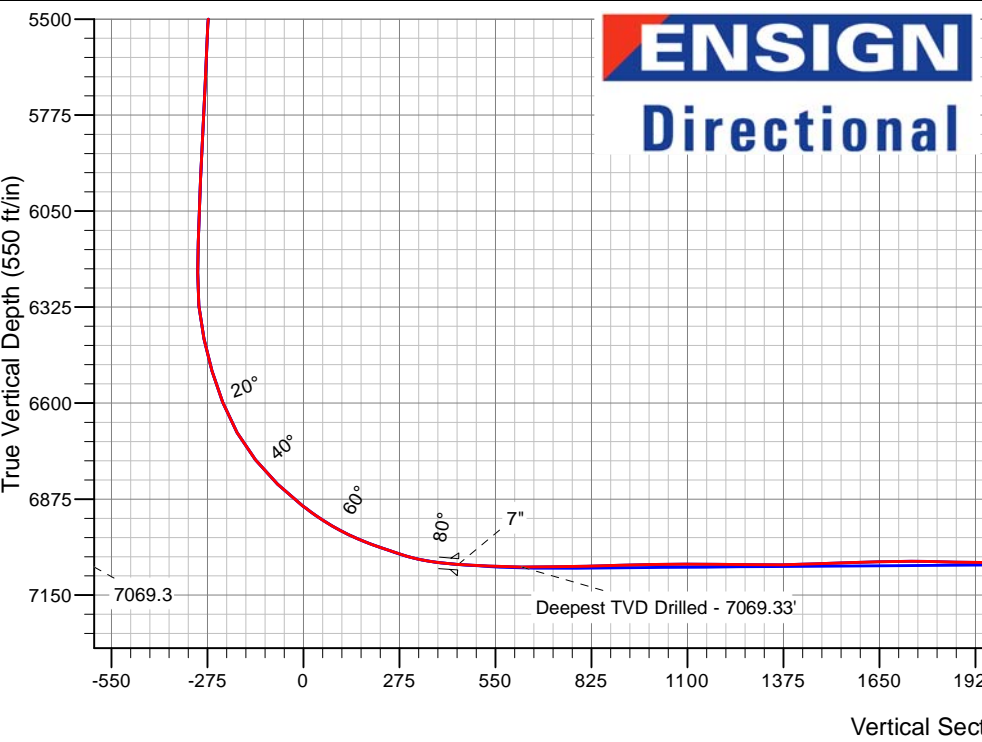
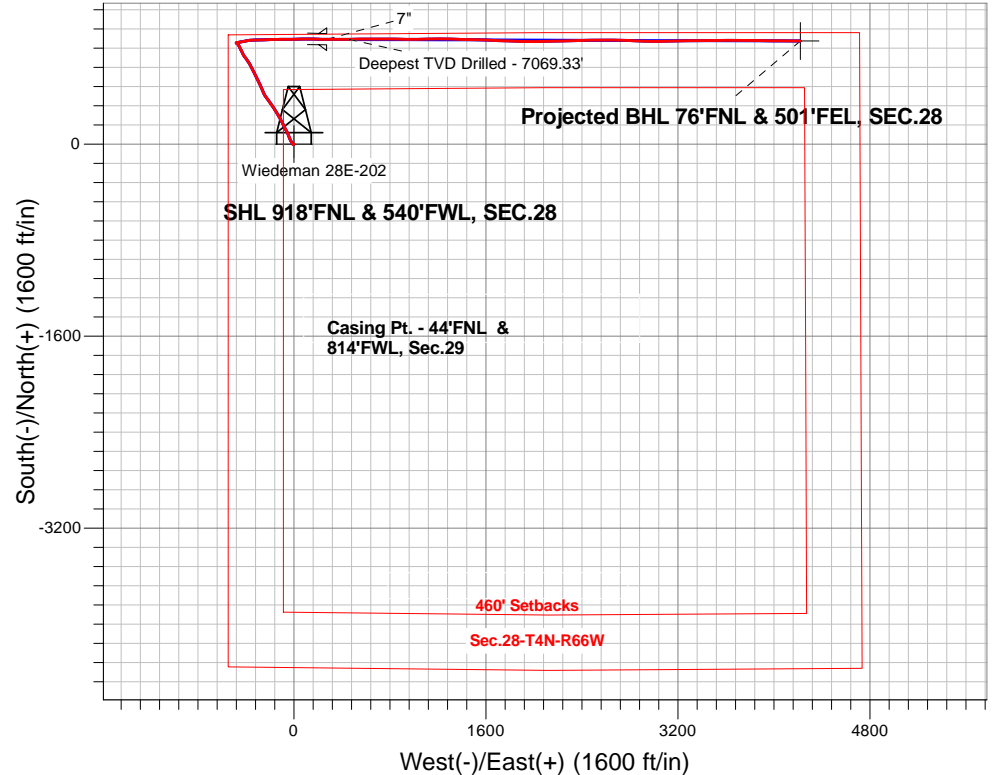


