

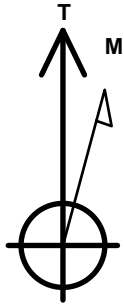
# PETROLEUM DEVELOPMENT CORP DJ Basin

Well Name: **Josephine 19N-204**

Surface Location: Josephine 5N64W19N Pad Sec.19-T5N-R64W  
 North American Datum 1983 , US State Plane 1983 Colorado Northern Zone  
 Ground Elevation: 4626.0  
 +N/-S +E/-W Northing Easting Latitude Longitude Slot  
 0.0 0.0 1385111.29 3253196.21 40.386970 -104.591050  
 Original Well Elev WELL @ 4649.0ft (Original Well Elev)

## DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Shape
SHL 1789'FNL, 2150'FEL, SEC.19	1.0	0.0	0.0	Point
BHL 1515'FNL, 2460'FEL, SEC.24	6708.0	284.8	-5479.5	Point
LPL 1515'FNL, 2306'FWL, SEC.19	6728.0	273.2	-715.9	Point



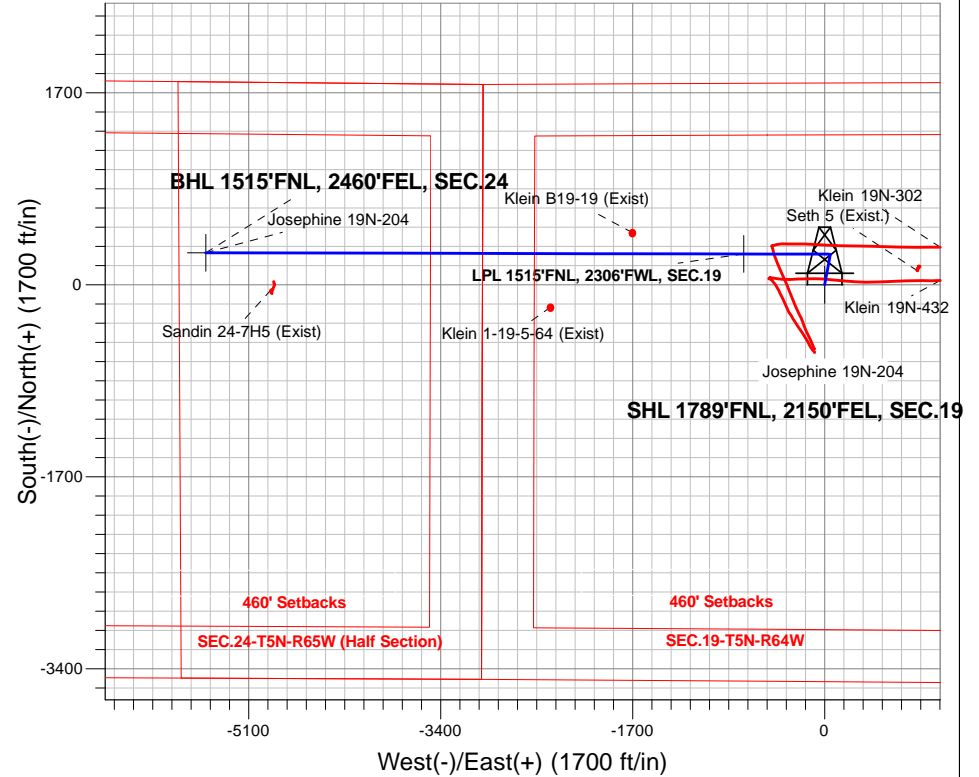
Azimuths to True North  
 Magnetic North: 8.02°

Magnetic Field  
 Strength: 52560.8snT  
 Dip Angle: 66.87°  
 Date: 12/27/2016  
 Model: IGRF2010

Josephine 5N64W19N Pad Sec.19-T5N-R64W  
 Josephine 19N-204  
 Plan #1 (12-20-16)  
 11:16, December 27 2016

