

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENTFORM APPROVED
OMB No. 1004-0137
Expires: July 31, 2010

WELL COMPLETION OR RECOMPLETION REPORT AND LOG

5. Lease Serial No.
NMLC029426B

- 1a. Type of Well ☒ Oil Well ☐ Gas Well ☐ Dry ☐ Other
 b. Type of Completion ☒ New Well ☐ Work Over ☐ Deepen ☐ Plug Back ☐ Diff. Resvr.
 Other _____

6. If Indian, Allottee or Tribe Name

7. Unit or CA Agreement Name and No.

2. Name of Operator
APACHE CORPORATION
Contact: FATIMA VASQUEZ
E-Mail: fatima.vasquez@apachecorp.com8. Lease Name and Well No.
CROW FEDERAL 14H3. Address 303 VETERANS AIRPARK LANE SUITE 3000
MIDLAND, TX 797053a. Phone No. (include area code)
Ph: 432-818-10159. API Well No.
30-015-40578-00-S14. Location of Well (Report location clearly and in accordance with Federal requirements)*
Sec 10 T17S R31E Mer NMP
At surface SWSW 923FSL 250FWL 32.844362 N Lat, 103.865371 W Lon10. Field and Pool, or Exploratory
FREN-GLORIETA-YESO11. Sec., T., R., M., or Block and Survey
or Area Sec 10 T17S R31E Mer NMPAt top prod interval reported below
Sec 9 T17S R31E Mer NMP
At total depth SWSW 906FSL 332FWL12. County or Parish
EDDY
13. State
NM14. Date Spudded
05/22/201315. Date T.D. Reached
06/07/201316. Date Completed
☐ D & A ☒ Ready to Prod.
11/15/201317. Elevations (DF, KB, RT, GL)*
3884 GL18. Total Depth: MD 10696
TVD 558819. Plug Back T.D.: MD 10696
TVD20. Depth Bridge Plug Set: MD
TVD21. Type Electric & Other Mechanical Logs Run (Submit copy of each)
CNGR SBGR (5)GAMMA-ROP(1" 2" & 5")22. Was well cored? ☒ No ☐ Yes (Submit analysis)
Was DST run? ☒ No ☐ Yes (Submit analysis)
Directional Survey? ☐ No ☒ Yes (Submit analysis)

23. Casing and Liner Record (Report all strings set in well)

Hole Size	Size/Grade	Wt. (#/ft.)	Top (MD)	Bottom (MD)	Stage Cementer Depth	No. of Sks. & Type of Cement	Slurry Vol. (BBL)	Cement Top*	Amount Pulled
17.500	13.375 H-40	48.0	0	575		660		0	
11.000	8.625 J-55	32.0	0	3454		1515		0	
7.875	5.500 L-80	17.0	0	10696		1620		0	

24. Tubing Record

Size	Depth Set (MD)	Packer Depth (MD)	Size	Depth Set (MD)	Packer Depth (MD)	Size	Depth Set (MD)	Packer Depth (MD)
2.875	5554							

25. Producing Intervals

Formation	Top	Bottom	Perforated Interval	Size	No. Holes	Perf. Status
A) YESO	5096	10696	5926 TO 10592	5.000	675	PRODUCING - YESO
B)						
C)						
D)						

26. Perforation Record

27. Acid, Fracture, Treatment, Cement Squeeze, Etc.

Depth Interval	Amount and Type of Material
5926 TO 10592	2688 GALS 15% HCL ACID & 2,703,800# SAND (100 MESH & 40/70)

28. Production - Interval A

Date First Produced	Test Date	Hours Tested	Test Production	Oil BBL	Gas MCF	Water BBL	Oil Gravity Corr. API	Gas Gravity	Production Method
11/15/2013	02/19/2014	24	→	145.0	212.0	1362.0	36.0		ELECTRIC PUMP SUB-SURFACE
Choke Size	Tbg. Press. Flwg.	Csg. Press.	24 Hr. Rate	Oil BBL	Gas MCF	Water BBL	Gas:Oil Ratio	Well Status	
SI			→	145	212	1362	1462	POW	

