

Apache Corporation
303 Veterans Airpark Lane, #3000
Midland, TX 79705

Crow Federal #042H
Eddy County, New Mexico

API - 30-0115-42744
L-03-175-31E
2273 FSL & 10 FWL

293
472

2.93
1.79

0.50
0.75

0.88
1.31

2.56
2.35

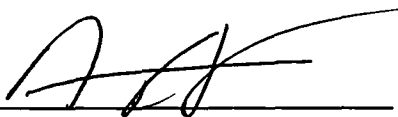
2.56
4.91

NM OIL CONSERVATION

ARTESIA DISTRICT

AUG 5 2015

RECEIVED

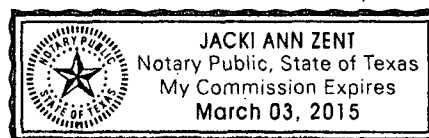


Archie Brown - General Manager

The attached instrument was acknowledged before me on the 28th day of February, 2015 by
Archie Brown - General Manager, CapStar Drilling, Inc.



Notary Public



NM OIL CONSERVATION
ARTESIA DISTRICT

AUG 5 2015

RECEIVED



Apache Corporation

Eddy County, NM (NAD27 NME)

Crow Federal

#42H

WB1 / Job #1512794

Design: Surveys (Capstar 114)

Standard Survey Report

19 February, 2015



Company:	Apache Corporation	Local Co-ordinate Reference:	Well #42H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3917.00usft (Capstar 114)
Site:	Crow Federal	MD Reference:	KB @ 3917.00usft (Capstar 114)
Well:	#42H	North Reference:	Grid
Wellbore:	WB1 / Job #1512794	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Capstar 114)	Database:	Compass 5000 GCR

Project	Eddy County, NM (NAD27 NME)		
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		Crow Federal				
Site Position:		Northing:	671,130.90 usft	Latitude:	32° 50' 38.92796 N	
From:	Map	Easting:	643,906.80 usft	Longitude:	103° 51' 53.16689 W	
Position Uncertainty:		0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.25 °

Well	#42H					
Well Position	+N-S	0.00 usft	Northing:	677,765.10 usft	Latitude:	32° 51' 44.81313 N
	+E-W	0.00 usft	Easting:	638,347.70 usft	Longitude:	103° 52' 57.99551 W
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level:	3,906.00 usft

Wellbore	WB1 / Job #1512794				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	BGGM2014	2/4/2015	7.51	60.63	48,546

Design	Surveys (Capstar 114)				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N-S (usft)	+E-W (usft)	Direction (°)	
	0.00	0.00	0.00	269.59	

Survey Program	Date 2/19/2015			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
100.00	575.00	Gyrodata Gyro Survey (WB1 / Job #15127	NS-GYRO-MS	North sensing gyrocompassing m/s
575.00	10,387.00	Phoenix MWD Survey (WB1 / Job #15127	PHX+MWD+BGGM	PHX+MWD+BGGM v3:standard declination

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)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.17	121.59	100.00	-0.08	0.13	-0.13	0.17	0.17	0.00
200.00	0.24	118.62	200.00	-0.26	0.44	-0.43	0.07	0.07	-2.97
300.00	0.28	115.04	300.00	-0.46	0.84	-0.84	0.04	0.04	-3.58
400.00	0.27	92.20	400.00	-0.57	1.30	-1.29	0.11	-0.01	-22.84
500.00	0.29	86.73	500.00	-0.57	1.79	-1.78	0.03	0.02	-5.47
575.00	0.41	89.19	574.99	-0.55	2.24	-2.24	0.16	0.16	3.28
Tie-on to Gyrodata Gyro Survey									
690.00	0.40	69.60	689.99	-0.41	3.03	-3.03	0.12	-0.01	-17.03



Survey Report



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 Site: Crow Federal
 Well: #42H
 Wellbore: WB1 / Job #1512794
 Design: Surveys (Capstar 114)

