Latitude:**	32° 49' 41.143 N
From:	Map	**Easting:**	588,494 00 usft	**Longitude:**	104° 2' 42 883 W
Position Uncertainty:	0 0 usft	**Slot Radius:**	13-3/16 "	**Grid Convergence:**	0.16 °

Well Dodd Federal 638

Well Position	**+N/-S**	0 0 usft	**Northing:**	665,092.80 usft	**Latitude:**	32° 49' 41 143 N
	+E/-W	0.0 usft	**Easting:**	588,494 00 usft	**Longitude:**	104° 2' 42 883 W
Position Uncertainty		0 0 usft	**Wellhead Elevation:**	usft	**Ground Level:**	3,607 0 usft

Wellbore 7-7/8" Hole

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	2012/04/16	7 75	60 64	48,842

Design 7-7/8" Hole

Audit Notes:

Version:	1 0	**Phase:**	ACTUAL	**Tie On Depth:**	0 0

Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0 0	0 0	0 0	272.22

Survey Program **Date** 2012/04/30

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
100 0	4,565.0	Gyro/MWD Survey (7-7/8" Hole)	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 31	223 37	100 0	-0.2	-0.2	0.2	0 31	0.31	0 00
200 0	0.44	230.84	200.0	-0 6	-0.7	0 6	0 14	0.13	7.47
300.0	0.43	232 05	300.0	-1.1	-1 3	1 2	0.01	-0 01	1 21
400.0	0 33	216 53	400.0	-1 6	-1 7	1.7	0 14	-0.10	-15.52
500.0	0.27	139 52	500.0	-2.0	-1 7	1.7	0.38	-0.06	-77.01
600 0	0 38	95 56	600 0	-2 2	-1 3	1 2	0 26	0 11	-43 96
700 0	0 62	71 60	700 0	-2 1	-0 4	0 3	0 31	0 24	-23 96
800.0	0.76	46.29	800.0	-1.4	0 6	-0.6	0 33	0.14	-25 31
900 0	1.28	50.91	900.0	-0.3	1.9	-1.9	0.53	0.52	4.62