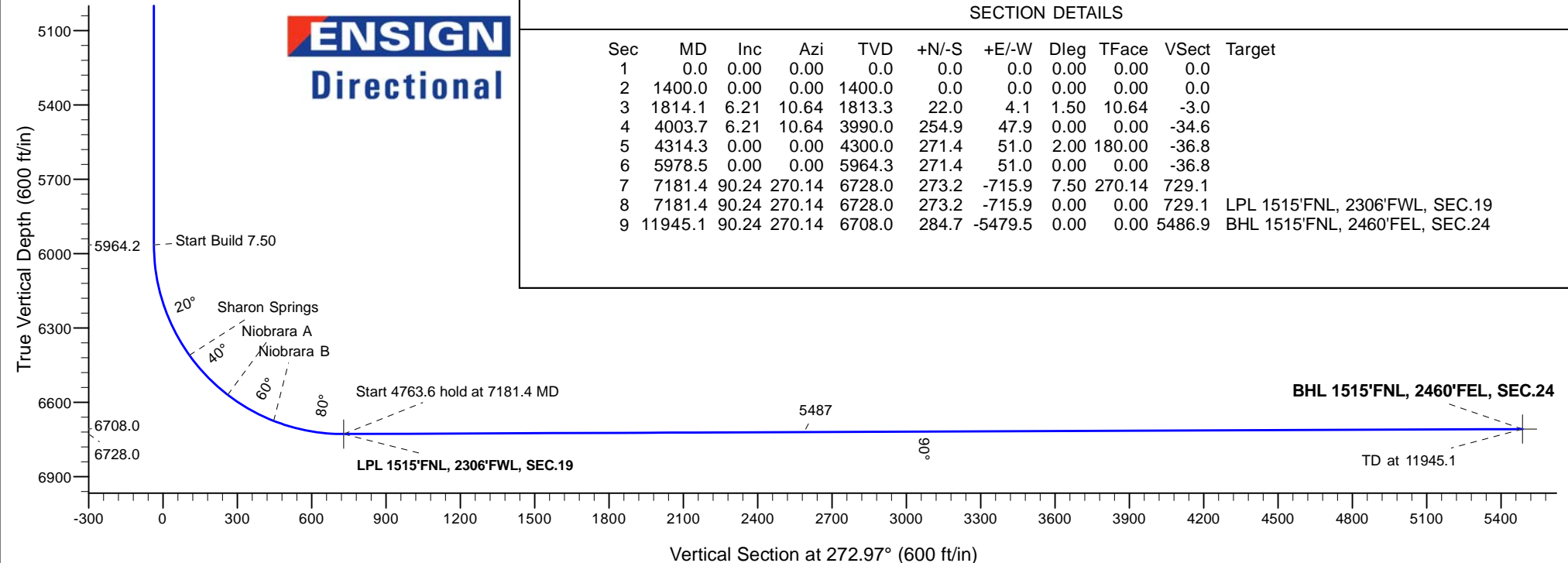
## ANNOTATIONS

TVD	MD	Annotation
1400.0	1400.0	KOP - Start Build 1.50
3990.0	4003.7	Start Drop -2.00
4300.0	4314.3	Start 1664.3 hold at 4314.3 MD
5964.3	5978.5	Start Build 7.50
6728.0	7181.4	Start 4763.6 hold at 7181.4 MD
6708.0	11945.1	TD at 11945.1



## SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	1400.0	0.00	0.00	1400.0	0.0	0.0	0.00	0.00	0.0	
3	1814.1	6.21	10.64	1813.3	22.0	4.1	1.50	10.64	-3.0	
4	4003.7	6.21	10.64	3990.0	254.9	47.9	0.00	0.00	-34.6	
5	4314.3	0.00	0.00	4300.0	271.4	51.0	2.00	180.00	-36.8	
6	5978.5	0.00	0.00	5964.3	271.4	51.0	0.00	0.00	-36.8	
7	7181.4	90.24	270.14	6728.0	273.2	-715.9	7.50	270.14	729.1	
8	7181.4	90.24	270.14	6728.0	273.2	-715.9	0.00	0.00	729.1	LPL 1515'FNL, 2306'FWL, SEC.19
9	11945.1	90.24	270.14	6708.0	284.7	-5479.5	0.00	0.00	5486.9	BHL 1515'FNL, 2460'FEL, SEC.24





# **PETROLEUM DEVELOPMENT CORP DJ Basin**

**SEC.19-T5N-R64W**

**Josephine 5N64W19N Pad Sec.19-T5N-R64W**

**Josephine 19N-204**

**Wellbore #1**

**Plan #1 (12-20-16)**

## **Anticollision Report**

**27 December, 2016**



<b>Company:</b>	PETROLEUM DEVELOPMENT CORP DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Josephine 19N-204
<b>Project:</b>	SEC.19-T5N-R64W	<b>TVD Reference:</b>	WELL @ 4649.0ft (Original Well Elev)
<b>Reference Site:</b>	Josephine 5N64W19N Pad Sec.19-T5N-R64W	<b>MD Reference:</b>	WELL @ 4649.0ft (Original Well Elev)
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Josephine 19N-204	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.45 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #1 (12-20-16)	<b>Offset TVD Reference:</b>	Offset Datum

