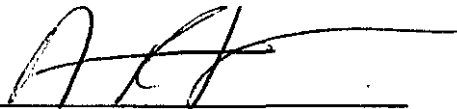


Apache Corporation
303 Veterans Airpark Lane, #3000
Midland, TX 79705

Raven Federal #016H
Eddy County, New Mexico

API # 30-015-40913
A-SIC. 7, 175, 31E 727' FNL, 1000' FEL

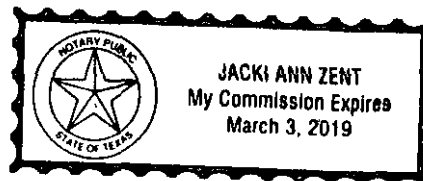
230	2.30	0.50	0.88	2.01	2.01
585	3.55	1.80	3.15	11.18	13.20
753	1.68	1.60	2.80	4.70	17.90
925	1.72	1.40	2.45	4.21	22.11
1139	2.14	1.20	2.10	4.49	26.61
1436	2.97	1.30	2.28	6.76	33.36
1734	2.98	1.30	2.28	6.78	40.14
1905	1.71	1.30	2.28	3.89	44.03
2159	2.54	0.70	1.23	3.11	47.15
2373	2.14	1.40	2.45	5.24	52.39
2671	2.98	1.30	2.28	6.78	59.17
2876	2.05	0.90	1.58	3.23	62.40
3174	2.98	0.60	1.05	3.13	65.53
3322	1.48	1.00	1.75	2.59	68.12
3465	1.43	1.20	2.10	3.00	71.12
3575	1.10	0.60	1.05	1.16	72.27
3745	1.70	1.00	1.75	2.98	75.25
3958	2.13	0.50	0.88	1.86	77.11
4171	2.13	0.40	0.70	1.49	78.60
4415	2.44	1.20	2.10	5.12	83.73



Archie Brown - General Manager

The attached instrument was acknowledged before me on the 30th day of April, 2015 by
Archie Brown - General Manager, CapStar Drilling, Inc.


Notary Public





Apache Corporation

Eddy County, NM (NAD27 NME)

Raven Federal

#16H

WB1 / Job #1411573

Design: Surveys (Capstar 119)

Standard Survey Report

23 April, 2015

WDS 2/16/16
Accepted for record
NR-1000



Company:	Apache Corporation	Local Co-ordinate Reference:	Well #16H
Project:	Eddy County, NM (NAD27, NME)	TVD Reference:	KB @ 3756.00usft (Capstar 119)
Site:	Raven Federal	MD Reference:	KB @ 3756.00usft (Capstar 119)
Well:	#16H	North Reference:	Grid
Wellbore:	WB1 / Job #1411573	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Capstar 119)	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	Raven Federal		
Site Position:	From:	Map	
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "
Northings:	673,239.70 usft	Latitude:	32° 51' 0.24298 N
Easting:	633,303.50 usft	Longitude:	103° 53' 57.35087 W
Grid Convergence:			0.24 °

Well	#16H		
Well Position	+N/-S	0.00 usft	Northings:
	+E/-W	0.00 usft	Easting:
Position Uncertainty	0.00 usft	Wellhead Elevation:	usft
			Ground Level:
			3,745.00 usft

Wellbore	WB1 / Job #1411573		
Magnetics	Model Name	Sample Date	Declination
	HDGM	4/6/2015	7.68
			60.80
			48,579

Design	Surveys (Capstar 119)		
Audit Notes:			
Version:	1.0	Phase:	ACTUAL
Tie On Depth:			0.00
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W
	(usft)	(usft)	(usft)
	0.00	0.00	0.00
			269.62

Survey Program	Date 4/23/2015		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name
153.31	4,370.69	Phoenix Gyro Survey (WB1 / Job #141157)	NS-GYRO-MS
4,415.00	8,322.00	Phoenix MWD Survey (WB1 / Job #14115)	PHX+MWD+HDGM
			Description
			North sensing gyrocompassing m/s
			PHX+MWD+HDGM

