



PHOENIX
TECHNOLOGY SERVICES

30-025-43608

October 20, 2017

Oil Conservation Division
State of New Mexico
1625 N. French Drive
District 1 - Hobbs
Hobbs, New Mexico 88240

HOBBS OCD

OCT 26 2017

RECEIVED

Attention: Regulatory Department

Re: Marathon Oil Corporation
Grama Ridge State 8 3H
Lea County, New Mexico
API #30-025-43608
Job No. 61593

Enclosed please find the Survey Data Certification, and the original Plat and one copy of the Survey Report performed on the above referenced Well by Phoenix Technology Services, Inc. (P-5 No. 664171). Other information required by your office is as follows:

Name & Title of Surveyor	Drain Hole Number	Surveyed Depths		Dates Performed		Type of Survey
		From	To	Start	End	
Michael Johnson	3H	1,783	15,048	8/9/17	8/21/17	MWD

A certified plat on which the bottom hole location is oriented both to the surface location and to the lease lines (or unit lines in case of pooling) is attached to the survey report. If any other information is required, please contact the undersigned at the letterhead address and phone number.

Best Regards,

Brittany Carley

Brittany Carley
Operations Administrator

**Phoenix Technology Services
SURVEY DATA CERTIFICATION**



PHOENIX JOB NUMBER 61593

ENERGY COMPANY Marathon Oil Corporation

WELL NAME Grama Ridge State 8 3H

COUNTY & STATE

Lea County, NM

API WELL NUMBER 30-025-43608

PROPOSED DIRECTION 356.05

TIE-IN DATA						
MEASURED	VERTICAL			N-S	E-W	DATA
DEPTH	DEPTH	INCLIN	AZIMUTH	COORD	COORD	SOURCE
1,649.00 ft	1,648.94 ft	0.53	251.34	6.25 ft	-7.91 ft	Teledrift

FIRST	FIRST		
SURVEY	SURVEY		
DATE	DEPTH	INCLIN	AZIMUTH
9-Aug-17	1,783.00 ft	0.19	41.29

SURVEY INSTRUMENT

TYPE

Phoenix MWD

LAST	LAST		
SURVEY	SURVEY		
DATE	DEPTH	INCLIN	AZIMUTH
21-Aug-17	15,048.00 ft	93.50	1.78

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
21-8-2017	15,108.00 ft	93.50	1.78

Michael Johnson

PRINT YOUR NAME ABOVE

Michael Johnson

SIGN YOUR NAME ABOVE

MAGNETIC DECLINATION OR TOTAL GRID

TOTAL CORRECTION USED	6.36
DECLINATION OR GRID	GRID

Monday, August 21, 2017

TODAY'S DATE

MWD SUPERVISOR 1

Michael Johnson

DIRECTIONAL DRILLER 1

Ruben Cano

MWD SUPERVISOR 2

Scott Walston

DIRECTIONAL DRILLER 2

Vinn Adams

12329 Cutten Rd., Houston, Texas 777066

(713)337-0600 (Voice), (713)337-0599 (Fax)



Marathon Oil EF LLC

Lea County, NM (NAD83 NME)

Grama Ridge State 8

3H

OH

Survey: Phoenix MWD Surveys

Standard Survey Report

23 August, 2017



Company:	Marathon Oil EF LLC	Local Co-ordinate Reference:	Well 3H
Project:	Lea County, NM (NAD83 NME)	TVD Reference:	GL + KB @ 3576.50usft (Patterson 244)
Site:	Grama Ridge State 8	MD Reference:	GL + KB @ 3576.50usft (Patterson 244)
Well:	3H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Patterson 244)	Database:	Compass 5000 GCR

Project	Lea County, NM (NAD83 NME)		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Eastern Zone		

Site	Grama Ridge State 8		
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Site Position:		Northing:	510,061.00 usft	Latitude:	32° 23' 57.75234 N
From:	Map	Easting:	802,931.00 usft	Longitude:	103° 29' 8.77069 W
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.45 °

