



PHOENIX
TECHNOLOGY SERVICES

30-025-44954

January 15, 2019

Oil Conservation Division
State of New Mexico
1625 N. French Drive
District 1 - Hobbs
Hobbs, New Mexico 88240

Attention: Regulatory Department

Re: Delaware Energy
Chapman SWD 1
Lea County, NM
API #30-025-44954
Job No. 63872

HOBBS OCO
FEB 04 2019
RECEIVED

Enclosed please find the Survey Data Certification, and the original Plat and one copy of the Survey Report performed on the above referenced Well by Phoenix Technology Services, Inc. (P-5 No. 664171). Other information required by your office is as follows:

Name & Title of Surveyor	Drain Hole Number	Surveyed Depths		Dates Performed		Type of Survey
		From	To	Start	End	
Bruce Manser	1	1,295	14,199	11/9/18	1/3/19	MWD

A certified plat on which the bottom hole location is oriented both to the surface location and to the lease lines (or unit lines in case of pooling) is attached to the survey report. If any other information is required, please contact the undersigned at the letterhead address and phone number.

Best Regards,

Brittany Carley

Brittany Carley
Operations Administrator

Phoenix Technology Services SURVEY DATA CERTIFICATION



PHOENIX JOB NUMBER 63872

OPERATOR Delaware Energy

WELL NAME Chapman SWD 1

COUNTY & STATE Lea Co., NM

API WELL NUMBER 30-025-44954

PROPOSED DIRECTION 0

TIE-IN DATA						
MEASURED DEPTH	VERTICAL DEPTH	INCLIN	AZIMUTH	N-S COORD	E-W COORD	DATA SOURCE
1,236.00 ft	1,235.91 ft	0.50°	45.87°	5.70 N	8.94 E	Surface

FIRST SURVEY DATE	FIRST SURVEY DEPTH	INCLIN	AZIMUTH
9-Nov-18	1,295 ft	0.93°	52.65°

SURVEY INSTRUMENT TYPE
Phoenix MWD

LAST SURVEY DATE	LAST SURVEY DEPTH	INCLIN	AZIMUTH
3-Jan-19	14,199 ft	3.98°	78.48°

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
3-Jan-19	14,276 ft	3.98°	78.49°

Bruce Manser

PRINT YOUR NAME ABOVE

Bruce Manser

SIGN YOUR NAME ABOVE

MAGNETIC DECLINATION OR TOTAL GRID

TOTAL CORRECTION USED	6.08°
DECLINATION OR GRID	GRID

3-Jan

TODAY'S DATE

MWD SUPERVISOR 1

Bruce Manser

DIRECTIONAL DRILLER 1

Jarod Brothers

MWD SUPERVISOR 2

Freddie Hicks

DIRECTIONAL DRILLER 2

James Ley



Delaware Energy, LLC

Lea County, NM (NAD83)

Chapman SWD

1

OH / 63872

Survey: Phoenix MWD Surveys

Standard Survey Report

14 January, 2019

Survey Report

Company:	Delaware Energy, LLC	Local Co-ordinate Reference:	Well 1
Project:	Lea County, NM (NAD83)	TVD Reference:	RKB @ 3153.00usft (Patterson 241)
Site:	Chapman SWD	MD Reference:	RKB @ 3153.00usft (Patterson 241)
Well:	1	North Reference:	Grid
Wellbore:	OH / 63872	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Patterson 241)	Database:	USA Compass

Project	Lea County, NM (NAD83)		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Eastern Zone		

Site		Chapman SWD			
Site Position:		Northing:	415,919.68 usft	Latitude:	32° 8' 19.66920 N
From:	Lat/Long	Easting:	876,973.03 usft	Longitude:	103° 14' 56.35680 W
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.58 °

Well		1				
Well Position	+N/-S	0.00 usft	Northing:	415,919.68 usft	Latitude:	32° 8' 19.66920 N
	+E/-W	0.00 usft	Easting:	876,973.03 usft	Longitude:	103° 14' 56.35680 W
Position Uncertainty	0.00 usft		Wellhead Elevation:	usft	Ground Level:	3,125.00 usft

Wellbore	OH / 63872				
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Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	MVHD	11/13/2018	6.65	59.77	47,898.34893901

Design	Surveys (Patterson 241)				
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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	0.00

Survey Program	Date: 1/14/2019				
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
1,295.00	14,276.00	Phoenix MWD Surveys (OH / 63872)	MWD+HDGM	OWSG Rev.2 MWD + HDGM	

