

PETROLEUM DEVELOPMENT CORP DJ Basin

Well Name: **Ottenhoff 29R-143**

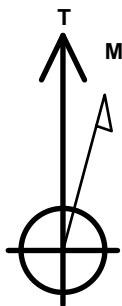
Surface Location: Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W
North American Datum 1983 , US State Plane 1983 Colorado Northern Zone
Ground Elevation: 4663.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1381166.70	3259674.53	40.375958	-104.567944	

RKB - 23' WELL @ 4686.0ft (RKB - 23')

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Shape
SHL 558'FNL & 1020'FEL, Sec.29	1.0	0.0	0.0	Point
BHL 2340'FNL & 1664'FEL, Sec.32	6617.0	-7067.2	-598.4	Point
LPL 815'FNL & 1616'FEL, SEC.29	6627.0	-267.4	-594.3	Point



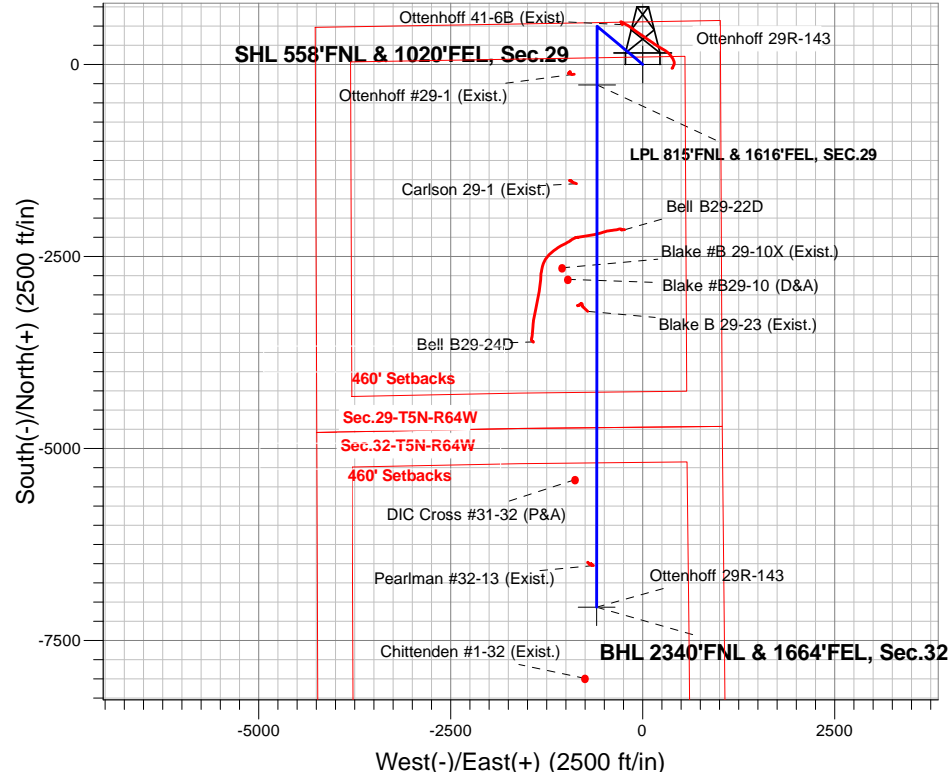
Azimuths to True North
Magnetic North: 8.00°

Magnetic Field
Strength: 52548.2snT
Dip Angle: 66.87°
Date: 1/27/2017
Model: IGRF2010

Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W
Ottenhoff 29R-143
Plan #2 (1-25-17)
15:05, January 27 2017

