

PRODIRECTIONAL

Professional Directional Ltd.

P.O. Box 750 | Conroe, TX 77305 | (936) 441-7266

July 23, 2014

HOBSOCD
JAN 12 2015
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ConocoPhillips

ConocoPhillips

Garnet Federal No. 5
Lea County, NM

Job No. LNM 5111614

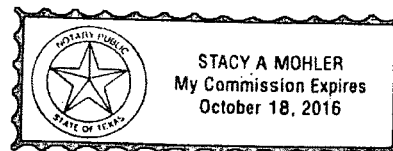
Survey Certification Form:

This is to certify surveys from **935'MD** to a depth of **7,102'MD** are true and correct MWD Surveys. These surveys were taken from **07/08/2014** through **07/12/2014**.

Sincerely,

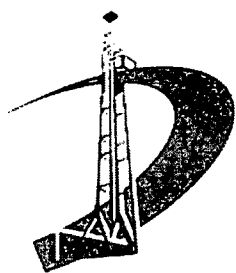
John Jordan | Well Planning

PRODIRECTIONAL



Stacy A. Mohler

FEB 10 2015



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www.prodirectional.com

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Garnet Federal No. 5
Lea County, NM

July 23, 2014

Job No. LNM 5111614

Survey Completion Report

Handwritten signature or initials.



ConocoPhillips

Lea County, NM
Garnet Federal No. 5
OH

Survey: ProDirectional

Wellpath Report

23 July, 2014

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Professional Directional
Wellpath Report



Company:	Conoco Phillips	Local Co-ordinate Reference:	Well No. 5
Project:	Lea County, N.M.	TVD Reference:	WELL @ 4040.00usft (Original Well Elev)
Site:	Garnet Federal	MD Reference:	WELL @ 4040.00usft (Original Well Elev)
Well:	No. 5	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Well_Planner1

Project	Lea County, N.M.		
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	Garnet Federal		
Site Position:		Northing:	665,838.65 usft
From:	Map	Easting:	680,526.85 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 49' 44.750 N
		Longitude:	103° 44' 44.280 W
		Grid Convergence:	0.32 °

Well		No. 5				
Well Position	+N/-S	0.00 usft	Northing:	666,019.70 usft	Latitude:	32° 49' 46.593 N
	+E/-W	0.00 usft	Easting:	679,581.70 usft	Longitude:	103° 44' 55.345 W
Position Uncertainty	0.00 usft	Wellhead Elevation:	usft	Ground Level:	4,027.00 usft	

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination	Dip Angle	Field Strength
			(°)	(°)	(nT)
	User Defined	6/10/2014	7.47	60.63	48,694

Design	OH			
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	167.20

Survey Program	Date	7/23/2014		
From	To	Survey (Wellbore)	Tool Name	Description
(usft)	(usft)			
935.00	7,102.00	Survey #1 (OH)	MWD	MWD - Standard



Professional Directional
Wellpath Report



Company:	Conoco Phillips	Local Co-ordinate Reference:	Well No. 5
Project:	Lea County, N.M.	TVD Reference:	WELL @ 4040.00usft (Original Well Elev)
Site:	Garnet Federal	MD Reference:	WELL @ 4040.00usft (Original Well Elev)
Well:	No. 5	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Well_Planner1

