

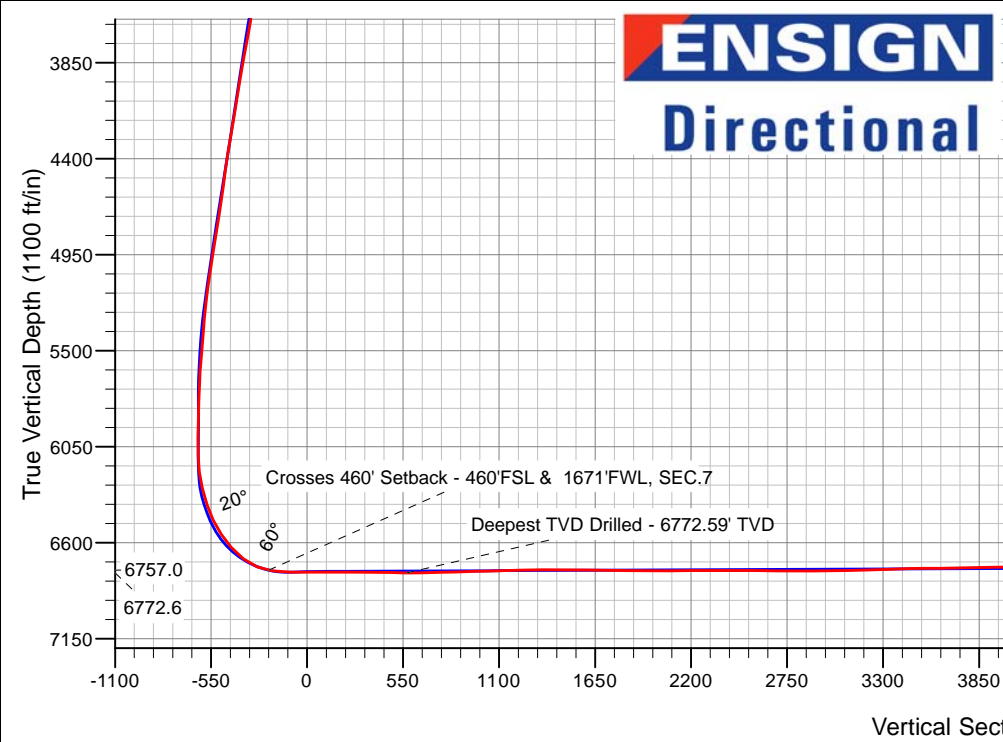
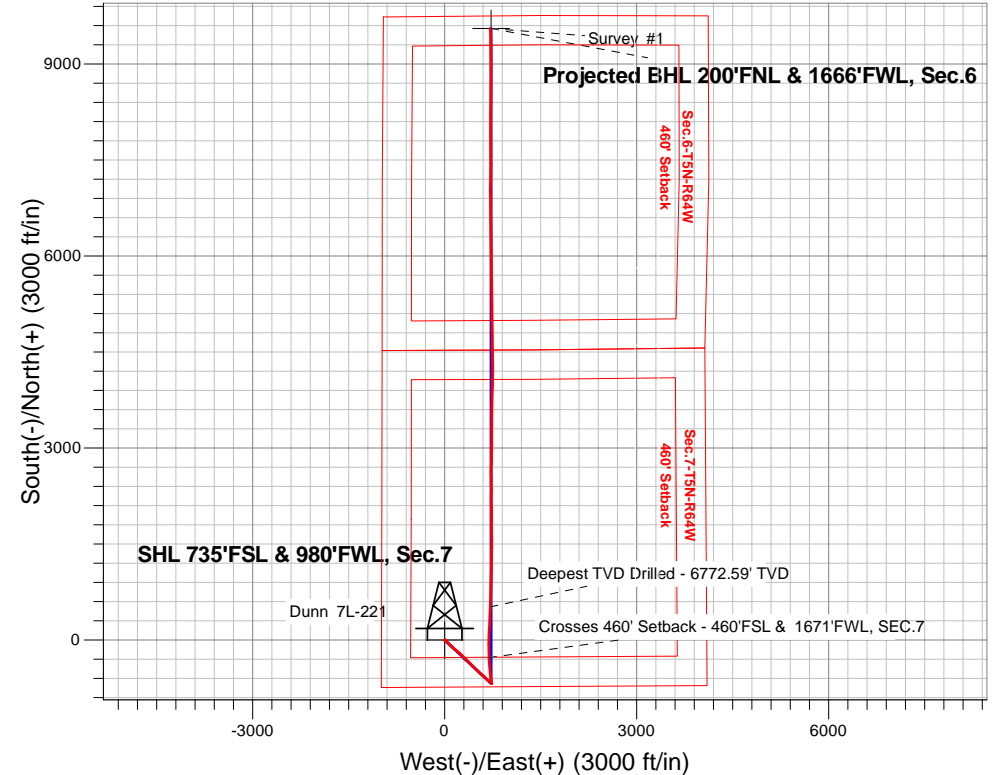
PETROLEUM DEVELOPMENT CORP DJ Basin

