

Phoenix Technology Services
SURVEY DATA CERTIFICATION

HOBBS OCD

SEP 28 2015

RECEIVED

30-025-42279



PHOENIX
TECHNOLOGY SERVICES

PHOENIX JOB NUMBER

1512719

OPERATOR

Chevron

WELL NAME

Salado Draw 18-26-33 Fed 4H

COUNTY & STATE

Lea County, NM

API WELL NUMBER

30-025-42279

PROPOSED DIRECTION

2.74

TIE-IN DATA						
MEASURED	VERTICAL			N-S	E-W	DATA
DEPTH	DEPTH	INCLIN	AZIMUTH	COORD	COORD	SOURCE
0 ft	.00 ft	.0 ft	.0 ft	.00 ft	.00 ft	Surface

FIRST	FIRST		
SURVEY	SURVEY		
DATE	DEPTH	INCLIN	AZIMUTH
11-Feb-15	132 ft	0.37	227.23

SURVEY INSTRUMENT
TYPE
APS QDT

LAST	LAST		
SURVEY	SURVEY		
DATE	DEPTH	INCLIN	AZIMUTH
25-Feb-15	13,842 ft	92.79	1.15

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
25-Feb-15	13,900 ft	92.79	1.15

Zak Dawson

PRINT YOUR NAME ABOVE

Zak Dawson

SIGN YOUR NAME ABOVE

MAGNETIC DECLINATION OR TOTAL GRID

TOTAL CORRECTION USED	
	6.94
DECLINATION OR GRID	GRID

2/25/2015

TODAY'S DATE

MWD SUPERVISOR 1

Zak Dawson

DIRECTIONAL DRILLER 1

Keith Scheppler

MWD SUPERVISOR 2

Daniel Johnson

DIRECTIONAL DRILLER 2

Brad Beck

12329 Cutten Road

Houston, Texas 77066

(713)337-0609 (Voice), (713)337-0599 (Fax)



Chevron

**Lea County, NM (NAD27 NME)
Salado Draw 18 26 33 Fed
4H**

Wellbore #1 Job #1512719

Survey: Phoenix MWD Surveys

Standard Survey Report

25 February, 2015





Survey Report



Company:	Chevron	Local Co-ordinate Reference:	Well 4H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	WELL @ 3216.00usft (Nabors Pace X30)
Site:	Salado Draw 18 26 33 Fed	MD Reference:	WELL @ 3216.00usft (Nabors Pace X30)
Well:	4H	North Reference:	Grid
Wellbore:	Wellbore #1 Job #1512719	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Nabors Pace X30)	Database:	Compass 5000 GCR

Project	Lea 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	Salado Draw 18 26 33 Fed				
Site Position:		Northing:	377,418.00 usft	Latitude:	32° 2' 8.12739 N
From:	Map	Easting:	723,192.00 usft	Longitude:	103° 36' 47.07645 W
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.38 °

Well	4H					
Well Position	+N/-S	0.00 usft	Northing:	377,418.00 usft	Latitude:	32° 2' 8.12409 N
	+E/-W	0.00 usft	Easting:	723,242.00 usft	Longitude:	103° 36' 46.49561 W
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level:	3,189.00 usft

Wellbore	Wellbore #1 Job #1512719				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	BGGM2014	1/9/2015	7.32	59.91	48,095

Design	Surveys (Nabors Pace X30)				
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		2.74

Survey Program	Date 2/25/2015				
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
132.00	13,900.00	Phoenix MWD Surveys (Wellbore #1 Job #	MWD	MWD - Standard	

