

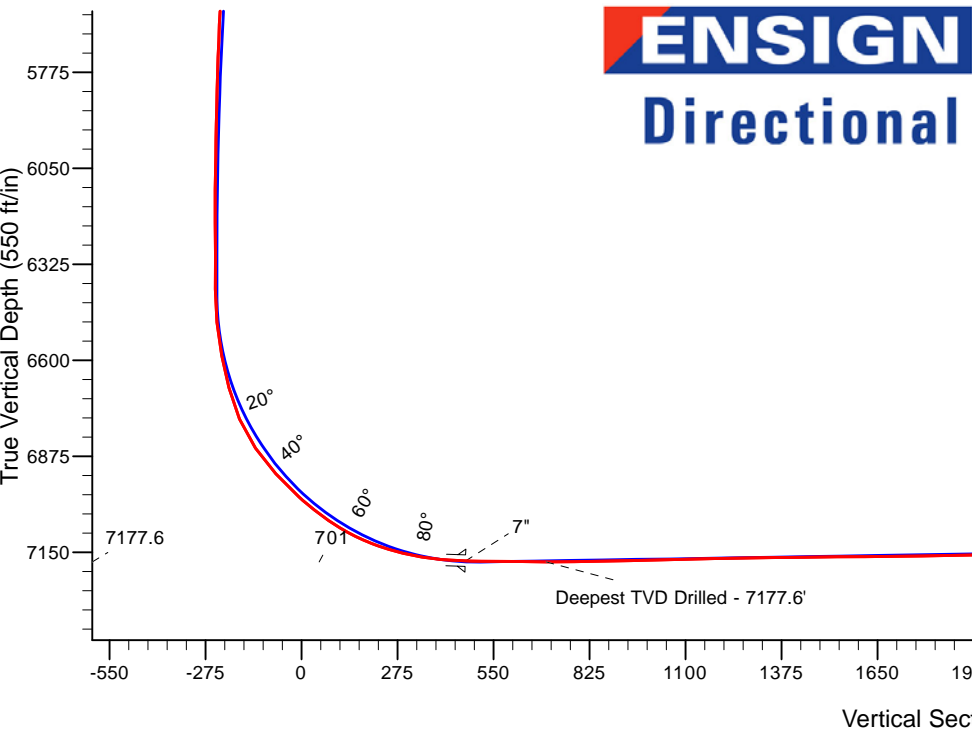
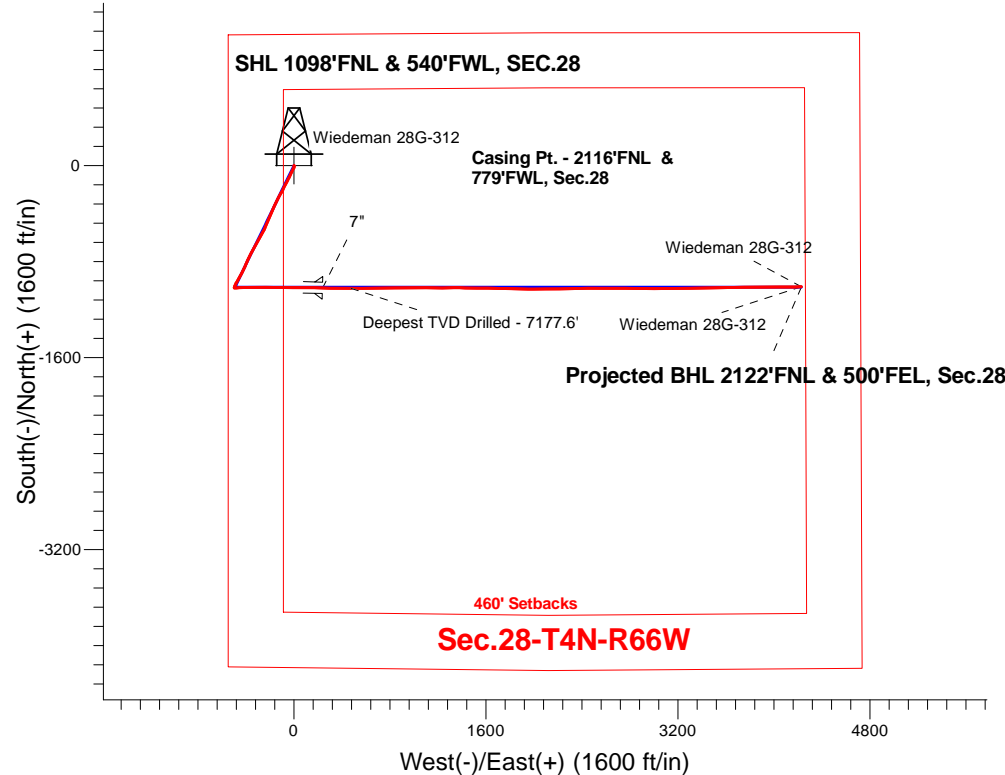
PETROLEUM DEVELOPMENT CORP DJ Basin