Survey										
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)	TFace (°)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	666,019.70	679,581.70	0.00
935.00	0.40	304.00	934.99	1.83	-2.71	-2.38	0.04	666,021.53	679,578.99	304.00
ProDirectional First Survey: 935' MD										
1,089.00	0.60	314.90	1,088.99	2.69	-3.72	-3.45	0.14	666,022.39	679,577.98	30.95
1,312.00	0.40	300.40	1,311.98	3.91	-5.22	-4.97	0.11	666,023.61	679,576.48	-154.79
1,447.00	0.30	309.50	1,446.98	4.38	-5.90	-5.57	0.08	666,024.08	679,575.80	155.43
1,626.00	0.30	269.30	1,625.97	4.67	-6.73	-6.04	0.12	666,024.37	679,574.97	-110.10
1,805.00	0.30	88.70	1,804.97	4.67	-6.73	-6.05	0.34	666,024.37	679,574.97	179.70
1,984.00	0.50	78.90	1,983.97	4.83	-5.50	-5.93	0.12	666,024.53	679,576.20	-23.83
2,163.00	0.50	83.40	2,162.96	5.07	-3.95	-5.82	0.02	666,024.77	679,577.75	92.25
2,253.00	2.70	173.80	2,252.93	3.01	-3.33	-3.68	3.05	666,022.71	679,578.37	100.87
2,341.00	4.60	177.30	2,340.74	-2.57	-2.94	1.86	2.17	666,017.13	679,578.76	8.44
2,430.00	5.70	160.90	2,429.39	-10.32	-1.33	9.77	2.05	666,009.38	679,580.37	-61.59
2,519.00	7.60	167.20	2,517.79	-20.23	1.42	20.04	2.28	665,999.47	679,583.12	24.16
2,609.00	8.50	170.20	2,606.90	-32.59	3.87	32.64	1.10	665,987.11	679,585.57	26.51
2,698.00	9.90	164.70	2,694.75	-46.45	7.01	46.85	1.86	665,973.25	679,588.71	-34.87
2,787.00	9.20	164.80	2,782.52	-60.70	10.89	61.60	0.79	665,959.00	679,592.59	178.69
2,877.00	9.10	160.10	2,871.38	-74.33	15.20	75.86	0.84	665,945.37	679,596.90	-99.94
2,966.00	8.40	160.00	2,959.34	-87.06	19.82	89.29	0.79	665,932.64	679,601.52	-178.80
3,055.00	7.80	161.60	3,047.45	-98.90	23.95	101.75	0.72	665,920.80	679,605.65	160.20
3,145.00	7.40	167.40	3,136.66	-110.35	27.14	113.62	0.96	665,909.35	679,608.84	120.39
3,234.00	7.70	169.00	3,224.89	-121.80	29.53	125.31	0.41	665,897.90	679,611.23	35.82
3,324.00	9.00	164.80	3,313.94	-134.51	32.53	138.37	1.59	665,885.19	679,614.23	-27.22
3,414.00	9.80	161.30	3,402.73	-148.56	36.83	153.03	1.09	665,871.14	679,618.53	-37.28
3,503.00	8.90	162.80	3,490.54	-162.31	41.29	167.43	1.05	665,857.39	679,622.99	165.59
3,592.00	9.30	164.00	3,578.42	-175.80	45.31	181.47	0.50	665,843.90	679,627.01	25.98
3,682.00	10.50	162.10	3,667.08	-190.59	49.84	196.90	1.38	665,829.11	679,631.54	-16.17

Company: Conoco Phillips
Project: Lea County, N.M.
Site: Garnet Federal
Well: No. 5
Wellbore: OH
Design: OH

Local Co-ordinate Reference: Well No. 5
TVD Reference: WELL @ 4040.00usft (Original Well Elev)
MD Reference: WELL @ 4040.00usft (Original Well Elev)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: Well_Planner1