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
153.31	0.75	138.94	153.31	-0.76	0.66	-0.65	0.49	0.49	0.00
281.11	1.95	216.28	281.08	-3.14	-0.08	0.10	1.51	0.94	60.52
408.91	0.54	203.33	408.84	-5.45	-1.60	1.64	1.12	-1.10	-10.13
536.71	1.35	204.67	536.62	-7.37	-2.47	2.52	0.63	0.63	1.05
664.51	1.94	209.60	664.37	-10.62	-4.17	4.24	0.47	0.46	3.86
792.31	2.02	226.34	792.10	-14.05	-6.87	6.96	0.46	0.06	13.10
920.11	1.78	231.39	919.82	-16.85	-10.05	10.16	0.23	-0.19	3.95
1,047.91	1.83	219.17	1,047.56	-19.67	-12.89	13.02	0.30	0.04	-9.56
1,175.71	1.71	208.51	1,175.30	-22.92	-15.08	15.24	0.27	-0.09	-8.34

Company:	Apache Corporation	Local Co-ordinate Reference:	Well #16H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3758.00usft (Capstar 119)
Site:	Raven Federal	MD Reference:	KB @ 3758.00usft (Capstar 119)
Well:	#16H	North Reference:	Grid
Wellbore:	WB1 / Job #1411573	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Capstar 119)	Database:	Compass 5000 GCR

Survey									
Measured	Vertical		Vertical		Dogleg		Build		Turn
Depth	Inclination	Azimuth	Depth	N-S	E-W	Section	Rate	Rate	Rate
(usft)	(°)	(°)	(usft)	(usft)	(usft)	(usft)	(°/100usft)	(°/100usft)	(°/100usft)
1,303.51	1.29	184.85	1,303.06	-26.03	-16.12	16.29	0.58	-0.33	-18.51
1,431.31	1.05	167.54	1,430.83	-28.61	-15.99	16.17	0.33	-0.19	-13.54
1,559.10	1.30	158.32	1,558.60	-31.10	-15.20	15.40	0.24	0.20	-7.21
1,686.90	1.64	146.38	1,686.35	-33.97	-13.65	13.87	0.36	0.27	-9.34
1,814.70	1.69	137.66	1,814.10	-36.89	-11.37	11.61	0.20	0.04	-6.82
1,942.50	1.39	138.19	1,941.85	-39.43	-9.06	9.33	0.24	-0.23	0.41
2,070.30	1.11	165.20	2,069.62	-41.79	-7.71	7.99	0.50	-0.22	21.13
2,198.10	1.38	176.53	2,197.39	-44.52	-7.31	7.60	0.28	0.21	8.87
2,325.90	1.27	183.80	2,325.16	-47.47	-7.31	7.62	0.16	-0.09	5.69
2,453.70	0.79	223.10	2,452.94	-49.53	-8.00	8.33	0.65	-0.38	30.75
2,581.50	0.91	245.92	2,580.73	-50.58	-9.53	9.87	0.28	0.09	17.86
2,709.30	1.21	256.00	2,708.50	-51.32	-11.77	12.11	0.28	0.23	7.89
2,837.10	1.53	249.43	2,836.27	-52.25	-14.67	15.02	0.28	0.25	-5.14