PETROLEUM DEVELOPMENT CORP DJ Basin

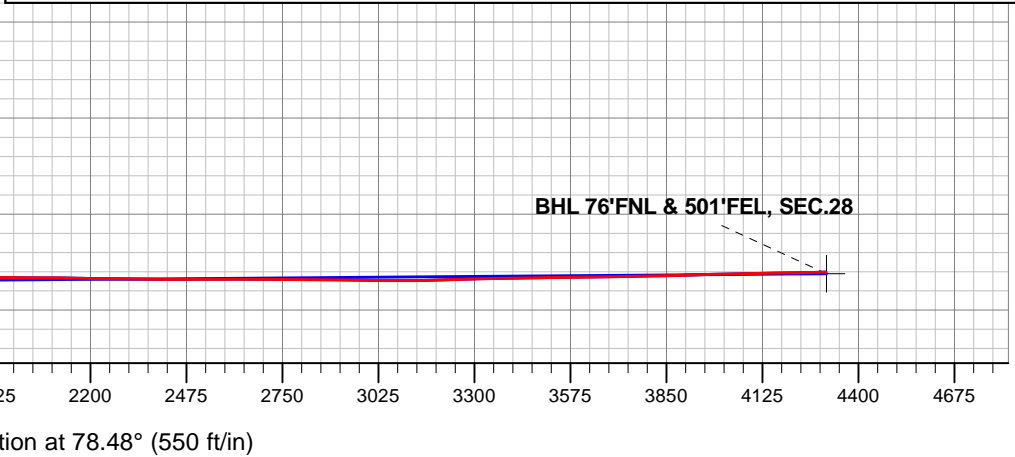
Well Name: **Wiedeman 28E-202**
Surface Location: Wiedeman 4N66W28F - East Pad Sec.28-T4N-R66W
North American Datum 1983 , US State Plane 1983, Colorado Northern Zone
Ground Elevation: 4762.0
+N/-S+E/-W Northing Easting Latitude Longitude Slot
0.0 0.01348308.53 3198077.24 40.287330 -104.789970
Ensign Rig #134 RKB - 13'WELL @ 4775.0ft (Ensign Rig #134 RKB - 13')

FINAL SURVEY

Projected Bottom Hole Location
11526'MD 7041'TVD 859'N & 4220'E of SHL
91.0 degree Incl @ 90.7 degree AZM



Wiedeman 4N66W28F - East Pad Sec.28-T4N-R66W Wiedeman 28E-202 Wellbore #1 5:29, October 26 2015	ANNOTATIONS		
	TVD	MD	Annotation
	7069.3	7764.0	Deepest TVD Drilled - 7069.33'
LEGEND			
Wiedeman 28E-202, Wellbore #1, Plan #4 (10-21-15) V0			
Wellbore #1			
Survey #1			





