

30-015-39763

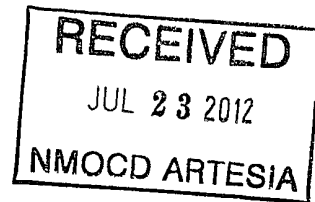
CAVALOZ DRILLING

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

INCLINATION REPORT

DATE: 4/16/12

WELL NAME AND NUMBER DOGWOOD FED #3
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
0.7	140				
0.7	384				
0.4	749				
1	998				

DRILLING CONTRACTOR:
CAVALOZ DRILLING

BY: Bob Wegner
BOB WEGNER
DRILLING SUPERINTENDENT

SUBSCRIBED AND SWORN TO BEFORE ME ON THE 17th DAY OF April, 2012

MY COMMISSION EXPIRES: 3/01/15

Jessica Bueno



OFFICIAL SEAL
JESSICA BUENO
NOTARY PUBLIC - STATE OF NEW MEXICO
My commission expires: 3/01/15



COG Operating LLC

Eddy County(NM27E)

Sec 25-T17S-R27E

Dogwood Federal 3

7-7/8" Hole

Survey: Gyro/MWD Survey

Standard Survey Report

13 April, 2012

Archer
The well company



Great White Directional Services
Survey Report

Archer
The well company

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well Dogwood Federal 3
Project:	Eddy County(NM27E)	TVD Reference:	WELL @ 3570.0usft (Original Well Elev)
Site:	Sec 25-T17S-R27E	MD Reference:	WELL @ 3570.0usft (Original Well Elev)
Well:	Dogwood Federal 3	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 25-T17S-R27E		
Site Position:		Northing:	657,570.90 usft
From:	Map	Easting:	529,988.70 usft
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 48' 27.767 N
		Longitude:	104° 14' 8.623 W
		Grid Convergence:	0.05 °

Well:	Dogwood Federal 3, SHL- 1650'FNL&1410'FWL BHL- 1650'FNL&1700'FWL					
Well Position	+N/-S	0.0 usft	Northing:	657,570.90 usft	Latitude:	32° 48' 27.767 N
	+E/-W	0.0 usft	Easting:	529,988.70 usft	Longitude:	104° 14' 8.623 W
Position Uncertainty	0.0 usft	Wellhead Elevation:	usft	Ground Level:	3,570.0 usft	

Wellbore:	7-7/8" Hole				
Magnetics:	Model Name	Sample Date	Declination	Dip Angle	Field Strength
			(°)	(°)	(nT)
	IGRF2010	2012/04/05	7.84	60.59	48,812

Design:	7-7/8" Hole				
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	92.15	

Survey Program		Date: 2012/04/13		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
100.0	4,766.0	Gyro/MWD Survey (7-7/8" Hole)	MWD	MWD - Standard

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	0.24	286.53	100.0	0.1	-0.2	-0.2	0.24	0.24	0.00
200.0	0.23	170.33	200.0	-0.1	-0.4	-0.4	0.40	-0.01	-116.20
300.0	0.23	214.18	300.0	-0.4	-0.4	-0.4	0.17	0.00	43.85
400.0	0.24	312.28	400.0	-0.5	-0.7	-0.7	0.36	0.01	98.10
500.0	0.13	136.58	500.0	-0.4	-0.8	-0.8	0.37	-0.11	-175.70
600.0	0.24	276.75	600.0	-0.5	-0.9	-0.9	0.35	0.11	140.17
700.0	0.14	118.99	700.0	-0.5	-1.0	-1.0	0.37	-0.10	-157.76
800.0	0.18	286.54	800.0	-0.5	-1.1	-1.0	0.32	0.04	167.55
900.0	0.30	225.18	900.0	-0.7	-1.4	-1.4	0.27	0.12	-61.36

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well Dogwood Federal 3
Project:	Eddy County(NM27E)	TVD Reference:	WELL @ 3570.0usft (Original Well Elev)
Site:	Sec 25-T17S-R27E	MD Reference:	WELL @ 3570 0usft (Original Well Elev)
Well:	Dogwood Federal 3	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

