PDC Energy Inc. DJ Basin

Well Name: **Fern 11V-214**

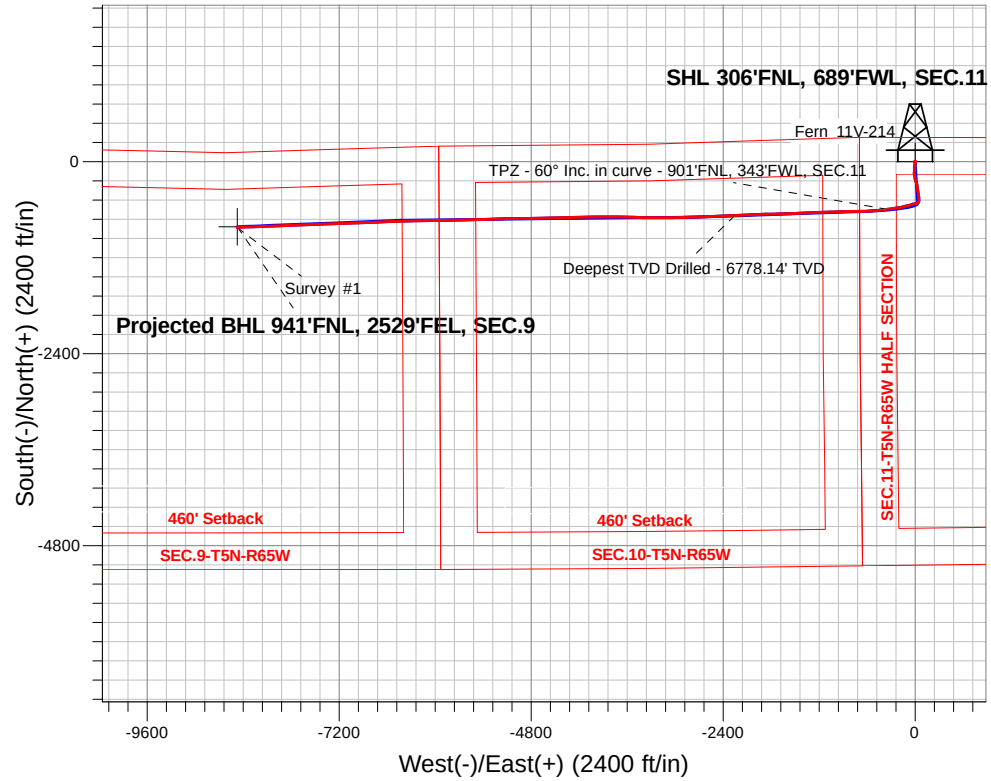
Surface Location: Fern 5N65W11EJ Pad Sec.11-T5N-R65W
North American Datum 1983 , US State Plane 1983, Colorado Northern Zone
Ground Elevation: 4619.0