28a. Production - Interval B

Date First Produced	Test Date	Hours Tested	Test Production	Oil BBL	Gas MCF	Water BBL	Oil Gravity Corr. API	Gas Gravity	Production Method
			→						ARTESIA DISTRICT
Choke Size	Tbg. Press. Flwg.	Csg. Press.	24 Hr. Rate	Oil BBL	Gas MCF	Water BBL	Gas:Oil Ratio	Well Status	
SI			→						

NM OIL CONSERVATION

JUL 07 2014

RECEIVED

(See Instructions and spaces for additional data on reverse side)

ELECTRONIC SUBMISSION #236004 VERIFIED BY THE BLM WELL INFORMATION SYSTEM

** BLM REVISED ** BLM REVISED ** BLM REVISED ** BLM REVISED ** BLM REVISED **

28b. Production - Interval C

Date First Produced	Test Date	Hours Tested	Test Production	Oil BBL	Gas MCF	Water BBL	Oil Gravity Corr. API	Gas Gravity	Production Method
			→						
Choke Size	Tbg. Press. Flwg. SI	Csg. Press.	24 Hr. Rate	Oil BBL	Gas MCF	Water BBL	Gas:Oil Ratio	Well Status	
			→						

28c. Production - Interval D

Date First Produced	Test Date	Hours Tested	Test Production	Oil BBL	Gas MCF	Water BBL	Oil Gravity Corr. API	Gas Gravity	Production Method
			→						
Choke Size	Tbg. Press. Flwg. SI	Csg. Press.	24 Hr. Rate	Oil BBL	Gas MCF	Water BBL	Gas:Oil Ratio	Well Status	
			→						

29. Disposition of Gas(Sold, used for fuel, vented, etc.)

SOLD

30. Summary of Porous Zones (Include Aquifers):

Show all important zones of porosity and contents thereof. Cored intervals and all drill-stem tests, including depth interval tested, cushion used, time tool open, flowing and shut-in pressures and recoveries.

31. Formation (Log) Markers

Formation	Top	Bottom	Descriptions, Contents, etc.	Name	Top Meas. Depth
				YATES	1847
				SEVEN RIVERS	2136
				BOWERS	2530
				QUEEN	2757
				GRAYBURG	3186
				SAN ANDRES	3516
				GLORIETA	5001
				YESO	5096

32. Additional remarks (include plugging procedure):

Attachments - Frac Disclosure, OCD Forms C-102 & C-104 and WBD. Logs mailed 02/19/2014.

33. Circle enclosed attachments:

- | | | | |
|---|--------------------|---------------|-----------------------|
| 1. Electrical/Mechanical Logs (1 full set req'd.) | 2. Geologic Report | 3. DST Report | 4. Directional Survey |
| 5. Sundry Notice for plugging and cement verification | 6. Core Analysis | 7. Other: | |

34. I hereby certify that the foregoing and attached information is complete and correct as determined from all available records (see attached instructions):

Electronic Submission #236004 Verified by the BLM Well Information System.
For APACHE CORPORATION, sent to the Carlsbad
Committed to AFMSS for processing by DEBORAH HAM on 04/10/2014 (14DMH0332SE)

Name (please print) FATIMA VASQUEZTitle REGULATORY ANALYST IISignature (Electronic Submission)Date 02/19/2014

Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

**** REVISED ** REVISED ** REVISED ** REVISED ** REVISED ** REVISED ** REVISED ****

Hydraulic Fracturing Fluid Product Component Information Disclosure

Fracture Date:	8/28/2013
State:	NM
County:	Eddy
API Number:	30-015-40578
Operator Name:	Apache Corporation
Well Name and Number:	Crow Federal 14H
Longitude:	-103.8647286
Latitude:	32.8442667
Long/Lat Projection:	NAD27
Production Type:	Gas
True Vertical Depth (TVD):	5,575
Total Water Volume (gal):	2,916,774