Survey										
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)	TFace (°)
3,771.00	10.40	162.10	3,754.61	-205.96	54.80	212.98	0.11	665,813.74	679,636.50	180.00
3,861.00	10.30	162.70	3,843.14	-221.37	59.69	229.09	0.16	665,798.33	679,641.39	133.15
3,950.00	10.00	161.30	3,930.75	-236.28	64.53	244.71	0.44	665,783.42	679,646.23	-141.25
4,039.00	10.00	161.70	4,018.40	-250.94	69.44	260.09	0.08	665,768.76	679,651.14	90.20
4,128.00	9.70	161.60	4,106.08	-265.39	74.23	275.24	0.34	665,754.31	679,655.93	-176.79
4,218.00	9.30	161.40	4,194.85	-279.48	78.94	290.02	0.45	665,740.22	679,660.64	-175.38
4,307.00	9.30	161.60	4,282.68	-293.12	83.51	304.33	0.04	665,726.58	679,665.21	90.10
4,397.00	9.20	161.90	4,371.51	-306.86	88.04	318.74	0.12	665,712.84	679,669.74	154.40
4,486.00	9.70	169.70	4,459.31	-321.00	91.59	333.31	1.54	665,698.70	679,673.29	72.55
4,575.00	10.00	169.90	4,546.99	-335.98	94.28	348.52	0.34	665,683.72	679,675.98	6.60
4,665.00	10.00	169.60	4,635.63	-351.36	97.06	364.13	0.06	665,668.34	679,678.76	-90.15
4,754.00	10.00	169.80	4,723.27	-366.57	99.83	379.57	0.04	665,653.13	679,681.53	90.10
4,844.00	9.90	169.80	4,811.92	-381.87	102.58	395.11	0.11	665,637.83	679,684.28	180.00
4,933.00	9.80	170.40	4,899.61	-396.87	105.20	410.31	0.16	665,622.83	679,686.90	134.55
5,023.00	7.80	167.00	4,988.54	-410.37	107.85	424.07	2.30	665,609.33	679,689.55	-167.10
5,112.00	6.90	162.20	5,076.81	-421.35	110.84	435.44	1.22	665,598.35	679,692.54	-148.06
5,201.00	6.90	161.50	5,165.17	-431.51	114.17	446.08	0.09	665,588.19	679,695.87	-90.35
5,291.00	5.60	168.50	5,254.63	-440.94	116.77	455.85	1.67	665,578.76	679,698.47	153.07
5,380.00	5.50	168.70	5,343.22	-449.38	118.47	464.46	0.11	665,570.32	679,700.17	169.15
5,470.00	5.30	160.30	5,432.82	-457.52	120.71	472.89	0.91	665,562.18	679,702.41	-108.35
5,559.00	4.30	166.10	5,521.51	-464.63	122.90	480.31	1.25	665,555.07	679,704.60	156.98
5,648.00	2.90	169.80	5,610.33	-470.08	124.10	485.90	1.59	665,549.62	679,705.80	172.42
5,738.00	3.10	170.90	5,700.20	-474.73	124.89	490.60	0.23	665,544.97	679,706.59	16.61
5,827.00	2.30	153.90	5,789.11	-478.71	126.06	494.74	1.26	665,540.99	679,707.76	-143.25
5,916.00	2.20	155.60	5,878.04	-481.87	127.55	498.15	0.14	665,537.83	679,709.25	147.13
6,005.00	2.20	154.50	5,966.97	-484.96	128.99	501.49	0.05	665,534.74	679,710.69	-90.55
6,095.00	2.10	153.10	6,056.91	-487.99	130.48	504.77	0.13	665,531.71	679,712.18	-152.99

Company:	Conoco Phillips	Local Co-ordinate Reference:	Well No. 5
Project:	Lea County, N.M.	TVD Reference:	WELL @ 4040.00usft (Original Well Elev)
Site:	Garnet Federal	MD Reference:	WELL @ 4040.00usft (Original Well Elev)
Well:	No. 5	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Well_Planner1

Survey										
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)	TFace (°)
6,184.00	2.00	157.30	6,145.85	-490.88	131.81	507.89	0.20	665,528.82	679,713.51	125.73
6,274.00	1.90	157.40	6,235.80	-493.71	132.99	510.90	0.11	665,525.99	679,714.69	178.10
6,363.00	1.90	157.50	6,324.75	-496.43	134.13	513.81	0.00	665,523.27	679,715.83	90.05
6,452.00	1.70	151.70	6,413.71	-498.96	135.32	516.54	0.30	665,520.74	679,717.02	-140.54
6,542.00	1.80	154.20	6,503.66	-501.41	136.56	519.20	0.14	665,518.29	679,718.26	38.61
6,631.00	1.70	151.40	6,592.62	-503.82	137.80	521.83	0.15	665,515.88	679,719.50	-140.86
6,721.00	1.50	151.10	6,682.59	-506.03	139.01	524.25	0.22	665,513.67	679,720.71	-177.75
6,810.00	1.50	150.30	6,771.56	-508.06	140.15	526.48	0.02	665,511.64	679,721.85	-90.40
6,900.00	1.50	150.40	6,861.53	-510.11	141.32	528.74	0.00	665,509.59	679,723.02	90.05
6,989.00	1.30	153.10	6,950.50	-512.02	142.35	530.83	0.24	665,507.68	679,724.05	163.09
7,051.00	1.40	155.30	7,012.48	-513.33	142.99	532.26	0.18	665,506.37	679,724.69	28.50
Last Survey: 7,012.48' MD										
7,102.00	1.40	155.30	7,063.47	-514.47	143.51	533.48	0.00	665,505.23	679,725.21	0.00
PTB: 7,102' MD										

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
935.00	934.99	1.83	-2.71	ProDirectional First Survey: 935' MD
7,051.00	7,012.48	-513.33	142.99	Last Survey: 7,012.48' MD
7,102.00	7,063.47	-514.47	143.51	PTB: 7,102' MD