



Apache Corporation

Eddy County, NM (NAD27 NME)

Crow Federal

#14H API# 30-015-40578

OH / Job #1310557

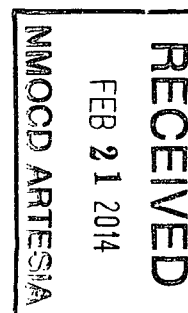
SL: 923' FSL + 250' FWL

WL: M-10-175-31E

Survey: Phoenix MWD Surveys

Apache

07 June, 2013



PHOENIX
TECHNOLOGY SERVICES



Phoenix Technology Services

Apache



Company:	Apache Corporation	Local Co-ordinate Reference:	Well #14H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3894.00usft (Capstar 114)
Site:	Crow Federal	MD Reference:	KB @ 3894.00usft (Capstar 114)
Well:	#14H	North Reference:	Grid
Wellbore:	OH / Job #1310557	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Capstar 114)	Database:	GCR DB v5000

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' 38.927956 N
From:	Easting:	643,906.80 usft	Longitude:	103° 51' 53.166888 W
Position Uncertainty:	Slot Radius:	13-3/16 "	Grid Convergence:	0.25 °

Well	#14H					
Well Position	+N/-S	0.00 usft	Northing:	671,170.90 usft	Latitude:	32° 50' 39.323772 N
	+E/-W	0.00 usft	Easting:	643,906.50 usft	Longitude:	103° 51' 53.168325 W
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level:	3,884.00 usft

Wellbore	OH / Job #1310557				
Magnetics	Model Name	Sample Date	Declination	Dip Angle	Field Strength
			(°)	(°)	(nT)
	IGRF2010_14	04/25/12	7.66	60.69	48,868

Design	Surveys (Capstar 114)				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W	Direction	
	(usft)	(usft)	(usft)	(°)	
	0.00	0.00	0.00	269.63	

Survey Program	Date 06/07/13				
From	To	Survey (Wellbore)	Tool Name	Description	
(usft)	(usft)				
601.00	10,696.00	Phoenix MWD Surveys (OH / Job #131055)	MWD	MWD - Standard	



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Wellbore:	OH / Job #1310557	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Capstar 114)	Database:	GCR DB v5000

Survey											
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVDSS (usft)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)	
0.00	0.00	0.00	-3,894.00	0.00	0.00	0.00	0.00	0.00	671,170.90	643,906.50	
601.00	0.70	199.20	-3,293.01	600.99	-3.47	-1.21	1.23	0.12	671,167.43	643,905.29	
First Phoenix MWD Survey											
671.00	0.70	206.20	-3,223.02	670.98	-4.25	-1.54	1.56	0.12	671,166.65	643,904.96	
756.00	0.50	219.30	-3,138.02	755.98	-5.01	-2.00	2.03	0.28	671,165.89	643,904.50	
842.00	0.70	200.30	-3,052.03	841.97	-5.79	-2.42	2.46	0.33	671,165.11	643,904.08	
928.00	0.70	214.20	-2,966.04	927.96	-6.72	-2.90	2.94	0.20	671,164.18	643,903.60	
1,013.00	1.20	251.50	-2,881.05	1,012.95	-7.43	-4.03	4.08	0.91	671,163.47	643,902.47	
1,099.00	1.50	284.70	-2,795.07	1,098.93	-7.43	-5.98	6.02	0.96	671,163.47	643,900.52	
1,184.00	1.70	291.30	-2,710.10	1,183.90	-6.69	-8.23	8.27	0.32	671,164.21	643,898.27	
1,270.00	1.80	295.10	-2,624.14	1,269.86	-5.65	-10.64	10.68	0.18	671,165.25	643,895.86	
1,355.00	1.50	302.30	-2,539.18	1,354.82	-4.49	-12.79	12.82	0.43	671,166.41	643,893.71	
1,441.00	0.80	326.40	-2,453.20	1,440.80	-3.39	-14.07	14.09	0.97	671,167.51	643,892.43	
1,527.00	0.70	321.90	-2,367.20	1,526.80	-2.48	-14.73	14.74	0.13	671,168.42	643,891.77	
1,612.00	0.70	333.10	-2,282.21	1,611.79	-1.61	-15.28	15.29	0.16	671,169.29	643,891.22	
1,698.00	0.40	335.40	-2,196.21	1,697.79	-0.86	-15.65	15.65	0.35	671,170.04	643,890.85	
1,782.00	0.40	348.80	-2,112.22	1,781.78	-0.31	-15.83	15.83	0.11	671,170.59	643,890.67	
1,868.00	0.40	11.70	-2,026.22	1,867.78	0.28	-15.82	15.82	0.18	671,171.18	643,890.68	
1,954.00	0.50	20.70	-1,940.22	1,953.78	0.92	-15.63	15.62	0.14	671,171.82	643,890.87	
2,039.00	0.60	17.20	-1,855.22	2,038.78	1.70	-15.37	15.36	0.12	671,172.60	643,891.13	
2,125.00	0.60	11.60	-1,769.23	2,124.77	2.57	-15.14	15.13	0.07	671,173.47	643,891.36	
2,210.00	0.80	15.80	-1,684.24	2,209.76	3.57	-14.89	14.87	0.24	671,174.47	643,891.61	
2,296.00	0.90	359.50	-1,598.24	2,295.76	4.83	-14.73	14.70	0.30	671,175.73	643,891.77	
2,382.00	1.20	33.30	-1,512.26	2,381.74	6.25	-14.25	14.21	0.78	671,177.15	643,892.25	
2,467.00	1.80	39.00	-1,427.29	2,466.71	8.04	-12.92	12.87	0.73	671,178.94	643,893.58	
2,553.00	1.80	40.90	-1,341.33	2,552.67	10.11	-11.18	11.12	0.07	671,181.01	643,895.32	
2,638.00	1.50	46.10	-1,256.37	2,637.63	11.89	-9.51	9.43	0.39	671,182.79	643,896.99	