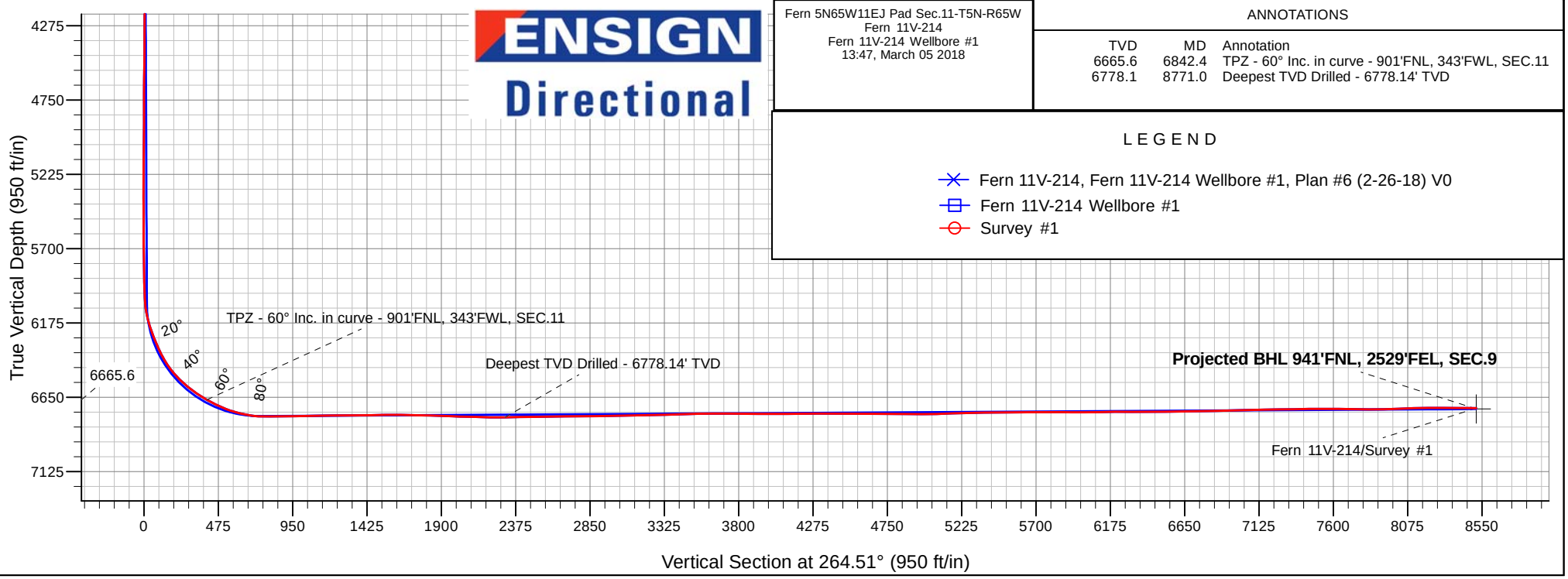
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	397183.99	3240103.79	40.420467	-104.637626	

Original Well Elev WELL @ 4642.0ft (Original Well Elev)

FINAL SURVEY

Projected Bottom Hole Location
14,996'MD 6720'TVD 823'S & 8473'W of SHL
89.3 degree Incl @ 266.10 degree AZM





Fern 5N65W11EJ Pad Sec.11-T5N-R65W
Fern 11V-214
Fern 11V-214 Wellbore #1
13:47, March 05 2018

ANNOTATIONS

TVD	MD	Annotation
6665.6	6842.4	TPZ - 60° Inc. in curve - 901'FNL, 343'FWL, SEC.11
6778.1	8771.0	Deepest TVD Drilled - 6778.14' TVD

L E G E N D

- Fern 11V-214, Fern 11V-214 Wellbore #1, Plan #6 (2-26-18) V0
- Fern 11V-214 Wellbore #1
- Survey #1

ENSIGN Directional

PDC Energy Inc. DJ Basin

SEC.11-T5N-R65W
Fern 5N65W11EJ Pad Sec.11-T5N-R65W
Fern 11V-214

Fern 11V-214 Wellbore #1

Survey: Survey #1

Standard Survey Report

05 March, 2018

PDC ENERGY
Growing E&P Value

Ensign Energy Services Inc.

Survey Report

Company:	PDC Energy Inc. DJ Basin	**Local Co-ordinate Reference:**	Well Fern 11V-214
Project:	SEC.11-T5N-R65W	**TVD Reference:**	WELL @ 4642.0ft (Original Well Elev)
Site:	Fern 5N65W11EJ Pad Sec.11-T5N-R65W	**MD Reference:**	WELL @ 4642.0ft (Original Well Elev)
Well:	Fern 11V-214	**North Reference:**	True
Wellbore:	Fern 11V-214 Wellbore #1	**Survey Calculation Method:**	Minimum Curvature
Design:	Fern 11V-214 Wellbore #1	**Database:**	US_EDM

Project SEC.11-T5N-R65W, Weld County, CO

Map System:	US State Plane 1983	**System Datum:**	Mean Sea Level
Geo Datum:	North American Datum 1983		Using Well Reference Point
Map Zone:	Colorado Northern Zone		Using geodetic scale factor

Site Fern 5N65W11EJ Pad Sec.11-T5N-R65W

Site Position:		**Northing:**	1,397,139.19 usft	**Latitude:**	40.420344
From:	Lat/Long	**Easting:**	3,240,103.68 usft	**Longitude:**	-104.637628
Position Uncertainty:	0.0 ft	**Slot Radius:**	13-3/16 "	**Grid Convergence:**	0.56 °

