

Apache Corporation

Eddy County, New Mexico

Sec 18, T17S,31E

Coffee Federal #17

API #30-015-41036

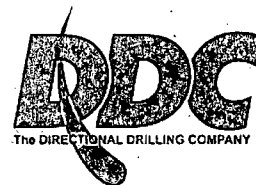
Wellbore #1

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Survey: MWD

DDC Survey Report

01 August, 2013





Survey Certification Sheet

Apache Corporation
Company

WT-13546
Job Number

8/1/13
Date

Sec18, T17S, R31E
Lease

Coffee Federal # 17
Well Name

Eddy, NM
County & State

API: 30-015-40387

Surveyed from a depth of: 340 feet to 6446 feet MD

Type of Survey: MWD

Directional Supervisor/Surveyor: Daniel Longoria

The data and calculations for this survey have been checked by me and conform to the standards and procedures set forth by **The Directional Drilling Company (DDC)**. This report represents a true and correct Directional survey of this well based on the original data obtained at the well site. Wellbore Coordinates are calculated using minimum curvature.

Digitally signed by Larry Wright
DN: cn=Larry Wright, o=The
Directional Drilling Company,
ou=GM of Guidance Services,
email=larry@directionaldriller
s.com, c=US
Date: 2013.08.07 16:34:40
-0500

Larry Wright
MWD General Manager



DDC
Survey Report



Company:	Apache Corporation	Local Co-ordinate Reference:	Well Coffee Federal #17
Project:	Eddy County, New Mexico	TVD Reference:	Well @ 3779.0usft
Site:	Sec 18, T17S,31E	MD Reference:	Well @ 3779.0usft
Well:	Coffee Federal #17	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Single User Db

Project	Eddy County, 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	Sec 18, T17S,31E				
Site Position:		Northing:	669,030.90 usft	Latitude:	32° 50' 18.784 N
From:	Map	Easting:	628,605.90 usft	Longitude:	103° 54' 52.613 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.23 °

Well	Coffee Federal #17					
Well Position	+N/-S	0.0 usft	Northing:	669,031.80 usft	Latitude:	32° 50' 18.787 N
	+E/-W	0.0 usft	Easting:	628,750.90 usft	Longitude:	103° 54' 50.913 W
Position Uncertainty		0.0 usft	Wellhead Elevation:	usft	Ground Level:	3,767.0 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination	Dip Angle	Field Strength
	IGRF2010	7/9/2013	(°)	(°)	(nT)
			7.54	60.64	48,739

Design	Wellbore #1				
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	294.71	

Survey Program	Date	8/1/2013			
From	To	Survey (Wellbore)	Tool Name	Description	
(usft)	(usft)				
100.0	340.0	Eline Services Gyro (Wellbore #1)	Good_gyro	Good Gyro	
401.0	6,446.0	MWD (Wellbore #1)	MWD default	MWD - Standard	

Survey									
Measured	Inclination	Azimuth	Vertical	+N/-S	+E/-W	Vertical	Dogleg	Build	Turn
Depth	(°)	(°)	Depth	(usft)	(usft)	Section	Rate	Rate	Rate
(usft)			(usft)			(usft)	(°/100usft)	(°/100usft)	(°/100usft)
TIE IN @ 340' MD / 340' TVD									
340.0	0.40	338.83	340.0	1.7	0.1	0.7	0.00	0.00	0.00
401.0	0.60	297.90	401.0	2.1	-0.3	1.1	0.65	0.33	-67.10
488.0	1.00	278.80	488.0	2.4	-1.5	2.3	0.55	0.46	-21.95
575.0	1.20	261.40	575.0	2.4	-3.1	3.8	0.44	0.23	-20.00
661.0	1.60	252.70	660.9	1.9	-5.1	5.5	0.53	0.47	-10.12
751.0	1.80	248.60	750.9	1.0	-7.7	7.4	0.26	0.22	-4.56
845.0	2.20	254.60	844.8	0.0	-10.8	9.8	0.48	0.43	6.38
940.0	2.30	256.40	939.8	-0.9	-14.4	12.7	0.13	0.11	1.89
1,035.0	2.50	269.40	1,034.7	-1.4	-18.3	16.0	0.61	0.21	13.68