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)
1,236.00	0.50	45.87	1,235.91	5.70	8.94	5.70	0.00	0.00	0.00
Tie In - OH									
1,295.00	0.93	52.65	1,294.91	6.17	9.50	6.17	0.74	0.73	11.49
First Phoenix MWD Survey - OH									
1,389.00	0.83	59.75	1,388.90	6.98	10.70	6.98	0.16	-0.11	7.55
1,483.00	0.93	84.35	1,482.89	7.40	12.04	7.40	0.41	0.11	26.17
1,577.00	0.90	91.01	1,576.87	7.46	13.54	7.46	0.12	-0.03	7.09
1,671.00	0.68	96.82	1,670.86	7.38	14.83	7.38	0.25	-0.23	6.18
1,764.00	0.49	115.36	1,763.86	7.15	15.74	7.15	0.29	-0.20	19.94
1,859.00	0.30	92.32	1,858.86	6.96	16.36	6.96	0.26	-0.20	-24.25

Survey Report

Company:	Delaware Energy, LLC	Local Co-ordinate Reference:	Well 1
Project:	Lea County, NM (NAD83)	TVD Reference:	RKB @ 3153.00usft (Patterson 241)
Site:	Chapman SWD	MD Reference:	RKB @ 3153.00usft (Patterson 241)
Well:	1	North Reference:	Grid
Wellbore:	OH / 63872	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Patterson 241)	Database:	USA Compass

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)
1,953.00	0.09	216.25	1,952.86	6.89	16.56	6.89	0.38	-0.22	131.84
2,047.00	0.12	308.47	2,046.86	6.89	16.44	6.89	0.16	0.03	98.11
2,142.00	0.14	39.75	2,141.86	7.04	16.43	7.04	0.20	0.02	96.08
2,236.00	0.15	27.32	2,235.86	7.24	16.56	7.24	0.04	0.01	-13.22
2,331.00	0.16	321.04	2,330.86	7.46	16.54	7.46	0.18	0.01	-69.77
2,425.00	0.25	22.17	2,424.86	7.75	16.53	7.75	0.24	0.10	65.03
2,520.00	0.28	35.78	2,519.85	8.13	16.75	8.13	0.07	0.03	14.33
2,615.00	0.30	48.87	2,614.85	8.48	17.07	8.48	0.07	0.02	13.78
2,709.00	0.48	80.30	2,708.85	8.71	17.64	8.71	0.29	0.19	33.44
2,803.00	0.58	65.20	2,802.85	8.97	18.46	8.97	0.18	0.11	-16.06
2,898.00	0.73	79.05	2,897.84	9.29	19.49	9.29	0.23	0.16	14.58
2,992.00	0.85	80.90	2,991.83	9.51	20.77	9.51	0.13	0.13	1.97
3,086.00	0.96	78.50	3,085.82	9.78	22.23	9.78	0.12	0.12	-2.55
3,181.00	0.78	86.33	3,180.81	9.98	23.65	9.98	0.23	-0.19	8.24