Well Fern 11V-214

Well Position	**+N/-S**	0.0 ft	**Northing:**	1,397,183.99 usft	**Latitude:**	40.420467
	+E/-W	0.0 ft	**Easting:**	3,240,103.80 usft	**Longitude:**	-104.637626
Position Uncertainty		0.0 ft	**Wellhead Elevation:**	0.0 ft	**Ground Level:**	4,619.0 ft

Wellbore Fern 11V-214 Wellbore #1

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	2/26/2018	7.89	66.85	52,451

Design Fern 11V-214 Wellbore #1

Audit Notes:

Version:	1.0	**Phase:**	ACTUAL	**Tie On Depth:**	0.0

Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.0	0.0	0.0	264.51

Survey Program **Date** 3/5/2018

From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
153.0	14,996.0	Survey #1 (Fern 11V-214 Wellbore #1)	MWD	MWD - Standard

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
1.0	0.01	289.10	1.0	0.0	0.0	0.0	0.52	0.52	0.00
SHL 306'FNL, 689'FWL, SEC.11									
153.0	0.80	289.10	153.0	0.3	-1.0	1.0	0.52	0.52	0.00
248.0	0.70	281.10	248.0	0.7	-2.2	2.1	0.15	-0.11	-8.42
344.0	0.90	288.30	344.0	1.0	-3.5	3.4	0.23	0.21	7.50
439.0	0.40	288.30	439.0	1.4	-4.5	4.4	0.53	-0.53	0.00
534.0	0.60	313.70	534.0	1.8	-5.2	5.0	0.31	0.21	26.74
629.0	0.40	304.80	629.0	2.3	-5.8	5.6	0.23	-0.21	-9.37
725.0	0.70	70.80	725.0	2.7	-5.5	5.3	1.03	0.31	131.25
820.0	0.70	61.20	820.0	3.2	-4.5	4.2	0.12	0.00	-10.11

Company:	PDC Energy Inc. DJ Basin	**Local Co-ordinate Reference:**	Well Fern 11V-214
Project:	SEC.11-T5N-R65W	**TVD Reference:**	WELL @ 4642.0ft (Original Well Elev)
Site:	Fern 5N65W11EJ Pad Sec.11-T5N-R65W	**MD Reference:**	WELL @ 4642.0ft (Original Well Elev)
Well:	Fern 11V-214	**North Reference:**	True
Wellbore:	Fern 11V-214 Wellbore #1	**Survey Calculation Method:**	Minimum Curvature
Design:	Fern 11V-214 Wellbore #1	**Database:**	US_EDM