Phoenix Technology Services

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Site:	Crow Federal	MD Reference:	KB @ 3894.00usft (Capstar 114)
Well:	#14H	North Reference:	Grid
Wellbore:	OH / Job #1310557	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Capstar 114)	Database:	GCR DB v5000

Survey											
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVDSS (usft)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)	
2,724.00	0.40	89.30	-1,170.38	2,723.62	12.67	-8.40	8.31	1.44	671,183.57	643,898.10	
2,810.00	0.50	65.00	-1,084.38	2,809.62	12.83	-7.76	7.67	0.25	671,183.73	643,898.74	
2,895.00	0.50	81.10	-999.38	2,894.62	13.05	-7.05	6.97	0.16	671,183.95	643,899.45	
2,981.00	0.60	57.60	-913.39	2,980.61	13.35	-6.30	6.22	0.28	671,184.25	643,900.20	
3,067.00	0.80	94.70	-827.39	3,066.61	13.54	-5.32	5.24	0.56	671,184.44	643,901.18	
3,152.00	1.10	115.80	-742.41	3,151.59	13.14	-4.00	3.91	0.54	671,184.04	643,902.50	
3,238.00	1.40	120.80	-656.43	3,237.57	12.24	-2.35	2.27	0.37	671,183.14	643,904.15	
3,324.00	1.20	118.60	-570.45	3,323.55	11.27	-0.66	0.59	0.24	671,182.17	643,905.84	
3,367.00	1.20	117.60	-527.46	3,366.54	10.85	0.14	-0.21	0.05	671,181.75	643,906.64	
3,475.00	1.20	125.20	-419.48	3,474.52	9.67	2.06	-2.12	0.15	671,180.57	643,908.56	
3,575.00	1.00	115.10	-319.50	3,574.50	8.70	3.71	-3.76	0.28	671,179.60	643,910.21	
3,663.00	0.80	118.00	-231.51	3,662.49	8.08	4.95	-5.00	0.23	671,178.98	643,911.45	
3,747.00	2.10	219.10	-147.53	3,746.47	6.61	4.49	-4.53	2.84	671,177.51	643,910.99	
3,834.00	2.50	210.40	-60.60	3,833.40	3.74	2.53	-2.55	0.61	671,174.64	643,909.03	
3,919.00	1.40	281.10	24.36	3,918.36	2.34	0.57	-0.58	2.86	671,173.24	643,907.07	
4,004.00	1.40	277.60	109.33	4,003.33	2.68	-1.48	1.46	0.10	671,173.58	643,905.02	
4,089.00	1.50	274.00	194.31	4,088.31	2.89	-3.62	3.60	0.16	671,173.79	643,902.88	
4,175.00	1.50	268.40	280.28	4,174.28	2.94	-5.87	5.85	0.17	671,173.84	643,900.63	
4,260.00	0.40	236.00	365.26	4,259.26	2.74	-7.22	7.21	1.39	671,173.64	643,899.28	
4,346.00	0.70	229.70	451.26	4,345.26	2.23	-7.87	7.86	0.36	671,173.13	643,898.63	
4,432.00	0.90	230.30	537.25	4,431.25	1.46	-8.79	8.78	0.23	671,172.36	643,897.71	
4,517.00	0.70	95.30	622.25	4,516.25	0.99	-8.79	8.78	1.74	671,171.89	643,897.71	
4,603.00	0.70	93.40	708.24	4,602.24	0.91	-7.74	7.74	0.03	671,171.81	643,898.76	
4,688.00	0.80	66.20	793.24	4,687.24	1.12	-6.68	6.67	0.43	671,172.02	643,899.82	
4,773.00	0.80	77.80	878.23	4,772.23	1.48	-5.56	5.55	0.19	671,172.38	643,900.94	
4,859.00	0.70	87.90	964.22	4,858.22	1.63	-4.45	4.44	0.19	671,172.53	643,902.05	
4,945.00	0.60	88.90	1,050.21	4,944.21	1.66	-3.47	3.46	0.12	671,172.56	643,903.03	