2,964.90	1.52	251.23	2,964.02	-53.39	-17.88	18.23	0.04	-0.01	1.41
3,092.70	1.28	259.08	3,091.78	-54.21	-20.88	21.24	0.24	-0.19	6.14
3,220.50	1.05	262.33	3,219.56	-54.64	-23.44	23.81	0.19	-0.18	2.54
3,348.30	0.82	256.66	3,347.34	-55.00	-25.49	25.86	0.19	-0.18	-4.44
3,476.09	0.72	275.66	3,475.12	-55.14	-27.18	27.55	0.21	-0.08	14.87
3,603.89	0.85	276.06	3,602.91	-54.96	-28.92	29.29	0.10	0.10	0.31
3,731.69	0.95	260.62	3,730.69	-55.03	-30.91	31.28	0.20	0.08	-12.08
3,859.49	0.92	259.93	3,858.47	-55.38	-32.97	33.33	0.03	-0.02	-0.54
3,987.29	0.87	265.75	3,986.26	-55.63	-34.95	35.31	0.08	-0.04	4.55
4,115.09	0.64	277.42	4,114.05	-55.61	-36.62	36.99	0.22	-0.18	9.13
4,242.89	0.62	284.66	4,241.84	-55.34	-38.00	38.36	0.06	-0.02	5.67
4,370.69	0.50	293.83	4,369.63	-54.94	-39.18	39.54	0.12	-0.09	7.18
Tie-on to Phoenix Gyro Survey									
4,415.00	1.20	280.50	4,413.94	-54.78	-39.81	40.17	1.63	1.58	-30.08
First Phoenix MWD Survey									
4,457.00	6.20	273.30	4,455.84	-54.57	-42.51	42.87	11.93	11.90	-17.14
4,500.00	12.90	274.80	4,498.22	-54.04	-49.62	49.98	15.59	15.58	3.49
4,543.00	19.50	275.70	4,539.49	-52.92	-61.56	61.90	15.36	15.35	2.09
4,585.00	25.50	275.70	4,578.27	-51.32	-77.54	77.88	14.29	14.29	0.00
4,628.00	29.10	276.90	4,616.48	-49.15	-97.14	97.46	8.47	8.37	2.79
4,670.00	32.10	276.50	4,652.63	-46.66	-118.37	118.68	7.16	7.14	-0.95
4,713.00	35.10	274.90	4,688.44	-44.31	-142.05	142.34	7.27	6.98	-3.72
4,755.00	39.80	272.50	4,721.77	-42.69	-167.52	167.80	11.72	11.19	-5.71
4,798.00	44.60	271.70	4,753.62	-41.64	-196.38	196.65	11.23	11.16	-1.86
4,841.00	48.80	273.10	4,783.10	-40.32	-227.63	227.90	10.05	9.77	3.26
4,883.00	52.60	275.30	4,809.70	-37.92	-260.04	260.28	9.91	9.05	5.24
4,926.00	56.90	276.30	4,834.51	-34.36	-294.96	295.19	10.18	10.00	2.33
4,968.00	60.60	275.80	4,856.30	-30.58	-330.66	330.86	8.87	8.81	-1.19
5,011.00	65.60	275.30	4,875.75	-26.88	-368.82	368.99	11.67	11.63	-1.16
5,053.00	70.20	274.40	4,891.54	-23.59	-407.58	407.73	11.13	10.95	-2.14