Well	3H				
Well Position	+N/-S	0.00 usft	Northing:	510,061.00 usft	Latitude: 32° 23' 57.75234 N
	+E/-W	0.00 usft	Easting:	802,931.00 usft	Longitude: 103° 29' 8.77069 W
Position Uncertainty	0.00 usft		Wellhead Elevation:	0.00 usft	Ground Level: 3,548.00 usft

Wellbore	OH				
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Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	8/17/2017	6.82	60.30	48,235

Design	Surveys (Patterson 244)				
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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	356.05

Survey Program		Date 8/23/2017			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
1,783.00	15,108.00	Phoenix MWD Surveys (OH)	MWD+HDGM	OWSG Rev.2 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)
1,649.00	0.53	251.34	1,648.94	6.25	-7.91	6.78	0.00	0.00	0.00
Tie In									
1,783.00	0.19	41.29	1,782.94	6.22	-8.35	6.78	0.52	-0.25	111.90
First Phoenix MWD Survey									
1,880.00	0.31	100.71	1,879.94	6.29	-7.99	6.83	0.28	0.12	61.26
1,976.00	0.42	94.26	1,975.94	6.22	-7.38	6.71	0.12	0.11	-6.72
2,071.00	0.38	78.78	2,070.93	6.25	-6.72	6.70	0.12	-0.04	-16.29
2,167.00	0.67	58.91	2,166.93	6.60	-5.93	7.00	0.35	0.30	-20.70
2,262.00	0.68	60.62	2,261.92	7.17	-4.96	7.49	0.02	0.01	1.80
2,358.00	0.77	47.14	2,357.92	7.89	-4.00	8.14	0.20	0.09	-14.04