PETROLEUM DEVELOPMENT CORP DJ Basin

SEC.28-T4N-R66W

Wiedeman 4N66W28F - East Pad Sec.28-T4N-R66W

Wiedeman 28E-202

Wellbore #1

Survey: Survey #1

Standard Survey Report

26 October, 2015

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Wiedeman 28E-202
Project:	SEC.28-T4N-R66W	TVD Reference:	WELL @ 4775.0ft (Ensign Rig #134 RKB - 13')
Site:	Wiedeman 4N66W28F - East Pad Sec.28-T4N-R66W	MD Reference:	WELL @ 4775.0ft (Ensign Rig #134 RKB - 13')
Well:	Wiedeman 28E-202	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	US_EDM

Project	SEC.28-T4N-R66W, Weld County, Colorado		
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		Wiedeman 4N66W28F - East Pad Sec.28-T4N-R66W			
Site Position:		Northing:	1,348,308.56 usft	Latitude:	40.287330
From:	Lat/Long	Easting:	3,198,077.24 usft	Longitude:	-104.789970
Position Uncertainty:	0.0 ft	Slot Radius:	13-3/16 "	Grid Convergence:	0.46 °

Well	Wiedeman 28E-202					
Well Position	+N/-S	0.0 ft	Northing:	1,348,308.53 usft	Latitude:	40.287330
	+E/-W	0.0 ft	Easting:	3,198,077.24 usft	Longitude:	-104.789970
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,762.0 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	10/20/2015	8.28	66.80	52,612

Design	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	78.48	

Survey Program	Date	10/26/2015			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
106.0	11,526.0	Survey #1 (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	0.00	232.80	1.0	0.0	0.0	0.0	0.38	0.38	0.00	
SHL 918'FNL & 540'FWL, SEC.28										
106.0	0.40	232.80	106.0	-0.2	-0.3	-0.3	0.38	0.38	0.00	
167.0	0.40	225.20	167.0	-0.5	-0.6	-0.7	0.09	0.00	-12.46	
259.0	0.40	269.00	259.0	-0.7	-1.2	-1.3	0.32	0.00	47.61	
351.0	0.40	263.50	351.0	-0.8	-1.8	-1.9	0.04	0.00	-5.98	
444.0	0.70	252.60	444.0	-1.0	-2.7	-2.8	0.34	0.32	-11.72	
536.0	0.90	235.20	536.0	-1.6	-3.8	-4.0	0.34	0.22	-18.91	
629.0	1.30	223.80	629.0	-2.7	-5.1	-5.6	0.49	0.43	-12.26	