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
132.00	0.37	227.23	132.00	-0.29	-0.31	-0.30	0.28	0.28	0.00
First Phoenix Survey									
219.00	0.41	218.41	219.00	-0.72	-0.71	-0.76	0.08	0.05	-10.14
312.00	0.36	209.06	311.99	-1.24	-1.06	-1.29	0.09	-0.05	-10.05
409.00	0.41	188.33	408.99	-1.85	-1.26	-1.91	0.15	0.05	-21.37
502.00	0.35	177.39	501.99	-2.46	-1.29	-2.52	0.10	-0.06	-11.76
595.00	0.15	178.29	594.99	-2.87	-1.28	-2.93	0.22	-0.22	0.97
688.00	0.14	236.97	687.99	-3.05	-1.37	-3.11	0.15	-0.01	63.10
782.00	1.89	17.32	781.97	-1.63	-1.00	-1.68	2.13	1.86	149.31
810.00	2.41	18.29	809.95	-0.63	-0.68	-0.67	1.86	1.86	3.46



Survey Report



Company:	Chevron	Local Co-ordinate Reference:	Well 4H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	WELL @ 3216.00usft (Nabors Pace X30)
Site:	Salado Draw 18 26 33 Fed	MD Reference:	WELL @ 3216.00usft (Nabors Pace X30)
Well:	4H	North Reference:	Grid
Wellbore:	Wellbore #1 Job #1512719	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Nabors Pace X30)	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)
971.00	3.63	17.23	970.73	7.45	1.89	7.53	0.76	0.76	-0.66
1,162.00	3.05	6.69	1,161.40	18.27	4.27	18.45	0.44	-0.30	-5.52
1,352.00	3.10	3.98	1,351.13	28.41	5.22	28.63	0.08	0.03	-1.43
1,542.00	2.16	341.32	1,540.93	36.93	4.43	37.10	0.73	-0.49	-11.93
1,733.00	2.98	352.76	1,731.74	45.27	2.65	45.34	0.50	0.43	5.99
1,924.00	2.53	0.94	1,922.52	54.41	2.09	54.45	0.31	-0.24	4.28
2,114.00	2.85	51.44	2,112.34	61.55	5.86	61.76	1.22	0.17	26.58
2,305.00	2.39	36.05	2,303.14	67.73	11.91	68.22	0.44	-0.24	-8.06
2,496.00	3.01	41.29	2,493.93	74.71	17.57	75.47	0.35	0.32	2.74
2,687.00	3.18	52.01	2,684.65	81.74	25.05	82.85	0.32	0.09	5.61
2,877.00	2.58	44.22	2,874.41	88.05	32.19	89.49	0.38	-0.32	-4.10
3,067.00	2.33	42.76	3,064.23	93.95	37.79	95.65	0.14	-0.13	-0.77
3,258.00	2.40	47.58	3,255.07	99.50	43.38	101.46	0.11	0.04	2.52
3,448.00	3.30	53.87	3,444.83	105.41	50.73	107.71	0.50	0.47	3.31