Company:	Marathon Oil EF LLC	Local Co-ordinate Reference:	Well 3H
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Site:	Gramma Ridge State 8	MD Reference:	GL + KB @ 3576.50usft (Patterson 244)
Well:	3H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Patterson 244)	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)
2,454.00	0.94	46.30	2,453.90	8.87	-2.95	9.05	0.18	0.18	-0.88
2,549.00	1.08	44.23	2,548.89	10.05	-1.77	10.15	0.15	0.15	-2.18
2,643.00	0.90	280.66	2,642.88	10.82	-1.87	10.92	1.86	-0.19	-131.46
2,738.00	1.13	293.90	2,737.87	11.34	-3.46	11.55	0.34	0.24	13.94
2,832.00	1.04	302.76	2,831.85	12.17	-5.03	12.49	0.20	-0.10	9.43
2,927.00	0.80	329.34	2,926.84	13.21	-6.09	13.60	0.51	-0.25	27.98
3,021.00	0.63	355.59	3,020.83	14.29	-6.46	14.70	0.39	-0.18	27.93
3,116.00	0.99	29.76	3,115.82	15.52	-6.10	15.91	0.62	0.38	35.97
3,210.00	1.11	41.44	3,209.81	16.91	-5.09	17.22	0.26	0.13	12.43
3,304.00	1.16	40.49	3,303.79	18.32	-3.87	18.54	0.06	0.05	-1.01
3,399.00	1.41	52.16	3,398.77	19.77	-2.32	19.88	0.38	0.26	12.28
3,494.00	0.35	147.44	3,493.76	20.24	-1.24	20.28	1.56	-1.12	100.29
3,589.00	0.92	189.09	3,588.75	19.24	-1.21	19.28	0.74	0.60	43.84
3,683.00	0.63	205.29	3,682.74	18.03	-1.55	18.09	0.38	-0.31	17.23
3,777.00	0.54	273.22	3,776.74	17.59	-2.21	17.70	0.70	-0.10	72.27
3,871.00	0.77	292.99	3,870.73	17.86	-3.24	18.04	0.34	0.24	21.03
3,965.00	1.14	312.78	3,964.72	18.74	-4.50	19.00	0.52	0.39	21.05
4,060.00	1.71	223.21	4,059.70	18.35	-6.17	18.73	2.16	0.60	-94.28
4,154.00	1.90	232.78	4,153.65	16.38	-8.37	16.92	0.38	0.20	10.18
4,249.00	1.95	233.52	4,248.60	14.47	-10.92	15.19	0.06	0.05	0.78
4,344.00	1.32	248.24	4,343.56	13.10	-13.24	13.98	0.79	-0.66	15.49
4,438.00	1.20	254.30	4,437.54	12.44	-15.19	13.45	0.19	-0.13	6.45
4,533.00	1.19	246.35	4,532.52	11.77	-17.05	12.92	0.17	-0.01	-8.37
4,628.00	0.88	130.43	4,627.51	10.90	-17.40	12.07	1.86	-0.33	-122.02
4,721.00	1.07	131.29	4,720.49	9.87	-16.21	10.96	0.20	0.20	0.92
4,815.00	1.11	123.54	4,814.48	8.78	-14.79	9.78	0.16	0.04	-8.24
4,910.00	1.06	137.06	4,909.46	7.63	-13.42	8.54	0.27	-0.05	14.23
5,004.00	1.22	132.89	5,003.44	6.31	-12.10	7.13	0.19	0.17	-4.44
5,099.00	1.39	127.43	5,098.42	4.93	-10.44	5.63	0.22	0.18	-5.75
5,131.00	1.37	127.21	5,130.41	4.46	-9.83	5.12	0.06	-0.06	-0.69
5,193.00	1.70	117.34	5,192.38	3.59	-8.42	4.16	0.68	0.53	-15.92
5,287.00	2.22	220.64	5,286.35	1.57	-8.37	2.14	3.29	0.55	109.89
5,382.00	3.56	232.13	5,381.23	-1.64	-11.89	-0.82	1.53	1.41	12.09
5,477.00	5.08	244.56	5,475.96	-5.26	-18.02	-4.01	1.87	1.60	13.08
5,571.00	4.82	242.81	5,569.61	-8.85	-25.29	-7.09	0.32	-0.28	-1.86
5,666.00	6.07	249.76	5,664.18	-12.41	-33.56	-10.07	1.49	1.32	7.32
5,761.00	5.83	245.81	5,758.67	-16.13	-42.67	-13.15	0.50	-0.25	-4.16
5,856.00	7.55	262.35	5,853.03	-18.94	-53.26	-15.23	2.70	1.81	17.41
5,950.00	7.21	262.33	5,946.25	-20.55	-65.22	-16.01	0.36	-0.36	-0.02
6,045.00	6.97	260.89	6,040.52	-22.25	-76.82	-16.91	0.31	-0.25	-1.52
6,139.00	7.19	260.85	6,133.80	-24.09	-88.26	-17.96	0.23	0.23	-0.04
6,233.00	7.34	261.21	6,227.05	-25.95	-100.00	-19.00	0.17	0.16	0.38
6,327.00	6.02	253.50	6,320.41	-28.26	-110.67	-20.58	1.69	-1.40	-8.20