<b>Reference</b>	Plan #1 (12-20-16)		
<b>Filter type:</b>	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
<b>Interpolation Method:</b>	Stations	<b>Error Model:</b>	ISCWSA
<b>Depth Range:</b>	Unlimited	<b>Scan Method:</b>	Closest Approach 3D
<b>Results Limited by:</b>	Maximum center-center distance of 800.0 ft	<b>Error Surface:</b>	Elliptical Conic
<b>Warning Levels Evaluated at:</b>	2.45 Sigma	<b>Casing Method:</b>	Not applied

<b>Survey Tool Program</b>	<b>Date</b>	12/27/2016		
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>
0.0	11,945.1	Plan #1 (12-20-16) (Wellbore #1)	MWD	MWD - Standard

Summary						
Site Name	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
Existing Wells - Sec.24-T5N-R65W						
Sandin 24-7H5 (Exist) - Wellbore #1 - Wellbore #1	11,361.7	6,700.0	330.0	146.2	1.795	CC, ES
Sandin 24-7H5 (Exist) - Wellbore #1 - Wellbore #1	11,400.0	6,700.9	332.3	147.1	1.794	SF
Josephine 5N64W19N Pad Sec.19-T5N-R64W						
Josephine 19M-234 - Wellbore #1 - Plan #1 (12-20-16)	366.3	367.3	76.6	74.8	43.877	CC
Josephine 19M-234 - Wellbore #1 - Plan #1 (12-20-16)	400.0	401.0	76.6	74.6	39.663	ES
Josephine 19M-234 - Wellbore #1 - Plan #1 (12-20-16)	900.0	888.5	108.6	103.9	23.160	SF
Josephine 19M-334 - Wellbore #1 - Plan #1 (12-20-16)	600.0	600.0	62.0	59.0	20.469	CC, ES
Josephine 19M-334 - Wellbore #1 - Plan #1 (12-20-16)	900.0	894.6	73.5	68.9	15.729	SF
Josephine 19M-404 - Wellbore #1 - Plan #1 (12-20-16)	200.0	200.0	91.1	90.3	110.313	CC, ES
Josephine 19M-404 - Wellbore #1 - Plan #1 (12-20-16)	900.0	876.5	153.2	148.5	32.431	SF
Josephine 19N-214 - Wellbore #1 - Plan #1 (12-20-16)	800.0	800.0	47.4	43.3	11.486	CC, ES
Josephine 19N-214 - Wellbore #1 - Plan #1 (12-20-16)	11,945.7	12,026.6	761.5	386.9	2.033	SF
Josephine 19N-314 - Wellbore #1 - Plan #1 (12-20-16)	1,000.0	1,000.0	29.1	23.9	5.570	CC, ES
Josephine 19N-314 - Wellbore #1 - Plan #1 (12-20-16)	11,945.7	12,075.5	539.2	170.0	1.460	Level 3, SF
Josephine 19N-334 - Wellbore #1 - Plan #1 (12-20-16)	1,400.0	1,400.0	14.6	7.1	1.960	CC
Josephine 19N-334 - Wellbore #1 - Plan #1 (12-20-16)	11,945.7	12,022.7	229.6	-117.7	0.661	Level 1, ES, SF
Josephine 19N-404 - Wellbore #1 - Plan #1 (12-20-16)	1,200.0	1,200.0	14.6	8.2	2.301	CC, ES
Josephine 19N-404 - Wellbore #1 - Plan #1 (12-20-16)	11,945.7	12,128.4	332.8	21.8	1.070	Level 2, SF
Josephine 19O-204 - Wellbore #1 - Plan #1 (12-20-16)	500.0	500.0	58.3	55.8	23.522	CC, ES
Josephine 19O-204 - Wellbore #1 - Plan #1 (12-20-16)	900.0	892.6	78.8	74.3	17.387	SF
Josephine 19O-214 - Wellbore #1 - Plan #1 (12-20-16)	1,400.0	1,400.0	29.1	21.7	3.921	CC, ES
Josephine 19O-214 - Wellbore #1 - Plan #1 (12-20-16)	11,945.7	11,947.2	557.4	183.4	1.490	Level 3, SF
Josephine 19O-314 - Wellbore #1 - Plan #1 (12-20-16)	1,000.0	1,000.0	43.7	38.5	8.357	CC, ES
Josephine 19O-314 - Wellbore #1 - Plan #1 (12-20-16)	1,100.0	1,098.9	45.0	39.3	7.833	SF
Klein (Existing) Sec.19-T5N-R64W						
Klein 1-19-5-64 (Exist) - Wellbore #1 - Wellbore #1	8,890.8	6,703.8	474.0	226.4	1.914	CC
Klein 1-19-5-64 (Exist) - Wellbore #1 - Wellbore #1	8,900.0	6,703.8	474.1	226.1	1.912	ES, SF
Klein B19-19 (Exist) - Wellbore #1 - Wellbore #1	8,168.0	6,705.9	187.1	-36.6	0.836	Level 1, CC, ES, SF
Seth 5 (Exist.) - Wellbore #1 - Wellbore #1	4,825.8	4,786.9	782.3	758.7	33.161	CC
Seth 5 (Exist.) - Wellbore #1 - Wellbore #1	5,980.9	5,944.6	787.4	757.3	26.130	ES
Seth 5 (Exist.) - Wellbore #1 - Wellbore #1	6,050.0	6,016.1	790.4	760.0	26.038	SF