Company:	Apache Corporation	Local Co-ordinate Reference:	Well #16H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3756.00usft (Capstar 119)
Site:	Raven Federal	MD Reference:	KB @ 3756.00usft (Capstar 119)
Well:	#16H	North Reference:	Grid
Wellbore:	WB1 / Job #1411573	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Capstar 119)	Database:	Compass 5000 GCR

Survey										
Measured			Vertical			Vertical	Dogleg	Build	Turn	
Depth	Inclination	Azimuth	Depth	+N/-S	+E/-W	Section	Rate	Rate	Rate	
(usft)	(°)	(°)	(usft)	(usft)	(usft)	(usft)	(°/100usft)	(°/100usft)	(°/100usft)	
5,096.00	76.00	275.70	4,904.04	-19.97	-448.55	448.67	13.79	13.49	3.02	
5,139.00	80.30	275.10	4,912.87	-16.01	-490.44	490.53	10.09	10.00	-1.40	
5,167.00	82.20	274.70	4,917.13	-13.65	-518.01	518.09	6.93	6.79	-1.43	
5,210.00	89.00	274.10	4,920.42	-10.36	-560.73	560.79	15.87	15.81	-1.40	
5,252.00	90.40	272.50	4,920.64	-7.94	-602.66	602.70	5.06	3.33	-3.81	
5,295.00	88.50	269.90	4,921.06	-7.04	-645.64	645.67	7.49	-4.42	-6.05	
5,337.00	88.60	269.20	4,922.12	-7.37	-687.62	687.66	1.68	0.24	-1.67	
5,423.00	92.30	268.70	4,921.44	-8.95	-773.59	773.63	4.34	4.30	-0.58	
5,550.00	92.40	269.70	4,916.24	-10.72	-900.47	900.52	0.79	0.08	0.79	
5,678.00	91.60	271.30	4,911.77	-9.60	-1,028.38	1,028.42	1.40	-0.63	1.25	
5,805.00	92.20	270.00	4,907.56	-8.16	-1,155.30	1,155.33	1.13	0.47	-1.02	
5,933.00	92.90	269.00	4,901.86	-9.28	-1,283.17	1,283.20	0.95	0.55	-0.78	
5,061.00	91.30	269.10	4,897.17	-11.40	-1,411.06	1,411.10	1.25	-1.25	0.08	
6,188.00	92.50	268.40	4,892.96	-14.17	-1,537.96	1,538.02	1.09	0.94	-0.55	
6,316.00	90.30	269.60	4,889.84	-16.40	-1,665.89	1,665.96	1.96	-1.72	0.94	
6,444.00	89.50	270.40	4,890.06	-16.40	-1,793.89	1,793.96	0.88	-0.63	0.63	
6,572.00	90.50	270.20	4,890.06	-15.73	-1,921.88	1,921.95	0.80	0.78	-0.16	
6,699.00	91.70	270.00	4,887.62	-15.51	-2,048.86	2,048.92	0.96	0.94	-0.16	
6,827.00	93.10	269.50	4,882.26	-16.07	-2,176.74	2,176.80	1.16	1.09	-0.39	
6,955.00	91.10	269.70	4,877.57	-16.96	-2,304.64	2,304.71	1.57	-1.56	0.16	
7,083.00	92.30	269.40	4,873.77	-17.96	-2,432.58	2,432.65	0.97	0.94	-0.23	
7,210.00	91.30	270.70	4,869.78	-17.85	-2,559.51	2,559.58	1.29	-0.79	1.02	
7,338.00	90.40	271.90	4,867.89	-14.95	-2,687.46	2,687.50	1.17	-0.70	0.94	
7,466.00	91.70	271.50	4,865.54	-11.15	-2,815.38	2,815.40	1.06	1.02	-0.31	
7,593.00	90.90	271.00	4,862.66	-8.38	-2,942.32	2,942.31	0.74	-0.63	-0.39	
7,721.00	91.30	271.00	4,860.20	-6.15	-3,070.28	3,070.25	0.31	0.31	0.00	
7,849.00	90.30	269.40	4,858.41	-5.70	-3,198.26	3,198.22	1.47	-0.78	-1.25	
7,977.00	91.60	268.60	4,856.29	-7.94	-3,326.22	3,326.20	1.19	1.02	-0.63	
8,105.00	92.80	268.00	4,851.38	-11.73	-3,454.06	3,454.06	1.05	0.94	-0.47	
8,232.00	94.00	267.70	4,843.85	-16.49	-3,580.75	3,580.78	0.97	0.94	-0.24	
8,254.00	94.20	267.80	4,842.27	-17.35	-3,602.67	3,602.71	1.02	0.91	0.45	
Last Phoenix MWD Survey										
8,322.00	94.20	267.80	4,837.29	-19.95	-3,670.44	3,670.49	0.00	0.00	0.00	
Projection to TD										

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
4,370.69	4,369.63	-54.94	-39.18	Tie-on to Phoenix Gyro Survey
4,415.00	4,413.94	-54.78	-39.81	First Phoenix MWD Survey
8,254.00	4,842.27	-17.35	-3,602.67	Last Phoenix MWD Survey
8,322.00	4,837.29	-19.95	-3,670.44	Projection to TD

Company:	Apache Corporation	Local Co-ordinate Reference:	Well #16H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3756.00usft (Capstar 119)
Site:	Raven Federal	MD Reference:	KB @ 3756.00usft (Capstar 119)
Well:	#16H	North Reference:	Grid
Wellbore:	WB1 / Job #1411573	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Capstar 119)	Database:	Compass 5000 GCR

Checked By: _____ Approved By: _____ Date: _____

DISTRICT I
1625 N. French Dr., Hobbs, NM 88240
Phone: (505) 393-6161 Fax: (505) 393-0720

DISTRICT II
811 S. First St., Artesia, NM 88210
Phone: (505) 748-1283 Fax: (505) 748-9720

DISTRICT III
1000 Rio Brazos Road, Aztec, NM 87410
Phone: (505) 334-6178 Fax: (505) 334-6170

DISTRICT IV
1220 S. St. Francis Dr., Santa Fe, NM 87505
Phone: (505) 476-3460 Fax: (505) 476-3462

State of New Mexico
Energy, Minerals & Natural Resources Department
OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
Santa Fe, New Mexico 87505