Well Name: **Dunn 7L-221**

Surface Location: Dunn 5N64W7 Pad Sec.7-T5N-R64W
 North American Datum 1983 , US State Plane 1983, Colorado Northern Zone
 Ground Elevation: 4625.0
 +N/-S+E/-W Northing Easting Latitude Longitude Slot
 0.0 0.0 1392891.023251104.65 40.408383 -104.598274
 Ensign Rig #152 - RKIB - 23'WELL @ 4648.0ft (Ensign Rig #152 - RKIB - 23')

FINAL SURVEY

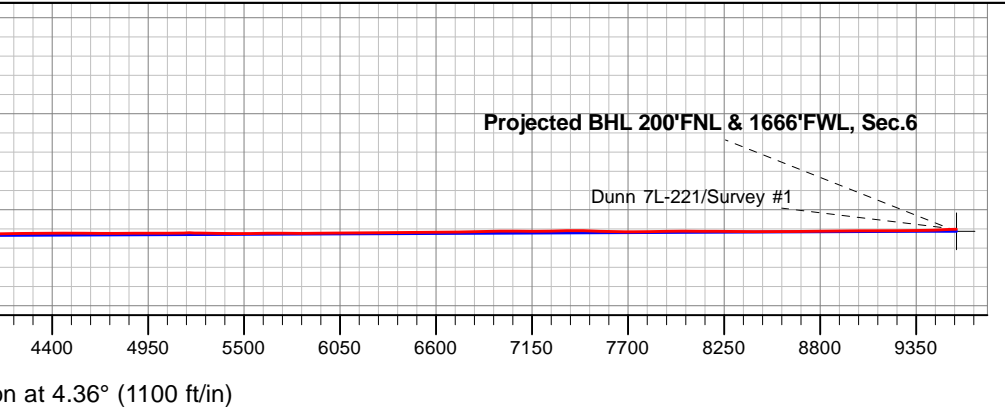
Projected Bottom Hole Location
16878'MD 6711'TVD 9553'N & 715'E of SHL
92.5 degree Incl @ 357.7 degree AZM



Dunn 5N64W7 Pad Sec.7-T5N-R64W
 Dunn 7L-221
 Wellbore #1
 11:12, January 16 2017

ANNOTATIONS		
TVD	MD	Annotation
6757.0	7045.9	Crosses 460' Setback - 460'FSL & 1671'FWL, SEC.7
6772.6	7839.0	Deepest TVD Drilled - 6772.59' TVD

LEGEND	
	Dunn 7L-221, Wellbore #1, Plan #2 (12-30-16)R V0
	Wellbore #1
	Survey #1





PETROLEUM DEVELOPMENT CORP DJ Basin

SEC.7-T5N-R64W

Dunn 5N64W7 Pad Sec.7-T5N-R64W

Dunn 7L-221

Wellbore #1

Survey: Survey #1

Standard Survey Report

16 January, 2017



Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Dunn 7L-221
Project:	SEC.7-T5N-R64W	TVD Reference:	WELL @ 4648.0ft (Ensign Rig #152 - RKIB - 23')
Site:	Dunn 5N64W7 Pad Sec.7-T5N-R64W	MD Reference:	WELL @ 4648.0ft (Ensign Rig #152 - RKIB - 23')
Well:	Dunn 7L-221	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	US_EDM