Local Co-ordinate Reference: Well #42H
 TVD Reference: KB @ 3917.00usft (Capstar 114)
 MD Reference: KB @ 3917.00usft (Capstar 114)
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature
 Database: Compass 5000 GCR

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)
First Phoenix MWD Survey									
775.00	0.20	49.30	774.99	-0.21	3.42	-3.42	0.26	-0.24	-23.88
861.00	0.80	302.70	860.99	0.22	3.03	-3.03	1.02	0.70	-123.95
947.00	1.60	288.30	946.97	0.92	1.39	-1.39	0.99	0.93	-16.74
1,031.00	2.50	284.60	1,030.91	1.75	-1.50	1.49	1.08	1.07	-4.40
1,117.00	3.20	277.90	1,116.81	2.55	-5.69	5.67	0.90	0.81	-7.79
1,203.00	3.70	282.10	1,202.65	3.46	-10.78	10.76	0.65	0.58	4.88
1,288.00	3.90	278.10	1,287.46	4.44	-16.33	16.29	0.39	0.24	-4.71
1,374.00	4.40	279.60	1,373.24	5.41	-22.48	22.44	0.59	0.58	1.74
1,459.00	4.80	277.00	1,457.96	6.38	-29.22	29.17	0.53	0.47	-3.06
1,545.00	4.00	267.30	1,543.71	6.68	-35.79	35.74	1.27	-0.93	-11.28
1,630.00	3.50	264.00	1,628.53	6.27	-41.33	41.28	0.64	-0.59	-3.88
1,716.00	2.40	259.70	1,714.41	5.67	-45.71	45.67	1.30	-1.28	-5.00
1,802.00	1.60	277.80	1,800.36	5.51	-48.67	48.63	1.17	-0.93	21.05
1,887.00	1.20	283.80	1,885.34	5.89	-50.71	50.67	0.50	-0.47	7.06
1,972.00	0.70	267.20	1,970.32	6.07	-52.10	52.05	0.67	-0.59	-19.53
2,061.00	0.80	260.80	2,059.32	5.95	-53.25	53.21	0.15	0.11	-7.19
2,146.00	0.50	274.90	2,144.31	5.89	-54.21	54.16	0.40	-0.35	16.59
2,231.00	0.70	291.90	2,229.31	6.11	-55.06	55.01	0.31	0.24	20.00
2,317.00	0.90	287.00	2,315.30	6.50	-56.19	56.14	0.25	0.23	-5.70
2,403.00	1.00	280.00	2,401.29	6.83	-57.58	57.53	0.18	0.12	-8.14
2,488.00	0.80	262.80	2,486.28	6.89	-58.90	58.85	0.39	-0.24	-20.24
2,573.00	0.90	255.30	2,571.27	6.64	-60.13	60.08	0.18	0.12	-8.82
2,659.00	0.90	257.80	2,657.26	6.33	-61.44	61.40	0.05	0.00	2.91
2,747.00	1.20	265.30	2,745.24	6.11	-63.04	62.99	0.37	0.34	8.52
2,833.00	0.80	239.80	2,831.23	5.73	-64.45	64.41	0.68	-0.47	-29.65
2,918.00	1.00	235.40	2,916.22	5.01	-65.58	65.54	0.25	0.24	-5.18
3,004.00	1.00	230.20	3,002.21	4.11	-66.77	66.74	0.11	0.00	-6.05
3,089.00	1.00	241.90	3,087.19	3.28	-68.00	67.97	0.24	0.00	13.76
3,178.00	1.00	244.40	3,176.18	2.58	-69.38	69.36	0.05	0.00	2.81
3,263.00	1.10	249.70	3,261.16	1.98	-70.82	70.80	0.16	0.12	6.24
3,349.00	1.20	252.70	3,347.15	1.42	-72.45	72.44	0.14	0.12	3.49
3,448.00	0.90	243.20	3,446.13	0.76	-74.13	74.13	0.35	-0.30	-9.60
3,557.00	1.00	251.30	3,555.12	0.07	-75.80	75.80	0.15	0.09	7.43
3,643.00	0.90	249.50	3,641.10	-0.40	-77.14	77.14	0.12	-0.12	-2.09
3,728.00	0.70	237.80	3,726.10	-0.92	-78.21	78.21	0.30	-0.24	-13.76
3,814.00	0.90	233.40	3,812.09	-1.60	-79.19	79.20	0.24	0.23	-5.12
3,899.00	0.70	249.90	3,897.08	-2.17	-80.22	80.23	0.36	-0.24	19.41
3,985.00	0.70	239.70	3,983.07	-2.62	-81.16	81.18	0.14	0.00	-11.86
4,070.00	0.80	243.40	4,068.07	-3.15	-82.14	82.16	0.13	0.12	4.35
4,156.00	0.30	49.10	4,154.06	-3.27	-82.51	82.53	1.27	-0.58	192.67
4,326.00	0.60	52.90	4,324.06	-2.44	-81.46	81.48	0.18	0.18	2.24
4,411.00	0.40	45.20	4,409.05	-1.96	-80.90	80.91	0.25	-0.24	-9.06