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)
965.0	0 28	235.19	965.0	-0.9	-1.7	-1 6	0.08	-0.03	15 40
Last VES Gyro									
1,067.0	0 70	199 80	1,067.0	-1.6	-2 1	-2 0	0.49	0.41	-34.70
1,129.0	1 10	141 00	1,129.0	-2.4	-1 8	-1 7	1.53	0 65	-94.84
1,192 0	2.10	116 80	1,192 0	-3.4	-0 4	-0 3	1.88	1.59	-38.41
1,254 0	3 30	106 30	1,253.9	-4 4	2 3	2 5	2.09	1.94	-16.94
1,317 0	4 50	99 40	1,316 7	-5.3	6 5	6 7	2 04	1.90	-10 95
1,380.0	5 50	90.50	1,379 5	-5 8	12 0	12.2	2.00	1 59	-14 13
1,473.0	5.50	88.40	1,472.1	-5.7	20 9	21.1	0 22	0.00	-2.26
1,567.0	5.40	86 70	1,565.7	-5.3	29.8	30 0	0 20	-0 11	-1.81
1,669 0	5.30	85.90	1,667 2	-4.7	39.3	39.4	0.12	-0.10	-0.78
1,765.0	5 20	85 30	1,762 8	-4.0	48 0	48 1	0.12	-0 10	-0 63
1,859 0	5 00	83 70	1,856 4	-3 2	56 3	56.4	0.26	-0.21	-1 70
1,954 0	4.80	85 50	1,951.1	-2 4	64 4	64.5	0.27	-0.21	1 89
2,047.0	4 80	85 70	2,043 8	-1.8	72 2	72.2	0 02	0.00	0 22
2,109.0	4 60	95.60	2,105.6	-1 9	77 2	77.3	1.35	-0.32	15 97
2,202 0	4.60	97.40	2,198 3	-2.7	84 7	84 7	0 16	0 00	1 94
2,296 0	4 60	97.30	2,291 9	-3.7	92.1	92.2	0 01	0 00	-0 11
2,390.0	4 40	95 90	2,385 7	-4.6	99.5	99.6	0.24	-0.21	-1 49
2,485 0	4.60	96 90	2,480 4	-5 4	106 9	107 0	0 23	0.21	1 05
2,580 0	4.70	95 80	2,575.1	-6 2	114 5	114.7	0.14	0.11	-1 16
2,674.0	4.60	99 00	2,668.7	-7.2	122.1	122.3	0.30	-0 11	3 40
2,767 0	4 30	98.00	2,761.5	-8 3	129 2	129.4	0 33	-0.32	-1.08
2,829.0	4 20	87 10	2,823.3	-8 5	133 8	134.0	1 31	-0.16	-17.58
2,923 0	4 30	84.20	2,917 0	-8.0	140 7	140.9	0 25	0 11	-3.09
3,018.0	4 20	84 90	3,011.8	-7 3	147 7	147 9	0.12	-0.11	0 74
3,112 0	4.40	85 40	3,105.5	-6 7	154.8	154 9	0.22	0.21	0 53
3,207 0	4 40	85 40	3,200 2	-6 1	162 0	162.1	0 00	0.00	0.00
3,300 0	4 50	84 50	3,293 0	-5 5	169 2	169.3	0 13	0.11	-0.97
3,393.0	4 40	83.00	3,385 7	-4 7	176 4	176.4	0 16	-0.11	-1 61
3,488 0	4 30	83 30	3,480.4	-3 8	183 5	183.5	0 11	-0 11	0 32
3,551.0	4.90	88.50	3,543.2	-3.5	188 6	188.6	1 16	0.95	8 25
3,646 0	4.80	89.10	3,637 9	-3.3	196 6	196 6	0.12	-0.11	0.63
3,740.0	5 00	89.10	3,731 5	-3 2	204 6	204 6	0 21	0.21	0.00
3,834.0	4 80	87 80	3,825 2	-3.0	212 6	212.6	0.24	-0 21	-1 38
3,897.0	4 60	98 20	3,888.0	-3 2	217.8	217 8	1 39	-0 32	16.51
3,992.0	4 50	102.60	3,982 7	-4 6	225 2	225 2	0 38	-0 11	4.63
4,085.0	4 40	101 10	4,075.4	-6 1	232 3	232.3	0.16	-0.11	-1 61
4,180 0	4 30	101 10	4,170.1	-7 5	239 3	239 4	0 11	-0 11	0.00
4,274 0	4.40	100 00	4,263.8	-8 8	246.3	246.5	0 14	0.11	-1.17
4,368 0	4.30	99.00	4,357.6	-9 9	253 4	253.6	0 13	-0.11	-1.06
4,462.0	4 20	103.10	4,451.3	-11 3	260.2	260.4	0.34	-0.11	4 36
4,525.0	4 80	96 10	4,514 1	-12.1	265.1	265 3	1 29	0 95	-11.11
4,618 0	5 00	94.80	4,606 8	-12.8	273 0	273.3	0.25	0.22	-1 40