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
916.0	0.70	74.30	915.9	3.6	-3.4	3.0	0.17	0.00	13.65
1,011.0	1.10	86.30	1,010.9	3.9	-1.9	1.6	0.46	0.42	12.63
1,106.0	1.00	81.00	1,105.9	4.0	-0.2	-0.2	0.15	-0.11	-5.58
1,202.0	0.80	77.50	1,201.9	4.3	1.3	-1.7	0.22	-0.21	-3.65
1,297.0	0.90	79.60	1,296.9	4.6	2.6	-3.1	0.11	0.11	2.21
1,392.0	1.00	162.20	1,391.9	3.9	3.6	-4.0	1.32	0.11	86.95
1,488.0	2.20	186.30	1,487.8	1.3	3.7	-3.8	1.41	1.25	25.10
1,583.0	3.00	183.50	1,582.8	-3.0	3.3	-3.0	0.85	0.84	-2.95
1,678.0	3.20	186.70	1,677.6	-8.1	2.9	-2.1	0.28	0.21	3.37
1,774.0	5.60	194.60	1,773.3	-15.3	1.4	0.1	2.57	2.50	8.23
1,869.0	7.80	190.40	1,867.7	-26.1	-0.9	3.4	2.37	2.32	-4.42
1,964.0	8.20	189.10	1,961.7	-39.1	-3.2	6.9	0.46	0.42	-1.37
2,060.0	7.70	187.20	2,056.8	-52.3	-5.1	10.1	0.59	-0.52	-1.98
2,155.0	7.90	185.80	2,150.9	-65.1	-6.5	12.7	0.29	0.21	-1.47
2,250.0	7.60	185.30	2,245.1	-77.8	-7.8	15.2	0.32	-0.32	-0.53
2,346.0	7.10	184.20	2,340.3	-90.1	-8.8	17.4	0.54	-0.52	-1.15
2,441.0	7.20	179.30	2,434.5	-101.9	-9.1	18.9	0.65	0.11	-5.16
2,536.0	7.20	182.60	2,528.8	-113.8	-9.3	20.2	0.44	0.00	3.47
2,631.0	7.00	180.00	2,623.1	-125.5	-9.6	21.6	0.40	-0.21	-2.74
2,727.0	6.90	181.90	2,718.4	-137.1	-9.8	22.9	0.26	-0.10	1.98
2,822.0	7.30	179.10	2,812.6	-148.9	-9.9	24.1	0.56	0.42	-2.95
2,918.0	6.80	176.30	2,907.9	-160.6	-9.4	24.8	0.63	-0.52	-2.92
3,014.0	7.00	171.00	3,003.2	-172.1	-8.2	24.6	0.69	0.21	-5.52
3,204.0	6.90	169.60	3,191.8	-194.8	-4.3	22.9	0.10	-0.05	-0.74
3,300.0	6.50	169.30	3,287.2	-205.8	-2.2	21.9	0.42	-0.42	-0.31
3,395.0	5.80	166.80	3,381.6	-215.7	-0.1	20.8	0.79	-0.74	-2.63
3,490.0	5.40	162.90	3,476.2	-224.7	2.3	19.2	0.58	-0.42	-4.11
3,586.0	5.20	164.30	3,571.8	-233.2	4.8	17.5	0.25	-0.21	1.46
3,681.0	8.20	159.20	3,666.1	-243.7	8.3	15.0	3.22	3.16	-5.37
3,777.0	8.10	159.60	3,761.1	-256.4	13.1	11.4	0.12	-0.10	0.42
3,872.0	8.00	161.90	3,855.2	-269.0	17.5	8.3	0.35	-0.11	2.42
3,968.0	7.10	163.30	3,950.4	-281.0	21.3	5.7	0.96	-0.94	1.46
4,063.0	7.40	174.00	4,044.6	-292.7	23.6	4.5	1.45	0.32	11.26
4,158.0	7.60	173.50	4,138.8	-305.0	25.0	4.3	0.22	0.21	-0.53
4,349.0	7.20	172.40	4,328.2	-329.4	28.0	3.6	0.22	-0.21	-0.58
4,445.0	7.00	169.60	4,423.5	-341.2	29.8	2.9	0.42	-0.21	-2.92
4,541.0	6.70	170.80	4,518.8	-352.4	31.8	2.1	0.35	-0.31	1.25
4,636.0	5.90	170.80	4,613.2	-362.7	33.5	1.4	0.84	-0.84	0.00
4,732.0	5.70	171.70	4,708.7	-372.3	34.9	0.8	0.23	-0.21	0.94
4,828.0	6.00	171.20	4,804.2	-382.0	36.4	0.3	0.32	0.31	-0.52
4,923.0	5.50	174.00	4,898.7	-391.4	37.6	0.0	0.60	-0.53	2.95
5,019.0	5.60	170.10	4,994.3	-400.6	38.9	-0.4	0.41	0.10	-4.06
5,114.0	5.10	163.60	5,088.9	-409.2	40.9	-1.6	0.83	-0.53	-6.84

Company:	PDC Energy Inc. DJ Basin	**Local Co-ordinate Reference:**	Well Fern 11V-214
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Site:	Fern 5N65W11EJ Pad Sec.11-T5N-R65W	**MD Reference:**	WELL @ 4642.0ft (Original Well Elev)
Well:	Fern 11V-214	**North Reference:**	True
Wellbore:	Fern 11V-214 Wellbore #1	**Survey Calculation Method:**	Minimum Curvature
Design:	Fern 11V-214 Wellbore #1	**Database:**	US_EDM