Company: Apache Corporation
Project: Eddy County, NM (NAD27 NME)
Site: Crow Federal
Well: #42H
Wellbore: WB1 / Job #1512794
Design: Surveys (Capstar 114)

Local Co-ordinate Reference: Well #42H
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MD Reference: KB @ 3917.00usft (Capstar 114)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: Compass 5000 GCR

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)
4,497.00	0.30	55.50	4,495.05	-1.62	-80.50	80.51	0.14	-0.12	11.98
4,583.00	0.20	28.10	4,581.05	-1.36	-80.24	80.25	0.18	-0.12	-31.86
4,668.00	0.30	41.20	4,666.05	-1.07	-80.03	80.03	0.13	0.12	15.41
4,754.00	0.20	14.60	4,752.05	-0.75	-79.84	79.84	0.18	-0.12	-30.93
4,842.00	0.20	42.10	4,840.05	-0.49	-79.70	79.70	0.11	0.00	31.25
4,927.00	0.10	66.60	4,925.05	-0.35	-79.53	79.53	0.14	-0.12	26.82
5,013.00	0.30	35.70	5,011.05	-0.14	-79.33	79.33	0.26	0.23	-35.93
5,098.00	0.30	36.70	5,096.05	0.22	-79.07	79.06	0.01	0.00	1.18
5,163.00	0.00	7.80	5,161.05	0.36	-78.97	78.96	0.46	-0.46	0.00
5,221.00	1.40	259.60	5,219.04	0.23	-79.66	79.66	2.41	2.41	0.00
5,264.00	5.60	261.10	5,261.95	-0.19	-82.25	82.25	9.77	9.77	3.49
5,307.00	10.90	263.00	5,304.49	-1.01	-88.37	88.37	12.34	12.33	4.42
5,350.00	16.40	264.80	5,346.26	-2.06	-98.46	98.47	12.83	12.79	4.19
5,392.00	21.90	265.40	5,385.92	-3.22	-112.18	112.20	13.10	13.10	1.43
5,434.00	25.60	263.80	5,424.36	-4.83	-129.01	129.04	8.94	8.81	-3.81
5,477.00	29.20	262.70	5,462.53	-7.17	-148.66	148.71	8.45	8.37	-2.56
5,519.00	34.10	260.70	5,498.27	-10.37	-170.45	170.52	11.93	11.67	-4.76
5,562.00	39.70	260.10	5,532.65	-14.69	-195.90	196.00	13.05	13.02	-1.40
5,604.00	45.90	260.80	5,563.45	-19.41	-224.03	224.16	14.81	14.76	1.67
5,647.00	52.20	260.40	5,591.62	-24.72	-256.05	256.22	14.67	14.65	-0.93