3,278.00	0.61	63.60	3,277.80	10.25	24.78	10.25	0.33	-0.18	-23.43
3,372.00	0.28	96.39	3,371.80	10.45	25.45	10.45	0.43	-0.35	34.88
3,466.00	0.42	38.09	3,465.80	10.70	25.89	10.70	0.39	0.15	-62.02
3,561.00	0.39	67.46	3,560.80	11.09	26.41	11.09	0.22	-0.03	30.92
3,655.00	0.77	56.22	3,654.79	11.57	27.23	11.57	0.42	0.40	-11.96
3,748.00	0.93	58.05	3,747.78	12.32	28.39	12.32	0.17	0.17	1.97
3,842.00	1.08	36.04	3,841.77	13.44	29.56	13.44	0.44	0.16	-23.41
3,937.00	1.34	31.14	3,936.75	15.11	30.66	15.11	0.29	0.27	-5.16
4,031.00	1.41	31.34	4,030.72	17.04	31.83	17.04	0.07	0.07	0.21
4,125.00	1.47	19.85	4,124.69	19.16	32.84	19.16	0.31	0.06	-12.22
4,220.00	1.80	21.31	4,219.65	21.70	33.79	21.70	0.35	0.35	1.54
4,314.00	1.56	19.25	4,313.61	24.28	34.75	24.28	0.26	-0.26	-2.19
4,409.00	1.04	16.99	4,408.58	26.32	35.43	26.32	0.55	-0.55	-2.38
4,503.00	0.96	32.21	4,502.57	27.81	36.10	27.81	0.29	-0.09	16.19
4,598.00	0.89	1.97	4,597.56	29.22	36.55	29.22	0.51	-0.07	-31.83
4,692.00	1.20	319.55	4,691.54	30.70	35.94	30.70	0.86	0.33	-45.13
4,787.00	1.84	329.73	4,786.51	32.77	34.52	32.77	0.73	0.67	10.72
4,880.00	2.11	331.52	4,879.45	35.57	32.95	35.57	0.30	0.29	1.92
4,974.00	2.20	333.83	4,973.39	38.71	31.33	38.71	0.13	0.10	2.46
5,069.00	2.31	337.76	5,068.31	42.11	29.80	42.11	0.20	0.12	4.14
5,158.00	2.48	329.88	5,157.24	45.44	28.16	45.44	0.42	0.19	-8.85
5,262.00	2.42	341.41	5,261.14	49.47	26.33	49.47	0.48	-0.06	11.09
5,356.00	2.10	342.38	5,355.07	52.99	25.17	52.99	0.34	-0.34	1.03
5,450.00	1.85	351.54	5,449.01	56.13	24.43	56.13	0.43	-0.27	9.74
5,545.00	1.70	352.84	5,543.97	59.05	24.03	59.05	0.16	-0.16	1.37
5,639.00	1.59	357.25	5,637.93	61.73	23.79	61.73	0.18	-0.12	4.69
5,733.00	1.52	359.94	5,731.90	64.28	23.73	64.28	0.11	-0.07	2.86
5,827.00	1.60	1.87	5,825.86	66.84	23.77	66.84	0.10	0.09	2.05
5,921.00	1.48	6.25	5,919.83	69.36	23.94	69.36	0.18	-0.13	4.66