Form C-102
Revised August 1, 2011
Submit one copy to appropriate
District Office

AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

API Number 30-015-40913	Pool Code 96831	Pool Name Cedar Lake; Glorieta-Yaso
Property Code 39330	Property Name RAVEN FEDERAL	Well Number 16H
OGRID No. 873	Operator Name APACHE CORPORATION	Elevation 3745'

Surface Location

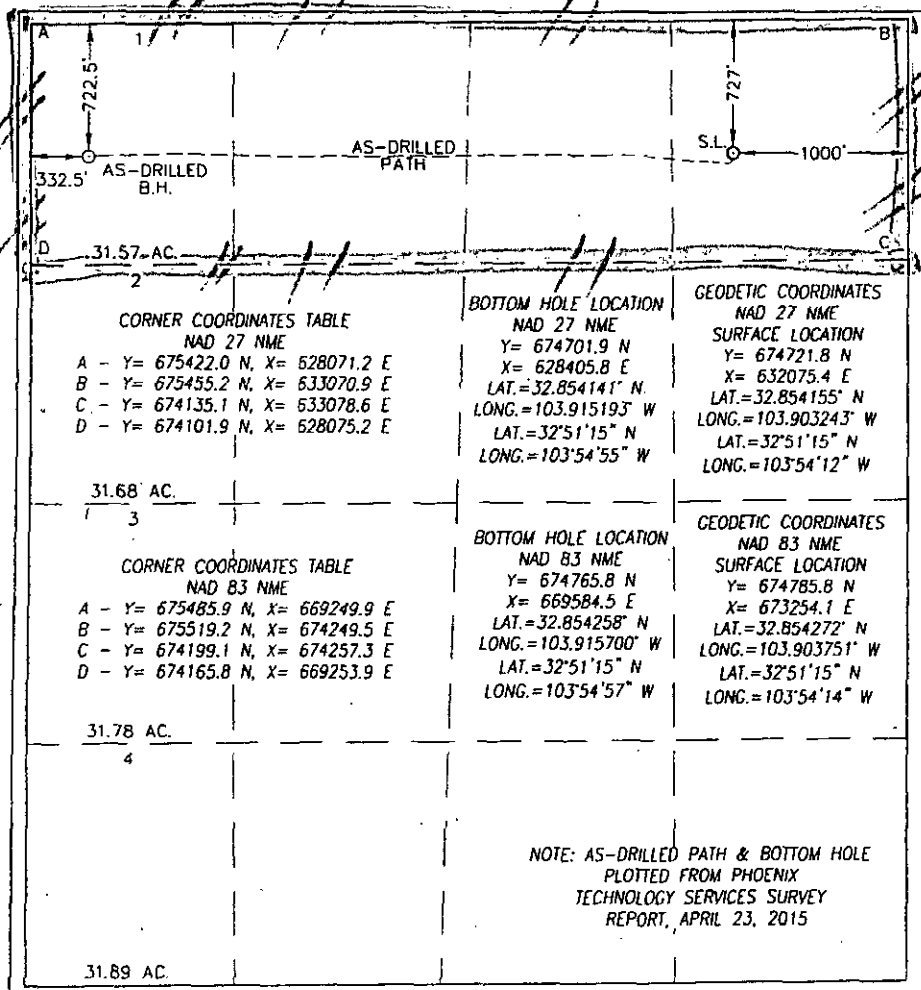
UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
A	7	17-S	31-E		727	NORTH	1000	EAST	EDDY

As-Drilled Bottom Hole Location If Different From Surface

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
1	7	17-S	31-E		722.5	NORTH	332.5	WEST	EDDY

Dedicated Acres	Joint or Infill	Consolidation Code	Order No.
151.57			

NO ALLOWABLE WILL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE BEEN CONSOLIDATED OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION



OPERATOR CERTIFICATION

I hereby certify that the information herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.

Emily Follis
Signature Date

Emily Follis
Printed Name

emily.follis@apachecorp.com
E-mail Address

SURVEYOR CERTIFICATION

I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.