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Wiedeman 28E-202
Project:	SEC.28-T4N-R66W	TVD Reference:	WELL @ 4775.0ft (Ensign Rig #134 RKB - 13')
Site:	Wiedeman 4N66W28F - East Pad Sec.28-T4N-R66W	MD Reference:	WELL @ 4775.0ft (Ensign Rig #134 RKB - 13')
Well:	Wiedeman 28E-202	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	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)	
721.0	0.20	193.70	721.0	-3.7	-5.9	-6.5	1.23	-1.20	-32.72	
813.0	1.60	334.00	812.9	-2.7	-6.5	-6.9	1.91	1.52	152.50	
857.0	1.90	331.20	856.9	-1.5	-7.1	-7.3	0.71	0.68	-6.36	
923.0	2.60	321.00	922.9	0.7	-8.6	-8.3	1.22	1.06	-15.45	
1,016.0	2.60	319.40	1,015.8	3.9	-11.3	-10.3	0.08	0.00	-1.72	
1,108.0	4.60	335.90	1,107.6	8.9	-14.1	-12.1	2.43	2.17	17.93	
1,200.0	4.40	330.80	1,199.3	15.3	-17.4	-14.0	0.49	-0.22	-5.54	
1,292.0	6.20	332.10	1,290.9	22.8	-21.4	-16.4	1.96	1.96	1.41	
1,385.0	5.80	324.90	1,383.4	31.1	-26.5	-19.7	0.92	-0.43	-7.74	
1,477.0	6.10	330.70	1,474.9	39.1	-31.5	-23.1	0.73	0.33	6.30	
1,570.0	8.70	340.30	1,567.1	50.1	-36.3	-25.6	3.09	2.80	10.32	
1,662.0	8.60	336.50	1,658.1	62.9	-41.4	-28.0	0.63	-0.11	-4.13	
1,755.0	9.10	342.30	1,750.0	76.3	-46.4	-30.3	1.10	0.54	6.24	
1,847.0	10.90	338.10	1,840.6	91.3	-51.9	-32.6	2.11	1.96	-4.57	
1,942.0	10.00	328.20	1,934.0	106.6	-59.6	-37.1	2.11	-0.95	-10.42	
2,038.0	11.10	331.60	2,028.4	121.9	-68.4	-42.7	1.32	1.15	3.54	
2,133.0	12.80	332.10	2,121.3	139.2	-77.6	-48.3	1.79	1.79	0.53	
2,228.0	12.70	333.00	2,214.0	157.8	-87.3	-54.0	0.23	-0.11	0.95	
2,324.0	13.20	335.90	2,307.5	177.2	-96.6	-59.2	0.85	0.52	3.02	
2,419.0	14.70	334.50	2,399.7	198.0	-106.2	-64.5	1.62	1.58	-1.47	
2,514.0	13.50	330.00	2,491.9	218.5	-116.9	-70.9	1.71	-1.26	-4.74	
2,610.0	13.60	327.90	2,585.2	237.8	-128.5	-78.5	0.52	0.10	-2.19	
2,705.0	15.70	329.40	2,677.1	258.3	-141.0	-86.6	2.25	2.21	1.58	
2,800.0	16.40	328.90	2,768.4	280.8	-154.5	-95.3	0.75	0.74	-0.53	
2,895.0	15.10	326.60	2,859.8	302.6	-168.2	-104.4	1.52	-1.37	-2.42	
2,990.0	14.00	322.10	2,951.8	322.0	-182.1	-114.1	1.66	-1.16	-4.74	
3,086.0	13.50	324.50	3,045.0	340.3	-195.7	-123.8	0.79	-0.52	2.50	
3,181.0	12.80	326.60	3,137.6	358.1	-208.0	-132.3	0.89	-0.74	2.21	
3,276.0	10.50	323.30	3,230.6	373.9	-218.9	-139.9	2.52	-2.42	-3.47	
3,371.0	10.90	323.10	3,323.9	388.0	-229.5	-147.4	0.42	0.42	-0.21	
3,467.0	10.20	328.20	3,418.3	402.5	-239.4	-154.2	1.21	-0.73	5.31	
3,562.0	9.80	332.30	3,511.9	416.8	-247.6	-159.4	0.86	-0.42	4.32	
3,657.0	9.60	338.80	3,605.5	431.3	-254.2	-163.0	1.17	-0.21	6.84	
3,752.0	11.00	336.50	3,699.0	447.0	-260.7	-166.2	1.54	1.47	-2.42	
3,847.0	12.70	335.60	3,792.0	464.8	-268.6	-170.4	1.80	1.79	-0.95	
3,943.0	12.60	334.00	3,885.6	483.9	-277.6	-175.4	0.38	-0.10	-1.67	
4,038.0	13.80	337.70	3,978.1	503.7	-286.4	-180.1	1.54	1.26	3.89	
4,133.0	11.90	334.20	4,070.7	523.0	-295.0	-184.6	2.16	-2.00	-3.68	
4,228.0	13.00	333.70	4,163.5	541.4	-304.0	-189.8	1.16	1.16	-0.53	
4,323.0	13.40	336.00	4,256.0	561.0	-313.2	-194.9	0.69	0.42	2.42	
4,418.0	11.60	330.80	4,348.7	579.4	-322.3	-200.2	2.23	-1.89	-5.47	
4,514.0	13.00	333.50	4,442.5	597.5	-331.9	-205.9	1.58	1.46	2.81	