Well Name: **Wiedeman 28G-312**

Surface Location: Wiedeman 4N66W28F - East Pad Sec.28-T4N-R66W
North American Datum 1983 , US State Plane 1983, Colorado Northern Zone
Ground Elevation: 4761.0
+N/-S+E/-W Northing Easting Latitude Longitude Slot
0.0 0.0 348130.05 3198078.67 40.286840 -104.789970
Ensign Rig #134 RKB - 13' WELL @ 4774.0ft (Ensign Rig #134 RKB - 13')

FINAL SURVEY

Projected Bottom Hole Location
11709'MD 7119'TVD 1009'S & 4230'E of SHL
90.3 degree Incl @ 88.8 degree AZM



Wiedeman 4N66W28F - East Pad Sec.28-T4N-R66W Wiedeman 28G-312 Wellbore #1 14:59, November 16 2015	ANNOTATIONS		
	TVD	MD	Annotation
	7177.6	7954.0	Deepest TVD Drilled - 7177.6'
LEGEND			
+ Wiedeman 28G-312, Wellbore #1, Plan #1 (11-6-15) R V0			
□ Wellbore #1			
○ Survey #1			

Projected BHL 2122'FNL & 500'FEL, Sec.28

Wiedeman 28G-312
Wiedeman 28G-312



Directional

PETROLEUM DEVELOPMENT CORP DJ Basin

SEC.28-T4N-R66W

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

Wiedeman 28G-312

Wellbore #1

Survey: Survey #1

Standard Survey Report

16 November, 2015

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Wiedeman 28G-312
Project:	SEC.28-T4N-R66W	TVD Reference:	WELL @ 4774.0ft (Ensign Rig #134 RKB - 13')
Site:	Wiedeman 4N66W28F - East Pad Sec.28-T4N-R66W	MD Reference:	WELL @ 4774.0ft (Ensign Rig #134 RKB - 13')
Well:	Wiedeman 28G-312	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 28G-312					
Well Position	+N/-S	0.0 ft	Northing:	1,348,130.05 usft	Latitude:	40.286840
	+E/-W	0.0 ft	Easting:	3,198,078.67 usft	Longitude:	-104.789970
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,761.0 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	11/6/2015	8.28	66.80	52,607

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	103.46	

Survey Program	Date	11/16/2015			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
104.0	11,709.0	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	
104.0	0.70	131.30	104.0	-0.4	0.5	0.6	0.67	0.67	0.00	
166.0	1.10	131.30	166.0	-1.1	1.2	1.4	0.65	0.65	0.00	
258.0	1.10	132.20	258.0	-2.2	2.5	3.0	0.02	0.00	0.98	
350.0	0.90	119.20	350.0	-3.2	3.8	4.4	0.33	-0.22	-14.13	
443.0	1.40	183.50	442.9	-4.7	4.4	5.3	1.39	0.54	69.14	
535.0	2.80	195.30	534.9	-8.0	3.7	5.5	1.58	1.52	12.83	
628.0	3.90	206.20	627.7	-13.0	1.7	4.7	1.36	1.18	11.72	
720.0	6.20	210.10	719.4	-20.1	-2.2	2.6	2.53	2.50	4.24	
812.0	7.90	206.20	810.7	-30.1	-7.4	-0.2	1.92	1.85	-4.24	