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Well:	Dodd Federal 638	**North Reference:**	Grid
Wellbore:	7-7/8" Hole	**Survey Calculation Method:**	Minimum Curvature
Design:	7-7/8" Hole	**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)
1,000.0	1.08	78 45	999.9	0.6	3.7	-3.7	0 59	-0 20	27 54
1,050.0	0 96	74 02	1,049.9	0.8	4.6	-4.5	0.29	-0.24	-8 86
Last VES Gyro									
1,110 0	1.10	69.50	1,109.9	1.2	5.6	-5.5	0 27	0 23	-7 53
1,174 0	0 60	56.90	1,173.9	1.6	6.5	-6 4	0.83	-0.78	-19.69
1,236 0	1 10	356.10	1,235.9	2 3	6.7	-6.6	1 55	0 81	-98 06
1,299.0	1 60	310.80	1,298 9	3.5	6.0	-5.8	1.81	0 79	-71 90
1,363.0	2.40	283 60	1,362.9	4.4	4.0	-3 8	1.91	1.25	-42.50
1,426 0	3 10	280 20	1,425.8	5 0	1 0	-0.8	1 14	1 11	-5 40
1,490 0	3 20	272 30	1,489 7	5.4	-2 5	2.7	0.70	0 16	-12 34
1,553 0	4.40	271 80	1,552 5	5.6	-6 6	6 8	1.91	1.90	-0 79
1,615 0	4.80	270 30	1,614 3	5.7	-11 6	11 8	0 67	0.65	-2 42
1,677.0	5 60	269 50	1,676 1	5.6	-17 2	17 4	1 30	1 29	-1 29
1,746.0	6 60	267 50	1,744.7	5 4	-24.5	24.7	1 48	1 45	-2 90
1,842 0	6.20	265 30	1,840 1	4 8	-35.2	35.4	0 49	-0 42	-2 29
1,937 0	5 50	264 10	1,934 6	3 9	-44.9	45 0	0 75	-0.74	-1.26
2,031 0	5 50	269.90	2,028 2	3.4	-53 8	53 9	0.59	0.00	6 17
2,125 0	4.70	269 30	2,121 8	3 4	-62 2	62.3	0 85	-0.85	-0.64
2,220.0	5 10	270.60	2,216 5	3.4	-70.3	70 4	0 44	0 42	1.37
2,315 0	6.30	268.10	2,311.0	3 2	-79 7	79.8	1 29	1 26	-2.63
2,411 0	5.90	267.20	2,406 4	2 8	-89.9	90 0	0.43	-0.42	-0 94
2,506 0	5 70	267 90	2,501 0	2 4	-99 5	99.6	0 22	-0.21	0.74
2,569.0	6.60	271 90	2,563 6	2 4	-106 3	106 3	1.58	1.43	6.35
2,664 0	7.10	273.80	2,657 9	3 0	-117 6	117.6	0 58	0.53	2.00
2,757 0	6.90	272 10	2,750 2	3 6	-128 9	129 0	0.31	-0.22	-1 83
2,852 0	6 90	273 30	2,844.5	4.1	-140 3	140 4	0 15	0 00	1 26
2,947.0	6 60	272 90	2,938.9	4.7	-151 5	151 5	0.32	-0 32	-0.42
3,042.0	6 50	274.30	3,033 3	5 4	-162 3	162.4	0 20	-0 11	1 47
3,136.0	6 70	272.50	3,126 6	6.0	-173 1	173 2	0.31	0 21	-1.91
3,199.0	6 10	275 50	3,189 2	6.5	-180 1	180 2	1 09	-0 95	4 76
3,292 0	5 70	276 80	3,281 7	7 5	-189 6	189 7	0 45	-0.43	1.40
3,386.0	5.60	276 40	3,375 3	8 6	-198 8	198 9	0 11	-0.11	-0 43
3,480 0	5 30	276.60	3,468 9	9 6	-207 6	207 8	0.32	-0 32	0 21
3,574.0	5 50	275 90	3,562 4	10 6	-216 4	216 7	0 22	0 21	-0 74
3,669.0	5 40	275.70	3,657 0	11 5	-225 4	225 7	0.11	-0 11	-0 21
3,763 0	5 10	277 50	3,750 6	12.5	-233 9	234 3	0.36	-0.32	1 91
3,857 0	5 30	275.80	3,844 2	13 4	-242 4	242 7	0 27	0.21	-1 81
3,921.0	4 30	271.00	3,908.0	13 8	-247.7	248 1	1 68	-1.56	-7 50
3,983.0	3 40	269 70	3,969.9	13.8	-251 9	252 3	1.46	-1.45	-2.10
4,045 0	2 70	274.30	4,031.8	13 9	-255.2	255.5	1 20	-1.13	7 42
4,108 0	1 50	272.00	4,094.7	14.0	-257.5	257.9	1.91	-1 90	-3.65
4,201 0	0 40	11.70	4,187 7	14 4	-258 7	259 0	1.74	-1 18	107 20
4,264 0	0 70	69 00	4,250 7	14.8	-258.3	258.6	0.94	0.48	90.95
4,327 0	1 50	78.00	4,313 7	15 1	-257 1	257 5	1 30	1 27	14.29

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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)
4,421.0	1.70	80.20	4,407 7	15 6	-254 5	254 9	0 22	0 21	2.34
4,519.0	1.80	71.90	4,505.6	16.3	-251 6	252.1	0.28	0.10	-8.47
Last MWD Survey									
4,565 0	1.80	71.90	4,551.6	16 7	-250.2	250.7	0.00	0 00	0 00
Projection to TD									

Survey Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	+E/-W (usft)	Comment
1,050 0	1,049.9	0.8	4.6	Last VES Gyro
4,519 0	4,505 6	16 3	-251.6	Last MWD Survey
4,565.0	4,551.6	16.7	-250.2	Projection to TD

Checked By: _____ Approved By: _____ Date _____