Project	SEC.7-T5N-R64W, 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	Dunn 5N64W7 Pad Sec.7-T5N-R64W				
Site Position:		Northing:	1,392,981.02 usft	Latitude:	40.408630
From:	Lat/Long	Easting:	3,251,104.57 usft	Longitude:	-104.598271
Position Uncertainty:	0.0 ft	Slot Radius:	13-3/16 "	Grid Convergence:	0.58 °

Well	Dunn 7L-221					
Well Position	+N/-S	0.0 ft	Northing:	1,392,891.02 usft	Latitude:	40.408383
	+E/-W	0.0 ft	Easting:	3,251,104.65 usft	Longitude:	-104.598274
Position Uncertainty		0.0 ft	Wellhead Elevation:	0.0 ft	Ground Level:	4,625.0 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	12/30/2016	8.03	66.89	52,570

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	4.36	

Survey Program	Date	1/16/2017			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
154.0	16,878.0	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	
154.0	1.10	138.60	154.0	-1.1	1.0	-1.0	0.71	0.71	0.00	
250.0	1.10	124.20	250.0	-2.3	2.3	-2.1	0.29	0.00	-15.00	
344.0	0.90	117.00	344.0	-3.2	3.8	-2.9	0.25	-0.21	-7.66	
439.0	1.30	95.60	438.9	-3.6	5.5	-3.2	0.60	0.42	-22.53	
535.0	1.50	95.70	534.9	-3.8	7.8	-3.2	0.21	0.21	0.10	
631.0	0.20	27.20	630.9	-3.8	9.2	-3.1	1.50	-1.35	-71.35	
727.0	0.30	3.10	726.9	-3.4	9.2	-2.7	0.15	0.10	-25.10	
823.0	0.40	19.80	822.9	-2.8	9.4	-2.1	0.15	0.10	17.40	
919.0	0.40	18.40	918.9	-2.2	9.6	-1.5	0.01	0.00	-1.46	