DDC
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Well:	Coffee Federal #17	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	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)
1,130.0	2.50	275.40	1,129.6	-1.2	-22.4	19.9	0.28	0.00	6.32
1,225.0	2.50	293.90	1,224.5	-0.2	-26.4	23.9	0.85	0.00	19.47
1,320.0	2.70	299.90	1,319.4	1.8	-30.2	28.2	0.36	0.21	6.32
1,415.0	3.00	301.60	1,414.3	4.2	-34.3	32.9	0.33	0.32	1.79
1,510.0	3.00	301.00	1,509.2	6.8	-38.5	37.8	0.03	0.00	-0.63
1,605.0	2.90	303.70	1,604.0	9.4	-42.7	42.7	0.18	-0.11	2.84
1,700.0	3.50	293.70	1,698.9	11.9	-47.3	48.0	0.86	0.63	-10.53
1,795.0	4.60	289.60	1,793.7	14.3	-53.6	54.6	1.20	1.16	-4.32
1,890.0	5.90	289.20	1,888.3	17.2	-61.8	63.3	1.37	1.37	-0.42
1,984.0	6.50	289.40	1,981.7	20.6	-71.4	73.4	0.64	0.64	0.21
2,079.0	7.30	293.30	2,076.0	24.7	-82.0	84.8	0.98	0.84	4.11
2,174.0	7.80	297.20	2,170.2	30.1	-93.2	97.3	0.75	0.53	4.11
2,269.0	8.00	297.40	2,264.3	36.0	-104.8	110.3	0.21	0.21	0.21
2,364.0	8.80	300.90	2,358.3	42.8	-117.0	124.1	1.00	0.84	3.68
2,459.0	8.80	300.00	2,452.2	50.2	-129.5	138.6	0.14	0.00	-0.95
2,554.0	8.80	299.20	2,546.0	57.4	-142.1	153.1	0.13	0.00	-0.84
2,648.0	8.90	297.00	2,638.9	64.2	-154.9	167.5	0.38	0.11	-2.34
2,743.0	8.90	297.80	2,732.8	70.9	-167.9	182.2	0.13	0.00	0.84
2,838.0	9.20	302.50	2,826.6	78.4	-180.8	197.1	0.84	0.32	4.95
2,933.0	9.70	302.10	2,920.3	86.8	-194.0	212.5	0.53	0.53	-0.42
3,028.0	8.80	304.10	3,014.1	95.1	-206.8	227.6	1.01	-0.95	2.11
3,123.0	9.40	304.30	3,107.9	103.6	-219.2	242.4	0.63	0.63	0.21
3,218.0	9.20	306.10	3,201.6	112.4	-231.8	257.5	0.37	-0.21	1.89
3,312.0	8.90	305.00	3,294.4	121.0	-243.8	272.1	0.37	-0.32	-1.17
3,407.0	8.90	302.00	3,388.3	129.1	-256.1	286.6	0.49	0.00	-3.16
3,452.0	9.10	301.70	3,432.8	132.8	-262.0	293.6	0.46	0.44	-0.67
3,534.0	9.30	295.10	3,513.7	139.0	-273.6	306.6	1.31	0.24	-8.05
3,629.0	7.50	278.50	3,607.7	143.2	-286.6	320.3	3.16	-1.89	-17.47
3,724.0	5.20	271.90	3,702.1	144.3	-297.1	330.2	2.54	-2.42	-6.95
3,819.0	4.10	272.90	3,796.8	144.6	-304.8	337.3	1.16	-1.16	1.05
3,914.0	1.50	275.10	3,891.7	144.9	-309.4	341.6	2.74	-2.74	2.32
4,008.0	0.20	11.40	3,985.7	145.1	-310.6	342.8	1.63	-1.38	102.45
4,103.0	0.10	103.80	4,080.7	145.3	-310.5	342.8	0.24	-0.11	97.26
4,198.0	0.10	53.20	4,175.7	145.3	-310.3	342.7	0.09	0.00	-53.26
4,293.0	0.00	26.40	4,270.7	145.4	-310.3	342.6	0.11	-0.11	0.00
4,388.0	0.20	358.80	4,365.7	145.5	-310.3	342.7	0.21	0.21	0.00
4,483.0	0.10	265.80	4,460.7	145.7	-310.4	342.8	0.24	-0.11	-97.89
4,578.0	0.20	284.90	4,555.7	145.7	-310.6	343.1	0.12	0.11	20.11
4,673.0	0.10	331.20	4,650.7	145.8	-310.8	343.3	0.16	-0.11	48.74
4,767.0	0.20	332.90	4,744.7	146.1	-310.9	343.5	0.11	0.11	1.81
4,862.0	0.30	327.30	4,839.7	146.4	-311.1	343.8	0.11	0.11	-5.89
4,957.0	0.20	220.70	4,934.7	146.5	-311.4	344.1	0.43	-0.11	-112.21
5,052.0	0.30	255.80	5,029.7	146.3	-311.7	344.3	0.19	0.11	36.95



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Well:	Coffee Federal #17	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	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)
5,147.0	0.40	204.10	5,124.6	145.9	-312.1	344.5	0.33	0.11	-54.42
5,242.0	0.10	275.50	5,219.6	145.7	-312.3	344.6	0.40	-0.32	75.16
5,337.0	0.10	235.30	5,314.6	145.6	-312.5	344.7	0.07	0.00	-42.32
5,432.0	0.00	312.90	5,409.6	145.6	-312.5	344.8	0.11	-0.11	0.00
5,526.0	0.30	262.00	5,503.6	145.5	-312.8	345.0	0.32	0.32	0.00
5,621.0	0.20	278.60	5,598.6	145.5	-313.2	345.3	0.13	-0.11	17.47
5,716.0	0.20	236.90	5,693.6	145.5	-313.5	345.6	0.15	0.00	-43.89
5,811.0	0.30	340.80	5,788.6	145.6	-313.7	345.9	0.42	0.11	109.37
5,906.0	0.10	275.60	5,883.6	145.8	-313.9	346.1	0.29	-0.21	-68.63
6,001.0	0.20	276.60	5,978.6	145.9	-314.1	346.3	0.11	0.11	1.05
6,096.0	0.30	263.60	6,073.6	145.9	-314.5	346.7	0.12	0.11	-13.68
6,191.0	0.40	269.80	6,168.6	145.8	-315.1	347.2	0.11	0.11	6.53
6,286.0	0.40	229.80	6,263.6	145.6	-315.7	347.7	0.29	0.00	-42.11
6,396.0	0.40	222.80	6,373.6	145.1	-316.3	347.9	0.04	0.00	-6.36
TD @ 6446' MD / 6423.6' TVD									
6,446.0	0.40	222.80	6,423.6	144.8	-316.5	348.1	0.00	0.00	0.00

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
340.0	340.0	1.7	0.1	TIE IN @ 340' MD / 340' TVD
6,446.0	6,423.6	144.8	-316.5	TD @ 6446' MD / 6423.6' TVD

Checked By: _____ Approved By: _____ Date: _____