APRIL 26, 2012
Date of Survey
Signature & Seal of Professional Surveyor

Ronald J. Eidson
NEW MEXICO
REGISTERED
3239
05/18/2015

Certificate Number
Ronald J. Eidson 12641
Ronald J. Eidson 3239

LSL REL. W.O.: 12.11.0465 JWSC W.O.: 15.13.0580

District I
1625 N. French Dr., Hobbs, NM 88240
District II
811 S. First St., Artesia, NM 88210
District III
1000 Rio Brazos Rd., Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy, Minerals & Natural Resources

Form C-104
Revised August 1, 2011

Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, NM 87505

Submit one copy to appropriate District Office

☐ AMENDED REPORT

I. REQUEST FOR ALLOWABLE AND AUTHORIZATION TO TRANSPORT

¹ Operator name and Address Apache Corporation 303 Veterans Airpark Lane Suite 1000 Midland TX 79705		² OGRID Number 873
		³ Reason for Filing Code/ Effective Date NW 12/17/15
⁴ API Number 30-015-40913	⁵ Pool Name CEDAR LAKE; GLORIETA-YESO	⁶ Pool Code [96831]
⁷ Property Code [39330]	⁸ Property Name RAVEN FEDERAL	⁹ Well Number 16H

II. ¹⁰ Surface Location

Ul or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South Line	Feet from the	East/West line	County
	7	17S	31E		727	NORTH	1000	EAST	EDDY

¹¹ Bottom Hole Location

Ul or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
	7	17S	31E		722	NORTH	332	EAST	EDDY
¹² Lse Code F	¹³ Producing Method Code P	¹⁴ Gas Connection Date 12/17/15	¹⁵ C-129 Permit Number	¹⁶ C-129 Effective Date	¹⁷ C-129 Expiration Date				

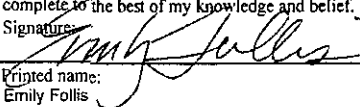
III. Oil and Gas Transporters

¹⁸ Transporter OGRID	¹⁹ Transporter Name and Address	²⁰ O/G/W
252293	Holly Energy Pipeline 311 W Quay / PO Box 1360 Artesia NM 88210	O
221115	Frontier Field Services LLC 4200 East Skelly Drive Suite 700 Tulsa OK 74135	G

IV. Well Completion Data

²¹ Spud Date 04/11/15	²² Ready Date 12/17/15	²³ TD 8322	²⁴ PBDT 8322	²⁵ Perforations 5245-8291	²⁶ DHC, MC
²⁷ Hole Size	²⁸ Casing & Tubing Size	²⁹ Depth Set	³⁰ Sacks Cement		
17.5	13.375 H40 48#	420'	670 sx Class C		
12.25	9.625 HCK55 40#	3500'	1450 sx Class C		
8.5	7" L80 29# / 5" L80 20#	4412'/8300'	500 sx Class C		
Tubing	2.875 J55	4667'			

V. Well Test Data

³¹ Date New Oil 12/17/15	³² Gas Delivery Date 12/17/15	³³ Test Date 12/24/15	³⁴ Test Length 24 hrs	³⁵ Tbg. Pressure	³⁶ Csg. Pressure
³⁷ Choke Size	³⁸ Oil 892	³⁹ Water 1972	⁴⁰ Gas 489		⁴¹ Test Method P
⁴² I hereby certify that the rules of the Oil Conservation Division have been complied with and that the information given above is true and complete to the best of my knowledge and belief. Signature: 			OIL CONSERVATION DIVISION		
Printed name: Emily Follis			Approved by:		
Title: Reg Analyst			Title:		
E-mail Address: emily.follis@apachecorp.com			Approval Date:		
Date: 1/4/2016		Phone: 432-818-1801			

Hydraulic Fracturing Fluid Product Component Information Disclosure

Fracture Date:	9/17/2015
State:	NM
County:	Eddy
API Number:	30-015-40913
Operator Name:	Apache
Well Name and Number:	Raven Federal #16H
Longitude:	-103.903243
Latitude:	32.854155
Long/Lat Projection:	NAD27
Production Type:	Oil
True Vertical Depth (TVD):	8,322
Total Water Volume (gal):	1,936,956

