



HOBBS OCD

MAY 05 2016

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Chevron

**Lea County, NM (NAD27 NME)
Salado Draw 29 26 33 Fed Com
8H**

Wellbore #1 Job #1513168

Survey: Phoenix MWD Surveys

Standard Survey Report

17 May, 2015



**PHOENIX
TECHNOLOGY SERVICES**

MAY 06 2016



Survey Report



Company: Chevron
 Project: Lea County, NM (NAD27 NME)
 Site: Salado Draw 29 26 33 Fed Com
 Well: 8H
 Wellbore: Wellbore #1 Job #1513168
 Design: Surveys (Pace X30)

Local Co-ordinate Reference: Well 8H
 TVD Reference: RKB @ 3274.00usft (Pace X30)
 MD Reference: RKB @ 3274.00usft (Pace X30)
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature
 Database: Compass 5000 GCR

Project: Lea 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: Salado Draw 29 26 33 Fed Com

Site Position: Northing: 372,173.00 usft Latitude: 32° 1' 15.91374 N
 From: Map Easting: 727,838.00 usft Longitude: 103° 35' 53.52012 W
 Position Uncertainty: 0.00 usft Slot Radius: 13-3/16" Grid Convergence: 0.39°

Well: 8H
 Well Position: +N/-S 0.00 usft Northing: 372,254.00 usft Latitude: 32° 1' 16.53775 N
 +E/-W 0.00 usft Easting: 730,460.00 usft Longitude: 103° 35' 23.05967 W
 Position Uncertainty: 0.00 usft Wellhead Elevation: 0.00 usft Ground Level: 3,247.00 usft

Wellbore: Wellbore #1 Job #1513168

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	4/15/2015	7.07	59.77	48,087

Design: Surveys (Pace X30)

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 0.00 171.77

Survey Program: Date: 5/17/2015

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
122.00	16,727.00	Phoenix MWD Surveys (Wellbore #1 Job #	PHX+MWD+HDGM	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
122.00	1.56	357.49	121.98	1.66	-0.07	-1.65	1.28	1.28	0.00
First Phoenix Survey									
310.00	1.35	344.83	309.92	6.35	-0.76	-6.40	0.20	-0.11	-6.73
499.00	1.31	307.76	498.88	9.83	-3.05	-10.16	0.45	-0.02	-19.61
684.00	0.64	331.82	683.85	12.03	-5.21	-12.65	0.42	-0.36	13.08
821.00	0.62	315.49	820.84	13.24	-6.08	-13.97	0.13	-0.01	-11.89
953.00	0.40	323.67	952.84	14.12	-6.87	-14.95	0.18	-0.17	6.20
1,130.00	0.37	302.78	1,129.83	14.92	-7.71	-15.87	0.08	-0.02	-11.80
1,307.00	0.99	202.42	1,306.82	13.82	-8.78	-14.93	0.63	-0.35	-56.70
1,485.00	1.39	146.80	1,484.79	10.59	-8.18	-11.65	0.65	0.22	-31.25