ANNOTATIONS

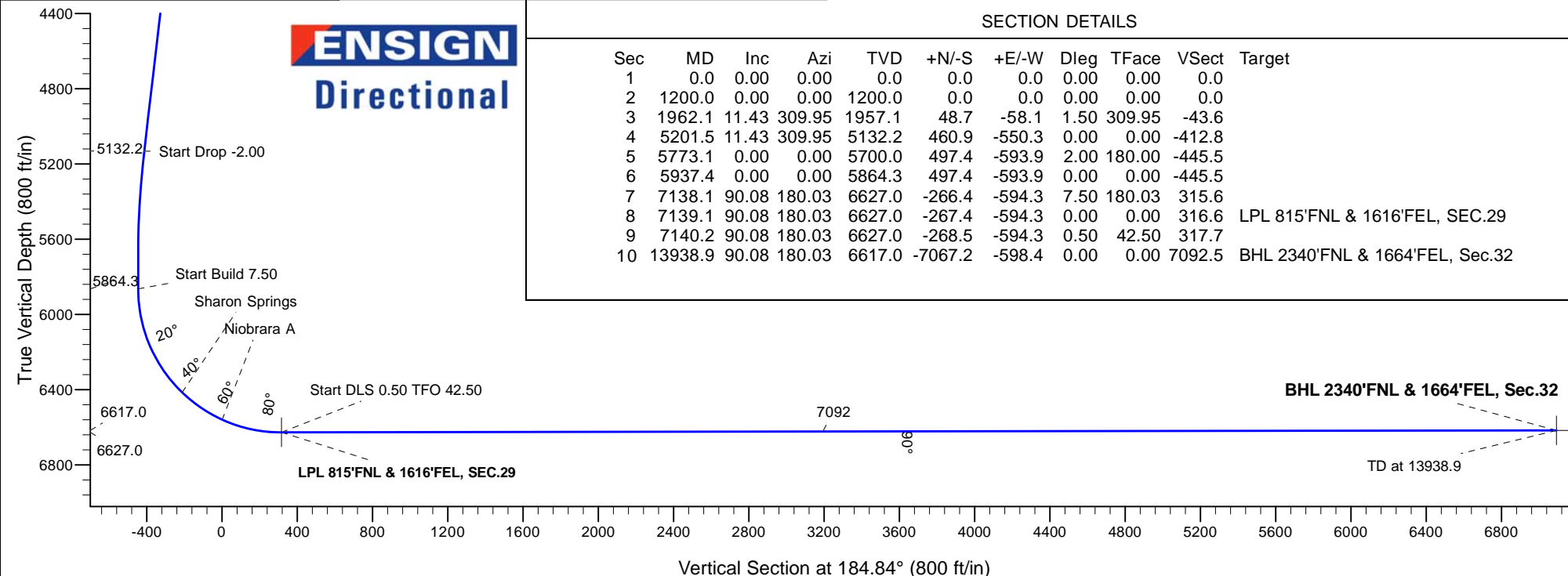
TVD	MD	Annotation
1200.0	1200.0	KOP - Start Build 1.50
5132.2	5201.5	Start Drop -2.00
5864.3	5937.4	Start Build 7.50
6627.0	7139.1	Start DLS 0.50 TFO 42.50
6627.0	7140.2	Start 6798.7 hold at 7140.2 MD
6617.0	13938.9	TD at 13938.9



ENSIGN
Directional

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	1200.0	0.00	0.00	1200.0	0.0	0.0	0.00	0.00	0.0	
3	1962.1	11.43	309.95	1957.1	48.7	-58.1	1.50	309.95	-43.6	
4	5201.5	11.43	309.95	5132.2	460.9	-550.3	0.00	0.00	-412.8	
5	5773.1	0.00	0.00	5700.0	497.4	-593.9	2.00	180.00	-445.5	
6	5937.4	0.00	0.00	5864.3	497.4	-593.9	0.00	0.00	-445.5	
7	7138.1	90.08	180.03	6627.0	-266.4	-594.3	7.50	180.03	315.6	
8	7139.1	90.08	180.03	6627.0	-267.4	-594.3	0.00	0.00	316.6	LPL 815'FNL & 1616'FEL, SEC.29
9	7140.2	90.08	180.03	6627.0	-268.5	-594.3	0.50	42.50	317.7	
10	13938.9	90.08	180.03	6617.0	-7067.2	-598.4	0.00	0.00	7092.5	BHL 2340'FNL & 1664'FEL, Sec.32





PETROLEUM DEVELOPMENT CORP DJ Basin

SEC.29-T5N-R64W

Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W

Ottenhoff 29R-143

Wellbore #1

Plan: Plan #2 (1-25-17)

Standard Planning Report

27 January, 2017

Database:	US_EDM	Local Co-ordinate Reference:	Well Ottenhoff 29R-143
Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	TVD Reference:	WELL @ 4686.0ft (RKB - 23')
Project:	SEC.29-T5N-R64W	MD Reference:	WELL @ 4686.0ft (RKB - 23')
Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	North Reference:	True
Well:	Ottenhoff 29R-143	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #2 (1-25-17)		

Project	SEC.29-T5N-R64W, 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		Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W			
Site Position:		Northing:	1,381,166.77 usft	Latitude:	40.375956
From:	Lat/Long	Easting:	3,259,749.48 usft	Longitude:	-104.567675
Position Uncertainty:	0.0 ft	Slot Radius:	13-3/16 "	Grid Convergence:	0.60

