

OCCIDENTAL PERMIAN LTD.

Triple X Bone Spring
Lea County, NM (Grid North)
Foxglove 29 Federal #5H
DH - Job #320914-MPH-1103

HOBBSOCD

FEB 26 2015

RECEIVED

Survey: MWD

Regulatory Survey Report (Grid Nort

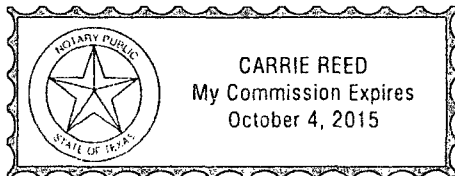
This survey is correct to the best of my knowledge and is supported by actual field data.

Jami Hathauer

Notarized this date 13th of November, 2014.

Carrie Reed

Notary Signature
County of Midland
State of Texas



MAR 04 2015

Regulatory Survey Report (Grid North)

Company:	OCCIDENTAL PERMIAN LTD.	Local Co-ordinate Reference:	Well Foxglove 29 Federal #5H
Project:	Triple X Bone Spring	TVD Reference:	Mean Sea Level (System)
Site:	Lea County, NM (Grid North)	MD Reference:	Mean Sea Level (System)
Well:	Foxglove 29 Federal #5H	North Reference:	Grid
Wellbore:	DH - Job #320914-MPH-1103	Survey Calculation Method:	Minimum Curvature
Design:	DH - Job #320914-MPH-1103	Database:	MID_Regulatory

Project	Triple X Bone Spring		
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		Lea County, NM (Grid North)			
Site Position:		Northing:	445,907.51 usft	Latitude:	32° 13' 25.997 N
From:	Lat/Long	Easting:	721,463.19 usft	Longitude:	103° 37' 1.870 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16"	Grid Convergence:	0.38 °

Well	Foxglove 29 Federal #5H, Horizontal					
Well Position	+N/-S	0.0 usft	Northing:	467,061.13 usft	Latitude:	32° 16' 54.894 N
	+E/-W	0.0 usft	Easting:	727,869.02 usft	Longitude:	103° 35' 45.612 W
Position Uncertainty		0.0 usft	Wellhead Elevation:	0.0 usft	Ground Level:	0.0 usft

Wellbore	DH - Job #320914-MPH-1103				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	9/13/2014	7.20	60.15	48,349

Design		DH - Job #320914-MPH-1103		
Audit Notes:				
Version:	1.0	Phase:	ACTUAL	Tie On Depth: 0.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.0	0.0	0.0	179.58

Survey Program	Date 11/20/2014			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
229.0	15,612.0	MWD (DH - Job #320914-MPH-1103)	MWD	MWD

Survey	MD (usft)	Inc (°)	Azi (grid_north_azim)	TVD (usft)	N/S (usft)	E/W (usft)	Closure Azimuth (°)	Closure Distance (usft)
	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.0
	229.0	0.57	294.50	229.0	0.5	-1.0	294.50	1.1
	318.0	0.35	237.35	318.0	0.5	-1.7	286.98	1.7
	411.0	0.26	259.32	411.0	0.3	-2.1	278.52	2.1
	592.0	0.26	303.62	592.0	0.5	-2.9	279.30	2.9
	773.0	0.35	294.74	773.0	0.9	-3.7	284.05	3.8
	955.0	0.70	318.73	955.0	2.0	-4.9	291.98	5.3
	1,144.0	1.14	311.88	1,144.0	4.1	-7.1	300.10	8.2
	1,316.0	0.97	315.75	1,315.9	6.3	-9.4	303.86	11.3
	1,425.0	1.23	277.25	1,424.9	7.1	-11.2	302.42	13.3
	1,519.0	1.32	314.60	1,518.9	8.0	-13.0	301.66	15.2
	1,614.0	1.58	278.39	1,613.9	9.0	-15.0	300.77	17.5