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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)
1,682.00	1.47	152.39	1,681.73	6.78	-5.95	-7.56	0.09	0.05	3.16
1,839.00	1.68	160.87	1,838.67	2.32	-4.05	-2.88	0.18	0.12	4.79
2,018.00	1.70	158.52	2,015.58	-2.58	-2.24	2.23	0.04	0.01	-1.33
2,193.00	1.86	167.64	2,192.51	-7.82	-0.66	7.65	0.18	0.09	5.15
2,371.00	3.08	143.31	2,370.34	-14.48	2.81	14.73	0.89	0.69	-13.67
2,549.00	3.80	101.28	2,548.08	-19.41	11.15	20.81	1.37	0.29	-23.81
2,726.00	6.25	90.39	2,724.40	-20.56	26.24	24.11	1.58	1.50	-6.15
2,903.00	6.35	92.12	2,900.33	-20.99	45.65	27.31	0.12	0.06	0.88
3,081.00	9.41	77.95	3,076.64	-18.32	68.73	28.11	2.02	1.72	-7.96
3,258.00	9.15	80.02	3,251.33	-12.86	97.74	26.71	0.24	-0.16	1.17
3,435.00	8.90	81.00	3,428.14	-8.27	125.12	26.10	0.17	-0.14	0.55
3,612.00	9.76	82.48	3,600.79	-4.16	153.52	26.10	0.50	-0.49	0.82
3,790.00	9.20	86.86	3,778.37	-1.40	182.69	27.54	0.51	-0.31	2.47
3,967.00	7.70	84.12	3,951.44	-0.59	208.61	29.28	0.88	-0.85	-1.55
4,144.00	7.29	82.61	4,128.93	3.24	231.54	29.93	0.26	-0.23	-0.85
4,322.00	7.84	83.00	4,303.38	6.18	254.79	30.36	0.31	0.31	0.22
4,499.00	7.98	83.79	4,478.69	8.98	278.99	31.05	0.10	0.08	0.45
4,676.00	8.95	87.85	4,653.76	10.82	304.96	32.94	0.64	0.55	2.29
4,792.00	8.91	86.46	4,768.36	11.72	322.95	34.63	0.19	-0.03	-1.20
4,862.00	8.96	88.03	4,837.51	12.43	333.80	35.48	0.12	0.07	-0.61
5,039.00	8.36	87.13	5,012.49	14.03	360.40	37.71	0.35	-0.34	0.62
5,217.00	8.16	87.80	5,188.64	15.16	385.94	40.24	0.12	-0.11	0.38
5,395.00	8.78	76.41	5,364.71	18.84	411.77	40.30	1.00	0.35	-6.40
5,572.00	8.20	76.78	5,539.77	24.90	437.19	37.94	0.33	-0.33	0.21
5,750.00	8.24	73.91	5,715.95	31.34	461.81	35.09	0.23	0.02	-1.61
5,927.00	9.43	78.24	5,890.84	37.81	488.19	32.47	0.77	0.67	2.45
6,105.00	8.96	78.30	6,066.58	43.59	516.04	30.73	0.26	-0.26	0.03
6,282.00	9.42	86.70	6,241.29	47.22	544.00	31.14	0.80	0.26	4.75
6,460.00	9.71	88.68	6,416.82	48.40	573.55	34.20	0.25	0.16	1.11
6,637.00	9.62	88.42	6,591.31	49.15	603.25	37.71	0.06	-0.05	-0.15
6,815.00	9.61	87.18	6,766.81	50.30	632.96	40.83	0.12	-0.01	-0.70
6,992.00	8.80	88.19	6,941.52	51.45	661.25	43.74	0.47	-0.46	0.57
7,169.00	8.71	86.72	7,116.48	52.84	688.16	46.41	0.14	-0.05	-0.83
7,346.00	8.47	88.42	7,291.48	53.77	714.57	49.07	0.20	-0.14	0.96
7,524.00	8.46	87.62	7,467.54	54.68	740.76	51.93	0.07	-0.01	-0.45
7,701.00	7.62	87.75	7,642.80	55.68	765.50	54.47	0.47	-0.47	0.07
7,878.00	8.65	82.03	7,818.02	57.98	790.40	55.78	0.74	0.58	-3.23
8,055.00	9.40	88.50	7,992.83	60.21	818.04	57.51	0.71	0.42	3.66
8,233.00	8.58	88.07	8,168.64	61.04	845.84	60.67	0.48	-0.48	-0.24
8,410.00	8.67	91.97	8,343.64	61.02	872.37	64.48	0.33	0.05	2.20
8,588.00	8.83	90.01	8,518.57	60.56	899.44	68.82	0.19	0.09	-1.10
8,765.00	8.67	90.14	8,694.51	60.52	926.36	72.71	0.09	-0.09	0.07
8,815.00	7.88	89.89	8,743.99	60.52	933.56	73.74	1.58	-1.58	-0.50



