

Phoenix Technology Services
SURVEY DATA CERTIFICATION



PHOENIX JOB NUMBER

1610091

OPERATOR

Chevron

WELL NAME

SD EA 19 Fed P6 6H

COUNTY & STATE

Lea County, NM

API WELL NUMBER

30-025-42798

PROPOSED DIRECTION

178.7

TIE-IN DATA

MEASURED DEPTH	VERTICAL DEPTH	INCLIN	AZIMUTH	N-S COORD	E-W COORD	DATA SOURCE
834.00 ft	833.82 ft	1.7°	40.4°	9.67 N	10.61 E	Wel Benders Surveys

FIRST SURVEY DATE	FIRST SURVEY DEPTH	INCLIN	AZIMUTH
22-Feb-16	962 ft	1.3°	39.4°

SURVEY INSTRUMENT

TYPE

Phoenix MWD

LAST SURVEY DATE	LAST SURVEY DEPTH	INCLIN	AZIMUTH
2-Mar-16	13,685 ft	90.5°	179.6°

TO THE BEST OF MY KNOWLEDGE I
CERTIFY THIS SURVEY DATA TO BE
TRUE AND CORRECT.

PROJECTED TD SURVEY DATE	PROJECTED TD SURVEY DEPTH	INCLIN	AZIMUTH
2-Mar-16	13,742 ft	90.5°	179.6°

Michael Johnson

PRINT YOUR NAME ABOVE

Michael Johnson

SIGN YOUR NAME ABOVE

MAGNETIC DECLINATION OR TOTAL GRID

TOTAL CORRECTION USED	6.60°
DECLINATION OR GRID	GRID

3/2/2016

TODAY'S DATE

MWD SUPERVISOR 1

Michael Johnson

DIRECTIONAL DRILLER 1

Casey Tubbe

MWD SUPERVISOR 2

Lance Mosby

DIRECTIONAL DRILLER 2

Justin Jackson

12329 Cutten Rd., Houston, Texas 77066 (713)337-0600 (Voice), (713)337-0599 (Fax)



Chevron

Lea County, NM (NAD27 NME)

SD EA 19 Fed

P6 6H

OH / Job 1610091

Survey: Phoenix MWD Surveys

Standard Survey Report

03 March, 2016





Phoenix Technology Services Survey Report



Company:	Chevron	Local Co-ordinate Reference:	Well P8 6H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	RKB @ 3232.00usft (Pace X30)
Site:	SD EA 19 Fed	MD Reference:	RKB @ 3232.00usft (Pace X30)
Well:	P8 6H	North Reference:	Grid
Wellbore:	OH / Job 1610091	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (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	SD EA 19 Fed		
Site Position:		Northing:	377,402.00 usft
From:	Map	Easting:	724,767.00 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 2' 7.86475 N
		Longitude:	103° 36' 28.78145 W
		Grid Convergence:	0.38 "

Well	P8 6H		
Well Position	+N/-S	0.00 usft	Northing: 377,422.00 usft
	+E/-W	0.00 usft	Easting: 724,783.00 usft
Position Uncertainty	0.00 usft	Wellhead Elevation:	0.00 usft
		Latitude:	32° 2' 8.06160 N
		Longitude:	103° 36' 28.58402 W
		Ground Level:	3,205.00 usft

Wellbore	OH / Job 1610091				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	1/27/2016	6.98	59.77	48,056

Design	Surveys (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	178.70	

Survey Program	Date	3/3/2016			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
182.00	834.00	Wellbenders MWD Surveys (OH / Job 161	MWD	MWD - Standard	
962.00	13,742.00	Phoenix MWD Surveys (OH / Job 1610091	PHX+MWD+HDGM	PHX+OWSG 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)	
834.00	1.70	40.40	833.82	9.67	10.61	-9.43	0.00	0.00	0.00	
Tie-In to Wellbenders										
962.00	1.30	39.40	961.77	12.24	12.76	-11.95	0.31	-0.31	-0.78	
First Phoenix MWD Survey										
1,143.00	1.90	320.00	1,142.72	18.13	12.14	-15.85	1.16	0.33	-43.87	
1,321.00	2.30	312.60	1,320.60	20.81	7.61	-20.63	0.27	0.22	-4.16	
1,498.00	2.50	305.50	1,497.44	25.45	1.85	-25.40	0.20	0.11	-4.01	
1,675.00	1.10	216.60	1,674.38	26.33	-2.30	-26.38	1.53	-0.79	-50.23	
1,853.00	1.40	206.30	1,852.33	23.01	-4.28	-23.10	0.21	0.17	-5.79	