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Survey								
MD (usft)	Inc (°)	Azi (grid_north_azim)	TVD (usft)	N/S (usft)	E/W (usft)	Closure Azimuth (°)	Closure Distance (usft)	
1,708.0	1.49	309.51	1,707.8	9.9	-17.3	299.89	19.9	
1,803.0	1.06	272.24	1,802.8	10.7	-19.1	299.36	21.9	
1,898.0	1.49	269.96	1,897.8	10.8	-21.2	296.94	23.8	
1,993.0	0.79	289.29	1,992.8	11.0	-23.1	295.48	25.6	
2,088.0	1.69	285.07	2,087.7	11.6	-25.0	294.81	27.6	
2,183.0	0.97	291.14	2,182.7	12.2	-27.1	294.26	29.8	
2,278.0	0.53	264.77	2,277.7	12.5	-28.3	293.77	31.0	
2,372.0	0.62	156.14	2,371.7	12.0	-28.6	292.75	31.0	
2,467.0	0.62	237.35	2,466.7	11.2	-28.8	291.31	30.9	
2,562.0	1.76	39.77	2,561.7	12.1	-28.3	293.12	30.7	
2,657.0	3.17	51.81	2,656.6	14.8	-25.3	300.37	29.3	
2,752.0	2.02	51.20	2,751.5	17.5	-21.9	308.60	28.0	
2,847.0	1.14	101.38	2,846.5	18.4	-19.7	313.00	26.9	
2,942.0	1.58	154.99	2,941.4	17.0	-18.2	313.01	24.9	
3,038.0	2.46	131.97	3,037.4	14.4	-16.1	311.80	21.6	
3,133.0	3.08	141.20	3,132.3	11.0	-13.0	310.38	17.1	
3,228.0	2.90	143.48	3,227.1	7.1	-10.0	305.58	12.3	
3,323.0	1.14	100.68	3,322.1	5.0	-7.6	303.44	9.1	
3,418.0	1.06	79.50	3,417.1	5.0	-5.8	310.74	7.7	
3,513.0	1.32	91.45	3,512.0	5.1	-3.9	323.13	6.4	
3,608.0	1.23	92.94	3,607.0	5.1	-1.7	340.99	5.4	
3,703.0	0.79	144.97	3,702.0	4.5	-0.3	355.54	4.5	
3,798.0	0.62	151.13	3,797.0	3.5	0.3	4.51	3.5	
3,893.0	0.70	57.35	3,892.0	3.3	1.0	16.82	3.5	
3,988.0	0.44	190.68	3,987.0	3.3	1.4	23.46	3.6	
4,083.0	0.62	202.37	4,082.0	2.5	1.2	25.35	2.7	
4,178.0	0.44	239.63	4,177.0	1.8	0.7	20.03	1.9	
4,273.0	0.62	153.50	4,272.0	1.2	0.6	26.24	1.3	
4,368.0	0.70	135.57	4,367.0	0.3	1.2	76.51	1.2	
4,463.0	2.11	112.19	4,461.9	-0.8	3.2	103.63	3.3	
4,558.0	0.62	103.23	4,556.9	-1.6	5.4	106.27	5.6	
4,653.0	1.67	133.29	4,651.9	-2.6	6.9	110.97	7.3	
4,748.0	1.06	107.18	4,746.9	-3.8	8.7	113.78	9.5	
4,843.0	1.93	111.31	4,841.8	-4.7	11.0	112.97	12.0	
5,032.0	1.41	114.04	5,030.7	-6.8	16.1	112.81	17.5	
5,098.0	1.49	125.99	5,096.7	-7.6	17.6	113.45	19.1	
5,215.0	1.32	106.22	5,213.7	-8.9	20.1	113.87	22.0	
5,310.0	0.53	256.33	5,308.7	-9.3	20.7	114.18	22.7	
5,405.0	0.53	219.07	5,403.7	-9.7	20.0	115.96	22.3	
5,500.0	0.70	235.59	5,498.7	-10.4	19.3	118.40	21.9	
5,595.0	0.70	214.14	5,593.7	-11.2	18.4	121.31	21.6	
5,690.0	0.62	261.25	5,688.7	-11.8	17.6	123.77	21.2	
5,785.0	0.70	28.70	5,783.7	-11.3	17.4	123.13	20.8	
5,880.0	0.88	17.36	5,878.6	-10.1	17.9	119.56	20.6	