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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)
8,905.00	10.98	103.12	8,832.77	58.59	948.08	77.73	4.18	3.44	14.70
8,950.00	18.25	114.82	8,876.29	54.67	958.68	83.12	17.32	16.16	25.56
8,994.00	26.11	124.07	8,917.02	46.36	972.99	93.40	19.56	17.86	21.48
9,038.00	29.93	139.03	8,955.90	32.63	988.23	109.17	18.12	8.68	34.00
9,082.00	32.50	154.29	8,993.59	13.66	1,000.58	129.71	18.85	5.84	34.68
9,127.00	33.71	171.47	9,031.37	-9.64	1,007.69	153.79	20.97	2.69	38.18
9,171.00	35.56	186.86	9,067.64	-34.47	1,007.97	178.40	20.27	4.20	34.98
9,215.00	41.38	188.98	9,102.07	-61.56	1,004.17	204.67	13.58	13.23	-4.82
9,260.00	43.41	183.92	9,135.32	-91.69	1,000.79	234.00	8.82	4.51	-11.24
9,304.00	45.19	177.10	9,166.82	-122.38	1,000.55	264.34	11.55	4.05	-15.50
9,348.00	49.60	172.96	9,196.61	-154.62	1,003.39	296.66	12.18	10.02	-9.41
9,393.00	55.79	168.69	9,223.88	-189.91	1,009.15	332.41	15.69	13.76	-9.49
9,437.00	63.18	166.81	9,246.20	-226.92	1,017.21	370.20	17.19	16.80	-4.27
9,481.00	71.27	169.19	9,263.22	-266.57	1,025.61	410.64	19.05	18.39	-5.41
9,525.00	79.22	173.45	9,274.43	-308.60	1,032.00	453.14	20.35	18.07	9.68
9,570.00	85.01	178.99	9,280.60	-353.04	1,034.92	497.55	17.72	12.87	12.31
9,659.00	88.71	180.31	9,285.48	-441.88	1,035.46	585.56	4.41	4.16	1.48
9,748.00	88.69	180.54	9,287.50	-530.86	1,034.80	673.52	0.26	-0.02	0.26
9,837.00	91.34	179.65	9,287.47	-619.85	1,034.65	761.57	3.14	2.98	-1.00
9,925.00	91.74	178.19	9,285.11	-707.80	1,036.31	848.86	1.72	-0.45	-1.66
10,014.00	92.02	178.77	9,282.19	-796.72	1,038.67	937.20	0.72	0.31	0.65
10,103.00	91.40	180.55	9,279.53	-885.68	1,039.20	1,025.31	2.12	-0.70	2.00
10,191.00	89.41	181.96	9,276.91	-973.65	1,037.27	1,112.10	2.77	-2.26	1.60
10,280.00	89.24	182.28	9,279.96	-1,062.58	1,033.98	1,199.65	0.41	-0.19	0.36
10,368.00	91.09	184.09	9,279.70	-1,150.43	1,029.09	1,285.90	2.94	2.10	2.06
10,457.00	90.92	183.17	9,278.14	-1,239.24	1,023.45	1,372.98	1.05	-0.19	-1.03
10,545.00	88.80	180.34	9,278.36	-1,327.19	1,020.76	1,459.64	4.02	-2.41	-3.22
10,634.00	88.46	179.42	9,280.49	-1,416.16	1,020.95	1,547.72	1.10	-0.38	-1.03
10,723.00	88.32	179.68	9,282.99	-1,505.12	1,021.64	1,635.87	0.33	-0.16	0.29
10,811.00	87.68	180.45	9,286.06	-1,593.07	1,021.54	1,722.89	1.14	-0.73	0.88
10,900.00	88.49	177.90	9,289.03	-1,682.00	1,022.83	1,811.09	3.00	0.91	-2.87
10,988.00	89.89	177.16	9,290.28	-1,769.91	1,026.62	1,898.64	1.80	1.59	-0.84
11,077.00	90.53	176.88	9,289.95	-1,858.78	1,031.24	1,987.26	0.78	0.72	-0.31
11,166.00	91.37	178.70	9,288.47	-1,947.70	1,034.68	2,075.75	2.25	0.94	2.04
11,255.00	91.01	179.23	9,288.83	-2,036.67	1,038.28	2,164.03	0.72	-0.40	0.60
11,343.00	90.00	180.47	9,285.85	-2,124.66	1,036.51	2,251.15	1.82	-1.15	-1.41
11,432.00	89.11	181.23	9,286.54	-2,213.65	1,035.19	2,339.03	1.31	-1.00	0.85
11,520.00	89.55	181.91	9,287.57	-2,301.61	1,032.78	2,425.74	0.92	0.50	0.77
11,609.00	89.50	180.55	9,288.31	-2,390.58	1,030.87	2,513.53	1.53	-0.06	-1.53
11,698.00	89.24	179.74	9,289.29	-2,479.57	1,030.65	2,601.57	0.96	-0.29	-0.91
11,786.00	89.50	180.06	9,290.25	-2,567.57	1,030.80	2,688.68	0.47	0.30	0.36
11,875.00	90.14	180.21	9,290.53	-2,656.57	1,030.59	2,776.74	0.74	0.72	0.17
11,964.00	91.15	180.68	9,289.53	-2,745.58	1,029.90	2,864.71	1.25	1.13	0.53