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Dunn 7L-221
Project:	SEC.7-T5N-R64W	TVD Reference:	WELL @ 4648.0ft (Ensign Rig #152 - RKIB - 23')
Site:	Dunn 5N64W7 Pad Sec.7-T5N-R64W	MD Reference:	WELL @ 4648.0ft (Ensign Rig #152 - RKIB - 23')
Well:	Dunn 7L-221	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)	
1,014.0	1.20	159.40	1,013.9	-2.8	10.0	-2.1	1.61	0.84	148.42	
1,110.0	1.30	156.70	1,109.9	-4.8	10.8	-3.9	0.12	0.10	-2.81	
1,206.0	2.90	140.70	1,205.8	-7.6	12.8	-6.7	1.76	1.67	-16.67	
1,301.0	3.40	139.30	1,300.7	-11.6	16.2	-10.4	0.53	0.53	-1.47	
1,397.0	3.70	135.60	1,396.5	-16.0	20.2	-14.4	0.39	0.31	-3.85	
1,493.0	4.60	131.60	1,492.2	-20.8	25.2	-18.8	0.98	0.94	-4.17	
1,589.0	6.20	131.30	1,587.8	-26.8	32.0	-24.3	1.67	1.67	-0.31	
1,684.0	7.30	133.70	1,682.1	-34.3	40.2	-31.2	1.20	1.16	2.53	
1,782.0	8.40	128.10	1,779.2	-43.0	50.4	-39.1	1.37	1.12	-5.71	
1,878.0	10.20	130.40	1,873.9	-52.9	62.3	-48.0	1.91	1.88	2.40	
1,974.0	12.70	135.80	1,968.0	-66.0	76.2	-60.0	2.83	2.60	5.63	
2,069.0	14.50	136.90	2,060.4	-82.1	91.6	-74.9	1.91	1.89	1.16	
2,165.0	13.50	134.20	2,153.5	-98.7	107.8	-90.2	1.24	-1.04	-2.81	
2,261.0	14.60	134.20	2,246.6	-115.0	124.5	-105.2	1.15	1.15	0.00	
2,357.0	16.70	132.70	2,339.1	-132.7	143.4	-121.5	2.23	2.19	-1.56	
2,453.0	15.70	128.40	2,431.3	-150.2	163.7	-137.3	1.63	-1.04	-4.48	
2,549.0	15.10	128.80	2,523.8	-166.1	183.6	-151.6	0.63	-0.63	0.42	
2,644.0	14.90	128.40	2,615.6	-181.4	202.8	-165.5	0.24	-0.21	-0.42	
2,740.0	14.90	126.90	2,708.4	-196.5	222.4	-179.0	0.40	0.00	-1.56	
2,836.0	15.00	134.20	2,801.1	-212.6	241.1	-193.6	1.96	0.10	7.60	
2,932.0	14.30	133.00	2,894.0	-229.3	258.7	-209.0	0.79	-0.73	-1.25	
3,028.0	13.90	132.10	2,987.1	-245.1	275.9	-223.4	0.48	-0.42	-0.94	
3,123.0	12.20	132.80	3,079.6	-259.6	291.8	-236.7	1.80	-1.79	0.74	
3,218.0	12.90	135.80	3,172.4	-274.0	306.5	-249.9	1.01	0.74	3.16	
3,314.0	13.70	137.60	3,265.8	-290.1	321.7	-264.8	0.94	0.83	1.88	
3,410.0	15.00	134.60	3,358.8	-307.2	338.2	-280.6	1.56	1.35	-3.13	
3,506.0	14.20	133.40	3,451.7	-324.0	355.6	-296.1	0.89	-0.83	-1.25	
3,602.0	14.90	137.10	3,544.6	-341.2	372.5	-311.9	1.21	0.73	3.85	
3,697.0	15.40	136.00	3,636.3	-359.2	389.6	-328.5	0.61	0.53	-1.16	
3,792.0	15.50	135.50	3,727.9	-377.3	407.3	-345.3	0.18	0.11	-0.53	
3,888.0	15.70	135.30	3,820.4	-395.7	425.4	-362.2	0.22	0.21	-0.21	
3,983.0	14.90	134.60	3,912.0	-413.4	443.1	-378.5	0.86	-0.84	-0.74	
4,079.0	14.00	131.30	4,004.9	-429.7	460.6	-393.5	1.27	-0.94	-3.44	
4,175.0	15.00	136.40	4,097.9	-446.4	477.9	-408.8	1.69	1.04	5.31	
4,270.0	13.30	136.70	4,190.0	-463.3	493.9	-424.4	1.79	-1.79	0.32	
4,366.0	14.20	134.60	4,283.3	-479.6	509.9	-439.4	1.07	0.94	-2.19	
4,462.0	14.90	132.10	4,376.2	-496.1	527.4	-454.6	0.98	0.73	-2.60	
4,558.0	13.90	129.10	4,469.2	-511.7	545.5	-468.7	1.30	-1.04	-3.13	
4,653.0	13.40	130.00	4,561.5	-525.9	562.8	-481.6	0.57	-0.53	0.95	
4,749.0	14.10	127.70	4,654.7	-540.2	580.6	-494.5	0.93	0.73	-2.40	
4,845.0	13.50	131.60	4,748.0	-554.8	598.2	-507.7	1.15	-0.63	4.06	
4,941.0	14.30	136.40	4,841.1	-570.8	614.8	-522.4	1.46	0.83	5.00	
5,037.0	14.20	134.40	4,934.2	-587.7	631.4	-538.0	0.52	-0.10	-2.08	
5,133.0	13.50	133.90	5,027.4	-603.7	647.8	-552.7	0.74	-0.73	-0.52	