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Survey								
MD (usft)	Inc (°)	Azi (grid_north_azim)	TVD (usft)	N/S (usft)	E/W (usft)	Closure Azimuth (°)	Closure Distance (usft)	
5,975.0	0.79	345.19	5,973.6	-8.8	17.9	116.17	20.0	
6,070.0	0.64	321.25	6,068.6	-7.8	17.4	114.01	19.1	
6,165.0	0.44	316.63	6,163.6	-7.1	16.9	112.81	18.3	
6,260.0	0.70	355.65	6,258.6	-6.2	16.6	110.66	17.7	
6,355.0	0.44	356.00	6,353.6	-5.3	16.5	107.82	17.3	
6,450.0	0.44	332.09	6,448.6	-4.6	16.3	105.82	16.9	
6,545.0	0.79	1.71	6,543.6	-3.6	16.1	102.70	16.5	
6,640.0	0.97	343.61	6,638.6	-2.2	15.9	97.90	16.1	
6,736.0	3.69	297.03	6,734.5	0.0	13.0	90.12	13.0	
6,831.0	1.58	299.57	6,829.4	2.0	9.1	77.54	9.3	
6,926.0	1.93	306.78	6,924.4	3.6	6.7	61.55	7.6	
7,021.0	1.23	322.25	7,019.3	5.4	4.8	41.53	7.2	
7,116.0	0.70	346.24	7,114.3	6.7	4.0	30.66	7.8	
7,211.0	1.23	273.73	7,209.3	7.4	2.8	21.08	7.9	
7,306.0	0.88	248.60	7,304.3	7.2	1.1	9.08	7.3	
7,401.0	0.62	217.40	7,399.3	6.5	0.2	1.37	6.5	
7,496.0	0.62	218.36	7,494.3	5.7	-0.5	355.22	5.7	
7,591.0	0.88	227.68	7,589.3	4.8	-1.3	344.46	5.0	
7,686.0	0.79	240.16	7,684.3	4.0	-2.4	328.47	4.7	
7,782.0	0.53	234.45	7,780.2	3.4	-3.4	315.13	4.8	
7,876.0	0.70	207.64	7,874.2	2.6	-4.0	303.35	4.8	
7,972.0	0.53	233.04	7,970.2	1.8	-4.6	291.74	5.0	
8,066.0	0.62	223.11	8,064.2	1.2	-5.3	282.83	5.5	
8,161.0	0.62	242.18	8,159.2	0.6	-6.1	275.56	6.2	
8,256.0	0.70	213.18	8,254.2	-0.1	-6.9	268.92	6.9	
8,351.0	0.62	222.76	8,349.2	-1.0	-7.6	262.52	7.6	
8,446.0	0.70	243.41	8,444.2	-1.6	-8.4	259.06	8.6	
8,541.0	0.79	244.56	8,539.2	-2.2	-9.5	257.18	9.8	
8,637.0	0.88	252.29	8,635.2	-2.7	-10.8	256.12	11.2	
8,732.0	1.23	236.82	8,730.2	-3.5	-12.4	254.40	12.9	
8,827.0	1.49	253.78	8,825.1	-4.4	-14.4	253.18	15.1	
8,921.0	1.41	253.87	8,919.1	-5.0	-16.7	253.27	17.5	
9,016.0	1.41	265.12	9,014.1	-5.4	-19.0	254.00	19.8	
9,111.0	1.41	253.78	9,109.1	-5.9	-21.3	254.57	22.1	
9,206.0	2.29	220.56	9,204.0	-7.6	-23.6	252.08	24.8	
9,302.0	1.85	227.15	9,299.9	-10.2	-26.0	248.69	27.9	
9,397.0	1.93	198.94	9,394.9	-12.7	-27.7	245.33	30.5	
9,492.0	2.02	202.19	9,489.8	-15.8	-28.8	241.31	32.9	
9,589.0	1.06	205.27	9,586.8	-18.2	-29.9	238.67	34.9	
9,684.0	1.32	217.92	9,681.8	-19.8	-30.9	237.31	36.7	
9,779.0	1.32	235.59	9,776.8	-21.3	-32.5	236.73	38.8	
9,875.0	2.29	276.64	9,872.7	-21.7	-35.3	238.40	41.4	
9,970.0	3.08	295.00	9,967.6	-20.4	-39.5	242.66	44.5	
10,065.0	0.88	300.89	10,062.5	-19.0	-42.4	245.92	46.5	

