



Apache Corporation

Eddy County, New Mexico

Sec 20, T17-S, R31-E

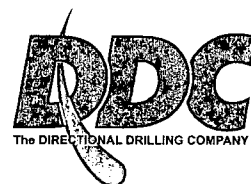
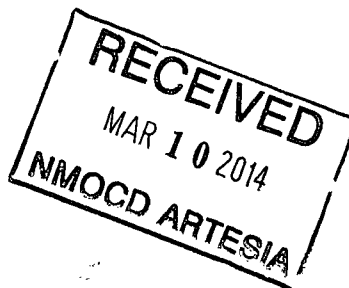
Lee Federal #74 AP1# 30-015-41421

Wellbore #1

Design: Wellbore #1

DDC Survey Report

16 December, 2013





DDC
Survey Report



Company:	Apache Corporation	Local Co-ordinate Reference:	Well Lee Federal #74
Project:	Eddy County, New Mexico	TVD Reference:	WELL @ 3689.0usft (Basic #38)
Site:	Sec 20, T17-S, R31-E	MD Reference:	WELL @ 3689.0usft (Basic #38)
Well:	Lee Federal #74	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 20, T17-S, R31-E		
Site Position:		Northing:	661,172.80 usft
From:	Map	Easting:	634,332.20 usft
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 49' 0.798 N
		Longitude:	103° 53' 45.878 W
		Grid Convergence:	0.24 °

Well	Lee Federal #74		
Well Position	+N/-S	0.0 usft	Northing:
	+E/-W	0.0 usft	Easting:
Position Uncertainty	0.0 usft	Wellhead Elevation:	
			usft
		Latitude:	32° 48' 50.920 N
		Longitude:	103° 53' 40.113 W
		Ground Level:	3,676.0 usft

Wellbore	Wellbore #1		
Magnetics	Model Name	Sample Date	Declination
			(°)
	IGRF2010	2/7/2013	7.58
			Dip Angle
			(°)
			60.64
			Field Strength
			(nT)
			48,769

Design	Wellbore #1		
Audit Notes:			
Version:	1.0	Phase:	ACTUAL
		Tie On Depth:	0.0
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W
	(usft)	(usft)	(usft)
	0.0	0.0	0.0
			Direction
			(°)
			359.62

Survey Program	Date 12/16/2013		
From	To	Survey (Wellbore)	Tool Name
(usft)	(usft)		
53.0	290.0	GYRO (Wellbore #1)	
467.0	6,443.0	MWD (Wellbore #1)	
		Description	

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)	
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00	
53.0	0.85	237.64	53.0	-0.2	-0.3	-0.2	1.60	1.60	0.00	
100.0	0.79	237.19	100.0	-0.6	-0.9	-0.6	0.13	-0.13	-0.96	
200.0	1.37	272.65	200.0	-0.9	-2.7	-0.9	0.86	0.58	35.46	
TIE IN @ 290' MD / 290' TVD										
290.0	1.59	279.80	289.9	-0.6	-5.0	-0.6	0.32	0.24	7.94	
467.0	1.70	299.30	466.9	1.1	-9.7	1.1	0.32	0.06	11.02	
633.0	1.70	303.70	632.8	3.6	-13.9	3.7	0.08	0.00	2.65	
792.0	1.80	302.50	791.7	6.3	-18.0	6.4	0.07	0.06	-0.75	
950.0	1.50	337.30	949.7	9.5	-20.8	9.7	0.65	-0.19	22.03	