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Wiedeman 28E-202
Project:	SEC.28-T4N-R66W	TVD Reference:	WELL @ 4775.0ft (Ensign Rig #134 RKB - 13')
Site:	Wiedeman 4N66W28F - East Pad Sec.28-T4N-R66W	MD Reference:	WELL @ 4775.0ft (Ensign Rig #134 RKB - 13')
Well:	Wiedeman 28E-202	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	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)
4,609.0	12.40	331.60	4,535.2	616.0	-341.5	-211.6	0.77	-0.63	-2.00
4,704.0	12.30	333.30	4,628.0	634.0	-350.9	-217.2	0.40	-0.11	1.79
4,799.0	10.90	331.70	4,721.1	651.0	-359.7	-222.5	1.51	-1.47	-1.68
4,895.0	12.40	329.10	4,815.1	667.8	-369.3	-228.5	1.66	1.56	-2.71
4,990.0	13.60	328.00	4,907.7	686.0	-380.5	-235.8	1.29	1.26	-1.16
5,085.0	12.10	326.60	5,000.3	703.8	-391.9	-243.4	1.61	-1.58	-1.47
5,181.0	9.90	322.80	5,094.5	718.8	-402.4	-250.7	2.41	-2.29	-3.96
5,276.0	9.80	321.70	5,188.1	731.7	-412.3	-257.9	0.22	-0.11	-1.16
5,371.0	10.50	329.60	5,281.6	745.5	-421.7	-264.4	1.64	0.74	8.32
5,466.0	9.60	339.10	5,375.2	760.3	-428.9	-268.5	1.98	-0.95	10.00
5,562.0	9.60	333.30	5,469.8	775.0	-435.4	-271.9	1.01	0.00	-6.04
5,657.0	10.70	333.50	5,563.3	789.9	-442.9	-276.2	1.16	1.16	0.21
5,752.0	10.40	333.70	5,656.7	805.5	-450.6	-280.7	0.32	-0.32	0.21
5,848.0	8.00	328.90	5,751.5	819.0	-457.9	-285.1	2.62	-2.50	-5.00
5,943.0	6.30	324.30	5,845.7	828.9	-464.4	-289.5	1.89	-1.79	-4.84
6,038.0	4.80	314.30	5,940.3	835.9	-470.2	-293.9	1.87	-1.58	-10.53
6,134.0	3.90	307.30	6,036.0	840.7	-475.7	-298.3	1.09	-0.94	-7.29
6,229.0	1.60	298.00	6,130.9	843.3	-479.5	-301.4	2.46	-2.42	-9.79
6,324.0	1.10	288.10	6,225.9	844.2	-481.5	-303.2	0.58	-0.53	-10.42
6,419.0	5.20	75.40	6,320.8	845.6	-478.2	-299.7	6.48	4.32	155.05
6,515.0	12.10	81.10	6,415.6	848.2	-464.0	-285.3	7.23	7.19	5.94
6,610.0	15.70	77.70	6,507.8	852.5	-441.6	-262.5	3.88	3.79	-3.58
6,705.0	21.80	77.40	6,597.7	859.1	-411.8	-232.0	6.42	6.42	-0.32
6,801.0	29.50	82.30	6,684.2	866.1	-370.9	-190.5	8.31	8.02	5.10
6,896.0	38.90	91.80	6,762.8	868.4	-317.8	-138.0	11.35	9.89	10.00
6,991.0	46.70	86.90	6,832.4	869.3	-253.3	-74.7	8.92	8.21	-5.16
7,087.0	52.80	87.60	6,894.4	872.8	-180.2	-2.3	6.38	6.35	0.73
7,181.0	58.80	89.50	6,947.3	874.7	-102.5	74.2	6.60	6.38	2.02
7,276.0	68.20	89.90	6,989.6	875.1	-17.6	157.5	9.90	9.89	0.42
7,371.0	71.80	89.30	7,022.1	875.8	71.7	245.1	3.84	3.79	-0.63
7,412.0	72.10	89.30	7,034.8	876.2	110.7	283.4	0.73	0.73	0.00
7,466.0	78.60	91.10	7,048.4	876.0	162.9	334.5	12.46	12.04	3.33
7,535.0	84.60	91.30	7,058.5	874.6	231.1	401.1	8.70	8.70	0.29
7,578.0	85.75	90.72	7,062.1	873.9	273.9	442.9	3.00	2.69	-1.35
7"									
7,669.0	88.20	89.50	7,066.9	873.7	364.8	531.9	3.00	2.69	-1.34
7,764.0	88.90	89.50	7,069.3	874.5	459.7	625.1	0.74	0.74	0.00
Deepest TVD Drilled - 7069.33'									
7,859.0	91.40	89.50	7,069.1	875.3	554.7	718.4	2.63	2.63	0.00
7,954.0	91.10	89.00	7,067.0	876.6	649.7	811.7	0.61	-0.32	-0.53
8,049.0	91.80	91.10	7,064.6	876.5	744.7	904.7	2.33	0.74	2.21
8,145.0	91.00	90.50	7,062.3	875.2	840.6	998.5	1.04	-0.83	-0.63
8,239.0	90.00	90.00	7,061.4	874.8	934.6	1,090.5	1.19	-1.06	-0.53