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Survey								
MD (usft)	Inc (°)	Azi (grid_north_azim)	TVD (usft)	N/S (usft)	E/W (usft)	Closure Azimuth (°)	Closure Distance (usft)	
10,160.0	1.67	266.00	10,157.5	-18.7	-44.4	247.20	48.2	
10,255.0	1.41	260.11	10,252.5	-19.0	-47.0	248.00	50.7	
10,351.0	1.14	261.08	10,348.5	-19.3	-49.1	248.50	52.7	
10,446.0	1.06	306.78	10,443.4	-19.0	-50.7	249.51	54.1	
10,471.0	1.41	287.27	10,468.4	-18.7	-51.2	249.91	54.5	
10,541.0	3.69	236.47	10,538.4	-19.7	-53.9	249.91	57.4	
10,573.0	8.45	214.51	10,570.2	-22.2	-56.1	248.39	60.3	
10,604.0	13.04	209.20	10,600.6	-27.1	-59.1	245.32	65.0	
10,636.0	18.47	208.17	10,631.4	-34.8	-63.2	241.19	72.2	
10,667.0	22.16	213.00	10,660.5	-44.0	-68.7	237.37	81.6	
10,699.0	24.53	209.84	10,689.9	-54.8	-75.3	233.95	93.2	
10,731.0	27.52	206.06	10,718.6	-67.2	-81.9	230.61	106.0	
10,762.0	31.04	202.54	10,745.7	-81.1	-88.1	227.38	119.7	
10,794.0	34.12	202.02	10,772.6	-97.0	-94.6	224.29	135.5	
10,826.0	36.32	200.08	10,798.8	-114.2	-101.3	221.55	152.6	
10,857.0	38.78	198.94	10,823.3	-132.0	-107.6	219.17	170.3	
10,889.0	41.68	196.48	10,847.8	-151.7	-113.8	216.88	189.7	
10,921.0	43.35	192.44	10,871.4	-172.7	-119.2	214.62	209.8	
10,952.0	45.28	189.52	10,893.5	-193.9	-123.3	212.46	229.8	
10,984.0	47.48	188.13	10,915.6	-216.8	-126.9	210.34	251.2	
11,016.0	49.51	189.01	10,936.8	-240.5	-130.5	208.48	273.6	
11,048.0	51.88	189.80	10,957.1	-264.9	-134.5	206.92	297.1	
11,080.0	53.55	189.10	10,976.5	-290.0	-138.7	205.55	321.5	
11,111.0	55.22	187.34	10,994.5	-315.0	-142.3	204.31	345.6	
11,143.0	56.89	187.25	11,012.4	-341.3	-145.6	203.11	371.1	
11,175.0	57.16	187.43	11,029.8	-367.9	-149.1	202.06	397.0	
11,207.0	58.30	187.16	11,046.9	-394.8	-152.5	201.12	423.2	
11,238.0	59.53	187.95	11,062.9	-421.1	-156.0	200.33	449.1	
11,270.0	61.73	187.69	11,078.6	-448.7	-159.8	199.60	476.3	
11,302.0	64.10	186.81	11,093.2	-477.0	-163.4	198.91	504.2	
11,333.0	66.04	188.31	11,106.2	-504.8	-167.1	198.31	531.8	
11,365.0	68.68	189.36	11,118.6	-534.0	-171.6	197.82	560.9	
11,397.0	72.11	189.54	11,129.3	-563.8	-176.6	197.39	590.8	
11,428.0	76.77	190.68	11,137.6	-593.1	-181.8	197.04	620.4	
11,460.0	79.40	191.29	11,144.2	-623.9	-187.8	196.75	651.5	
11,492.0	81.16	192.35	11,149.6	-654.7	-194.3	196.52	683.0	
11,512.0	82.75	192.70	11,152.4	-674.1	-198.5	196.41	702.7	
11,593.0	86.00	194.02	11,160.3	-752.5	-217.2	196.10	783.2	
11,689.0	89.25	193.75	11,164.3	-845.6	-240.2	195.86	879.0	
11,784.0	91.19	191.73	11,164.0	-938.2	-261.1	195.55	973.9	
11,879.0	92.42	188.39	11,161.0	-1,031.7	-277.7	195.07	1,068.5	
11,974.0	91.63	183.73	11,157.6	-1,126.1	-287.7	194.33	1,162.3	
12,069.0	91.10	178.80	11,155.3	-1,221.0	-289.8	193.35	1,255.0	
12,164.0	91.10	178.55	11,153.5	-1,316.0	-287.6	192.33	1,347.1	
12,259.0	91.54	178.46	11,151.3	-1,410.9	-285.2	191.43	1,439.5	