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	Customer	Carrier/Base Fluid	Water	7732-18-5	100.00%	84.95444%	
Sand (Proppant)	US Silica	Proppant	Silica Substrate	14808-60-7	100.00%	8.13137%	
RCS (Proppant)	Momentive	Proppant	Silica Substrate	14808-60-7	100.00%	2.77896%	
Hydrochloric Acid (1 CNR)	Chemplex	Acidizing	Hydrochloric Acid	7647-01-0	38.80000%	1.51627%	
Claymax	Chemplex	Clay Stabilizer	Choline Chloride	67-48-1	62.00000%	0.00000%	
4-N-1 Plus	Chemplex	Iron Control, Corr Inhib, S	Acetic Acid	64-19-7	80.00000%	0.00000%	
			Methanol	67-56-1	10.00000%	0.00000%	
Plexicide 24L	Chemplex	Biocide	Tetrahydro-3, Dimethyl-2H	533-74-4	24.00000%	0.00000%	
Plexset 730	Chemplex	Activator	Secondary Alcohol Ethoxylate	84133-50-6	50.00000%	0.00000%	
Plexsurf 240 E	Chemplex	Surfactant	Methyl Alcohol	67-56-1	10.00000%	0.00824%	
			Alcohol Alkoxylate	Proprietary	50.00000%	0.04122%	
Plexsick 953	Chemplex	Friction Reducer	Alcohol Ethoxylate Surfactants	Proprietary	8.00000%	0.00600%	
			Hydro-treated Petroleum Distillate	64742-47-8	30.00000%	0.02251%	
AMA 398	Chemplex	Biocide	Polyacrylamide-co-Acrylic Acid	9003-06-9	31.00000%	0.02326%	
Plexgel 907 LE	Chemplex	Polymer	Tetrahydro-3, Dimethyl-2H	533-74-4	98.00%	0.00000%	
			Guar Gum	9000-30-0	50.00000%	0.00000%	
			Mineral Oil	64742-47-8	55.00000%	0.00000%	
			Bentonite Clay	14808-60-7	2.00000%	0.00000%	
			Surfactant	68439-51-0	2.00000%	0.00000%	
Plexbor 101	Chemplex	Crosslinker	Ethylene Glycol	107-21-1	9.99000%	0.00000%	
			Potassium Metaborate	13709-94-9	30.00000%	0.00000%	
			Potassium Hydroxide	1310-58-3	5.00000%	0.00000%	
Plexgel Breaker 10L	Chemplex	Gel Breaker	Mannanase Enzymes	Proprietary	2.00000%	0.00000%	
Sodium Persulfate	Chemplex	Gel Breaker	Sodium Chloride	7647-14-5	15.00000%	0.00000%	
Buffer 11	Chemplex	PH Control	Sodium Persulfate	7765-27-1	98.00%	0.00000%	
Greenhib 679	Chemplex	Scale Inhibitor	Potassium Hydroxide	1310-58-3	23.00000%	0.00000%	
			Glycerine	56-81-5	35.00000%	0.01631%	

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
			Proprietary	Proprietary	35.000000%	0.01631%	
			Water	7732-18-5	30.000000%	0.01398%	
Chaplex 650	Chemplex	Clay Stabilizer	Water	7732-18-5	60.000000%	0.00066%	
			Ethanolamine, 2-hydroxy-N,N,N-trimethylethanolamine	67-48-1	35.000000%	0.00038%	
Plexicide 15G	Chemplex, LQ Biocide		Glutaraldehyde	111-30-8	14.000000%	0.00308%	
			Didecyl dimethyl ammonium chloride	7173-51-5	3.000000%	0.00066%	
			Alkyl dimethyl benzyl ammonium chlor	68424-85-1	3.000000%	0.00066%	
			Ethanol	64-17-5	3.000000%	0.00066%	

* 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.