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
5,210.0	5.60	170.80	5,184.5	-417.9	42.9	-2.7	0.87	0.52	7.50
5,305.0	6.40	172.60	5,278.9	-427.8	44.3	-3.2	0.86	0.84	1.89
5,401.0	6.80	179.80	5,374.3	-438.8	45.0	-2.8	0.96	0.42	7.50
5,496.0	6.10	177.20	5,468.7	-449.4	45.3	-2.1	0.80	-0.74	-2.74
5,592.0	5.30	169.30	5,564.2	-458.9	46.3	-2.2	1.17	-0.83	-8.23
5,688.0	6.00	179.50	5,659.8	-468.3	47.2	-2.2	1.27	0.73	10.63
5,812.0	4.90	182.60	5,783.2	-480.0	47.0	-0.9	0.92	-0.89	2.50
5,906.0	7.10	187.70	5,876.7	-489.8	46.1	1.0	2.41	2.34	5.43
6,002.0	5.50	190.40	5,972.1	-500.2	44.4	3.6	1.69	-1.67	2.81
6,097.0	9.00	212.00	6,066.3	-511.0	39.7	9.4	4.61	3.68	22.74
6,192.0	16.10	252.10	6,159.2	-521.4	23.1	26.8	11.42	7.47	42.21
6,288.0	20.60	261.40	6,250.3	-528.0	-6.2	56.7	5.58	4.69	9.69
6,383.0	24.70	255.60	6,337.9	-535.4	-42.0	93.0	4.91	4.32	-6.11
6,479.0	31.60	255.00	6,422.5	-546.9	-85.8	137.7	7.19	7.19	-0.63
6,574.0	41.00	254.90	6,499.0	-561.5	-140.0	193.1	9.89	9.89	-0.11
6,670.0	49.20	260.80	6,566.8	-575.6	-206.5	260.5	9.58	8.54	6.15
6,766.0	55.90	262.20	6,625.1	-586.8	-281.8	336.6	7.07	6.98	1.46
6,842.4	60.00	262.93	6,665.6	-595.2	-346.0	401.3	5.43	5.37	0.96
TPZ - 60° Inc. in curve - 901'FNL, 343'FWL, SEC.11									
6,861.0	61.00	263.10	6,674.8	-597.1	-362.1	417.5	5.43	5.37	0.91
6,957.0	67.10	263.50	6,716.8	-607.2	-447.7	503.8	6.37	6.35	0.42
7,053.0	75.20	265.80	6,747.8	-615.6	-538.1	594.5	8.74	8.44	2.40
7,148.0	81.30	268.20	6,767.1	-620.4	-631.0	687.4	6.88	6.42	2.53
7,203.7	87.22	269.44	6,772.7	-621.6	-686.3	742.6	10.86	10.63	2.22
LPL 932'FNL, 0'FEL, SEC.10									
7,243.0	91.40	270.30	6,773.1	-621.7	-725.6	781.7	10.86	10.63	2.20
7,339.0	90.70	269.50	6,771.4	-621.8	-821.6	877.3	1.11	-0.73	-0.83
7,435.0	90.70	268.60	6,770.2	-623.4	-917.6	973.0	0.94	0.00	-0.94
7,530.0	90.90	268.00	6,768.9	-626.3	-1,012.5	1,067.8	0.67	0.21	-0.63
7,625.0	90.80	267.50	6,767.5	-630.0	-1,107.5	1,162.6	0.54	-0.11	-0.53
7,720.0	90.70	267.50	6,766.2	-634.1	-1,202.4	1,257.5	0.11	-0.11	0.00
7,816.0	90.60	267.30	6,765.1	-638.5	-1,298.2	1,353.4	0.23	-0.10	-0.21
7,911.0	90.70	267.30	6,764.1	-643.0	-1,393.1	1,448.2	0.11	0.11	0.00
8,007.0	91.00	267.00	6,762.6	-647.7	-1,489.0	1,544.1	0.44	0.31	-0.31
8,103.0	89.10	268.40	6,762.6	-651.6	-1,584.9	1,640.0	2.46	-1.98	1.46
8,198.0	88.70	268.90	6,764.4	-653.8	-1,679.9	1,734.7	0.67	-0.42	0.53
8,294.0	88.60	269.30	6,766.6	-655.3	-1,775.8	1,830.4	0.43	-0.10	0.42
8,388.0	87.70	269.30	6,769.7	-656.5	-1,869.8	1,924.0	0.96	-0.96	0.00
8,484.0	88.80	268.00	6,772.6	-658.7	-1,965.7	2,019.7	1.77	1.15	-1.35
8,580.0	88.50	267.70	6,774.9	-662.3	-2,061.6	2,115.5	0.44	-0.31	-0.31
8,676.0	88.30	267.00	6,777.6	-666.8	-2,157.5	2,211.3	0.76	-0.21	-0.73
8,771.0	91.00	266.80	6,778.1	-671.9	-2,252.3	2,306.3	2.85	2.84	-0.21
Deepest TVD Drilled - 6778.14' TVD									
8,867.0	91.30	266.30	6,776.2	-677.7	-2,348.1	2,402.2	0.61	0.31	-0.52