Well	Ottenhoff 29R-143					
Well Position	+N/-S	0.7 ft	Northing:	1,381,166.70 usft	Latitude:	40.375958
	+E/-W	-74.9 ft	Easting:	3,259,674.53 usft	Longitude:	-104.567944
Position Uncertainty		0.0 ft	Wellhead Elevation:	0.0 ft	Ground Level:	4,663.0 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	1/27/2017	8.00	66.87	52,548

Design	Plan #2 (1-25-17)			
Audit Notes:				
Version:	Phase:	PROTOTYPE	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.0	0.0	0.0	184.84

Plan Sections										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,200.0	0.00	0.00	1,200.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,962.1	11.43	309.95	1,957.1	48.7	-58.1	1.50	1.50	0.00	309.95	
5,201.5	11.43	309.95	5,132.2	460.9	-550.3	0.00	0.00	0.00	0.00	
5,773.1	0.00	0.00	5,700.0	497.4	-593.9	2.00	-2.00	0.00	180.00	
5,937.4	0.00	0.00	5,864.3	497.4	-593.9	0.00	0.00	0.00	0.00	
7,138.1	90.08	180.03	6,627.0	-266.4	-594.3	7.50	7.50	0.00	180.03	
7,139.1	90.08	180.03	6,627.0	-267.4	-594.3	0.00	0.00	0.00	0.00	LPL 815'FNL & 1616'I
7,140.2	90.08	180.03	6,627.0	-268.5	-594.3	0.50	0.37	0.34	42.50	
13,938.9	90.08	180.03	6,617.0	-7,067.2	-598.4	0.00	0.00	0.00	0.00	BHL 2340'FNL & 1664'I

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Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	TVD Reference:	WELL @ 4686.0ft (RKB - 23')
Project:	SEC.29-T5N-R64W	MD Reference:	WELL @ 4686.0ft (RKB - 23')
Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	North Reference:	True
Well:	Ottenhoff 29R-143	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #2 (1-25-17)		