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Josephine 19N-204
<b>Project:</b>	SEC.19-T5N-R64W	<b>TVD Reference:</b>	WELL @ 4649.0ft (Original Well Elev)
<b>Reference Site:</b>	Josephine 5N64W19N Pad Sec.19-T5N-R64W	<b>MD Reference:</b>	WELL @ 4649.0ft (Original Well Elev)
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Josephine 19N-204	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.45 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #1 (12-20-16)	<b>Offset TVD Reference:</b>	Offset Datum

Summary						
Site Name	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
Klein 190-HZ Pad Sec.19-T5N-R64W						
Klein 19N-302 - Wellbore #1 - Wellbore #1	6,770.1	6,747.4	90.8	50.7	2.265	CC, ES, SF
Klein 19N-432 - Wellbore #1 - Wellbore #1	6,742.9	6,732.4	223.5	184.6	5.746	CC, ES
Klein 19N-432 - Wellbore #1 - Wellbore #1	6,750.0	6,731.0	223.7	184.7	5.735	SF

<b>Offset Design</b> Existing Wells - Sec.24-T5N-R65W - Sandin 24-7H5 (Exist) - Wellbore #1 - Wellbore #1												Offset Site Error:	0.0 ft
Survey Program: 100-Reference												Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
10,700.0	6,713.3	6,700.0	6,697.4	144.8	16.5	-90.51	-46.7	-4,897.0	739.5	578.2	161.23	4.586	
10,800.0	6,712.8	6,700.0	6,697.4	148.2	16.5	-90.51	-46.7	-4,897.0	651.5	486.9	164.65	3.957	
10,900.0	6,712.4	6,700.0	6,697.4	151.6	16.5	-90.51	-46.7	-4,897.0	567.6	399.5	168.07	3.377	
11,000.0	6,712.0	6,700.0	6,697.4	155.0	16.5	-90.51	-46.7	-4,897.0	489.7	318.2	171.48	2.856	
11,100.0	6,711.6	6,700.0	6,697.4	158.4	16.5	-90.51	-46.7	-4,897.0	421.2	246.3	174.90	2.408	
11,200.0	6,711.2	6,700.0	6,697.4	161.9	16.5	-90.51	-46.7	-4,897.0	367.5	189.2	178.32	2.061	
11,300.0	6,710.7	6,700.0	6,697.4	165.3	16.5	-90.51	-46.7	-4,897.0	335.8	154.0	181.74	1.848	
11,361.7	6,710.5	6,700.0	6,697.4	167.4	16.5	-90.51	-46.7	-4,897.0	330.0	146.2	183.85	1.795	CC, ES
11,400.0	6,710.3	6,700.9	6,698.3	168.7	16.5	-90.67	-46.7	-4,897.0	332.3	147.1	185.16	1.794	SF
11,500.0	6,709.9	6,701.4	6,698.9	172.1	16.5	-90.76	-46.7	-4,897.0	357.8	169.3	188.58	1.898	
11,600.0	6,709.5	6,702.0	6,699.4	175.6	16.5	-90.85	-46.7	-4,897.0	407.1	215.1	192.00	2.120	
11,700.0	6,709.1	6,702.5	6,700.0	179.0	16.5	-90.95	-46.7	-4,897.0	472.6	277.2	195.42	2.418	
11,800.0	6,708.7	6,703.1	6,700.5	182.4	16.5	-91.05	-46.7	-4,897.0	548.6	349.8	198.84	2.759	
11,900.0	6,708.2	6,703.6	6,701.1	185.8	16.5	-91.14	-46.7	-4,897.0	631.4	429.1	202.26	3.122	
11,945.1	6,708.0	6,703.9	6,701.3	187.4	16.5	-91.19	-46.7	-4,897.0	670.2	466.4	203.80	3.289	
11,945.7	6,708.0	6,703.9	6,701.3	187.4	16.5	-91.19	-46.7	-4,897.0	670.8	466.9	203.82	3.291	