5,690.00	55.10	262.70	5,617.10	-29.79	-290.30	290.51	8.00	6.74	5.35
5,731.00	57.50	265.00	5,639.85	-33.44	-324.21	324.44	7.49	5.85	5.61
5,772.00	60.80	268.00	5,660.88	-35.57	-359.33	359.58	10.21	8.05	7.32
5,815.00	66.00	270.20	5,680.12	-36.15	-397.76	398.01	12.93	12.09	5.12
5,857.00	69.30	272.80	5,696.10	-35.13	-436.58	436.82	9.72	7.86	6.19
5,900.00	75.10	275.00	5,709.24	-32.33	-477.41	477.63	14.34	13.49	5.12
5,943.00	80.90	276.50	5,718.17	-28.11	-519.24	519.42	13.91	13.49	3.49
5,986.00	87.20	276.10	5,722.63	-23.42	-561.73	561.88	14.68	14.65	-0.93
6,029.00	90.10	276.00	5,723.64	-18.89	-604.47	604.59	6.75	6.74	-0.23
6,115.00	91.60	275.60	5,722.37	-10.20	-690.02	690.07	1.81	1.74	-0.47
6,199.00	93.10	273.80	5,718.92	-3.33	-773.66	773.66	2.79	1.79	-2.14
6,285.00	92.40	270.40	5,714.79	-0.18	-859.49	859.47	4.03	-0.81	-3.95
6,370.00	92.70	270.70	5,711.01	0.64	-944.40	944.37	0.50	0.35	0.35
6,455.00	92.50	270.60	5,707.16	1.60	-1,029.31	1,029.27	0.26	-0.24	-0.12
6,541.00	92.30	270.70	5,703.56	2.57	-1,115.23	1,115.18	0.26	-0.23	0.12
6,629.00	92.00	270.70	5,700.25	3.65	-1,203.16	1,203.10	0.34	-0.34	0.00
6,715.00	91.30	268.40	5,697.78	2.97	-1,289.11	1,289.06	2.79	-0.81	-2.67
6,801.00	90.10	267.30	5,696.73	-0.25	-1,375.04	1,375.01	1.89	-1.40	-1.28
6,886.00	89.90	267.30	5,696.73	-4.26	-1,459.95	1,459.94	0.24	-0.24	0.00
6,972.00	89.60	266.90	5,697.10	-8.61	-1,545.84	1,545.86	0.58	-0.35	-0.47
7,057.00	90.10	267.40	5,697.32	-12.83	-1,630.73	1,630.78	0.83	0.59	0.59
7,143.00	90.80	268.40	5,696.65	-15.99	-1,716.67	1,716.74	1.42	0.81	1.16
7,228.00	91.20	268.00	5,695.17	-18.66	-1,801.61	1,801.70	0.67	0.47	-0.47
7,314.00	90.90	267.90	5,693.59	-21.73	-1,887.54	1,887.65	0.37	-0.35	-0.12