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Wiedeman 28G-312
Project:	SEC.28-T4N-R66W	TVD Reference:	WELL @ 4774.0ft (Ensign Rig #134 RKB - 13')
Site:	Wiedeman 4N66W28F - East Pad Sec.28-T4N-R66W	MD Reference:	WELL @ 4774.0ft (Ensign Rig #134 RKB - 13')
Well:	Wiedeman 28G-312	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)
905.0	7.40	206.00	902.8	-41.2	-12.9	-2.9	0.54	-0.54	-0.22
1,016.0	6.50	202.70	1,013.0	-53.4	-18.4	-5.5	0.89	-0.81	-2.97
1,108.0	8.70	203.70	1,104.2	-64.6	-23.2	-7.6	2.40	2.39	1.09
1,200.0	9.80	207.60	1,195.0	-77.9	-29.7	-10.7	1.38	1.20	4.24
1,293.0	10.90	205.30	1,286.5	-92.9	-37.1	-14.5	1.26	1.18	-2.47
1,385.0	12.80	209.50	1,376.5	-109.6	-45.8	-19.1	2.27	2.07	4.57
1,478.0	12.40	207.40	1,467.3	-127.4	-55.5	-24.3	0.65	-0.43	-2.26
1,570.0	14.30	208.30	1,556.8	-146.2	-65.4	-29.6	2.08	2.07	0.98
1,662.0	12.60	204.10	1,646.3	-165.4	-74.9	-34.4	2.13	-1.85	-4.57
1,755.0	13.20	208.80	1,736.9	-183.9	-84.2	-39.0	1.30	0.65	5.05
1,848.0	12.20	203.90	1,827.7	-202.2	-93.3	-43.6	1.58	-1.08	-5.27
1,943.0	13.30	210.30	1,920.3	-220.8	-102.9	-48.6	1.88	1.16	6.74
2,038.0	12.60	204.60	2,012.9	-239.7	-112.7	-53.8	1.53	-0.74	-6.00
2,133.0	12.60	212.70	2,105.6	-257.8	-122.6	-59.2	1.86	0.00	8.53
2,229.0	11.80	208.30	2,199.5	-275.3	-132.9	-65.2	1.28	-0.83	-4.58
2,324.0	11.90	212.00	2,292.4	-292.2	-142.7	-70.8	0.81	0.11	3.89
2,419.0	10.90	205.20	2,385.6	-308.6	-151.7	-75.7	1.76	-1.05	-7.16
2,515.0	13.00	206.00	2,479.5	-326.5	-160.3	-79.9	2.19	2.19	0.83
2,610.0	12.80	202.30	2,572.1	-345.8	-169.0	-83.8	0.89	-0.21	-3.89
2,705.0	13.10	202.00	2,664.7	-365.6	-177.0	-87.1	0.32	0.32	-0.32
2,800.0	12.80	200.90	2,757.2	-385.4	-184.8	-90.0	0.41	-0.32	-1.16
2,896.0	12.20	199.90	2,851.0	-404.8	-192.1	-92.5	0.66	-0.63	-1.04
2,991.0	14.40	205.30	2,943.4	-425.0	-200.5	-96.1	2.66	2.32	5.68
3,086.0	13.60	205.00	3,035.6	-445.8	-210.3	-100.7	0.85	-0.84	-0.32
3,181.0	12.00	205.30	3,128.2	-464.8	-219.2	-105.0	1.69	-1.68	0.32
3,276.0	12.40	203.90	3,221.1	-483.1	-227.6	-108.9	0.52	0.42	-1.47
3,372.0	10.70	199.70	3,315.1	-500.9	-234.8	-111.7	1.97	-1.77	-4.38
3,467.0	11.70	200.80	3,408.3	-518.2	-241.2	-113.9	1.08	1.05	1.16
3,562.0	12.20	205.30	3,501.3	-536.3	-248.9	-117.2	1.11	0.53	4.74
3,658.0	12.20	210.40	3,595.1	-554.2	-258.3	-122.2	1.12	0.00	5.31
3,753.0	12.80	210.60	3,687.9	-571.9	-268.8	-128.3	0.63	0.63	0.21
3,848.0	12.60	209.50	3,780.5	-590.0	-279.2	-134.2	0.33	-0.21	-1.16
3,943.0	14.50	210.60	3,872.9	-609.3	-290.4	-140.6	2.02	2.00	1.16
4,038.0	14.30	208.50	3,964.9	-629.8	-302.0	-147.1	0.59	-0.21	-2.21
4,133.0	13.10	206.40	4,057.2	-649.8	-312.4	-152.6	1.37	-1.26	-2.21
4,229.0	13.20	211.00	4,150.7	-668.9	-322.9	-158.3	1.09	0.10	4.79
4,324.0	12.20	208.50	4,243.4	-687.0	-333.3	-164.2	1.20	-1.05	-2.63
4,419.0	13.70	209.50	4,335.9	-705.6	-343.6	-169.9	1.60	1.58	1.05
4,514.0	12.60	208.50	4,428.4	-724.5	-354.1	-175.7	1.18	-1.16	-1.05
4,609.0	15.00	207.10	4,520.7	-744.6	-364.6	-181.3	2.55	2.53	-1.47
4,705.0	13.60	205.00	4,613.7	-765.9	-375.1	-186.5	1.55	-1.46	-2.19
4,800.0	11.70	204.80	4,706.4	-784.7	-383.8	-190.6	2.00	-2.00	-0.21