Phoenix Technology Services Survey Report



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Site:	SD EA 19 Fed	MD Reference:	RKB @ 3232.00usft (Pace X30)
Well:	P8 6H	North Reference:	Grid
Wellbore:	OH / Job 1810091	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (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)
2,030.00	1.30	201.50	2,029.29	19.20	-5.98	-19.33	0.09	-0.06	-2.71
2,207.00	1.30	147.80	2,206.25	15.63	-5.64	-15.78	0.86	0.00	-30.34
2,384.00	1.30	146.20	2,383.20	12.27	-3.46	-12.34	0.02	0.00	-0.90
2,561.00	1.30	143.90	2,560.16	8.98	-1.16	-9.00	0.03	0.00	-1.30
2,738.00	1.30	145.20	2,737.11	5.71	1.17	-5.68	0.02	0.00	0.73
2,916.00	1.40	138.70	2,915.06	2.41	3.78	-2.33	0.10	0.06	-3.65
3,093.00	1.40	141.90	3,092.01	-0.91	6.52	1.06	0.04	0.00	1.81
3,270.00	1.50	139.20	3,268.95	-4.37	9.37	4.58	0.07	0.06	-1.53
3,448.00	1.90	133.30	3,446.87	-8.15	13.04	8.45	0.25	0.22	-3.21
3,625.00	1.90	138.40	3,623.78	-12.36	17.12	12.75	0.10	0.00	2.88
3,802.00	1.70	137.40	3,800.69	-16.49	20.85	16.96	0.11	-0.11	-0.56
3,980.00	1.30	119.50	3,978.63	-19.43	24.39	19.97	0.34	-0.22	-10.06
4,157.00	2.30	141.00	4,155.54	-23.17	28.37	23.81	0.67	0.56	12.15
4,335.00	2.40	135.00	4,333.39	-28.59	33.28	29.33	0.15	0.06	-3.37
4,512.00	3.40	134.80	4,510.16	-34.91	39.60	35.79	0.56	0.56	-0.11
4,682.00	3.40	136.30	4,679.86	-42.10	46.66	43.15	0.05	0.00	0.88
4,790.00	3.00	139.10	4,787.69	-46.55	50.73	47.69	0.40	-0.37	2.59
4,967.00	2.80	134.60	4,964.47	-53.09	56.84	54.37	0.17	-0.11	-2.54
5,144.00	2.80	133.30	5,141.26	-59.09	63.06	60.51	0.04	0.00	-0.73
5,322.00	1.90	160.40	5,319.11	-64.85	67.22	66.36	0.79	-0.51	15.22
5,499.00	0.60	196.30	5,496.07	-68.51	67.94	70.03	0.82	-0.73	20.28
5,677.00	0.50	197.90	5,674.06	-70.14	67.44	71.65	0.06	-0.06	0.90
5,854.00	0.50	227.10	5,851.05	-71.40	66.64	72.89	0.14	0.00	16.50
6,031.00	0.30	205.60	6,028.05	-72.34	65.87	73.82	0.14	-0.11	-12.15
6,208.00	0.30	216.00	6,205.04	-73.14	65.40	74.60	0.03	0.00	5.88
6,385.00	1.20	135.90	6,382.03	-74.84	66.42	76.33	0.67	0.51	-45.25
6,563.00	1.20	138.80	6,559.99	-77.58	68.94	79.13	0.03	0.00	1.63
6,740.00	1.10	149.30	6,736.96	-80.44	71.03	82.03	0.13	-0.06	5.93
6,917.00	1.80	155.30	6,913.90	-84.43	73.06	86.06	0.40	0.40	3.39
7,095.00	0.90	227.40	7,091.86	-87.91	73.20	89.55	0.98	-0.51	40.51
7,272.00	1.30	232.50	7,268.82	-90.07	70.58	91.65	0.23	0.23	2.88
7,450.00	0.20	283.50	7,446.81	-91.23	68.68	92.77	0.67	-0.62	28.65
7,628.00	0.30	261.10	7,624.80	-91.23	67.91	92.75	0.08	0.06	-12.58
7,805.00	0.40	185.90	7,801.80	-91.92	67.39	93.42	0.25	0.06	-42.49
7,982.00	0.70	128.80	7,978.80	-93.21	68.17	94.73	0.33	0.17	-32.26
8,160.00	1.50	195.70	8,156.77	-96.13	68.39	97.66	0.78	0.45	37.58
8,337.00	1.80	182.80	8,333.69	-101.14	67.63	102.65	0.27	0.17	-7.29
8,514.00	1.70	177.60	8,510.61	-106.54	67.60	108.05	0.11	-0.06	-2.94
8,699.00	1.50	184.20	8,635.56	-110.02	67.56	111.53	0.22	-0.16	5.28
8,707.00	3.00	152.00	8,703.51	-112.48	68.33	114.00	2.80	2.21	-47.35
8,751.00	9.10	135.60	8,747.25	-115.99	71.31	117.58	14.27	13.86	-37.27
8,795.00	18.70	136.60	8,789.91	-123.62	78.60	125.37	21.82	21.82	2.27
8,840.00	25.80	143.30	8,831.54	-136.73	89.43	138.72	16.73	15.78	14.89