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Well:	#14H	North Reference:	Grid
Wellbore:	OH / Job #1310557	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Capstar 114)	Database:	GCR DB v5000

Survey											
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVDSS (usft)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)	
5,030.00	0.50	96.80	1,135.21	5,029.21	1.62	-2.66	2.65	0.15	671,172.52	643,903.84	
5,116.00	0.40	82.40	1,221.21	5,115.21	1.62	-1.99	1.98	0.17	671,172.52	643,904.51	
5,147.00	0.60	93.40	1,252.21	5,146.21	1.62	-1.72	1.71	0.71	671,172.52	643,904.78	
5,198.00	0.80	253.30	1,303.20	5,197.20	1.50	-1.79	1.78	2.70	671,172.40	643,904.71	
5,240.00	4.00	274.90	1,345.16	5,239.16	1.54	-3.53	3.52	7.78	671,172.44	643,902.97	
5,283.00	8.20	266.70	1,387.91	5,281.91	1.49	-8.09	8.08	9.95	671,172.39	643,898.41	
5,326.00	12.20	270.00	1,430.22	5,324.22	1.32	-15.70	15.69	9.40	671,172.22	643,890.80	
5,369.00	16.00	275.00	1,471.92	5,365.92	1.83	-26.15	26.14	9.27	671,172.73	643,880.35	
5,412.00	20.00	275.50	1,512.81	5,406.81	3.06	-39.38	39.36	9.31	671,173.96	643,867.12	
5,454.00	25.20	273.80	1,551.57	5,445.57	4.34	-55.46	55.43	12.48	671,175.24	643,851.04	
5,497.00	30.80	272.80	1,589.52	5,483.52	5.48	-75.61	75.57	13.07	671,176.38	643,830.89	
5,540.00	35.70	270.40	1,625.47	5,519.47	6.11	-99.17	99.12	11.80	671,177.01	643,807.33	
5,583.00	42.10	268.40	1,658.92	5,552.92	5.79	-126.15	126.11	15.17	671,176.69	643,780.35	
5,625.00	48.70	266.40	1,688.40	5,582.40	4.41	-156.00	155.97	16.07	671,175.31	643,750.50	
5,668.00	55.70	266.40	1,714.74	5,608.74	2.28	-189.89	189.87	16.28	671,173.18	643,716.61	
5,711.00	60.70	268.20	1,737.39	5,631.39	0.57	-226.38	226.37	12.16	671,171.47	643,680.12	
5,753.00	66.80	268.40	1,755.96	5,649.96	-0.54	-264.02	264.02	14.53	671,170.36	643,642.48	
5,796.00	73.40	267.50	1,770.58	5,664.58	-2.00	-304.40	304.41	15.47	671,168.90	643,602.10	
5,839.00	80.00	266.40	1,780.47	5,674.47	-4.23	-346.16	346.18	15.55	671,166.67	643,560.34	
5,882.00	85.80	266.30	1,785.78	5,679.78	-6.94	-388.73	388.77	13.49	671,163.96	643,517.77	
5,925.00	89.60	267.80	1,787.51	5,681.51	-9.15	-431.63	431.68	9.50	671,161.75	643,474.87	
6,010.00	93.00	270.20	1,785.58	5,679.58	-10.64	-516.58	516.63	4.90	671,160.26	643,389.92	
6,096.00	91.70	270.40	1,782.06	5,676.06	-10.19	-602.50	602.55	1.53	671,160.71	643,304.00	
6,182.00	91.50	270.30	1,779.65	5,673.65	-9.66	-688.46	688.51	0.26	671,161.24	643,218.04	
6,267.00	91.30	271.10	1,777.58	5,671.58	-8.62	-773.43	773.47	0.97	671,162.28	643,133.07	
6,353.00	90.90	269.90	1,775.93	5,669.93	-7.87	-859.41	859.44	1.47	671,163.03	643,047.09	
6,438.00	90.80	270.10	1,774.67	5,668.67	-7.87	-944.40	944.43	0.26	671,163.03	642,962.10	