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Site:	Fern 5N65W11EJ Pad Sec.11-T5N-R65W	**MD Reference:**	WELL @ 4642.0ft (Original Well Elev)
Well:	Fern 11V-214	**North Reference:**	True
Wellbore:	Fern 11V-214 Wellbore #1	**Survey Calculation Method:**	Minimum Curvature
Design:	Fern 11V-214 Wellbore #1	**Database:**	US_EDM

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
8,963.0	90.70	267.70	6,774.5	-682.7	-2,444.0	2,498.1	1.59	-0.63	1.46
9,058.0	90.80	266.80	6,773.3	-687.3	-2,538.9	2,592.9	0.95	0.11	-0.95
9,154.0	90.80	269.10	6,772.0	-690.7	-2,634.8	2,688.8	2.40	0.00	2.40
9,161.3	90.78	269.08	6,771.9	-690.8	-2,642.1	2,696.1	0.38	-0.32	-0.21
WP#1 (Fern 11V-214)									
9,249.0	90.50	268.90	6,770.9	-692.4	-2,729.8	2,783.5	0.38	-0.32	-0.21
9,345.0	90.40	268.40	6,770.1	-694.6	-2,825.7	2,879.2	0.53	-0.10	-0.52
9,440.0	90.70	268.40	6,769.2	-697.3	-2,920.7	2,974.0	0.32	0.32	0.00
9,535.0	91.30	268.20	6,767.5	-700.1	-3,015.6	3,068.8	0.67	0.63	-0.21
9,630.0	91.10	270.20	6,765.6	-701.4	-3,110.6	3,163.4	2.12	-0.21	2.11
9,726.0	91.20	270.00	6,763.6	-701.2	-3,206.6	3,258.9	0.23	0.10	-0.21
9,821.0	92.00	269.60	6,761.0	-701.6	-3,301.5	3,353.5	0.94	0.84	-0.42
9,917.0	92.00	271.90	6,757.6	-700.3	-3,397.5	3,448.9	2.39	0.00	2.40
10,012.0	91.00	271.90	6,755.1	-697.2	-3,492.4	3,543.0	1.05	-1.05	0.00
10,108.0	90.70	271.40	6,753.7	-694.4	-3,588.3	3,638.3	0.61	-0.31	-0.52
10,203.0	89.30	271.00	6,753.7	-692.4	-3,683.3	3,732.6	1.53	-1.47	-0.42
10,298.0	89.50	270.70	6,754.7	-691.0	-3,778.3	3,827.1	0.38	0.21	-0.32
10,394.0	89.50	270.20	6,755.6	-690.3	-3,874.3	3,922.5	0.52	0.00	-0.52
10,489.0	89.90	269.60	6,756.0	-690.4	-3,969.3	4,017.1	0.76	0.42	-0.63
10,584.0	90.50	269.10	6,755.7	-691.5	-4,064.3	4,111.8	0.82	0.63	-0.53
10,679.0	90.30	268.60	6,755.1	-693.4	-4,159.3	4,206.5	0.57	-0.21	-0.53
10,775.0	90.40	268.60	6,754.5	-695.8	-4,255.2	4,302.3	0.10	0.10	0.00