3,639.00	3.87	36.69	3,635.47	113.82	59.02	116.51	0.63	0.30	-8.99
3,830.00	3.92	34.58	3,826.02	124.36	66.58	127.40	0.08	0.03	-1.10
4,020.00	3.95	42.54	4,015.58	134.53	74.69	137.95	0.29	0.02	4.19
4,211.00	3.71	51.32	4,206.15	143.24	83.96	147.09	0.33	-0.13	4.60
4,402.00	2.85	51.00	4,396.84	150.09	92.48	154.34	0.45	-0.45	-0.17
4,592.00	2.65	33.14	4,586.62	156.74	98.55	161.27	0.46	-0.11	-9.40
4,674.00	2.44	28.33	4,668.54	159.86	100.41	164.48	0.37	-0.26	-5.87
4,801.00	2.45	25.94	4,795.43	164.69	102.88	169.42	0.08	0.01	-1.88
4,991.00	2.94	35.81	4,985.22	172.29	107.51	177.23	0.35	0.26	5.19
5,182.00	2.99	35.51	5,175.96	180.32	113.27	185.52	0.03	0.03	-0.16
5,372.00	2.80	37.76	5,365.72	188.02	118.99	193.49	0.12	-0.10	1.18
5,563.00	2.98	31.43	5,556.48	195.94	124.44	201.67	0.19	0.09	-3.31
5,753.00	3.40	45.18	5,746.18	204.13	131.01	210.16	0.46	0.22	7.24
5,944.00	3.29	44.85	5,936.86	212.01	138.89	218.40	0.06	-0.06	-0.17
6,134.00	3.27	44.12	6,126.55	219.76	146.51	226.51	0.02	-0.01	-0.38
6,324.00	3.40	41.56	6,316.23	227.87	154.02	234.97	0.10	0.07	-1.35
6,514.00	3.28	38.71	6,505.90	236.33	161.16	243.76	0.11	-0.06	-1.50
6,705.00	3.28	39.73	6,696.59	244.79	168.07	252.55	0.03	0.00	0.53
6,896.00	2.92	43.75	6,887.31	252.51	174.92	260.58	0.22	-0.19	2.10
7,086.00	2.77	52.21	7,077.08	258.82	181.90	267.22	0.23	-0.08	4.45
7,277.00	3.70	34.12	7,267.78	266.75	189.00	275.48	0.72	0.49	-9.47
7,467.00	3.14	32.25	7,457.44	276.22	195.22	285.24	0.30	-0.29	-0.98
7,657.00	3.13	34.92	7,647.15	284.88	200.96	294.16	0.08	-0.01	1.41
7,848.00	3.00	29.30	7,837.88	293.51	206.39	303.04	0.17	-0.07	-2.94
8,038.00	2.92	30.35	8,027.63	302.02	211.27	311.78	0.05	-0.04	0.55
8,229.00	3.17	29.29	8,218.36	310.83	216.31	320.81	0.13	0.13	-0.55
8,420.00	3.82	21.50	8,409.00	321.35	221.23	331.56	0.42	0.34	-4.08
8,610.00	3.09	20.31	8,598.65	332.05	225.33	342.44	0.39	-0.38	-0.63
8,680.00	2.59	23.56	8,668.57	335.26	226.61	345.71	0.75	-0.71	4.64