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Wiedeman 28G-312
Project:	SEC.28-T4N-R66W	TVD Reference:	WELL @ 4774.0ft (Ensign Rig #134 RKB - 13')
Site:	Wiedeman 4N66W28F - East Pad Sec.28-T4N-R66W	MD Reference:	WELL @ 4774.0ft (Ensign Rig #134 RKB - 13')
Well:	Wiedeman 28G-312	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)
4,895.0	12.80	203.60	4,799.2	-803.1	-392.1	-194.4	1.19	1.16	-1.26
4,991.0	12.70	203.60	4,892.9	-822.5	-400.6	-198.1	0.10	-0.10	0.00
5,086.0	11.50	203.40	4,985.8	-840.8	-408.5	-201.6	1.26	-1.26	-0.21
5,181.0	12.10	201.30	5,078.8	-858.8	-415.9	-204.6	0.78	0.63	-2.21
5,276.0	12.60	209.20	5,171.6	-877.1	-424.6	-208.7	1.85	0.53	8.32
5,371.0	14.00	209.50	5,264.0	-896.1	-435.3	-214.7	1.48	1.47	0.32
5,467.0	12.10	209.70	5,357.5	-915.0	-446.0	-220.7	1.98	-1.98	0.21
5,562.0	13.10	208.70	5,450.2	-933.1	-456.1	-226.4	1.08	1.05	-1.05
5,657.0	10.70	207.30	5,543.2	-950.4	-465.3	-231.3	2.54	-2.53	-1.47
5,753.0	8.80	209.50	5,637.8	-964.7	-473.0	-235.5	2.02	-1.98	2.29
5,848.0	6.90	213.50	5,731.9	-975.8	-479.7	-239.4	2.08	-2.00	4.21
5,943.0	7.40	203.20	5,826.2	-986.1	-485.3	-242.4	1.45	0.53	-10.84
6,039.0	5.50	206.70	5,921.6	-995.9	-489.8	-244.5	2.02	-1.98	3.65
6,134.0	4.50	204.10	6,016.2	-1,003.4	-493.4	-246.2	1.08	-1.05	-2.74
6,229.0	4.10	206.20	6,110.9	-1,009.9	-496.4	-247.7	0.45	-0.42	2.21
6,324.0	3.80	176.70	6,205.7	-1,016.0	-497.7	-247.5	2.14	-0.32	-31.05
6,420.0	0.20	346.50	6,301.7	-1,019.1	-497.6	-246.7	4.16	-3.75	176.88
6,515.0	0.40	221.50	6,396.7	-1,019.1	-497.8	-246.9	0.57	0.21	-131.58
6,610.0	5.90	82.30	6,491.5	-1,018.7	-493.2	-242.5	6.54	5.79	-146.53
6,706.0	10.90	89.70	6,586.4	-1,018.0	-479.2	-229.1	5.32	5.21	7.71
6,801.0	15.30	86.00	6,678.9	-1,017.1	-457.7	-208.4	4.71	4.63	-3.89
6,896.0	23.90	89.00	6,768.4	-1,015.9	-425.9	-177.7	9.11	9.05	3.16
6,992.0	35.00	89.10	6,851.8	-1,015.1	-378.8	-132.1	11.56	11.56	0.10
7,087.0	43.30	89.00	6,925.4	-1,014.1	-318.9	-74.1	8.74	8.74	-0.11
7,182.0	48.70	89.30	6,991.4	-1,013.1	-250.6	-7.9	5.69	5.68	0.32
7,277.0	54.50	90.90	7,050.4	-1,013.3	-176.2	64.6	6.25	6.11	1.68
7,371.0	63.20	91.40	7,099.0	-1,014.9	-95.8	143.1	9.27	9.26	0.53
7,466.0	71.90	90.90	7,135.2	-1,016.7	-8.1	228.8	9.17	9.16	-0.53
7,561.0	79.20	89.10	7,158.9	-1,016.6	83.8	318.2	7.90	7.68	-1.89
7,675.0	86.60	91.60	7,173.0	-1,017.4	196.9	428.3	6.85	6.49	2.19
7,717.0	87.97	91.41	7,175.0	-1,018.5	238.8	469.3	3.29	3.26	-0.45
7"									
7,764.0	89.50	91.20	7,176.0	-1,019.5	285.8	515.2	3.29	3.26	-0.45
7,859.0	89.50	90.70	7,176.8	-1,021.1	380.7	608.0	0.53	0.00	-0.53
7,954.0	89.60	90.20	7,177.6	-1,021.9	475.7	700.5	0.54	0.11	-0.53
Deepest TVD Drilled - 7177.6'									
8,049.0	90.70	89.70	7,177.3	-1,021.8	570.7	792.9	1.27	1.16	-0.53
8,145.0	91.40	89.70	7,175.6	-1,021.3	666.7	886.1	0.73	0.73	0.00
8,240.0	91.40	88.40	7,173.3	-1,019.7	761.7	978.1	1.37	0.00	-1.37
8,335.0	91.40	89.80	7,170.9	-1,018.2	856.6	1,070.1	1.47	0.00	1.47
8,430.0	91.20	89.00	7,168.8	-1,017.2	951.6	1,162.2	0.87	-0.21	-0.84
8,525.0	90.90	90.50	7,167.0	-1,016.8	1,046.6	1,254.5	1.61	-0.32	1.58
8,620.0	90.70	90.40	7,165.7	-1,017.5	1,141.6	1,347.1	0.24	-0.21	-0.11