Survey Report

Company:	Delaware Energy, LLC	Local Co-ordinate Reference:	Well 1
Project:	Lea County, NM (NAD83)	TVD Reference:	RKB @ 3153.00usft (Patterson 241)
Site:	Chapman SWD	MD Reference:	RKB @ 3153.00usft (Patterson 241)
Well:	1	North Reference:	Grid
Wellbore:	OH / 63872	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Patterson 241)	Database:	USA Compass

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)
6,015.00	1.50	8.18	6,013.79	71.78	24.25	71.78	0.06	0.02	2.05
6,109.00	1.54	18.06	6,107.76	74.20	24.82	74.20	0.28	0.04	10.51
6,203.00	1.83	23.76	6,201.72	76.78	25.81	76.78	0.36	0.31	6.06
6,298.00	1.96	36.81	6,296.67	79.47	27.40	79.47	0.47	0.14	13.74
6,392.00	2.14	43.71	6,390.61	82.02	29.58	82.02	0.32	0.19	7.34
6,487.00	2.13	46.58	6,485.54	84.52	32.08	84.52	0.11	-0.01	3.02
6,581.00	2.08	46.86	6,579.48	86.88	34.60	86.88	0.05	-0.05	0.30
6,676.00	2.19	49.15	6,674.41	89.25	37.23	89.25	0.15	0.12	2.41
6,770.00	2.10	78.44	6,768.35	90.77	40.27	90.77	1.16	-0.10	31.16
6,865.00	1.85	95.62	6,863.30	90.97	43.50	90.97	0.67	-0.26	18.08
6,959.00	1.57	108.97	6,957.25	90.40	46.23	90.40	0.52	-0.30	14.20
7,056.00	1.84	104.95	7,054.21	89.57	48.99	89.57	0.30	0.28	-4.14
7,151.00	2.29	100.83	7,149.15	88.82	52.33	88.82	0.50	0.47	-4.34
7,245.00	2.20	107.29	7,243.08	87.93	55.90	87.93	0.29	-0.10	6.87
7,335.00	2.05	110.20	7,333.02	86.86	59.06	86.86	0.21	-0.17	3.23
7,431.00	1.90	103.88	7,428.96	85.88	62.22	85.88	0.28	-0.16	-6.58
7,525.00	1.98	92.97	7,522.90	85.43	65.35	85.43	0.40	0.09	-11.61
7,619.00	2.17	85.52	7,616.84	85.48	68.75	85.48	0.35	0.20	-7.93
7,713.00	2.88	80.10	7,710.75	86.03	72.85	86.03	0.80	0.76	-5.77
7,808.00	2.78	80.62	7,805.64	86.81	77.47	86.81	0.11	-0.11	0.55
7,903.00	2.46	78.21	7,900.54	87.60	81.74	87.60	0.36	-0.34	-2.54
7,997.00	2.55	80.74	7,994.45	88.35	85.78	88.35	0.15	0.10	2.69
8,091.00	2.55	82.93	8,088.35	88.95	89.92	88.95	0.10	0.00	2.33
8,186.00	2.76	81.60	8,183.25	89.54	94.28	89.54	0.23	0.22	-1.40
8,281.00	3.33	84.71	8,278.12	90.13	99.29	90.13	0.62	0.60	3.27
8,375.00	3.09	88.75	8,371.97	90.44	104.54	90.44	0.35	-0.26	4.30
8,469.00	3.17	92.62	8,465.83	90.37	109.67	90.37	0.24	0.09	4.12
8,564.00	3.42	98.13	8,560.67	89.85	115.10	89.85	0.42	0.26	5.80
8,658.00	3.24	94.41	8,654.51	89.25	120.52	89.25	0.30	-0.19	-3.96
8,753.00	3.41	98.36	8,749.35	88.63	125.99	88.63	0.30	0.18	4.16
8,846.00	3.76	98.79	8,842.17	87.77	131.74	87.77	0.38	0.38	0.46
8,941.00	3.72	97.09	8,936.97	86.91	137.88	86.91	0.12	-0.04	-1.79
9,036.00	3.65	101.63	9,031.77	85.92	143.90	85.92	0.32	-0.07	4.78
9,130.00	3.73	98.20	9,125.58	84.88	149.86	84.88	0.25	0.09	-3.65
9,224.00	3.70	102.45	9,219.38	83.79	155.84	83.79	0.29	-0.03	4.52
9,318.00	3.59	106.64	9,313.19	82.29	161.63	82.29	0.31	-0.12	4.46
9,412.00	3.68	107.93	9,407.00	80.52	167.32	80.52	0.13	0.10	1.37
9,507.00	3.76	108.21	9,501.80	78.61	173.18	78.61	0.09	0.08	0.29
9,602.00	3.72	111.28	9,596.60	76.52	179.01	76.52	0.21	-0.04	3.23
9,696.00	3.51	115.24	9,690.41	74.18	184.45	74.18	0.35	-0.22	4.21
9,791.00	3.58	113.08	9,785.23	71.78	189.81	71.78	0.16	0.07	-2.27
9,885.00	3.51	116.86	9,879.05	69.33	195.08	69.33	0.26	-0.07	4.02
9,979.00	3.38	113.21	9,972.88	66.94	200.19	66.94	0.27	-0.14	-3.88
10,073.00	3.10	112.67	10,066.73	64.87	205.08	64.87	0.30	-0.30	-0.57

Survey Report

Company: Delaware Energy, LLC
Project: Lea County, NM (NAD83)
Site: Chapman SWD
Well: 1
Wellbore: OH / 63872
Design: Surveys (Patterson 241)

Local Co-ordinate Reference: Well 1
TVD Reference: RKB @ 3153.00usft (Patterson 241)
MD Reference: RKB @ 3153.00usft (Patterson 241)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: USA Compass