Survey Report



Company:	Chevron	Local Co-ordinate Reference:	Well 4H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	WELL @ 3216.00usft (Nabors Pace X30)
Site:	Salado Draw 18 26 33 Fed	MD Reference:	WELL @ 3216.00usft (Nabors Pace X30)
Well:	4H	North Reference:	Grid
Wellbore:	Wellbore #1 Job #1512719	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Nabors Pace X30)	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)	
8,760.00	4.54	10.52	8,748.41	340.04	227.91	350.54	2.62	2.44	-16.30	
8,791.00	7.58	2.38	8,779.23	343.29	228.22	353.80	10.17	9.81	-26.26	
8,823.00	10.77	3.97	8,810.82	348.38	228.52	358.90	10.00	9.97	4.97	
8,855.00	13.51	2.44	8,842.10	355.10	228.88	365.63	8.62	8.56	-4.78	
8,887.00	16.31	0.34	8,873.02	363.33	229.07	373.86	8.91	8.75	-6.56	
8,918.00	19.33	359.21	8,902.53	372.81	229.03	383.33	9.81	9.74	-3.65	
8,950.00	22.14	357.62	8,932.46	384.13	228.70	394.63	8.95	8.78	-4.97	
8,982.00	25.13	357.15	8,961.77	396.95	228.11	407.40	9.36	9.34	-1.47	
9,014.00	28.65	357.00	8,990.30	411.40	227.37	421.80	11.00	11.00	-0.47	
9,045.00	31.15	357.66	9,017.18	426.83	226.66	437.18	8.13	8.06	2.13	
9,077.00	33.64	358.42	9,044.19	443.97	226.08	454.27	7.88	7.78	2.38	
9,109.00	37.19	358.71	9,070.27	462.50	225.61	472.76	11.11	11.09	0.91	
9,141.00	41.04	358.83	9,095.09	482.68	225.18	492.89	12.03	12.03	0.38	
9,172.00	45.17	358.74	9,117.72	503.86	224.73	514.02	13.32	13.32	-0.29	
9,204.00	50.60	358.10	9,139.17	527.58	224.07	537.68	17.03	16.97	-2.00	
9,236.00	55.43	357.43	9,158.42	553.11	223.07	563.14	15.19	15.09	-2.09	
9,268.00	59.77	357.75	9,175.56	580.10	221.94	590.04	13.59	13.56	1.00	
9,300.00	64.90	358.52	9,190.41	608.41	221.02	618.28	16.17	16.03	2.41	
9,331.00	70.27	359.06	9,202.23	637.06	220.42	646.86	17.40	17.32	1.74	
9,363.00	75.60	359.37	9,211.62	667.63	220.00	677.39	16.68	16.66	0.97	
9,375.00	77.87	358.97	9,214.37	679.31	219.83	689.04	19.19	18.92	-3.33	
9,407.00	84.26	359.05	9,219.34	710.90	219.28	720.57	19.97	19.97	0.25	
9,438.00	88.19	359.24	9,221.38	741.82	218.82	751.44	12.69	12.68	0.61	
9,470.00	89.02	359.14	9,222.16	773.81	218.37	783.37	2.61	2.59	-0.31	
9,565.00	90.28	359.25	9,222.74	868.80	217.03	878.18	1.33	1.33	0.12	
9,660.00	91.90	359.56	9,220.93	963.77	216.05	973.00	1.74	1.71	0.33	
9,755.00	91.90	0.08	9,217.78	1,058.72	215.75	1,067.82	0.55	0.00	0.55	
9,851.00	90.11	359.85	9,216.10	1,154.70	215.69	1,163.69	1.88	-1.86	-0.24	
9,946.00	90.28	359.71	9,215.77	1,249.70	215.33	1,258.56	0.23	0.18	-0.15	
10,041.00	91.01	359.14	9,214.70	1,344.69	214.37	1,353.40	0.97	0.77	-0.60	
10,136.00	90.92	359.56	9,213.10	1,439.67	213.30	1,448.22	0.45	-0.09	0.44	
10,232.00	91.93	359.20	9,210.72	1,535.63	212.26	1,544.02	1.12	1.05	-0.38	
10,327.00	90.19	0.69	9,208.96	1,630.61	212.17	1,638.89	2.41	-1.83	1.57	
10,422.00	91.26	0.33	9,207.76	1,725.60	213.01	1,733.81	1.19	1.13	-0.38	
10,517.00	90.22	0.75	9,206.53	1,820.58	213.91	1,828.73	1.18	-1.09	0.44	
10,613.00	90.61	0.83	9,205.84	1,916.57	215.23	1,924.67	0.41	0.41	0.08	
10,708.00	92.10	0.74	9,203.59	2,011.53	216.53	2,019.58	1.57	1.57	-0.09	
10,803.00	90.53	0.95	9,201.41	2,106.49	217.93	2,114.50	1.67	-1.65	0.22	
10,898.00	90.47	1.11	9,200.58	2,201.47	219.64	2,209.46	0.18	-0.06	0.17	
10,993.00	90.45	0.40	9,199.82	2,296.46	220.89	2,304.40	0.75	-0.02	-0.75	
11,088.00	91.43	359.78	9,198.26	2,391.45	221.04	2,399.28	1.22	1.03	-0.65	
11,183.00	92.79	0.05	9,194.76	2,486.38	220.90	2,494.10	1.46	1.43	0.28	
11,278.00	90.03	0.32	9,192.42	2,581.34	221.21	2,588.97	2.92	-2.91	0.28	