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Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Patterson 244)	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)
6,421.00	5.59	252.89	6,413.93	-31.01	-119.77	-22.69	0.46	-0.46	-0.65
6,515.00	5.24	254.14	6,507.51	-33.53	-128.27	-24.62	0.39	-0.37	1.33
6,609.00	4.97	252.90	6,601.14	-35.90	-136.29	-26.43	0.31	-0.29	-1.32
6,704.00	4.69	252.74	6,695.80	-38.26	-143.94	-28.26	0.30	-0.29	-0.17
6,798.00	4.41	253.60	6,789.50	-40.42	-151.07	-29.93	0.31	-0.30	0.91
6,893.00	4.08	256.13	6,884.24	-42.27	-157.86	-31.30	0.40	-0.35	2.66
6,987.00	4.29	255.95	6,977.99	-43.92	-164.51	-32.49	0.22	0.22	-0.19
7,081.00	3.79	252.04	7,071.76	-45.73	-170.88	-33.86	0.61	-0.53	-4.16
7,175.00	3.68	258.38	7,165.56	-47.30	-176.79	-35.02	0.45	-0.12	6.74
7,270.00	4.35	263.59	7,260.32	-48.31	-183.36	-35.58	0.80	0.71	5.48
7,364.00	4.82	259.66	7,354.02	-49.42	-190.78	-36.17	0.60	0.50	-4.18
7,458.00	4.26	261.24	7,447.73	-50.66	-198.12	-36.90	0.61	-0.60	1.68
7,552.00	3.38	261.33	7,541.52	-51.61	-204.31	-37.42	0.94	-0.94	0.10
7,646.00	4.49	259.20	7,635.30	-52.72	-210.66	-38.09	1.19	1.18	-2.27
7,740.00	3.98	250.71	7,729.04	-54.48	-217.36	-39.39	0.86	-0.54	-9.03
7,835.00	3.85	244.12	7,823.82	-56.97	-223.34	-41.46	0.49	-0.14	-6.94
7,929.00	3.46	236.95	7,917.63	-59.89	-228.56	-44.02	0.64	-0.41	-7.63
8,024.00	3.70	243.96	8,012.44	-62.80	-233.71	-46.56	0.52	0.25	7.38
8,118.00	3.94	258.46	8,106.24	-64.78	-239.60	-48.13	1.06	0.26	15.43
8,212.00	2.60	254.33	8,200.08	-66.00	-244.82	-48.99	1.45	-1.43	-4.39
8,307.00	4.67	241.84	8,294.89	-68.41	-250.30	-51.01	2.32	2.18	-13.15
8,401.00	4.32	239.40	8,388.60	-72.01	-256.73	-54.17	0.42	-0.37	-2.60
8,495.00	3.82	237.03	8,482.36	-75.52	-262.40	-57.28	0.56	-0.53	-2.52
8,589.00	5.41	250.31	8,576.05	-78.72	-269.20	-60.00	2.03	1.69	14.13
8,684.00	4.53	251.73	8,670.70	-81.40	-276.98	-62.14	0.94	-0.93	1.49
8,778.00	3.05	251.90	8,764.49	-83.34	-282.88	-63.67	1.57	-1.57	0.18
8,871.00	2.53	247.97	8,857.38	-84.88	-287.14	-64.92	0.60	-0.56	-4.23
8,966.00	1.75	245.86	8,952.31	-86.26	-290.40	-66.07	0.83	-0.82	-2.22
9,060.00	2.37	202.12	9,046.25	-88.65	-292.44	-68.31	1.74	0.66	-46.53
9,155.00	0.36	276.90	9,141.23	-90.43	-293.48	-70.02	2.42	-2.12	78.72
9,243.00	0.85	265.17	9,229.22	-90.46	-294.41	-69.98	0.57	0.56	-13.33
9,337.00	2.05	252.27	9,323.19	-91.03	-296.70	-70.39	1.31	1.28	-13.72
9,432.00	1.87	163.63	9,418.15	-93.03	-297.88	-72.31	2.89	-0.19	-93.31
9,527.00	1.52	127.79	9,513.11	-95.29	-296.45	-74.66	1.15	-0.37	-37.73
9,621.00	1.24	120.45	9,607.08	-96.57	-294.59	-76.06	0.35	-0.30	-7.81
9,715.00	1.45	124.13	9,701.06	-97.75	-292.73	-77.37	0.24	0.22	3.91
9,809.00	2.11	131.58	9,795.01	-99.57	-290.45	-79.34	0.74	0.70	7.93
9,857.00	1.19	137.19	9,842.99	-100.52	-289.45	-80.36	1.94	-1.92	11.69
9,904.00	4.03	353.68	9,889.96	-99.24	-289.30	-79.09	10.72	6.04	-305.34
9,950.00	9.02	3.70	9,935.65	-94.03	-289.24	-73.89	11.09	10.85	21.78
9,996.00	13.28	7.21	9,980.77	-85.18	-288.35	-65.13	9.37	9.26	7.63
10,043.00	17.81	0.52	10,026.04	-72.63	-287.60	-52.66	10.35	9.64	-14.23
10,090.00	20.40	355.10	10,070.45	-57.28	-288.24	-37.30	6.67	5.51	-11.53
10,137.00	25.50	358.92	10,113.72	-38.99	-289.13	-19.00	11.30	10.85	8.13