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Site:	Dunn 5N64W7 Pad Sec.7-T5N-R64W	MD Reference:	WELL @ 4648.0ft (Ensign Rig #152 - RKIB - 23')
Well:	Dunn 7L-221	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)	
5,228.0	12.50	132.70	5,120.0	-618.3	663.4	-566.1	1.09	-1.05	-1.26	
5,324.0	11.10	130.70	5,213.9	-631.4	678.0	-578.0	1.52	-1.46	-2.08	
5,420.0	10.40	123.20	5,308.3	-642.2	692.3	-587.7	1.63	-0.73	-7.81	
5,516.0	9.40	120.70	5,402.8	-650.9	706.3	-595.3	1.13	-1.04	-2.60	
5,612.0	8.20	131.30	5,497.7	-659.5	718.2	-602.9	2.10	-1.25	11.04	
5,708.0	6.10	139.70	5,593.0	-667.9	726.6	-610.7	2.44	-2.19	8.75	
5,804.0	3.30	148.10	5,688.6	-674.1	731.4	-616.5	3.00	-2.92	8.75	
5,899.0	1.60	149.90	5,783.5	-677.6	733.5	-619.8	1.79	-1.79	1.89	
6,024.0	1.80	150.20	5,908.5	-680.8	735.3	-622.9	0.16	0.16	0.24	
6,119.0	1.10	122.30	6,003.4	-682.6	736.8	-624.6	1.03	-0.74	-29.37	
6,215.0	0.70	39.70	6,099.4	-682.6	738.0	-624.5	1.28	-0.42	-86.04	
6,311.0	8.40	339.20	6,195.1	-675.6	735.9	-617.7	8.41	8.02	-63.02	
6,407.0	13.80	349.00	6,289.3	-657.8	731.2	-600.3	5.94	5.63	10.21	
6,503.0	19.20	354.70	6,381.3	-630.8	727.6	-573.7	5.87	5.63	5.94	
6,598.0	25.50	355.40	6,469.1	-594.8	724.5	-538.0	6.64	6.63	0.74	
6,694.0	33.40	355.00	6,552.6	-547.8	720.5	-491.5	8.23	8.23	-0.42	
6,789.0	42.20	353.30	6,627.6	-490.0	714.5	-434.2	9.33	9.26	-1.79	
6,885.0	52.60	351.70	6,692.5	-420.0	705.2	-365.2	10.90	10.83	-1.67	
6,980.0	69.00	354.00	6,738.7	-338.0	695.0	-284.2	17.39	17.26	2.42	
7,045.9	78.70	358.03	6,757.0	-275.0	690.7	-221.6	15.84	14.71	6.12	
Crosses 460' Setback - 460'FSL & 1671'FWL, SEC.7										
7,073.0	82.70	359.60	6,761.4	-248.2	690.2	-195.0	15.84	14.78	5.78	
7,169.0	89.10	1.70	6,768.3	-152.5	691.2	-99.5	7.01	6.67	2.19	
7,264.0	90.00	1.70	6,769.0	-57.6	694.1	-4.6	0.95	0.95	0.00	
7,360.0	90.10	0.30	6,768.9	38.4	695.7	91.2	1.46	0.10	-1.46	
7,456.0	90.00	2.10	6,768.8	134.4	697.8	187.0	1.88	-0.10	1.88	
7,552.0	89.70	2.90	6,769.1	230.3	701.9	283.0	0.89	-0.31	0.83	
7,648.0	89.30	2.40	6,769.9	326.2	706.4	378.9	0.67	-0.42	-0.52	
7,743.0	89.30	2.40	6,771.1	421.1	710.4	473.9	0.00	0.00	0.00	
7,839.0	88.90	1.70	6,772.6	517.0	713.8	569.8	0.84	-0.42	-0.73	
Deepest TVD Drilled - 6772.59' TVD										
7,935.0	91.50	2.20	6,772.3	613.0	717.1	665.7	2.76	2.71	0.52	
8,031.0	91.50	1.90	6,769.7	708.9	720.5	761.6	0.31	0.00	-0.31	
8,127.0	91.70	1.70	6,767.1	804.8	723.5	857.5	0.29	0.21	-0.21	
8,222.0	91.50	1.50	6,764.4	899.7	726.2	952.3	0.30	-0.21	-0.21	
8,319.0	91.30	1.50	6,762.0	996.6	728.7	1,049.2	0.21	-0.21	0.00	
8,414.0	91.50	0.80	6,759.7	1,091.6	730.6	1,144.0	0.77	0.21	-0.74	
8,510.0	91.90	0.60	6,756.9	1,187.5	731.8	1,239.7	0.47	0.42	-0.21	
8,607.0	90.00	0.70	6,755.3	1,284.5	732.9	1,336.5	1.96	-1.96	0.10	
8,702.0	89.90	0.60	6,755.3	1,379.5	734.0	1,431.3	0.15	-0.11	-0.11	
8,798.0	89.80	0.60	6,755.6	1,475.5	735.0	1,527.1	0.10	-0.10	0.00	
8,893.0	89.30	359.60	6,756.3	1,570.5	735.1	1,621.8	1.18	-0.53	-1.05	
8,989.0	89.20	359.80	6,757.6	1,666.5	734.6	1,717.5	0.23	-0.10	0.21	