10,870.0	90.10	268.60	6,754.1	-698.1	-4,350.2	4,397.0	0.32	-0.32	0.00
10,966.0	89.60	268.00	6,754.3	-700.9	-4,446.2	4,492.8	0.81	-0.52	-0.63
11,061.0	89.40	267.50	6,755.1	-704.7	-4,541.1	4,587.6	0.57	-0.21	-0.53
11,157.0	89.80	269.60	6,755.8	-707.1	-4,637.0	4,683.4	2.23	0.42	2.19
11,253.0	89.90	269.60	6,756.1	-707.8	-4,733.0	4,779.0	0.10	0.10	0.00
11,348.0	89.60	269.50	6,756.5	-708.5	-4,828.0	4,873.7	0.33	-0.32	-0.11
11,443.0	89.10	268.70	6,757.5	-710.0	-4,923.0	4,968.3	0.99	-0.53	-0.84
11,539.0	92.20	269.10	6,756.5	-711.8	-5,019.0	5,064.0	3.26	3.23	0.42
11,634.0	92.00	268.90	6,753.0	-713.5	-5,113.9	5,158.7	0.30	-0.21	-0.21
11,730.0	91.50	268.20	6,750.0	-715.9	-5,209.8	5,254.4	0.90	-0.52	-0.73
11,825.0	91.00	267.50	6,748.0	-719.5	-5,304.7	5,349.2	0.91	-0.53	-0.74
11,919.0	90.40	267.00	6,746.8	-724.0	-5,398.6	5,443.1	0.83	-0.64	-0.53
12,015.0	90.50	269.30	6,746.1	-727.1	-5,494.6	5,538.9	2.40	0.10	2.40
12,110.0	90.70	269.30	6,745.1	-728.2	-5,589.5	5,633.6	0.21	0.21	0.00
12,205.0	90.20	269.10	6,744.3	-729.6	-5,684.5	5,728.2	0.57	-0.53	-0.21
12,301.0	90.00	269.10	6,744.2	-731.1	-5,780.5	5,823.9	0.21	-0.21	0.00
12,396.0	88.90	268.20	6,745.1	-733.3	-5,875.5	5,918.7	1.50	-1.16	-0.95
12,492.0	90.50	269.30	6,745.6	-735.4	-5,971.5	6,014.4	2.02	1.67	1.15
12,587.0	91.20	269.60	6,744.2	-736.3	-6,066.4	6,109.1	0.80	0.74	0.32
12,682.0	90.50	268.90	6,742.8	-737.6	-6,161.4	6,203.7	1.04	-0.74	-0.74
12,778.0	90.00	268.60	6,742.3	-739.7	-6,257.4	6,299.5	0.61	-0.52	-0.31

Company:	PDC Energy Inc. DJ Basin	**Local Co-ordinate Reference:**	Well Fern 11V-214
Project:	SEC.11-T5N-R65W	**TVD Reference:**	WELL @ 4642.0ft (Original Well Elev)
Site:	Fern 5N65W11EJ Pad Sec.11-T5N-R65W	**MD Reference:**	WELL @ 4642.0ft (Original Well Elev)
Well:	Fern 11V-214	**North Reference:**	True
Wellbore:	Fern 11V-214 Wellbore #1	**Survey Calculation Method:**	Minimum Curvature
Design:	Fern 11V-214 Wellbore #1	**Database:**	US_EDM