Planned 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
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	0.00
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	0.00
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	0.00
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	0.00
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	0.00
700.0	0.00	0.00	700.0	0.0	0.0	0.0	0.00	0.00	0.00
800.0	0.00	0.00	800.0	0.0	0.0	0.0	0.00	0.00	0.00
900.0	0.00	0.00	900.0	0.0	0.0	0.0	0.00	0.00	0.00
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.0	0.00	0.00	0.00
1,100.0	0.00	0.00	1,100.0	0.0	0.0	0.0	0.00	0.00	0.00
1,200.0	0.00	0.00	1,200.0	0.0	0.0	0.0	0.00	0.00	0.00
KOP - Start Build 1.50									
1,300.0	1.50	309.95	1,300.0	0.8	-1.0	-0.8	1.50	1.50	0.00
1,400.0	3.00	309.95	1,399.9	3.4	-4.0	-3.0	1.50	1.50	0.00
1,500.0	4.50	309.95	1,499.7	7.6	-9.0	-6.8	1.50	1.50	0.00
1,600.0	6.00	309.95	1,599.3	13.4	-16.0	-12.0	1.50	1.50	0.00
1,700.0	7.50	309.95	1,698.6	21.0	-25.1	-18.8	1.50	1.50	0.00
1,800.0	9.00	309.95	1,797.5	30.2	-36.1	-27.0	1.50	1.50	0.00
1,900.0	10.50	309.95	1,896.1	41.1	-49.0	-36.8	1.50	1.50	0.00
1,962.1	11.43	309.95	1,957.1	48.7	-58.1	-43.6	1.50	1.50	0.00
2,000.0	11.43	309.95	1,994.2	53.5	-63.9	-47.9	0.00	0.00	0.00
2,100.0	11.43	309.95	2,092.2	66.2	-79.0	-59.3	0.00	0.00	0.00
2,200.0	11.43	309.95	2,190.2	78.9	-94.2	-70.7	0.00	0.00	0.00
2,300.0	11.43	309.95	2,288.3	91.7	-109.4	-82.1	0.00	0.00	0.00
2,400.0	11.43	309.95	2,386.3	104.4	-124.6	-93.5	0.00	0.00	0.00
2,500.0	11.43	309.95	2,484.3	117.1	-139.8	-104.9	0.00	0.00	0.00
2,600.0	11.43	309.95	2,582.3	129.8	-155.0	-116.3	0.00	0.00	0.00
2,700.0	11.43	309.95	2,680.3	142.6	-170.2	-127.7	0.00	0.00	0.00
2,800.0	11.43	309.95	2,778.3	155.3	-185.4	-139.1	0.00	0.00	0.00
2,900.0	11.43	309.95	2,876.3	168.0	-200.6	-150.5	0.00	0.00	0.00
3,000.0	11.43	309.95	2,974.4	180.7	-215.8	-161.9	0.00	0.00	0.00
3,100.0	11.43	309.95	3,072.4	193.5	-231.0	-173.3	0.00	0.00	0.00
3,200.0	11.43	309.95	3,170.4	206.2	-246.2	-184.7	0.00	0.00	0.00
3,300.0	11.43	309.95	3,268.4	218.9	-261.4	-196.1	0.00	0.00	0.00
3,400.0	11.43	309.95	3,366.4	231.6	-276.6	-207.5	0.00	0.00	0.00
3,500.0	11.43	309.95	3,464.4	244.4	-291.8	-218.9	0.00	0.00	0.00
3,566.9	11.43	309.95	3,530.0	252.9	-301.9	-226.5	0.00	0.00	0.00
Parkman Sandstone									
3,600.0	11.43	309.95	3,562.5	257.1	-307.0	-230.3	0.00	0.00	0.00
3,700.0	11.43	309.95	3,660.5	269.8	-322.2	-241.7	0.00	0.00	0.00
3,800.0	11.43	309.95	3,758.5	282.5	-337.4	-253.1	0.00	0.00	0.00
3,900.0	11.43	309.95	3,856.5	295.3	-352.6	-264.5	0.00	0.00	0.00
4,000.0	11.43	309.95	3,954.5	308.0	-367.8	-275.9	0.00	0.00	0.00
4,100.0	11.43	309.95	4,052.5	320.7	-383.0	-287.3	0.00	0.00	0.00
4,200.0	11.43	309.95	4,150.6	333.5	-398.1	-298.7	0.00	0.00	0.00
4,250.4	11.43	309.95	4,200.0	339.9	-405.8	-304.4	0.00	0.00	0.00
Sussex Sandstone									
4,300.0	11.43	309.95	4,248.6	346.2	-413.3	-310.1	0.00	0.00	0.00
4,400.0	11.43	309.95	4,346.6	358.9	-428.5	-321.5	0.00	0.00	0.00
4,500.0	11.43	309.95	4,444.6	371.6	-443.7	-332.9	0.00	0.00	0.00

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Project:	SEC.29-T5N-R64W	MD Reference:	WELL @ 4686.0ft (RKB - 23')
Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	North Reference:	True
Well:	Ottenhoff 29R-143	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #2 (1-25-17)		