Phoenix Technology Services

Survey Report



Company: Chevron
Project: Lea County, NM (NAD27 NME)
Site: SD EA 19 Fed
Well: P8 6H
Wellbore: OH / Job 1610091
Design: Surveys (Pace X30)

Local Co-ordinate Reference: Well P8 6H
TVD Reference: RKB @ 3232.00usft (Pace X30)
MD Reference: RKB @ 3232.00usft (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)
8,884.00	33.20	150.50	8,869.82	-154.92	101.10	157.18	18.62	16.82	16.36
8,928.00	36.80	159.90	8,905.88	-177.81	111.57	180.29	14.71	8.18	21.36
8,973.00	44.30	169.70	8,940.09	-205.99	119.03	208.64	21.83	16.67	21.78
9,017.00	46.00	179.60	8,971.15	-236.98	121.90	239.68	16.40	3.86	22.50
9,061.00	46.80	182.60	9,001.50	-268.83	121.22	271.51	5.57	1.82	7.27
9,106.00	49.20	184.10	9,031.61	-302.20	119.20	304.83	5.75	5.33	2.89
9,150.00	52.30	185.40	9,059.45	-336.15	116.37	338.71	7.41	7.05	2.95
9,194.00	56.00	185.60	9,085.21	-371.65	112.95	374.11	8.42	8.41	0.45
9,239.00	58.90	185.00	9,109.42	-409.41	109.45	411.79	6.54	6.44	-1.33
9,283.00	63.10	185.10	9,130.75	-447.74	106.07	450.03	9.55	9.55	0.23
9,327.00	65.60	184.90	9,149.79	-487.25	102.81	489.45	5.70	5.68	-0.45
9,371.00	70.80	184.00	9,168.13	-527.96	99.45	530.08	11.97	11.82	-2.05
9,410.00	77.60	183.50	9,176.74	-565.39	97.00	567.44	17.48	17.44	-1.28
9,488.00	86.20	182.60	9,187.72	-642.43	92.80	644.37	11.08	11.03	-1.15
9,576.00	86.30	182.40	9,193.48	-730.16	89.07	731.99	0.25	0.11	-0.23
9,665.00	88.90	182.20	9,197.20	-819.00	85.50	820.73	2.93	2.92	-0.22
9,754.00	90.20	182.30	9,197.90	-907.92	82.01	909.55	1.46	1.46	0.11
9,842.00	91.60	182.10	9,196.52	-995.85	78.83	997.37	1.61	1.59	-0.23
9,931.00	89.60	178.50	9,195.59	-1,084.82	78.16	1,086.32	4.63	-2.25	-4.04
10,019.00	90.80	179.20	9,195.28	-1,172.80	79.93	1,174.31	1.58	1.36	0.80
10,108.00	90.00	176.10	9,194.66	-1,261.71	83.58	1,263.28	3.60	-0.80	-3.48
10,197.00	93.00	177.80	9,192.33	-1,350.54	88.31	1,352.20	3.87	3.37	1.91
10,285.00	93.60	180.20	9,187.26	-1,438.38	89.85	1,440.04	2.81	0.68	2.73
10,374.00	92.80	180.40	9,182.30	-1,527.24	89.38	1,528.87	0.93	-0.90	0.22
10,463.00	92.50	181.10	9,178.18	-1,616.13	88.22	1,617.72	0.85	-0.34	0.79
10,552.00	93.50	181.80	9,173.52	-1,704.98	85.97	1,708.49	1.37	1.12	0.79
10,640.00	91.40	181.40	9,169.78	-1,792.86	83.51	1,794.29	2.43	-2.39	-0.45
10,729.00	92.10	181.50	9,167.04	-1,881.79	81.26	1,883.15	0.79	0.79	0.11
10,818.00	91.40	181.60	9,164.32	-1,970.72	78.86	1,972.00	0.79	-0.79	0.11
10,906.00	90.00	181.10	9,163.25	-2,058.66	76.78	2,059.89	1.69	-1.59	-0.57
10,995.00	90.00	180.60	9,163.25	-2,147.67	75.46	2,148.83	0.56	0.00	-0.56
11,083.00	92.60	181.10	9,161.25	-2,235.63	74.16	2,236.74	3.01	2.95	0.57
11,172.00	92.20	180.20	9,157.53	-2,324.55	73.15	2,325.61	1.11	-0.45	-1.01
11,260.00	88.80	179.80	9,156.76	-2,412.53	73.15	2,413.57	3.89	-3.86	-0.45
11,349.00	89.60	179.40	9,158.00	-2,501.52	73.77	2,502.55	1.00	0.90	-0.45
11,438.00	89.50	178.30	9,158.70	-2,590.50	75.56	2,591.54	1.24	-0.11	-1.24
11,526.00	90.30	178.90	9,158.85	-2,678.47	77.71	2,679.54	1.14	0.91	0.68
11,615.00	91.70	179.00	9,157.30	-2,767.44	79.34	2,768.53	1.58	1.57	0.11
11,703.00	89.90	178.40	9,156.07	-2,855.40	81.34	2,856.51	2.16	-2.05	-0.68
11,792.00	89.30	177.90	9,156.69	-2,944.35	84.21	2,945.51	0.88	-0.67	-0.56
11,880.00	90.00	176.80	9,157.23	-3,032.26	88.28	3,033.48	1.48	0.80	-1.25
11,969.00	91.40	175.70	9,156.14	-3,121.06	94.10	3,122.39	2.00	1.57	-1.24
12,057.00	91.50	176.90	9,153.92	-3,208.84	99.77	3,210.28	1.37	0.11	1.36
12,146.00	89.20	178.20	9,153.37	-3,297.75	103.58	3,299.25	2.97	-2.58	1.46