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)
10,167.00	2.91	113.93	10,160.60	62.92	209.61	62.92	0.21	-0.20	1.34
10,261.00	2.53	110.71	10,254.50	61.22	213.73	61.22	0.44	-0.40	-3.43
10,356.00	2.17	102.09	10,349.42	60.10	217.45	60.10	0.53	-0.38	-9.07
10,450.00	1.96	101.33	10,443.35	59.41	220.77	59.41	0.23	-0.22	-0.81
10,639.00	1.47	93.51	10,632.27	58.63	226.36	58.63	0.29	-0.26	-4.14
10,733.00	1.43	96.26	10,726.24	58.43	228.72	58.43	0.09	-0.04	2.93
10,827.00	1.94	98.74	10,820.20	58.06	231.46	58.06	0.55	0.54	2.64
10,921.00	3.01	121.19	10,914.11	56.54	235.15	56.54	1.52	1.14	23.88
11,015.00	3.32	121.67	11,007.97	53.83	239.57	53.83	0.33	0.33	0.51
11,109.00	1.99	141.61	11,101.87	51.12	242.91	51.12	1.70	-1.41	21.21
11,204.00	1.97	137.04	11,196.81	48.63	245.04	48.63	0.17	-0.02	-4.81
11,298.00	1.80	136.41	11,290.76	46.38	247.16	46.38	0.18	-0.18	-0.67
11,392.00	1.59	125.00	11,384.72	44.56	249.25	44.56	0.42	-0.22	-12.14
11,486.00	1.52	116.14	11,478.68	43.27	251.43	43.27	0.27	-0.07	-9.43
11,581.00	1.69	101.44	11,573.65	42.43	253.94	42.43	0.47	0.18	-15.47
11,675.00	1.94	92.73	11,667.60	42.08	256.89	42.08	0.40	0.27	-9.27
11,769.00	1.66	85.30	11,761.55	42.12	259.83	42.12	0.39	-0.30	-7.90
11,864.00	1.69	83.13	11,856.51	42.40	262.60	42.40	0.07	0.03	-2.28
11,958.00	2.43	79.12	11,950.45	42.94	265.93	42.94	0.80	0.79	-4.27
12,053.00	2.51	84.28	12,045.36	43.53	269.98	43.53	0.25	0.08	5.43
12,148.00	1.90	68.73	12,140.29	44.31	273.51	44.31	0.89	-0.64	-16.37
12,242.00	3.18	73.56	12,234.20	45.61	277.47	45.61	1.38	1.36	5.14
12,335.00	3.31	65.10	12,327.05	47.47	282.38	47.47	0.53	0.14	-9.10
12,429.00	3.48	52.84	12,420.89	50.34	287.11	50.34	0.79	0.18	-13.04
12,523.00	3.42	64.99	12,514.72	53.25	291.93	53.25	0.78	-0.06	12.93
12,618.00	2.73	81.61	12,609.58	54.77	296.73	54.77	1.18	-0.73	17.49
12,712.00	1.57	109.24	12,703.52	54.68	300.16	54.68	1.62	-1.23	29.39
12,807.00	2.64	87.01	12,798.45	54.36	303.58	54.36	1.40	1.13	-23.40
12,901.00	2.20	74.02	12,892.37	54.97	307.47	54.97	0.75	-0.47	-13.82
12,996.00	0.82	43.10	12,987.34	55.97	309.69	55.97	1.64	-1.45	-32.55
13,091.00	1.53	61.19	13,082.32	57.08	311.27	57.08	0.83	0.75	19.04
13,185.00	2.02	69.98	13,176.27	58.25	313.92	58.25	0.59	0.52	9.35
13,276.00	2.60	70.22	13,267.20	59.50	317.37	59.50	0.64	0.64	0.26
13,370.00	2.38	73.56	13,361.11	60.77	321.25	60.77	0.28	-0.23	3.55
13,465.00	2.54	74.66	13,456.02	61.89	325.17	61.89	0.18	0.17	1.16
13,560.00	3.19	73.74	13,550.90	63.18	329.74	63.18	0.69	0.68	-0.97
13,655.00	2.60	76.13	13,645.78	64.44	334.37	64.44	0.63	-0.62	2.52
13,750.00	2.52	73.48	13,740.68	65.55	338.46	65.55	0.15	-0.08	-2.79
13,844.00	2.95	73.01	13,834.58	66.84	342.76	66.84	0.46	0.46	-0.50
13,938.00	3.45	80.23	13,928.43	68.03	347.86	68.03	0.68	0.53	7.68
14,032.00	4.11	80.25	14,022.23	69.08	353.97	69.08	0.70	0.70	0.02
14,116.00	4.23	77.04	14,106.00	70.29	359.95	70.29	0.31	0.14	-3.82
14,199.00	3.98	78.48	14,188.79	71.55	365.76	71.55	0.33	-0.30	1.73

Survey Report

Company:	Delaware Energy, LLC	Local Co-ordinate Reference:	Well 1
Project:	Lea County, NM (NAD83)	TVD Reference:	RKB @ 3153.00usft (Patterson 241)
Site:	Chapman SWD	MD Reference:	RKB @ 3153.00usft (Patterson 241)
Well:	1	North Reference:	Grid
Wellbore:	OH / 63872	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Patterson 241)	Database:	USA Compass

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)
Final Phoenix MWD Survey - OH									
14,276.00	3.98	78.49	14,265.60	72.61	370.99	72.61	0.00	0.00	0.01
Projection to TD - OH									

Survey Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
1,236.00	1,235.91	5.70	8.94	Tie In - OH
1,295.00	1,294.91	6.17	9.50	First Phoenix MWD Survey - OH
14,189.00	14,188.79	71.55	365.76	Final Phoenix MWD Survey - OH
14,276.00	14,265.60	72.61	370.99	Projection to TD - OH