Hydraulic Fracturing Fluid Composition:

Trade Name	Supplier	Purpose	Ingredients	Chemical Abstract Service Number (CAS #)	Maximum Ingredient Concentration in Additive (% by mass)**	Maximum Ingredient Concentration in HF Fluid (% by mass)**	Comments
Water	Swire	Carrier/Base Fluid	Water	7732-18-5	100.00%	86.92545%	
Sand (Proppant)	TSS	Proppant	Silica Substrate	14808-60-7	100.00%	9.09043%	
Hydrochloric Acid (15)	Reagent	Acidizing	Hydrochloric Acid	7647-01-0	15.00000%	0.52079%	
AP-Bio-1	Dow Chemical	Biocide	Glutaraldehyde	111-30-8	42.50000%	0.01965%	
			Quaternary ammonium compounds, be	68424-85-1	7.50000%	0.00347%	
			Ethanol	64-17-5	1.00000%	0.00046%	
AP-FR-1	Ashland	Friction Reducer	Hydrocarbon-aliphatic	25450-40-01	30.00000%	0.02789%	
			Fatty alcohol alkoxylate	Proprietary	5.00000%	0.00465%	
			Polyacrylate based copolymer	Proprietary	35.00000%	0.03254%	
Ferriplex 40	Chemplex	Iron Control	Sodium Hydroxide	1310-73-2	1.00000%	0.00017%	
			Sodium Sulfate Anhydrous	7757-82-6	2.00000%	0.00034%	
			Trisodium Nitrilotriacetate	5064-31-3	40.00000%	0.00673%	
Plexbreak 145	Chemplex	Non-Emulsifier	2-Butoxyethanol	111-76-2	15.00000%	0.00093%	
			Cocamide Based Surfactant	Proprietary	10.00000%	0.00062%	
			Diethanolamine	111-42-2	3.00000%	0.00019%	
			Methyl Alcohol	67-56-1	15.00000%	0.00093%	
AP-Scale-1	Blentech	Scale Inhibitor	Ethylene Glycol	107-21-1	35.00000%	0.01645%	
			Polyacrylate blend	Proprietary	7.00000%	0.00329%	
Plexhib 256	Chemplex	Acid Inhibitor	Methyl Alcohol	67-56-1	60.00000%	0.00334%	
			Propargyl Alcohol	107-19-7	10.00000%	0.00056%	
			Thiourea/Formaldehyde Copolymer	68527-49-1	30.00000%	0.00167%	
			Polyethoxylated Alcohol Surfactant	68951-67-7	30.00000%	0.00167%	
			C-14 to C-16 Alpha Olefins	64743-02-8	5.00000%	0.00028%	
AP-Surf-1A	Blentech	Surfactant	Methanol	67-56-1	25.00000%	0.02127%	
			Sulfonate	Proprietary	4.00000%	0.00340%	
			Alkyl alkoxylate	Proprietary	11.00000%	0.00936%	
Claymax	Chemplex	Clay Stabilizer	Choline Chloride	67-48-1	65.00000%	0.10843%	

Hydraulic Fracturing Fluid Composition:

Trade Name	Supplier	Purpose	Ingredients	Chemical Abstract Service Number (CAS #)	Maximum Ingredient Concentration in Additive (% by mass)**	Maximum Ingredient Concentration in HF Fluid (% by mass)**	Comments
Plexset 730	Chemplex	Proppant Consolidator	Alcohol Ethoxylates	Proprietary	60.00000%	0.02733%	
			Methyl Alcohol	67-56-1	50.00000%	0.02277%	

* Total Water Volume sources may include fresh water, produced water, and/or recycled water

** Information is based on the maximum potential for concentration and thus the total may be over 100%

All component information listed was obtained from the supplier's Material Safety Data Sheets (MSDS). As such, the Operator is not responsible for inaccurate and/or incomplete information. Any questions regarding the content of the MSDS should be directed to the supplier who provided it. The Occupational Safety and Health Administration's (OSHA) regulations govern the criteria for the disclosure of this information. Please note that Federal Law protects "proprietary", "trade secret", and "confidential business information" and the criteria for how this information is reported on an MSDS is subject to 29 CFR 1910.1200(i) and Appendix D.