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Well:	Dunn 7L-221	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)	
9,085.0	88.90	359.10	6,759.2	1,762.5	733.7	1,813.2	0.79	-0.31	-0.73	
9,180.0	89.70	0.10	6,760.4	1,857.5	733.0	1,907.8	1.35	0.84	1.05	
9,276.0	89.80	359.80	6,760.8	1,953.5	733.0	2,003.5	0.33	0.10	-0.31	
9,372.0	90.10	359.40	6,760.9	2,049.5	732.3	2,099.2	0.52	0.31	-0.42	
9,468.0	90.70	358.90	6,760.2	2,145.4	730.9	2,194.8	0.81	0.63	-0.52	
9,563.0	89.80	1.00	6,759.8	2,240.4	730.8	2,289.5	2.40	-0.95	2.21	
9,659.0	90.00	0.10	6,759.9	2,336.4	731.7	2,385.3	0.96	0.21	-0.94	
9,755.0	90.20	359.10	6,759.8	2,432.4	731.0	2,481.0	1.06	0.21	-1.04	
9,851.0	90.00	358.20	6,759.6	2,528.4	728.8	2,576.5	0.96	-0.21	-0.94	
9,947.0	89.50	1.20	6,760.0	2,624.4	728.3	2,672.2	3.17	-0.52	3.13	
10,043.0	89.30	1.00	6,761.0	2,720.4	730.1	2,768.0	0.29	-0.21	-0.21	
10,138.0	90.00	1.20	6,761.6	2,815.3	731.9	2,862.8	0.77	0.74	0.21	
10,234.0	89.90	0.60	6,761.7	2,911.3	733.4	2,958.7	0.63	-0.10	-0.63	
10,329.0	91.60	1.00	6,760.5	3,006.3	734.8	3,053.5	1.84	1.79	0.42	
10,425.0	91.90	0.80	6,757.5	3,102.2	736.3	3,149.3	0.38	0.31	-0.21	
10,521.0	91.70	0.30	6,754.5	3,198.2	737.2	3,245.0	0.56	-0.21	-0.52	
10,617.0	91.50	359.90	6,751.8	3,294.2	737.4	3,340.7	0.47	-0.21	-0.42	
10,713.0	92.20	359.20	6,748.7	3,390.1	736.6	3,436.3	1.03	0.73	-0.73	
10,808.0	90.20	1.20	6,746.7	3,485.1	736.9	3,531.0	2.98	-2.11	2.11	
10,904.0	90.50	0.80	6,746.1	3,581.1	738.6	3,626.9	0.52	0.31	-0.42	
11,000.0	91.50	1.00	6,744.5	3,677.0	740.1	3,722.7	1.06	1.04	0.21	
11,095.0	92.30	2.10	6,741.3	3,771.9	742.7	3,817.5	1.43	0.84	1.16	
11,191.0	89.90	1.70	6,739.5	3,867.9	745.9	3,913.4	2.53	-2.50	-0.42	
11,287.0	90.00	1.00	6,739.6	3,963.8	748.1	4,009.2	0.74	0.10	-0.73	
11,383.0	90.90	0.80	6,738.8	4,059.8	749.6	4,105.1	0.96	0.94	-0.21	
11,479.0	91.50	1.00	6,736.8	4,155.8	751.1	4,200.9	0.66	0.63	0.21	
11,574.0	90.90	0.60	6,734.8	4,250.8	752.5	4,295.7	0.76	-0.63	-0.42	
11,670.0	91.30	0.10	6,733.0	4,346.7	753.1	4,391.4	0.67	0.42	-0.52	
11,766.0	88.90	358.90	6,732.8	4,442.7	752.2	4,487.1	2.80	-2.50	-1.25	
11,861.0	89.10	358.50	6,734.5	4,537.7	750.1	4,581.6	0.47	0.21	-0.42	
11,957.0	89.40	358.40	6,735.7	4,633.6	747.5	4,677.1	0.33	0.31	-0.10	
12,053.0	90.20	358.70	6,736.0	4,729.6	745.0	4,772.6	0.89	0.83	0.31	
12,149.0	91.20	358.20	6,734.9	4,825.6	742.4	4,868.0	1.16	1.04	-0.52	
12,244.0	89.70	359.90	6,734.1	4,920.5	740.9	4,962.6	2.39	-1.58	1.79	
12,340.0	90.20	0.30	6,734.2	5,016.5	741.0	5,058.4	0.67	0.52	0.42	
12,436.0	91.10	0.30	6,733.1	5,112.5	741.5	5,154.1	0.94	0.94	0.00	
12,531.0	88.40	359.60	6,733.5	5,207.5	741.5	5,248.8	2.94	-2.84	-0.74	
12,627.0	89.00	358.90	6,735.7	5,303.5	740.2	5,344.4	0.96	0.63	-0.73	
12,723.0	89.60	358.50	6,736.9	5,399.5	738.0	5,439.9	0.75	0.63	-0.42	
12,819.0	90.70	359.10	6,736.6	5,495.4	736.0	5,535.5	1.31	1.15	0.63	
12,915.0	91.40	358.40	6,734.9	5,591.4	733.9	5,631.0	1.03	0.73	-0.73	
13,011.0	89.20	359.80	6,734.4	5,687.4	732.4	5,726.6	2.72	-2.29	1.46	
13,106.0	89.80	359.60	6,735.2	5,782.4	731.9	5,821.3	0.67	0.63	-0.21	
13,202.0	90.70	359.40	6,734.8	5,878.4	731.1	5,916.9	0.96	0.94	-0.21	