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12,053.00	91.04	181.20	9,287.83	-2,834.53	1,028.44	2,952.58	0.60	-0.12	0.58
12,141.00	90.53	180.65	9,286.83	-2,922.51	1,027.02	3,039.43	0.85	-0.58	-0.63
12,230.00	88.38	178.82	9,287.47	-3,011.50	1,027.43	3,127.55	3.17	-2.42	-2.06
12,318.00	87.17	178.10	9,290.89	-3,099.39	1,029.79	3,214.89	1.60	-1.38	-0.82
12,407.00	88.04	179.64	9,294.61	-3,188.30	1,031.55	3,303.12	1.99	0.98	1.73
12,496.00	88.71	179.17	9,297.13	-3,277.28	1,032.47	3,391.30	0.92	0.75	-0.53
12,585.00	90.39	180.17	9,297.83	-3,366.25	1,032.98	3,479.45	2.20	1.89	1.12
12,673.00	90.28	179.67	9,297.32	-3,454.24	1,033.11	3,566.56	0.58	-0.13	-0.57
12,762.00	89.86	180.10	9,297.21	-3,543.24	1,033.28	3,654.67	0.68	-0.47	0.48
12,851.00	90.09	179.63	9,297.25	-3,632.24	1,033.49	3,742.78	0.59	0.26	-0.53
12,939.00	89.83	180.39	9,297.31	-3,720.24	1,033.48	3,829.87	0.91	-0.30	0.86
13,028.00	89.24	181.12	9,298.03	-3,809.23	1,032.31	3,917.77	1.05	-0.66	0.82
13,116.00	90.03	179.70	9,298.59	-3,897.22	1,031.68	4,004.77	1.85	0.90	-1.61
13,205.00	90.48	179.67	9,298.20	-3,986.22	1,032.17	4,092.92	0.51	0.51	-0.03
13,294.00	90.84	180.09	9,297.17	-4,075.22	1,032.35	4,181.02	0.62	0.40	0.47
13,382.00	91.31	179.22	9,295.52	-4,163.20	1,032.88	4,268.18	1.12	0.53	-0.99
13,471.00	90.28	179.65	9,294.28	-4,252.18	1,033.76	4,356.37	1.25	-1.16	0.48
13,560.00	91.04	179.58	9,293.26	-4,341.17	1,034.36	4,444.53	0.86	0.85	-0.08
13,648.00	89.72	179.97	9,292.68	-4,429.17	1,034.70	4,531.67	1.56	-1.50	0.44
13,737.00	90.56	180.70	9,292.46	-4,518.17	1,034.18	4,619.68	1.25	0.94	0.82
13,826.00	90.28	181.86	9,291.81	-4,607.14	1,032.19	4,707.45	1.34	-0.31	1.30
13,914.00	89.27	181.14	9,292.15	-4,695.11	1,029.89	4,794.18	1.41	-1.15	-0.82
14,003.00	88.29	179.81	9,294.05	-4,784.08	1,029.15	4,882.13	1.86	-1.10	-1.49
14,092.00	90.11	181.07	9,295.29	-4,873.06	1,028.47	4,970.10	2.49	2.04	1.42
14,181.00	90.67	181.32	9,294.68	-4,962.04	1,026.61	5,057.90	0.69	0.63	0.28
14,269.00	89.97	179.13	9,294.19	-5,050.03	1,026.27	5,144.93	2.61	-0.80	-2.49
14,358.00	87.40	176.98	9,296.23	-5,138.95	1,029.29	5,233.38	3.76	-2.89	-2.42
14,446.00	85.15	175.43	9,301.95	-5,226.56	1,035.10	5,320.91	3.10	-2.56	-1.76
14,535.00	86.02	175.37	9,308.10	-5,315.06	1,042.22	5,409.51	1.99	1.99	-0.07
14,624.00	88.18	175.76	9,311.91	-5,403.71	1,049.09	5,498.23	1.48	1.42	0.44
14,712.00	90.45	178.27	9,312.96	-5,491.57	1,053.67	5,585.85	3.85	2.58	2.85
14,801.00	91.09	178.19	9,311.77	-5,580.52	1,058.42	5,674.27	0.72	0.72	-0.09
14,889.00	88.47	178.13	9,311.34	-5,668.47	1,059.25	5,761.72	1.84	-1.84	-0.07
14,978.00	88.41	177.70	9,312.98	-5,757.39	1,062.49	5,850.19	1.29	-1.19	-0.48
15,067.00	87.98	177.00	9,315.80	-5,846.25	1,066.60	5,938.73	0.93	-0.51	-0.79
15,155.00	90.09	177.23	9,317.30	-5,934.12	1,071.03	6,026.33	2.43	2.42	0.26
15,244.00	91.62	178.65	9,315.97	-6,022.98	1,075.78	6,114.95	1.84	1.72	-0.65
15,333.00	91.90	180.49	9,313.24	-6,111.90	1,078.00	6,203.27	4.32	0.31	4.31
15,422.00	90.42	184.28	9,311.43	-6,200.78	1,074.29	6,290.71	4.57	-1.66	4.26
15,511.00	88.52	183.84	9,312.26	-6,289.55	1,067.99	6,377.68	2.19	-2.13	-0.49
15,599.00	88.23	183.54	9,314.75	-6,377.33	1,062.33	6,463.73	0.47	-0.33	-0.34
15,688.00	88.24	182.95	9,317.49	-6,466.15	1,057.30	6,550.91	0.88	0.01	-0.66
15,776.00	87.87	182.69	9,320.48	-6,553.99	1,052.97	6,637.22	0.51	-0.42	-0.30
15,865.00	87.18	180.04	9,324.32	-6,642.87	1,050.85	6,724.89	3.07	-0.78	-2.98