Apache Corporation

Eddy County, NM (NAD27 NME)

Crow Federal

#14H

OH / Job #1310557

Survey: Phoenix MWD Surveys

Apache

07 June, 2013



PHOENIX
TECHNOLOGY SERVICES



Phoenix Technology Services

Apache



Company: Apache Corporation
Project: Eddy County, NM (NAD27 NME)
Site: Crow Federal
Well: #14H
Wellbore: OH / Job #1310557
Design: Surveys (Capstar 114)

Local Co-ordinate Reference: Well #14H
TVD Reference: KB @ 3894.00usft (Capstar 114)
MD Reference: KB @ 3894.00usft (Capstar 114)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: GCR DB v5000

Project: Eddy County, NM (NAD27 NME)

Map System: US State Plane 1927 (Exact solution)
Geo Datum: NAD 1927 (NADCON CONUS)
Map Zone: New Mexico East 3001

System Datum: Mean Sea Level

Site: Crow Federal

Site Position:	From:	Map	Northing:	671,130.90 usft	Latitude:	32° 50' 38.927956 N
			Easting:	643,906.80 usft	Longitude:	103° 51' 53.166888 W
Position Uncertainty:		0.00 usft	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) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	269.63

Survey Program: Date 06/07/13

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



Phoenix Technology Services

Apache



Company: Apache Corporation
Project: Eddy County, NM (NAD27 NME)
Site: Crow Federal
Well: #14H
Wellbore: OH / Job #1310557
Design: Surveys (Capstar 114)

Local Co-ordinate Reference: Well #14H
TVD Reference: KB @ 3894.00usft (Capstar 114)
MD Reference: KB @ 3894.00usft (Capstar 114)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
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

Apache



Company: Apache Corporation
Project: Eddy County, NM (NAD27 NME)
Site: Crow Federal
Well: #14H
Wellbore: OH / Job #1310557
Design: Surveys (Capstar 114)

Local Co-ordinate Reference: Well #14H
TVD Reference: KB @ 3894.00usft (Capstar 114)
MD Reference: KB @ 3894.00usft (Capstar 114)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
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



Phoenix Technology Services

Apache



Company: Apache Corporation
Project: Eddy County, NM (NAD27 NME)
Site: Crow Federal
Well: #14H
Wellbore: OH / Job #1310557
Design: Surveys (Capstar 114)

Local Co-ordinate Reference: Well #14H
TVD Reference: KB @ 3894.00usft (Capstar 114)
MD Reference: KB @ 3894.00usft (Capstar 114)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
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



Phoenix Technology Services

Apache



Company: Apache Corporation
Project: Eddy County, NM (NAD27 NME)
Site: Crow Federal
Well: #14H
Wellbore: OH / Job #1310557
Design: Surveys (Capstar 114)

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

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

Local Co-ordinate Reference: Well #14H
TVD Reference: KB @ 3894.00usft (Capstar 114)
MD Reference: KB @ 3894.00usft (Capstar-114)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: GCR DB v5000

Survey Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		
		+N/-S (usft)	+E/-W (usft)	Comment
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: _____

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

SURVEY INSTRUMENT
TYPE
Phoenix MWD

LAST SURVEY	LAST 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

MAGNETIC DECLINATION OR TOTAL GRID

TOTAL CORRECTION USED	
7.41	
DECLINATION OR GRID	DECLINATION

SIGN YOUR NAME ABOVE

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)