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Dunn 7L-221
Project:	SEC.7-T5N-R64W	TVD Reference:	WELL @ 4648.0ft (Ensign Rig #152 - RKIB - 23')
Site:	Dunn 5N64W7 Pad Sec.7-T5N-R64W	MD Reference:	WELL @ 4648.0ft (Ensign Rig #152 - RKIB - 23')
Well:	Dunn 7L-221	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)	
13,298.0	91.50	358.90	6,732.9	5,974.3	729.7	6,012.5	0.98	0.83	-0.52	
13,394.0	89.70	359.80	6,731.9	6,070.3	728.6	6,108.1	2.10	-1.88	0.94	
13,489.0	89.80	359.10	6,732.4	6,165.3	727.6	6,202.8	0.74	0.11	-0.74	
13,586.0	90.50	359.10	6,732.1	6,262.3	726.1	6,299.4	0.72	0.72	0.00	
13,682.0	91.10	358.50	6,730.8	6,358.3	724.1	6,394.9	0.88	0.63	-0.63	
13,777.0	90.00	359.90	6,729.8	6,453.2	722.8	6,489.5	1.87	-1.16	1.47	
13,871.0	90.10	359.40	6,729.8	6,547.2	722.2	6,583.2	0.54	0.11	-0.53	
13,969.0	91.20	359.20	6,728.7	6,645.2	721.0	6,680.8	1.14	1.12	-0.20	
14,065.0	92.10	359.10	6,725.9	6,741.2	719.6	6,776.4	0.94	0.94	-0.10	
14,160.0	90.40	359.60	6,723.8	6,836.1	718.5	6,871.0	1.87	-1.79	0.53	
14,256.0	90.90	358.50	6,722.7	6,932.1	716.9	6,966.6	1.26	0.52	-1.15	
14,352.0	89.40	0.80	6,722.5	7,028.1	716.3	7,062.2	2.86	-1.56	2.40	
14,448.0	89.90	1.20	6,723.1	7,124.1	718.0	7,158.1	0.67	0.52	0.42	
14,544.0	90.70	0.80	6,722.6	7,220.1	719.7	7,253.9	0.93	0.83	-0.42	
14,639.0	91.70	0.30	6,720.6	7,315.1	720.6	7,348.7	1.18	1.05	-0.53	
14,735.0	88.20	0.60	6,720.7	7,411.0	721.4	7,444.4	3.66	-3.65	0.31	
14,831.0	88.40	0.30	6,723.5	7,507.0	722.1	7,540.2	0.38	0.21	-0.31	
14,927.0	88.90	359.80	6,725.8	7,603.0	722.2	7,635.9	0.74	0.52	-0.52	
15,022.0	89.90	359.40	6,726.8	7,698.0	721.5	7,730.5	1.13	1.05	-0.42	
15,118.0	90.90	359.20	6,726.1	7,793.9	720.4	7,826.2	1.06	1.04	-0.21	
15,214.0	91.90	358.90	6,723.7	7,889.9	718.8	7,921.7	1.09	1.04	-0.31	
15,309.0	89.40	0.30	6,722.7	7,984.9	718.1	8,016.4	3.02	-2.63	1.47	
15,405.0	90.00	359.60	6,723.2	8,080.9	718.0	8,112.1	0.96	0.63	-0.73	
15,501.0	89.80	1.00	6,723.3	8,176.9	718.5	8,207.8	1.47	-0.21	1.46	
15,597.0	89.00	1.40	6,724.3	8,272.8	720.5	8,303.7	0.93	-0.83	0.42	
15,693.0	89.30	0.80	6,725.8	8,368.8	722.4	8,399.5	0.70	0.31	-0.63	
15,788.0	90.30	0.10	6,726.1	8,463.8	723.1	8,494.3	1.28	1.05	-0.74	
15,884.0	91.00	0.50	6,725.0	8,559.8	723.6	8,590.0	0.84	0.73	0.42	
15,980.0	90.10	1.00	6,724.1	8,655.8	724.9	8,685.9	1.07	-0.94	0.52	
16,075.0	90.90	0.80	6,723.3	8,750.8	726.4	8,780.7	0.87	0.84	-0.21	
16,171.0	90.50	0.10	6,722.1	8,846.8	727.1	8,876.4	0.84	-0.42	-0.73	
16,267.0	90.80	359.20	6,721.0	8,942.8	726.5	8,972.1	0.99	0.31	-0.94	
16,363.0	89.60	359.90	6,720.7	9,038.7	725.8	9,067.8	1.45	-1.25	0.73	
16,459.0	90.30	359.80	6,720.7	9,134.7	725.5	9,163.5	0.74	0.73	-0.10	
16,555.0	90.60	358.70	6,720.0	9,230.7	724.3	9,259.1	1.19	0.31	-1.15	
16,650.0	91.00	359.10	6,718.7	9,325.7	722.5	9,353.6	0.60	0.42	0.42	
16,746.0	91.50	358.00	6,716.6	9,421.7	720.0	9,449.1	1.26	0.52	-1.15	
16,820.0	92.50	357.70	6,714.0	9,495.6	717.3	9,522.6	1.41	1.35	-0.41	
16,878.0	92.50	357.70	6,711.5	9,553.5	714.9	9,580.2	0.00	0.00	0.00	