Planned 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)
4,600.0	11.43	309.95	4,542.6	384.4	-458.9	-344.3	0.00	0.00	0.00
4,700.0	11.43	309.95	4,640.6	397.1	-474.1	-355.7	0.00	0.00	0.00
4,800.0	11.43	309.95	4,738.7	409.8	-489.3	-367.1	0.00	0.00	0.00
4,900.0	11.43	309.95	4,836.7	422.5	-504.5	-378.5	0.00	0.00	0.00
5,000.0	11.43	309.95	4,934.7	435.3	-519.7	-389.9	0.00	0.00	0.00
5,100.0	11.43	309.95	5,032.7	448.0	-534.9	-401.3	0.00	0.00	0.00
5,200.0	11.43	309.95	5,130.7	460.7	-550.1	-412.7	0.00	0.00	0.00
5,201.5	11.43	309.95	5,132.2	460.9	-550.3	-412.8	0.00	0.00	0.00
Start Drop -2.00									
5,300.0	9.46	309.95	5,229.0	472.4	-564.0	-423.1	2.00	-2.00	0.00
5,400.0	7.46	309.95	5,328.0	481.8	-575.3	-431.6	2.00	-2.00	0.00
5,500.0	5.46	309.95	5,427.3	489.0	-583.9	-438.0	2.00	-2.00	0.00
5,600.0	3.46	309.95	5,527.0	494.0	-589.9	-442.5	2.00	-2.00	0.00
5,700.0	1.46	309.95	5,626.9	496.8	-593.2	-445.0	2.00	-2.00	0.00
5,773.1	0.00	0.00	5,700.0	497.4	-593.9	-445.5	2.00	-2.00	0.00
5,800.0	0.00	0.00	5,726.9	497.4	-593.9	-445.5	0.00	0.00	0.00
5,900.0	0.00	0.00	5,826.9	497.4	-593.9	-445.5	0.00	0.00	0.00
5,937.4	0.00	0.00	5,864.3	497.4	-593.9	-445.5	0.00	0.00	0.00
Start Build 7.50									
6,000.0	4.70	180.03	5,926.8	494.8	-593.9	-443.0	7.50	7.50	0.00
6,100.0	12.20	180.03	6,025.7	480.2	-593.9	-428.3	7.50	7.50	0.00
6,200.0	19.70	180.03	6,121.8	452.7	-593.9	-401.0	7.50	7.50	0.00
6,300.0	27.20	180.03	6,213.4	412.9	-593.9	-361.3	7.50	7.50	0.00
6,400.0	34.71	180.03	6,299.1	361.5	-594.0	-310.1	7.50	7.50	0.00
6,500.0	42.21	180.03	6,377.4	299.4	-594.0	-248.2	7.50	7.50	0.00
6,552.5	46.15	180.03	6,415.0	262.8	-594.0	-211.8	7.50	7.50	0.00
Sharon Springs									
6,600.0	49.71	180.03	6,446.8	227.5	-594.0	-176.6	7.50	7.50	0.00
6,700.0	57.21	180.03	6,506.3	147.2	-594.1	-96.6	7.50	7.50	0.00
6,800.0	64.72	180.03	6,554.8	59.9	-594.1	-9.5	7.50	7.50	0.00
6,812.3	65.64	180.03	6,560.0	48.7	-594.1	1.6	7.50	7.50	0.00
Niobrara A									
6,900.0	72.22	180.03	6,591.5	-33.1	-594.2	83.1	7.50	7.50	0.00
7,000.0	79.72	180.03	6,615.7	-130.0	-594.2	179.7	7.50	7.50	0.00
7,100.0	87.22	180.03	6,627.1	-229.3	-594.3	278.6	7.50	7.50	0.00
7,138.1	90.08	180.03	6,627.0	-266.4	-594.3	315.6	7.50	7.50	0.00
7,139.1	90.08	180.03	6,627.0	-267.4	-594.3	316.6	0.00	0.00	0.00
Start DLS 0.50 TFO 42.50									
7,140.2	90.08	180.03	6,627.0	-268.5	-594.3	317.7	0.50	0.37	0.34
Start 6798.7 hold at 7140.2 MD									
7,200.0	90.08	180.03	6,626.9	-328.3	-594.3	377.3	0.00	0.00	0.00
7,300.0	90.08	180.03	6,626.8	-428.3	-594.4	476.9	0.00	0.00	0.00
7,400.0	90.08	180.03	6,626.6	-528.3	-594.5	576.6	0.00	0.00	0.00
7,500.0	90.08	180.03	6,626.5	-628.3	-594.5	676.2	0.00	0.00	0.00
7,600.0	90.08	180.03	6,626.3	-728.3	-594.6	775.9	0.00	0.00	0.00
7,700.0	90.08	180.03	6,626.2	-828.3	-594.6	875.5	0.00	0.00	0.00
7,800.0	90.08	180.03	6,626.0	-928.3	-594.7	975.2	0.00	0.00	0.00
7,900.0	90.08	180.03	6,625.9	-1,028.3	-594.8	1,074.8	0.00	0.00	0.00
8,000.0	90.08	180.03	6,625.7	-1,128.3	-594.8	1,174.4	0.00	0.00	0.00
8,100.0	90.08	180.03	6,625.6	-1,228.3	-594.9	1,274.1	0.00	0.00	0.00
8,200.0	90.08	180.03	6,625.4	-1,328.3	-594.9	1,373.7	0.00	0.00	0.00

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Project:	SEC.29-T5N-R64W	MD Reference:	WELL @ 4686.0ft (RKB - 23')
Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	North Reference:	True
Well:	Ottenhoff 29R-143	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #2 (1-25-17)		