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Wiedeman 28E-202
Project:	SEC.28-T4N-R66W	TVD Reference:	WELL @ 4775.0ft (Ensign Rig #134 RKB - 13')
Site:	Wiedeman 4N66W28F - East Pad Sec.28-T4N-R66W	MD Reference:	WELL @ 4775.0ft (Ensign Rig #134 RKB - 13')
Well:	Wiedeman 28E-202	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	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)
8,334.0	89.80	89.80	7,061.6	874.9	1,029.6	1,183.6	0.30	-0.21	-0.21
8,430.0	88.80	89.10	7,062.8	875.8	1,125.6	1,277.8	1.27	-1.04	-0.73
8,525.0	90.80	89.80	7,063.1	876.7	1,220.6	1,371.1	2.23	2.11	0.74
8,620.0	92.20	92.00	7,060.6	875.3	1,315.5	1,463.8	2.74	1.47	2.32
8,715.0	91.70	91.10	7,057.4	872.7	1,410.5	1,556.3	1.08	-0.53	-0.95
8,810.0	91.60	91.20	7,054.7	870.8	1,505.4	1,649.0	0.15	-0.11	0.11
8,905.0	90.30	92.30	7,053.1	867.9	1,600.3	1,741.4	1.79	-1.37	1.16
9,001.0	88.50	92.50	7,054.1	863.9	1,696.2	1,834.6	1.89	-1.88	0.21
9,096.0	88.40	92.30	7,056.7	859.9	1,791.1	1,926.8	0.24	-0.11	-0.21
9,191.0	90.60	91.20	7,057.5	857.0	1,886.1	2,019.2	2.59	2.32	-1.16
9,286.0	88.80	89.80	7,058.0	856.2	1,981.1	2,112.1	2.40	-1.89	-1.47
9,381.0	89.10	89.50	7,059.7	856.7	2,076.0	2,205.3	0.45	0.32	-0.32
9,476.0	89.60	88.30	7,060.8	858.6	2,171.0	2,298.7	1.37	0.53	-1.26
9,572.0	89.60	89.10	7,061.5	860.7	2,267.0	2,393.2	0.83	0.00	0.83
9,667.0	89.80	88.40	7,062.0	862.8	2,362.0	2,486.7	0.77	0.21	-0.74
9,762.0	90.30	87.90	7,061.9	865.9	2,456.9	2,580.3	0.74	0.53	-0.53
9,857.0	90.00	88.80	7,061.6	868.6	2,551.9	2,673.9	1.00	-0.32	0.95
9,952.0	89.90	91.40	7,061.7	868.4	2,646.9	2,767.0	2.74	-0.11	2.74
10,047.0	88.80	92.50	7,062.8	865.2	2,741.8	2,859.3	1.64	-1.16	1.16
10,142.0	89.30	92.50	7,064.4	861.1	2,836.7	2,951.5	0.53	0.53	0.00
10,238.0	89.00	91.10	7,065.8	858.1	2,932.6	3,044.9	1.49	-0.31	-1.46
10,333.0	91.50	89.70	7,065.4	857.4	3,027.6	3,137.9	3.02	2.63	-1.47
10,428.0	91.50	88.60	7,062.9	858.8	3,122.6	3,231.2	1.16	0.00	-1.16