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Well:	3H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
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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)
10,184.00	29.27	2.85	10,155.45	-17.39	-288.75	2.53	8.89	8.02	8.36
10,232.00	33.14	2.34	10,196.50	7.45	-287.63	27.23	8.08	8.06	-1.06
10,279.00	35.87	357.40	10,235.23	34.05	-287.73	53.78	8.31	5.81	-10.51
10,326.00	42.63	355.31	10,271.61	63.70	-289.66	83.49	14.65	14.38	-4.45
10,373.00	48.11	357.19	10,304.62	97.07	-291.82	116.92	12.00	11.66	4.00
10,420.00	54.30	359.45	10,334.05	133.66	-292.86	153.50	13.69	13.17	4.81
10,467.00	59.00	359.46	10,359.89	172.91	-293.23	192.68	10.00	10.00	0.02
10,474.00	59.87	359.39	10,363.44	178.94	-293.29	198.70	12.46	12.43	-1.00
10,515.00	64.94	359.01	10,382.43	215.26	-293.80	234.97	12.39	12.37	-0.93
10,562.00	69.82	359.56	10,400.50	258.62	-294.34	278.27	10.44	10.38	1.17
10,609.00	73.16	0.23	10,415.42	303.19	-294.42	322.73	7.23	7.11	1.43
10,657.00	77.67	0.00	10,427.51	349.63	-294.33	369.06	9.41	9.40	-0.48
10,704.00	80.56	0.66	10,436.38	395.78	-294.06	415.08	6.30	6.15	1.40
10,751.00	82.76	359.99	10,443.20	442.27	-293.80	461.45	4.89	4.68	-1.43
10,798.00	82.89	359.49	10,449.07	488.91	-294.01	507.99	1.09	0.28	-1.06
10,846.00	84.83	358.85	10,454.20	536.62	-294.70	555.64	4.25	4.04	-1.33
10,893.00	87.95	359.39	10,457.16	583.52	-295.42	602.47	6.74	6.64	1.15
10,940.00	88.30	359.27	10,458.70	630.49	-295.97	649.37	0.79	0.74	-0.26
10,975.00	88.66	357.85	10,459.63	665.47	-296.85	684.32	4.18	1.03	-4.06
11,069.00	91.17	357.38	10,459.77	759.38	-300.76	778.28	2.72	2.67	-0.50
11,163.00	90.67	359.11	10,458.26	853.32	-303.64	872.19	1.92	-0.53	1.84
11,257.00	89.97	359.02	10,457.73	947.30	-305.17	966.06	0.75	-0.74	-0.10
11,351.00	88.88	358.30	10,458.67	1,041.27	-307.37	1,059.96	1.39	-1.16	-0.77
11,445.00	88.54	358.90	10,460.79	1,135.22	-309.67	1,153.84	0.73	-0.36	0.64
11,539.00	88.18	0.36	10,463.48	1,229.17	-310.28	1,247.62	1.60	-0.38	1.55
11,633.00	89.89	1.03	10,465.06	1,323.15	-309.14	1,341.29	1.95	1.82	0.71
11,728.00	89.69	0.94	10,465.41	1,418.13	-307.50	1,435.94	0.23	-0.21	-0.09
11,822.00	88.57	0.38	10,466.84	1,512.12	-306.42	1,529.62	1.33	-1.19	-0.60
11,916.00	88.46	359.63	10,469.28	1,606.08	-306.41	1,623.37	0.81	-0.12	-0.80
12,010.00	91.20	0.37	10,469.55	1,700.07	-306.41	1,717.13	3.02	2.91	0.79
12,104.00	89.02	1.18	10,469.37	1,794.06	-305.14	1,810.81	2.47	-2.32	0.86
12,198.00	86.83	1.44	10,472.78	1,887.97	-302.99	1,904.34	2.35	-2.33	0.28
12,292.00	87.82	1.12	10,477.16	1,981.84	-300.90	1,997.85	1.11	1.05	-0.34
12,387.00	89.97	1.87	10,479.00	2,076.78	-298.42	2,092.40	2.40	2.26	0.79
12,481.00	88.57	0.72	10,480.19	2,170.75	-296.29	2,185.99	1.93	-1.49	-1.22
12,575.00	88.57	359.88	10,482.54	2,264.72	-295.80	2,279.71	0.89	0.00	-0.89
12,669.00	87.48	358.60	10,485.78	2,358.65	-297.05	2,373.50	1.79	-1.16	-1.36
12,764.00	87.90	357.62	10,489.61	2,453.52	-300.18	2,468.36	1.12	0.44	-1.03
12,858.00	86.33	357.85	10,494.34	2,547.32	-303.89	2,562.20	1.69	-1.67	0.24
12,952.00	86.38	357.82	10,500.32	2,641.07	-307.43	2,655.96	0.06	0.05	-0.03
13,046.00	87.28	357.65	10,505.51	2,734.85	-311.14	2,749.78	0.97	0.96	-0.18
13,140.00	88.80	357.55	10,508.73	2,828.71	-315.07	2,843.69	1.62	1.62	-0.11
13,235.00	89.58	357.99	10,510.07	2,923.62	-318.77	2,938.63	0.94	0.82	0.46