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Site:	Wiedeman 4N66W28F - East Pad Sec.28-T4N-R66W	MD Reference:	WELL @ 4774.0ft (Ensign Rig #134 RKB - 13')
Well:	Wiedeman 28G-312	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)	
8,716.0	90.80	90.00	7,164.5	-1,017.9	1,237.6	1,440.5	0.43	0.10	-0.42	
8,811.0	90.60	89.50	7,163.3	-1,017.5	1,332.6	1,532.8	0.57	-0.21	-0.53	
8,906.0	90.70	91.20	7,162.2	-1,018.0	1,427.5	1,625.3	1.79	0.11	1.79	
9,001.0	90.00	90.50	7,161.6	-1,019.4	1,522.5	1,718.0	1.04	-0.74	-0.74	
9,096.0	91.50	91.20	7,160.4	-1,020.9	1,617.5	1,810.7	1.74	1.58	0.74	
9,191.0	90.80	90.90	7,158.5	-1,022.6	1,712.5	1,903.5	0.80	-0.74	-0.32	
9,286.0	91.50	91.40	7,156.6	-1,024.5	1,807.4	1,996.3	0.91	0.74	0.53	
9,382.0	91.00	91.20	7,154.5	-1,026.7	1,903.4	2,090.1	0.56	-0.52	-0.21	
9,477.0	91.10	89.80	7,152.7	-1,027.5	1,998.4	2,182.7	1.48	0.11	-1.47	
9,572.0	91.00	89.50	7,151.0	-1,026.9	2,093.3	2,274.9	0.33	-0.11	-0.32	
9,667.0	90.70	89.30	7,149.6	-1,025.9	2,188.3	2,367.0	0.38	-0.32	-0.21	
9,762.0	90.80	88.60	7,148.3	-1,024.2	2,283.3	2,459.0	0.74	0.11	-0.74	
9,857.0	91.10	89.80	7,146.8	-1,022.9	2,378.3	2,551.1	1.30	0.32	1.26	
9,953.0	91.20	89.00	7,144.8	-1,021.9	2,474.3	2,644.2	0.84	0.10	-0.83	
10,048.0	91.50	90.20	7,142.6	-1,021.2	2,569.2	2,736.4	1.30	0.32	1.26	
10,143.0	91.20	90.00	7,140.4	-1,021.4	2,664.2	2,828.8	0.38	-0.32	-0.21	
10,238.0	90.90	90.40	7,138.6	-1,021.7	2,759.2	2,921.2	0.53	-0.32	0.42	
10,333.0	90.50	91.10	7,137.5	-1,022.9	2,854.2	3,013.9	0.85	-0.42	0.74	
10,428.0	90.40	90.40	7,136.7	-1,024.2	2,949.2	3,106.5	0.74	-0.11	-0.74	
10,524.0	89.90	90.90	7,136.5	-1,025.3	3,045.1	3,200.2	0.74	-0.52	0.52	
10,619.0	90.80	88.80	7,135.9	-1,025.0	3,140.1	3,292.5	2.40	0.95	-2.21	
10,714.0	91.10	87.90	7,134.3	-1,022.3	3,235.1	3,384.2	1.00	0.32	-0.95	