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Well:	Lee Federal #74	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)
1,109.0	1.60	20.50	1,108.6	13.5	-20.9	13.7	0.72	0.06	27.17
1,267.0	2.20	39.60	1,266.5	17.9	-18.2	18.1	0.55	0.38	12.09
1,425.0	2.30	55.40	1,424.4	22.1	-13.6	22.2	0.40	0.06	10.00
1,456.0	2.30	52.80	1,455.4	22.8	-12.6	22.9	0.34	0.00	-8.39
1,551.0	2.20	41.20	1,550.3	25.3	-9.9	25.4	0.49	-0.11	-12.21
1,646.0	3.30	34.50	1,645.2	29.0	-7.1	29.0	1.20	1.16	-7.05
1,741.0	4.40	31.30	1,740.0	34.3	-3.7	34.3	1.18	1.16	-3.37
1,836.0	4.60	23.00	1,834.7	40.9	-0.3	40.9	0.72	0.21	-8.74
1,931.0	4.90	10.00	1,929.4	48.4	1.9	48.4	1.17	0.32	-13.68
2,026.0	5.20	3.50	2,024.0	56.7	2.8	56.7	0.68	0.32	-6.84
2,121.0	5.70	2.20	2,118.6	65.7	3.3	65.7	0.54	0.53	-1.37
2,216.0	5.00	359.30	2,213.2	74.6	3.4	74.6	0.79	-0.74	-3.05
2,310.0	4.80	356.30	2,306.8	82.6	3.1	82.6	0.35	-0.21	-3.19
2,468.0	5.10	355.90	2,464.2	96.2	2.2	96.2	0.19	0.19	-0.25
2,627.0	5.60	356.40	2,622.5	111.0	1.2	111.0	0.32	0.31	0.31
2,722.0	5.10	359.10	2,717.1	119.9	0.8	119.9	0.59	-0.53	2.84
2,817.0	5.10	1.80	2,811.7	128.3	0.9	128.3	0.25	0.00	2.84
2,912.0	4.60	2.10	2,906.4	136.3	1.2	136.3	0.53	-0.53	0.32
3,006.0	3.90	357.90	3,000.1	143.3	1.2	143.3	0.81	-0.74	-4.47
3,101.0	4.10	357.70	3,094.9	149.9	0.9	149.9	0.21	0.21	-0.21
3,291.0	5.00	2.20	3,284.3	165.0	1.0	165.0	0.51	0.47	2.37
3,386.0	4.60	2.70	3,379.0	172.9	1.3	172.9	0.42	-0.42	0.53
3,471.0	4.30	5.70	3,463.7	179.5	1.8	179.5	0.45	-0.35	3.53
3,574.0	4.60	6.70	3,566.4	187.4	2.7	187.4	0.30	0.29	0.97
3,669.0	4.20	352.00	3,661.1	194.7	2.6	194.6	1.26	-0.42	-15.47
3,763.0	4.50	352.00	3,754.9	201.7	1.6	201.7	0.32	0.32	0.00
3,858.0	4.40	351.20	3,849.6	209.0	0.6	209.0	0.12	-0.11	-0.84
4,048.0	4.50	350.90	4,039.0	223.6	-1.7	223.6	0.05	0.05	-0.16
4,238.0	4.50	350.30	4,228.4	238.3	-4.2	238.3	0.02	0.00	-0.32
4,428.0	4.80	5.20	4,417.8	253.6	-4.7	253.6	0.65	0.16	7.84
4,618.0	4.70	359.70	4,607.1	269.3	-4.0	269.3	0.25	-0.05	-2.89
4,808.0	4.30	0.30	4,796.6	284.2	-4.0	284.2	0.21	-0.21	0.32
4,998.0	4.30	2.50	4,986.0	298.4	-3.7	298.4	0.09	0.00	1.16
5,187.0	4.60	3.20	5,174.5	313.0	-3.0	313.1	0.16	0.16	0.37
5,377.0	4.90	6.30	5,363.8	328.7	-1.6	328.7	0.21	0.16	1.63
5,567.0	4.90	4.70	5,553.1	344.9	-0.1	344.9	0.07	0.00	-0.84
5,757.0	5.30	358.70	5,742.4	361.7	0.4	361.7	0.35	0.21	-3.16
5,947.0	5.40	3.90	5,931.5	379.4	0.8	379.4	0.26	0.05	2.74
6,137.0	5.10	0.10	6,120.7	396.8	1.4	396.8	0.24	-0.16	-2.00
6,327.0	5.70	7.10	6,309.9	414.6	2.6	414.6	0.47	0.32	3.68
6,401.0	6.40	8.60	6,383.5	422.3	3.7	422.3	0.97	0.95	2.03
TD @ 6443' MD / 6425' TVD									
6,443.0	6.40	8.60	6,425.2	427.0	4.4	426.9	0.00	0.00	0.00



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Survey Report



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Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
290.0	289.9	-0.6	-5.0	TIE IN @ 290' MD / 290' TVD
6,443.0	6,425.2	427.0	4.4	TD @ 6443' MD / 6425' TVD

Checked By: _____ Approved By: _____ Date: _____