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12,354.0	91.89	178.37	11,148.5	-1,505.8	-282.5	190.63	1,532.1	
12,450.0	90.57	178.29	11,146.4	-1,601.8	-279.7	189.91	1,626.0	
12,545.0	89.08	177.41	11,146.7	-1,696.7	-276.2	189.24	1,719.0	
12,640.0	89.25	177.58	11,148.1	-1,791.6	-272.0	188.63	1,812.1	
12,735.0	90.40	177.85	11,148.4	-1,886.5	-268.2	188.09	1,905.5	
12,831.0	91.10	177.67	11,147.1	-1,982.5	-264.5	187.60	2,000.0	
12,926.0	91.63	176.79	11,144.9	-2,077.3	-259.9	187.13	2,093.5	
13,021.0	92.33	176.18	11,141.6	-2,172.1	-254.1	186.67	2,186.9	
13,115.0	90.75	176.26	11,139.1	-2,265.8	-247.9	186.24	2,279.4	
13,210.0	87.41	176.53	11,140.6	-2,360.6	-241.9	185.85	2,373.0	
13,304.0	86.79	176.35	11,145.3	-2,454.3	-236.1	185.49	2,465.6	
13,398.0	87.76	178.37	11,149.8	-2,548.1	-231.8	185.20	2,558.6	
13,493.0	89.78	180.04	11,151.9	-2,643.1	-230.4	184.98	2,653.1	
13,587.0	90.13	180.13	11,151.9	-2,737.1	-230.6	184.82	2,746.8	
13,682.0	90.04	181.71	11,151.8	-2,832.0	-232.1	184.69	2,841.5	
13,776.0	90.31	182.94	11,151.5	-2,926.0	-235.9	184.61	2,935.5	
13,871.0	90.75	182.77	11,150.6	-3,020.8	-240.6	184.55	3,030.4	
13,965.0	91.19	182.42	11,149.0	-3,114.7	-244.9	184.50	3,124.3	
14,060.0	91.54	182.77	11,146.8	-3,209.6	-249.2	184.44	3,219.3	
14,154.0	92.15	183.12	11,143.7	-3,303.4	-254.0	184.40	3,313.2	
14,248.0	89.08	181.71	11,142.7	-3,397.3	-258.0	184.34	3,407.1	
14,343.0	88.81	182.68	11,144.5	-3,492.2	-261.6	184.28	3,502.0	
14,437.0	88.81	179.34	11,146.4	-3,586.2	-263.3	184.20	3,595.9	
14,531.0	90.13	180.39	11,147.3	-3,680.2	-263.1	184.09	3,689.6	
14,625.0	88.99	179.08	11,148.0	-3,774.2	-262.6	183.98	3,783.3	
14,720.0	90.04	178.37	11,148.8	-3,869.2	-260.5	183.85	3,877.9	
14,814.0	91.07	179.08	11,147.9	-3,963.1	-258.4	183.73	3,971.5	
14,908.0	91.71	178.81	11,145.6	-4,057.1	-256.7	183.62	4,065.2	
15,002.0	92.51	179.08	11,142.2	-4,151.0	-255.0	183.51	4,158.8	
15,096.0	89.60	179.34	11,140.4	-4,245.0	-253.7	183.42	4,252.5	
15,190.0	87.58	178.99	11,142.8	-4,338.9	-252.3	183.33	4,346.3	
15,285.0	87.67	179.25	11,146.7	-4,433.8	-250.8	183.24	4,440.9	
15,379.0	88.20	179.16	11,150.1	-4,527.8	-249.5	183.15	4,534.6	
15,474.0	88.81	179.96	11,152.6	-4,622.7	-248.8	183.08	4,629.4	
15,561.0	89.50	180.15	11,153.8	-4,709.7	-248.9	183.03	4,716.3	
15,612.0	89.50	180.15	11,154.3	-4,760.7	-249.0	182.99	4,767.2	

Survey Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
15,561.0	11,153.8	-4,709.7	-248.9	Last MWD Survey	
15,612.0	11,154.3	-4,760.7	-249.0	Projection to Bit	



F29F 5H
Lea County, New Mexico
Northing: 467061.10
Easting: 727869.00
Plan #2



To convert Magnetic North to Grid, Add 6.92°
To convert True North to Grid, Subtract 0.39°

Azimuths to Grid North
True North: -0.39°
Magnetic North: 6.92°

Magnetic Field
Strength: 48414.0nT
Dip Angle: 60.18°
Date: 10/11/2013
Model: IGRF2010



KB= 25° @ 3728.5usft (H&P 615)
Gr @ 3703.5