10,809.0	91.40	89.30	7,132.2	-1,020.0	3,330.0	3,476.0	1.51	0.32	1.47	
10,904.0	92.20	88.60	7,129.3	-1,018.2	3,425.0	3,567.9	1.12	0.84	-0.74	
10,999.0	91.30	90.20	7,126.4	-1,017.2	3,519.9	3,660.0	1.93	-0.95	1.68	
11,095.0	91.50	89.50	7,124.0	-1,017.0	3,615.9	3,753.3	0.76	0.21	-0.73	
11,190.0	90.90	88.10	7,122.0	-1,015.0	3,710.8	3,845.2	1.60	-0.63	-1.47	
11,285.0	89.80	89.30	7,121.4	-1,012.8	3,805.8	3,937.0	1.71	-1.16	1.26	
11,380.0	90.60	88.30	7,121.1	-1,010.8	3,900.8	4,028.9	1.35	0.84	-1.05	
11,475.0	90.50	90.90	7,120.2	-1,010.2	3,995.8	4,121.2	2.74	-0.11	2.74	
11,570.0	90.10	89.80	7,119.7	-1,010.8	4,090.8	4,213.7	1.23	-0.42	-1.16	
11,652.0	90.30	88.80	7,119.4	-1,009.8	4,172.8	4,293.2	1.24	0.24	-1.22	
11,709.0	90.30	88.80	7,119.1	-1,008.6	4,229.7	4,348.3	0.00	0.00	0.00	

Design Targets										
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude		Longitude
SHL 1098'FNL & 540'FM	0.00	0.00	1.0	0.0	0.0	1,348,130.06	3,198,078.67	40.286840		-104.789970
- hit/miss target										
- Shape										
- survey hits target center										
- Point										

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Wiedeman 28G-312
Project:	SEC.28-T4N-R66W	TVD Reference:	WELL @ 4774.0ft (Ensign Rig #134 RKB - 13')
Site:	Wiedeman 4N66W28F - East Pad Sec.28-T4N-R66W	MD Reference:	WELL @ 4774.0ft (Ensign Rig #134 RKB - 13')
Well:	Wiedeman 28G-312	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	US_EDM

Casing Points					
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")	
7,717.0	7,175.0	7"	7	8-3/4	

Survey Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment	
		+N/-S (ft)	+E/-W (ft)		
7,954.0	7,177.6	-1,021.9	475.7	Deepest TVD Drilled - 7177.6'	

Checked By: _____	Approved By: _____	Date: _____
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