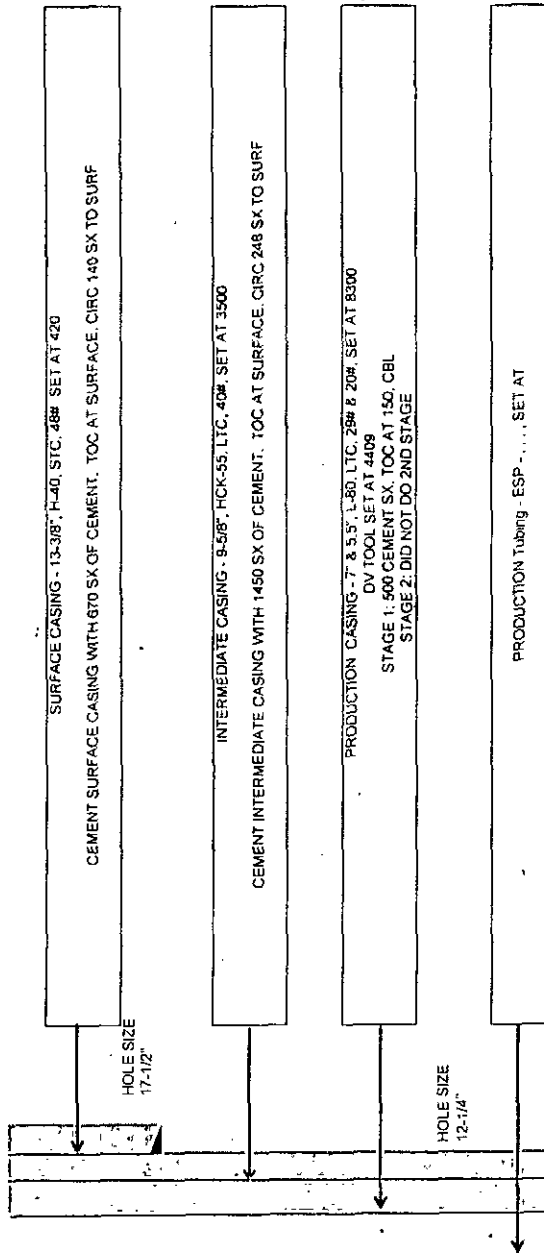
WELL NAME: RAVEN FEDERAL 16H
 API: 30015-40913
 SPUD DATE: 4/11/2015
 PRODUCING FORMATION: YESO PADDOCK
 FIELD: CEDAR LAKE (BP)
 COUNTY: EDDY
 STATE: NEW MEXICO
 WORKING INTEREST: 60.00%

SURFACE LOC: 727 FNL & 1000 FEL
 SECTION: 7
 TOWNSHIP: 17-S
 RANGE: 31-E
 SURVEY: JOHN WEST SURVEYING CO
 BOTTOM HOLE LOC: 722 FNL & 332 FEL
 SECTION: 7
 TOWNSHIP: 17-S
 RANGE: 31-E
 SURVEY: JOHN WEST SURVEYING CO
 DRILL RIG: CAPSTAR 119
 RIG RELEASE: 4/24/2015

KB (ft): 3,755.00
 GL (ft): 3,745.00
 KBGL DIFF (ft): 11.00
 TMD (ft): 8,322.00
 TD OF PILOT HOLE (ft): N/A
 FC DEPTH (ft): 8,291.00
 PBMD (ft): 8,322.00
 ROV DEPTH (ft): N/A
 ORIO VALVE (ft): N/A
 DEEPEST TVD (ft): 4,922.00

TAPERED CASING STRING:

7" 20# L-80 TO X-OVER @ 4,412'
 TAPERING TO 5.5" 20# L-80 SET @ 8,300'



HOLE SIZE
 9 1/2"



PACKERS & SLEEVES
 TOP PERF (MD): 5,245
 BOTTOM PERF (MD): 8,291

TMD (ft): 8,322
 FC DEPTH (ft): 8,291
 PBMD (ft): 8,322
 ROV DEPTH (ft): N/A
 ORIO VALVE (ft): N/A

KOP (ft): 4,417
 LATERAL LENGTH (ft): 3,077
 TD OF PILOT HOLE (ft): N/A

COMPLETION:

STIMULATION:

STATUS:

COMMENTS:

PACKERS & SLEEVES - 11 STAGES

TOTAL ACID (bbl)	TOTAL LTR (bbl)	TOTAL PROPPANT (lbs)	MAX WH RATE (bpm)	MAX WH PRESSURE (PSI)
1,832	48,066	2,075,680	92.00	5,064

PRODUCTION METHOD	LIFT TYPE	SETTING DEPTH
Pumping	ESP	0

CROSSOVER SUB @ 4,412'

LAST UPDATED BY: HILLARI GOULD
 LAST UPDATED: 10/23/2015