Survey Report



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Site:	Salado Draw 18 26 33 Fed	MD Reference:	WELL @ 3216.00usft (Nabors Pace X30)
Well:	4H	North Reference:	Grid
Wellbore:	Wellbore #1 Job #1512719	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Nabors Pace X30)	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)
11,374.00	91.09	0.41	9,191.49	2,677.33	221.82	2,684.88	1.11	1.10	0.09
11,469.00	92.27	359.61	9,188.70	2,772.29	221.84	2,779.73	1.50	1.24	-0.84
11,564.00	92.60	359.98	9,184.66	2,867.20	221.50	2,874.52	0.52	0.35	0.39
11,660.00	91.59	0.48	9,181.15	2,963.14	221.88	2,970.36	1.17	-1.05	0.52
11,755.00	92.27	359.43	9,177.96	3,058.08	221.81	3,065.19	1.32	0.72	-1.11
11,850.00	90.92	359.96	9,175.31	3,153.04	221.30	3,160.02	1.53	-1.42	0.56
11,946.00	90.34	0.52	9,174.26	3,249.03	221.70	3,255.92	0.84	-0.60	0.58
12,041.00	91.17	0.56	9,173.00	3,344.02	222.60	3,350.84	0.87	0.87	0.04
12,136.00	89.94	0.69	9,172.08	3,439.01	223.63	3,445.77	1.30	-1.29	0.14
12,231.00	90.28	0.21	9,171.90	3,534.01	224.38	3,540.69	0.62	0.36	-0.51
12,326.00	90.34	0.21	9,171.39	3,629.00	224.73	3,635.60	0.06	0.06	0.00
12,422.00	89.08	359.83	9,171.87	3,725.00	224.76	3,731.49	1.37	-1.31	-0.40
12,517.00	89.08	359.13	9,173.40	3,819.98	223.90	3,826.32	0.74	0.00	-0.74
12,612.00	89.78	358.97	9,174.34	3,914.97	222.33	3,921.12	0.76	0.74	-0.17
12,707.00	90.53	359.91	9,174.09	4,009.96	221.40	4,015.96	1.27	0.79	0.99
12,803.00	90.50	0.52	9,173.22	4,105.95	221.76	4,111.86	0.64	-0.03	0.64
12,898.00	91.23	0.60	9,171.79	4,200.94	222.69	4,206.78	0.77	0.77	0.08
12,993.00	91.48	358.77	9,169.54	4,295.91	222.16	4,301.61	1.94	0.26	-1.93
13,089.00	91.51	359.35	9,167.04	4,391.86	220.59	4,397.38	0.60	0.03	0.60
13,184.00	91.93	358.60	9,164.19	4,486.80	218.89	4,492.13	0.90	0.44	-0.79
13,279.00	90.31	358.04	9,162.33	4,581.74	216.11	4,586.83	1.80	-1.71	-0.59
13,375.00	88.83	358.25	9,163.05	4,677.68	213.00	4,682.52	1.56	-1.54	0.22
13,470.00	88.16	358.89	9,165.55	4,772.62	210.63	4,777.23	0.98	-0.71	0.67
13,565.00	89.97	0.44	9,167.10	4,867.60	210.07	4,872.08	2.51	1.91	1.63
13,660.00	91.09	1.93	9,166.22	4,962.57	212.04	4,967.03	1.96	1.18	1.57
13,755.00	89.39	0.48	9,165.82	5,057.54	214.04	5,061.99	2.35	-1.79	-1.53
13,842.00	92.79	1.15	9,164.16	5,144.50	215.27	5,148.91	3.98	3.91	0.77
Final Phoenix Survey									
13,900.00	92.79	1.15	9,161.34	5,202.42	216.44	5,206.82	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)	
132.00	132.00	-0.29	-0.31	First Phoenix Survey
13,842.00	9,164.16	5,144.50	215.27	Final Phoenix Survey
13,900.00	9,161.34	5,202.42	216.44	Projection to TD

Checked By: _____ Approved By: _____ Date: _____