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7,399.00	91.60	269.30	5,691.74	-23.81	-1,972.50	1,972.62	1.84	0.82	1.65
7,485.00	92.10	269.70	5,688.96	-24.56	-2,058.45	2,058.57	0.74	0.58	0.47
7,571.00	91.90	269.50	5,685.96	-25.16	-2,144.39	2,144.52	0.33	-0.23	-0.23
7,656.00	91.70	269.10	5,683.29	-26.20	-2,229.34	2,229.48	0.53	-0.24	-0.47
7,742.00	91.90	268.70	5,680.59	-27.85	-2,315.29	2,315.43	0.52	0.23	-0.47
7,828.00	91.90	268.40	5,677.73	-30.02	-2,401.21	2,401.36	0.35	0.00	-0.35
7,913.00	91.90	269.40	5,674.92	-31.65	-2,486.15	2,486.31	1.18	0.00	1.18
7,999.00	91.80	269.10	5,672.14	-32.78	-2,572.10	2,572.26	0.37	-0.12	-0.35
8,084.00	91.20	268.90	5,669.92	-34.26	-2,657.05	2,657.23	0.74	-0.71	-0.24
8,170.00	91.80	269.70	5,667.66	-35.31	-2,743.02	2,743.20	1.16	0.70	0.93
8,255.00	91.40	269.40	5,665.29	-35.98	-2,827.98	2,828.17	0.59	-0.47	-0.35
8,341.00	90.60	269.40	5,663.79	-36.88	-2,913.96	2,914.15	0.93	-0.93	0.00
8,426.00	89.90	268.80	5,663.42	-38.21	-2,998.95	2,999.15	1.08	-0.82	-0.71
8,512.00	90.80	270.10	5,662.89	-39.04	-3,084.94	3,085.14	1.84	1.05	1.51
8,597.00	91.90	270.60	5,660.89	-38.52	-3,169.91	3,170.11	1.42	1.29	0.59
8,682.00	92.00	270.30	5,658.00	-37.85	-3,254.86	3,255.05	0.37	0.12	-0.35
8,768.00	92.00	270.20	5,655.00	-37.48	-3,340.81	3,340.99	0.12	0.00	-0.12
8,854.00	91.60	270.20	5,652.30	-37.18	-3,426.77	3,426.94	0.47	-0.47	0.00
8,942.00	91.50	270.30	5,649.92	-36.79	-3,514.73	3,514.91	0.16	-0.11	0.11
9,028.00	92.00	270.50	5,647.29	-36.19	-3,600.69	3,600.86	0.63	0.58	0.23
9,114.00	91.90	270.40	5,644.36	-35.52	-3,686.64	3,686.80	0.16	-0.12	-0.12
9,199.00	91.60	270.30	5,641.77	-35.00	-3,771.60	3,771.75	0.37	-0.35	-0.12
9,285.00	91.70	270.20	5,639.29	-34.62	-3,857.56	3,857.71	0.16	0.12	-0.12
9,370.00	91.40	270.10	5,636.99	-34.40	-3,942.53	3,942.67	0.37	-0.35	-0.12
9,455.00	91.60	269.80	5,634.77	-34.48	-4,027.50	4,027.64	0.42	0.24	-0.35
9,541.00	91.50	269.50	5,632.44	-35.00	-4,113.47	4,113.61	0.37	-0.12	-0.35
9,627.00	91.30	268.80	5,630.34	-36.28	-4,199.43	4,199.58	0.85	-0.23	-0.81
9,712.00	90.90	268.30	5,628.71	-38.43	-4,284.39	4,284.55	0.75	-0.47	-0.59
9,798.00	90.80	268.00	5,627.43	-41.20	-4,370.33	4,370.52	0.37	-0.12	-0.35
9,883.00	90.50	267.60	5,626.47	-44.47	-4,455.26	4,455.47	0.59	-0.35	-0.47
9,968.00	91.60	268.70	5,624.91	-47.21	-4,540.20	4,540.42	1.83	1.29	1.29
10,053.00	92.20	268.90	5,622.09	-48.99	-4,625.14	4,625.37	0.74	0.71	0.24
10,138.00	92.10	268.50	5,618.90	-50.92	-4,710.06	4,710.30	0.48	-0.12	-0.47
10,223.00	92.00	268.30	5,615.86	-53.29	-4,794.97	4,795.23	0.26	-0.12	-0.24
10,318.00	92.30	268.50	5,612.30	-55.94	-4,889.86	4,890.14	0.38	0.32	0.21
Last Phoenix MWD Survey									
10,387.00	92.30	268.50	5,609.53	-57.74	-4,958.78	4,959.07	0.00	0.00	0.00
Projection to TD									

Company:	Apache Corporation	Local Co-ordinate Reference:	Well #42H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3917.00usft (Capstar 114)
Site:	Crow Federal	MD Reference:	KB @ 3917.00usft (Capstar 114)
Well:	#42H	North Reference:	Grid
Wellbore:	WB1 / Job #1512794	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Capstar 114)	Database:	Compass 5000 GCR

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
575.00	574.99	-0.55	2.24	Tie-on to Gyrodata Gyro Survey
690.00	689.99	-0.41	3.03	First Phoenix MWD Survey
10,318.00	5,612.30	-55.94	-4,889.86	Last Phoenix MWD Survey
10,387.00	5,609.53	-57.74	-4,958.78	Projection to TD

Checked By: _____ Approved By: _____ Date: _____