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6,523.00	91.70	269.30	1,772.81	5,666.81	-8.32	-1,029.38	1,029.41	1.42	671,162.58	642,877.12	
6,608.00	91.10	268.30	1,770.73	5,664.73	-10.10	-1,114.33	1,114.38	1.37	671,160.80	642,792.17	
6,694.00	90.90	268.10	1,769.23	5,663.23	-12.80	-1,200.28	1,200.34	0.33	671,158.10	642,706.22	
6,779.00	92.70	269.10	1,766.56	5,660.56	-14.87	-1,285.21	1,285.28	2.42	671,156.03	642,621.29	
6,864.00	92.00	269.10	1,763.08	5,657.08	-16.21	-1,370.12	1,370.20	0.82	671,154.69	642,536.38	
6,950.00	91.70	268.00	1,760.30	5,654.30	-18.38	-1,456.05	1,456.14	1.33	671,152.52	642,450.45	
7,035.00	92.40	270.50	1,757.26	5,651.26	-19.50	-1,540.98	1,541.07	3.05	671,151.40	642,365.52	
7,120.00	91.80	269.90	1,754.15	5,648.15	-19.20	-1,625.92	1,626.01	1.00	671,151.70	642,280.58	
7,205.00	91.10	270.40	1,752.00	5,646.00	-18.98	-1,710.89	1,710.98	1.01	671,151.92	642,195.61	
7,291.00	92.20	269.30	1,749.52	5,643.52	-19.20	-1,796.86	1,796.94	1.81	671,151.70	642,109.64	
7,377.00	92.20	268.40	1,746.22	5,640.22	-20.93	-1,882.77	1,882.87	1.05	671,149.97	642,023.73	
7,462.00	92.60	269.30	1,742.66	5,636.66	-22.63	-1,967.68	1,967.79	1.16	671,148.27	641,938.82	
7,548.00	92.60	271.50	1,738.76	5,632.76	-22.03	-2,053.59	2,053.68	2.56	671,148.87	641,852.91	
7,633.00	91.80	271.70	1,735.49	5,629.49	-19.66	-2,138.49	2,138.57	0.97	671,151.24	641,768.01	
7,719.00	91.90	271.40	1,732.72	5,626.72	-17.33	-2,224.41	2,224.48	0.37	671,153.57	641,682.09	
7,805.00	91.20	270.40	1,730.39	5,624.39	-15.98	-2,310.37	2,310.42	1.42	671,154.92	641,596.13	
7,890.00	91.50	269.50	1,728.39	5,622.39	-16.06	-2,395.34	2,395.40	1.12	671,154.84	641,511.16	
7,976.00	90.90	270.20	1,726.59	5,620.59	-16.28	-2,481.32	2,481.38	1.07	671,154.62	641,425.18	
8,061.00	90.90	269.50	1,725.25	5,619.25	-16.51	-2,566.31	2,566.37	0.82	671,154.39	641,340.19	
8,147.00	91.30	269.10	1,723.60	5,617.60	-17.56	-2,652.29	2,652.35	0.66	671,153.34	641,254.21	
8,232.00	91.60	269.70	1,721.45	5,615.45	-18.45	-2,737.26	2,737.32	0.79	671,152.45	641,169.24	
8,318.00	92.30	269.80	1,718.52	5,612.52	-18.82	-2,823.21	2,823.27	0.82	671,152.08	641,083.29	
8,403.00	91.10	269.90	1,716.00	5,610.00	-19.04	-2,908.17	2,908.23	1.42	671,151.86	640,998.33	
8,489.00	89.80	269.60	1,715.33	5,609.33	-19.42	-2,994.16	2,994.22	1.55	671,151.48	640,912.34	
8,574.00	89.90	269.60	1,715.55	5,609.55	-20.01	-3,079.16	3,079.22	0.12	671,150.89	640,827.34	
8,664.00	90.20	269.90	1,715.47	5,609.47	-20.40	-3,169.16	3,169.22	0.47	671,150.50	640,737.34	
8,747.00	90.10	268.50	1,715.25	5,609.25	-21.56	-3,252.15	3,252.22	1.69	671,149.34	640,654.35	