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
12,873.0	89.10	268.20	6,743.1	-742.3	-6,352.4	6,394.2	1.04	-0.95	-0.42
12,898.4	89.44	268.07	6,743.4	-743.1	-6,377.8	6,419.6	1.45	1.35	-0.52
WP#2 (Fern 11V-214)									
12,969.0	90.40	267.70	6,743.5	-745.8	-6,448.3	6,490.1	1.45	1.35	-0.52
13,065.0	91.50	268.00	6,741.9	-749.4	-6,544.2	6,585.9	1.19	1.15	0.31
13,161.0	91.20	268.20	6,739.7	-752.5	-6,640.1	6,681.7	0.38	-0.31	0.21
13,256.0	90.70	266.30	6,738.1	-757.1	-6,735.0	6,776.5	2.07	-0.53	-2.00
13,352.0	91.50	268.70	6,736.2	-761.3	-6,830.9	6,872.4	2.63	0.83	2.50
13,447.0	91.50	268.90	6,733.7	-763.3	-6,925.8	6,967.1	0.21	0.00	0.21
13,543.0	91.10	268.40	6,731.6	-765.5	-7,021.8	7,062.8	0.67	-0.42	-0.52
13,639.0	91.10	267.90	6,729.7	-768.6	-7,117.7	7,158.6	0.52	0.00	-0.52
13,734.0	91.30	267.50	6,727.7	-772.4	-7,212.6	7,253.4	0.47	0.21	-0.42
13,830.0	90.70	267.20	6,726.1	-776.9	-7,308.5	7,349.3	0.70	-0.63	-0.31
13,925.0	90.60	266.50	6,725.0	-782.1	-7,403.3	7,444.2	0.74	-0.11	-0.74
14,021.0	89.90	268.40	6,724.6	-786.4	-7,499.2	7,540.1	2.11	-0.73	1.98
14,116.0	89.60	268.60	6,725.0	-788.9	-7,594.2	7,634.8	0.38	-0.32	0.21
14,212.0	89.30	268.40	6,725.9	-791.4	-7,690.2	7,730.6	0.38	-0.31	-0.21
14,308.0	88.90	267.50	6,727.4	-794.8	-7,786.1	7,826.4	1.03	-0.42	-0.94
14,403.0	91.60	268.00	6,727.0	-798.5	-7,881.0	7,921.3	2.89	2.84	0.53
14,499.0	92.20	267.50	6,723.8	-802.3	-7,976.9	8,017.1	0.81	0.63	-0.52
14,594.0	92.30	266.60	6,720.1	-807.2	-8,071.7	8,111.9	0.95	0.11	-0.95
14,690.0	90.00	268.90	6,718.2	-810.9	-8,167.6	8,207.7	3.39	-2.40	2.40
14,786.0	89.90	268.70	6,718.2	-813.0	-8,263.6	8,303.4	0.23	-0.10	-0.21
14,881.0	89.70	267.70	6,718.6	-815.9	-8,358.5	8,398.2	1.07	-0.21	-1.05
14,938.0	89.30	266.10	6,719.1	-819.0	-8,415.4	8,455.2	2.89	-0.70	-2.81
14,996.0	89.30	266.10	6,719.8	-823.0	-8,473.3	8,513.2	0.00	0.00	0.00
BHL 932'FNL, 2530'FEL, SEC.9									

Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude
SHL 306'FNL, 689'FWL, - survey hits target center - Point	0.00	0.00	1.0	0.0	0.0	1,397,184.00	3,240,103.80	40.420467	-104.637626
BHL 932'FNL, 2530'FEL - survey misses target center by 10.4ft at 14996.0ft MD (6719.8 TVD, -823.0 N, -8473.3 E) - Point	0.00	0.00	6,725.0	-814.0	-8,474.1	1,396,287.61	3,231,638.38	40.418229	-104.668060

Company:	PDC Energy Inc. DJ Basin	**Local Co-ordinate Reference:**	Well Fern 11V-214
Project:	SEC.11-T5N-R65W	**TVD Reference:**	WELL @ 4642.0ft (Original Well Elev)
Site:	Fern 5N65W11EJ Pad Sec.11-T5N-R65W	**MD Reference:**	WELL @ 4642.0ft (Original Well Elev)
Well:	Fern 11V-214	**North Reference:**	True
Wellbore:	Fern 11V-214 Wellbore #1	**Survey Calculation Method:**	Minimum Curvature
Design:	Fern 11V-214 Wellbore #1	**Database:**	US_EDM

Survey Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates +N/-S (ft)	Local Coordinates +E/-W (ft)	Comment
6,842.4	6,665.6	-595.2	-346.0	TPZ - 60° Inc. in curve - 901'FNL, 343'FWL, SEC.11
8,771.0	6,778.1	-671.9	-2,252.3	Deepest TVD Drilled - 6778.14' TVD

Checked By: _____ Approved By: _____ Date: _____