Survey Report



Company: Chevron
Project: Lea County, NM (NAD27 NME)
Site: Salado Draw 29 28 33 Fed Com
Well: 8H
Wellbore: Wellbore #1 Job #1513168
Design: Surveys (Pace X30)

Local Co-ordinate Reference: Well 8H
TVD Reference: RKB @ 3274.00usft (Pace X30)
MD Reference: RKB @ 3274.00usft (Pace X30)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
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)
15,954.00	87.73	178.71	9,328.28	-6,731.78	1,051.82	6,813.02	1.62	0.62	-1.49
16,042.00	88.88	177.51	9,330.88	-6,819.69	1,054.72	6,900.44	1.89	1.31	-1.36
16,131.00	89.78	177.42	9,331.92	-6,908.60	1,058.68	6,988.99	1.02	1.01	-0.10
16,220.00	91.04	177.21	9,331.28	-6,997.49	1,062.83	7,077.57	1.44	1.42	-0.24
16,308.00	89.36	178.73	9,330.98	-7,085.43	1,065.94	7,165.05	2.57	-1.91	1.73
16,397.00	88.66	179.28	9,332.51	-7,174.41	1,067.49	7,253.33	1.00	-0.79	0.62
16,486.00	87.59	178.59	9,335.43	-7,263.34	1,069.14	7,341.58	1.43	-1.20	-0.78
16,574.00	89.19	177.50	9,337.90	-7,351.25	1,072.14	7,429.02	2.20	1.82	-1.24
16,663.00	88.85	176.85	9,339.42	-7,440.12	1,076.68	7,517.62	1.03	-0.38	-0.96
16,669.00	88.91	176.66	9,339.54	-7,446.11	1,077.03	7,523.60	1.01	1.00	0.17

Last Phoenix MWD Survey

16,727.00	88.91	176.66	9,340.64	-7,504.00	1,080.41	7,581.38	0.00	0.00	0.00
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Projection to TD

Survey Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
122.00	121.98	1.66	-0.07	First Phoenix Survey
16,669.00	9,339.54	-7,446.11	1,077.03	Last Phoenix MWD Survey
16,727.00	9,340.64	-7,504.00	1,080.41	Projection to TD

Checked By: _____ Approved By: _____ Date: _____