Phoenix Technology Services
Apache



Company:	Apache Corporation	Local Co-ordinate Reference:	Well #14H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3894.00usft (Capstar 114)
Site:	Crow Federal	MD Reference:	KB @ 3894.00usft (Capstar 114)
Well:	#14H	North Reference:	Grid
Wellbore:	OH / Job #1310557	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Capstar 114)	Database:	GCR DB v5000

Survey											
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVDSS (usft)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)	
8,833.00	90.50	269.00	1,714.80	5,608.80	-23.44	-3,338.13	3,338.21	0.74	671,147.46	640,568.37	
8,919.00	90.90	268.80	1,713.75	5,607.75	-25.09	-3,424.10	3,424.19	0.52	671,145.81	640,482.40	
9,004.00	91.20	268.80	1,712.19	5,606.19	-26.87	-3,509.07	3,509.17	0.35	671,144.03	640,397.43	
9,084.00	91.80	268.40	1,710.10	5,604.10	-28.82	-3,589.02	3,589.13	0.90	671,142.08	640,317.48	
9,174.00	92.20	268.40	1,706.96	5,600.96	-31.34	-3,678.93	3,679.05	0.44	671,139.56	640,227.57	
9,260.00	91.30	269.50	1,704.33	5,598.33	-32.91	-3,764.87	3,765.01	1.65	671,137.99	640,141.63	
9,346.00	90.30	269.80	1,703.13	5,597.13	-33.44	-3,850.86	3,851.00	1.21	671,137.46	640,055.64	
9,431.00	90.10	270.70	1,702.84	5,596.84	-33.06	-3,935.86	3,935.99	1.08	671,137.84	639,970.64	
9,517.00	90.30	270.80	1,702.54	5,596.54	-31.94	-4,021.85	4,021.97	0.26	671,138.96	639,884.65	
9,603.00	90.20	270.20	1,702.16	5,596.16	-31.19	-4,107.85	4,107.96	0.71	671,139.71	639,798.65	
9,688.00	90.70	269.80	1,701.49	5,595.49	-31.19	-4,192.84	4,192.96	0.75	671,139.71	639,713.66	
9,774.00	90.80	269.50	1,700.37	5,594.37	-31.71	-4,278.83	4,278.95	0.37	671,139.19	639,627.67	
9,859.00	91.00	269.50	1,699.03	5,593.03	-32.46	-4,363.82	4,363.94	0.24	671,138.44	639,542.68	
9,944.00	91.20	269.40	1,697.40	5,591.40	-33.27	-4,448.80	4,448.92	0.26	671,137.63	639,457.70	
10,030.00	91.30	269.00	1,695.52	5,589.52	-34.47	-4,534.77	4,534.90	0.48	671,136.43	639,371.73	
10,116.00	91.60	269.10	1,693.35	5,587.35	-35.90	-4,620.73	4,620.87	0.37	671,135.00	639,285.77	
10,201.00	92.10	269.30	1,690.60	5,584.60	-37.08	-4,705.68	4,705.82	0.63	671,133.82	639,200.82	
10,287.00	90.00	269.10	1,689.03	5,583.03	-38.28	-4,791.65	4,791.80	2.45	671,132.62	639,114.85	
10,372.00	90.20	268.50	1,688.88	5,582.88	-40.06	-4,876.63	4,876.79	0.74	671,130.84	639,029.87	
10,458.00	90.50	268.40	1,688.35	5,582.35	-42.39	-4,962.60	4,962.77	0.37	671,128.51	638,943.90	
10,549.00	90.60	268.10	1,687.48	5,581.48	-45.17	-5,053.55	5,053.74	0.35	671,125.73	638,852.95	
10,637.00	91.10	268.00	1,686.18	5,580.18	-48.16	-5,141.49	5,141.69	0.58	671,122.74	638,765.01	
Last Phoenix MWD Survey											
10,696.00	91.10	268.00	1,685.04	5,579.04	-50.22	-5,200.44	5,200.66	0.00	671,120.68	638,706.06	
Projection to TD											