Company:	Marathon Oil EF LLC	Local Co-ordinate Reference:	Well 3H
Project:	Lea County, NM (NAD83 NME)	TVD Reference:	GL + KB @ 3576.50usft (Patterson 244)
Site:	Grama Ridge State 8	MD Reference:	GL + KB @ 3576.50usft (Patterson 244)
Well:	3H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Patterson 244)	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)
13,329.00	90.53	358.01	10,509.98	3,017.57	-322.05	3,032.58	1.01	1.01	0.02
13,423.00	91.04	357.46	10,508.69	3,111.48	-325.77	3,126.53	0.80	0.54	-0.59
13,517.00	91.93	358.29	10,506.26	3,205.39	-329.25	3,220.45	1.29	0.95	0.88
13,611.00	89.91	358.47	10,504.75	3,299.33	-331.91	3,314.35	2.16	-2.15	0.19
13,705.00	89.72	359.24	10,505.05	3,393.31	-333.79	3,408.24	0.84	-0.20	0.82
13,800.00	88.82	359.76	10,506.26	3,488.30	-334.61	3,503.06	1.09	-0.95	0.55
13,895.00	89.97	359.44	10,507.27	3,583.29	-335.28	3,597.87	1.26	1.21	-0.34
13,989.00	87.65	359.30	10,509.22	3,677.26	-336.31	3,691.68	2.47	-2.47	-0.15
14,083.00	87.62	359.31	10,513.10	3,771.17	-337.45	3,785.45	0.03	-0.03	0.01
14,177.00	89.55	358.67	10,515.42	3,865.12	-339.11	3,879.30	2.16	2.05	-0.68
14,272.00	91.29	358.92	10,514.72	3,960.09	-341.10	3,974.18	1.85	1.83	0.26
14,366.00	90.14	0.08	10,513.55	4,054.08	-341.92	4,068.00	1.74	-1.22	1.23
14,461.00	89.52	0.20	10,513.83	4,149.08	-341.69	4,162.76	0.66	-0.65	0.13
14,555.00	87.82	1.02	10,516.01	4,243.04	-340.69	4,256.43	2.01	-1.81	0.87
14,649.00	87.79	1.61	10,519.61	4,336.95	-338.54	4,349.97	0.63	-0.03	0.63
14,743.00	88.16	1.32	10,522.93	4,430.86	-336.13	4,443.49	0.50	0.39	-0.31
14,838.00	89.16	1.85	10,525.16	4,525.80	-333.51	4,538.02	1.19	1.05	0.56
14,932.00	91.04	1.94	10,524.99	4,619.74	-330.40	4,631.53	2.00	2.00	0.10
15,026.00	93.05	1.65	10,521.64	4,713.63	-327.46	4,724.99	2.16	2.14	-0.31
15,048.00	93.50	1.78	10,520.38	4,735.58	-326.80	4,746.85	2.13	2.05	0.59
Final Phoenix MWD Survey									
15,108.00	93.50	1.78	10,516.72	4,795.44	-324.94	4,806.44	0.00	0.00	0.00
Projection to TD									

Survey Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
1,649.00	1,648.94	4,795.44	-324.94	Tie In
1,783.00	1,782.94			First Phoenix MWD Survey
15,048.00	10,520.38	6.22	-8.35	Final Phoenix MWD Survey
15,108.00	10,516.72	4,735.58	-326.80	Projection to TD