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Site: SD EA 19 Fed
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Wellbore: OH / Job 1610091
Design: Surveys (Pace X30)

Local Co-ordinate Reference: Well P8 6H
TVD Reference: RKB @ 3232.00usft (Pace X30)
MD Reference: RKB @ 3232.00usft (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)
12,235.00	89.10	177.80	9,154.69	-3,386.69	106.68	3,388.24	0.46	-0.11	-0.45
12,323.00	90.00	180.80	9,155.38	-3,474.67	107.76	3,476.22	3.56	1.02	3.41
12,412.00	91.20	180.50	9,154.45	-3,563.65	106.75	3,565.16	1.39	1.35	-0.34
12,500.00	91.10	180.20	9,152.69	-3,651.64	106.21	3,653.10	0.36	-0.11	-0.34
12,589.00	90.20	179.30	9,151.68	-3,740.63	106.60	3,742.08	1.43	-1.01	-1.01
12,677.00	90.40	177.90	9,151.22	-3,828.60	108.75	3,830.08	1.61	0.23	-1.59
12,766.00	92.50	178.50	9,146.96	-3,917.52	111.54	3,919.04	2.45	2.36	0.67
12,855.00	90.70	177.70	9,146.48	-4,006.43	114.49	4,008.00	2.21	-2.02	-0.90
12,943.00	88.50	177.40	9,147.09	-4,094.34	118.26	4,095.97	2.52	-2.50	-0.34
13,032.00	93.70	179.00	9,145.39	-4,183.25	121.05	4,184.92	6.11	5.84	1.80
13,121.00	91.50	177.90	9,141.35	-4,272.12	123.46	4,273.82	2.76	-2.47	-1.24
13,210.00	89.90	181.10	9,140.26	-4,361.09	124.23	4,362.79	4.02	-1.80	3.60
13,298.00	91.60	183.30	9,139.10	-4,450.01	120.82	4,451.61	3.12	1.91	2.47
13,387.00	90.60	182.60	9,137.41	-4,537.88	116.29	4,539.35	1.39	-1.14	-0.80
13,476.00	90.80	181.60	9,136.32	-4,626.81	113.03	4,628.18	1.15	0.22	-1.12
13,565.00	91.80	180.70	9,134.30	-4,715.77	111.24	4,717.08	1.51	1.12	-1.01
13,654.00	90.10	179.80	9,132.82	-4,804.75	110.85	4,806.03	2.16	-1.91	-1.01
13,685.00	90.50	179.60	9,132.66	-4,835.75	111.02	4,837.02	1.44	1.29	-0.65
Final Phoenix MWD Survey									
13,742.00	90.50	179.60	9,132.16	-4,892.75	111.41	4,894.01	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)	
834.00	833.82	9.67	10.61	Tie-in to Wellbenders
962.00	961.77	12.24	12.76	First Phoenix MWD Survey
13,685.00	9,132.66	-4,835.78	109.47	Final Phoenix MWD Survey
13,742.00	9,132.16	-4,892.77	109.67	Projection to TD

Checked By: _____ Approved By: _____ Date: _____