Phoenix Technology Services

Apache



Company:	Apache Corporation	Local Co-ordinate Reference:	Well #14H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3894.00usft (Capstar 114)
Site:	Crow Federal	MD Reference:	KB @ 3894.00usft (Capstar 114)
Well:	#14H	North Reference:	Grid
Wellbore:	OH / Job #1310557	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Capstar 114)	Database:	GCR DB v5000

Survey Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
601.00	600.99	-3.47	-1.21	First Phoenix MWD Survey
10,637.00	5,580.18	-48.16	-5,141.49	Last Phoenix MWD Survey
10,696.00	5,579.04	-50.22	-5,200.44	Projection to TD

Checked By: _____	Approved By: _____	Date: _____
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Phoenix Technology Services SURVEY DATA CERTIFICATION



PHOENIX JOB NUMBER 1310557

OPERATOR Apache

WELL NAME Crow Federal 14H

COUNTY & STATE

Eddy, NM

API WELL NUMBER 30-015-40578

PROPOSED DIRECTION 269.63

TIE-IN DATA						
MEASURED	VERTICAL			N-S	E-W	DATA
DEPTH	DEPTH	INCLIN	AZIMUTH	COORD	COORD	SOURCE
ft	.00 ft	.0 ft	.0 ft	.00 ft	.00 ft	Surface

FIRST	FIRST		
SURVEY	SURVEY		
DATE	DEPTH	INCLIN	AZIMUTH
24-May-13	601 ft	0.7	199.2

SURVEY INSTRUMENT
TYPE
Phoenix MWD

LAST	LAST		
SURVEY	SURVEY		
DATE	DEPTH	INCLIN	AZIMUTH
7-Jun-13	10,637 ft	91.1	268.0

TO THE BEST OF MY KNOWLEDGE I
CERTIFY THIS SURVEY DATA TO BE
TRUE AND CORRECT.

PROJECTED	PROJECTED		
TD SURVEY	TD SURVEY		
DATE	DEPTH	INCLIN	AZIMUTH
7-Jun-13	10,637 ft	91.1	268.0

Matthew Dice

PRINT YOUR NAME ABOVE

SIGN YOUR NAME ABOVE

MAGNETIC DECLINATION OR TOTAL GRID

TOTAL CORRECTION USED	7.41
DECLINATION OR GRID	DECLINATION

6/7/2013

TODAY'S DATE

MWD SUPERVISOR 1

Brad Hill

DIRECTIONAL DRILLER 1

Tim Owens

MWD SUPERVISOR 2

Matt Dice

DIRECTIONAL DRILLER 2

Ken Smith

1805 Brittmore Road

Houston, Texas 77043

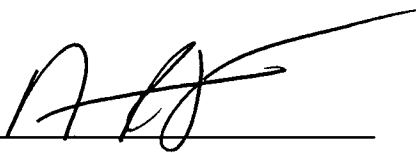
(713)3370609 (Voice), (713)337-0599 (Fax)

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

Crow Federal #14 H API# 30-015-40578 SL: 923' FSL + 250' FWL ULL: IN 10-178-31E
Eddy County, New Mexico

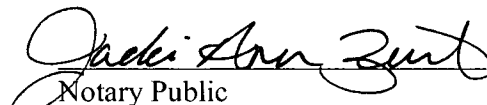
156	1.56	0.25	0.44	0.68	0.68
295	2.95	0.50	0.88	2.58	2.58
575	5.75	0.75	1.31	7.55	7.55





Archie Brown - General Manager

The attached instrument was acknowledged before me on the 26th day of June, 2013
by Archie Brown - General Manager, CapStar Drilling, Inc.



Notary Public