10,523.0	91.30	88.30	7,060.6	861.4	3,217.5	3,324.7	0.38	-0.21	-0.32
10,618.0	91.30	89.80	7,058.4	862.9	3,312.5	3,418.1	1.58	0.00	1.58
10,713.0	90.70	90.00	7,056.8	863.1	3,407.5	3,511.2	0.67	-0.63	0.21
10,809.0	91.00	89.80	7,055.3	863.3	3,503.4	3,605.3	0.38	0.31	-0.21
10,904.0	90.70	89.30	7,053.9	864.0	3,598.4	3,698.5	0.61	-0.32	-0.53
10,999.0	90.40	88.80	7,053.0	865.6	3,693.4	3,791.9	0.61	-0.32	-0.53
11,094.0	92.50	90.70	7,050.6	866.0	3,788.4	3,885.0	2.98	2.21	2.00
11,189.0	91.20	91.40	7,047.5	864.3	3,883.3	3,977.7	1.55	-1.37	0.74
11,284.0	90.90	91.20	7,045.8	862.1	3,978.3	4,070.3	0.38	-0.32	-0.21
11,379.0	91.20	90.40	7,044.1	860.8	4,073.2	4,163.1	0.90	0.32	-0.84
11,468.0	91.00	90.70	7,042.3	859.9	4,162.2	4,250.1	0.41	-0.22	0.34
11,526.0	91.00	90.70	7,041.3	859.2	4,220.2	4,306.8	0.00	0.00	0.00
BHL 75°FNL & 500°FEL, SEC.28									

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Wiedeman 28E-202
Project:	SEC.28-T4N-R66W	TVD Reference:	WELL @ 4775.0ft (Ensign Rig #134 RKB - 13')
Site:	Wiedeman 4N66W28F - East Pad Sec.28-T4N-R66W	MD Reference:	WELL @ 4775.0ft (Ensign Rig #134 RKB - 13')
Well:	Wiedeman 28E-202	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	US_EDM

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 918'FNL & 540'FWI - survey hits target center - Point	0.00	0.00	1.0	0.0	0.0	1,348,308.56	3,198,077.24	40.287330	-104.789970
BHL 75'FNL & 500'FEL, - survey misses target center by 4.8ft at 11526.0ft MD (7041.3 TVD, 859.2 N, 4220.2 E) - Point	0.00	0.00	7,046.0	860.1	4,220.9	1,349,202.41	3,202,290.94	40.289690	-104.774840

Casing Points					
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")	
7,578.0	7,062.1	7"	7	8-3/4	

Survey Annotations					
Measured Depth (ft)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Comment	
7,764.0	7,069.3	874.5	459.7	Deepest TVD Drilled - 7069.33'	

Checked By: _____	Approved By: _____	Date: _____
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