Great White Directional Services
Survey Report

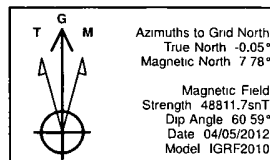
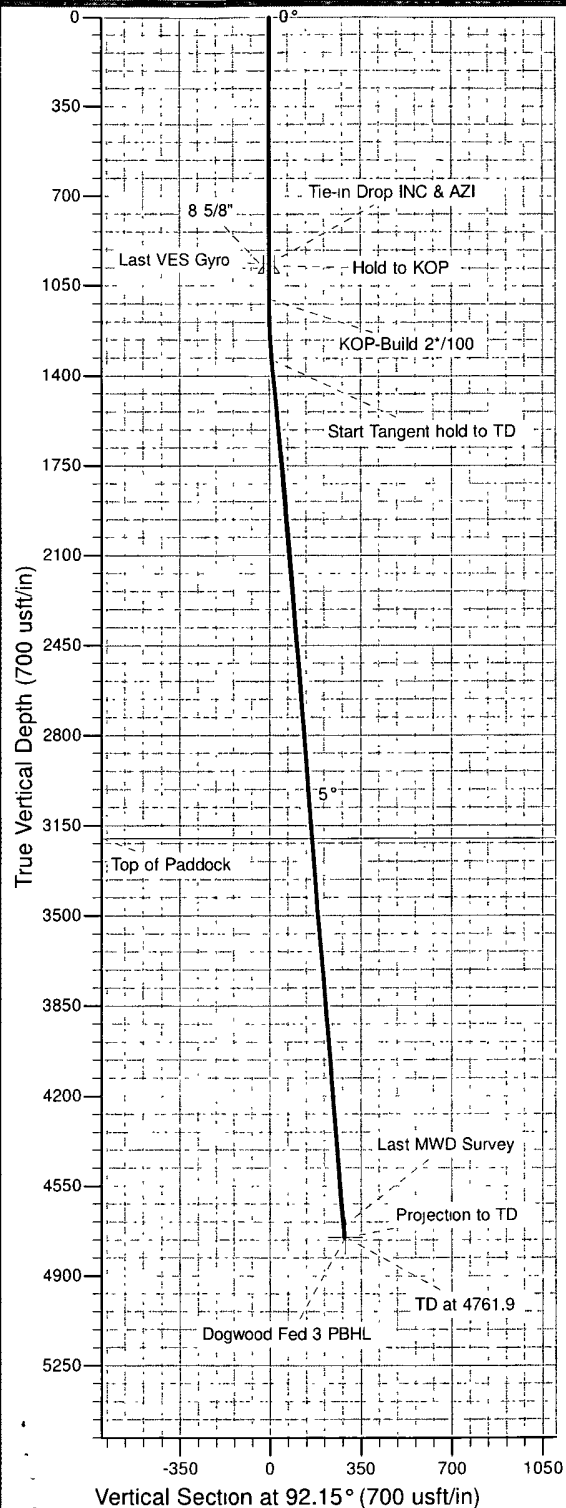
Archer
The well company

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well Dogwood Federal 3
Project:	Eddy County(NM27E)	TVD Reference:	WELL @ 3570 0usft:(Original Well Elev)
Site:	Sec 25-T17S-R27E	MD Reference:	WELL @ 3570 0usft (Original Well Elev)
Well:	Dogwood Federal 3	North Reference:	Gnd
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)
4,720.0	4.70	95.80	4,708.4	-13.6	281.6	281.9	0.31	-0.29	0.98
Last MWD Survey									
4,766.0	4.70	95.80	4,754.2	-14.0	285.3	285.6	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	
965.0	965.0	-0.9	-1.7	Last VES Gyro	
4,720.0	4,708.4	-13.6	281.6	Last MWD Survey	
4,766.0	4,754.2	-14.0	285.3	Projection to TD	

Checked By _____	Approved By. _____	Date. _____
------------------	--------------------	-------------



Project Eddy County(NM27E)
Site Sec 25-T17S-R27E
Well Dogwood Federal 3
Wellbore 7-7/8" Hole
Design Dogwood Fed 3 Plan 2



WELL DETAILS Dogwood Federal 3

+N/-S	+E/-W	Northing	Ground Level Easting	3570.0 Latitude	Longitude	Slot
0.0	0.0	657570.90	529988.70	32°48' 27.767 N	104°14' 8.623 W	

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VFace	Target
1	965.0	0.28	235.19	965.0	-0.9	-1.7	0.00	0.00	-1.6	
2	972.0	0.00	0.00	972.0	-0.9	-1.7	4.00	180.00	-1.6	
3	1100.0	0.00	0.00	1100.0	-0.9	-1.7	0.00	0.00	-1.6	
4	1336.1	4.72	91.97	1335.8	-1.2	8.0	2.00	91.97	8.1	
5	4761.9	4.72	91.97	4750.0	-10.9	289.9	0.00	0.00	290.1	Dogwood Fed 3 PBHL

ANNOTATIONS

TVD	MD	Inc	Azi	+N/-S	+E/-W	VFace	Departure	Annotation
965.0	965.0	0.28	235.19	-0.9	-1.7	-1.6	0.0	Tie-in Drop INC & AZI
972.0	972.0	0.00	0.00	-0.9	-1.7	-1.6	0.0	Hold to KOP
1100.0	1100.0	0.00	0.00	-0.9	-1.7	-1.6	0.0	KOP-Build 2°/100
1335.8	1336.1	4.72	91.97	-1.2	8.0	8.1	9.7	Start Tangent hold to TD
4750.0	4761.9	4.72	91.97	-10.9	289.9	290.1	291.8	TD at 4761.9

Surveys must be provided 3 times per day (6-7am) (3-4pm) (8-9pm), Halt drilling and call to discuss on ANY substantial doglegs greater than the 2°/100 MAX. Never exceed an inclination of 9.5°, follow plan inclinations. 60' to 90' survey course lengths (unless otherwise requested)