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Dunn 7L-221
Project:	SEC.7-T5N-R64W	TVD Reference:	WELL @ 4648.0ft (Ensign Rig #152 - RKIB - 23')
Site:	Dunn 5N64W7 Pad Sec.7-T5N-R64W	MD Reference:	WELL @ 4648.0ft (Ensign Rig #152 - RKIB - 23')
Well:	Dunn 7L-221	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	US_EDM

Design Targets									
Target Name	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- hit/miss target	(°)	(°)	(ft)	(ft)	(ft)	(usft)	(usft)		
- Shape									
SHL 735'FSL & 980'FWL - survey hits target center - Point	0.00	0.00	1.0	0.0	0.0	1,392,891.04	3,251,104.65	40.408383	-104.598274
BHL 200'FNL & 1680'FM - survey misses target center by 17.8ft at 16877.3ft MD (6711.5 TVD, 9552.7 N, 715.0 E) - Point	0.00	0.00	6,723.0	9,553.8	728.5	1,402,451.33	3,251,735.96	40.434607	-104.595657

Survey Annotations					
Measured Depth	Vertical Depth	Local Coordinates		Comment	
(ft)	(ft)	+N/-S (ft)	+E/-W (ft)		
7,045.9	6,757.0	-275.0	690.7	Crosses 460' Setback - 460'FSL & 1671'FWL, SEC.7	
7,839.0	6,772.6	517.0	713.8	Deepest TVD Drilled - 6772.59' TVD	

Checked By: _____ Approved By: _____ Date: _____