Planned 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)
8,300.0	90.08	180.03	6,625.3	-1,428.3	-595.0	1,473.4	0.00	0.00	0.00
8,400.0	90.08	180.03	6,625.1	-1,528.3	-595.1	1,573.0	0.00	0.00	0.00
8,500.0	90.08	180.03	6,625.0	-1,628.3	-595.1	1,672.7	0.00	0.00	0.00
8,600.0	90.08	180.03	6,624.9	-1,728.3	-595.2	1,772.3	0.00	0.00	0.00
8,700.0	90.08	180.03	6,624.7	-1,828.3	-595.2	1,872.0	0.00	0.00	0.00
8,800.0	90.08	180.03	6,624.6	-1,928.3	-595.3	1,971.6	0.00	0.00	0.00
8,900.0	90.08	180.03	6,624.4	-2,028.3	-595.4	2,071.3	0.00	0.00	0.00
9,000.0	90.08	180.03	6,624.3	-2,128.3	-595.4	2,170.9	0.00	0.00	0.00
9,100.0	90.08	180.03	6,624.1	-2,228.3	-595.5	2,270.6	0.00	0.00	0.00
9,200.0	90.08	180.03	6,624.0	-2,328.3	-595.5	2,370.2	0.00	0.00	0.00
9,300.0	90.08	180.03	6,623.8	-2,428.3	-595.6	2,469.9	0.00	0.00	0.00
9,400.0	90.08	180.03	6,623.7	-2,528.3	-595.7	2,569.5	0.00	0.00	0.00
9,500.0	90.08	180.03	6,623.5	-2,628.3	-595.7	2,669.2	0.00	0.00	0.00
9,600.0	90.08	180.03	6,623.4	-2,728.3	-595.8	2,768.8	0.00	0.00	0.00
9,700.0	90.08	180.03	6,623.2	-2,828.3	-595.8	2,868.5	0.00	0.00	0.00
9,800.0	90.08	180.03	6,623.1	-2,928.3	-595.9	2,968.1	0.00	0.00	0.00
9,900.0	90.08	180.03	6,622.9	-3,028.3	-596.0	3,067.8	0.00	0.00	0.00
10,000.0	90.08	180.03	6,622.8	-3,128.3	-596.0	3,167.4	0.00	0.00	0.00
10,100.0	90.08	180.03	6,622.6	-3,228.3	-596.1	3,267.1	0.00	0.00	0.00
10,200.0	90.08	180.03	6,622.5	-3,328.3	-596.1	3,366.7	0.00	0.00	0.00
10,300.0	90.08	180.03	6,622.4	-3,428.3	-596.2	3,466.4	0.00	0.00	0.00
10,400.0	90.08	180.03	6,622.2	-3,528.3	-596.3	3,566.0	0.00	0.00	0.00
10,500.0	90.08	180.03	6,622.1	-3,628.3	-596.3	3,665.7	0.00	0.00	0.00
10,600.0	90.08	180.03	6,621.9	-3,728.3	-596.4	3,765.3	0.00	0.00	0.00
10,700.0	90.08	180.03	6,621.8	-3,828.3	-596.4	3,865.0	0.00	0.00	0.00
10,800.0	90.08	180.03	6,621.6	-3,928.3	-596.5	3,964.6	0.00	0.00	0.00
10,900.0	90.08	180.03	6,621.5	-4,028.3	-596.6	4,064.3	0.00	0.00	0.00
11,000.0	90.08	180.03	6,621.3	-4,128.3	-596.6	4,163.9	0.00	0.00	0.00
11,100.0	90.08	180.03	6,621.2	-4,228.3	-596.7	4,263.5	0.00	0.00	0.00
11,200.0	90.08	180.03	6,621.0	-4,328.3	-596.7	4,363.2	0.00	0.00	0.00
11,300.0	90.08	180.03	6,620.9	-4,428.3	-596.8	4,462.8	0.00	0.00	0.00
11,400.0	90.08	180.03	6,620.7	-4,528.3	-596.9	4,562.5	0.00	0.00	0.00
11,500.0	90.08	180.03	6,620.6	-4,628.3	-596.9	4,662.1	0.00	0.00	0.00
11,600.0	90.08	180.03	6,620.4	-4,728.3	-597.0	4,761.8	0.00	0.00	0.00
11,700.0	90.08	180.03	6,620.3	-4,828.3	-597.0	4,861.4	0.00	0.00	0.00
11,800.0	90.08	180.03	6,620.1	-4,928.3	-597.1	4,961.1	0.00	0.00	0.00
11,900.0	90.08	180.03	6,620.0	-5,028.3	-597.2	5,060.7	0.00	0.00	0.00
12,000.0	90.08	180.03	6,619.9	-5,128.3	-597.2	5,160.4	0.00	0.00	0.00
12,100.0	90.08	180.03	6,619.7	-5,228.3	-597.3	5,260.0	0.00	0.00	0.00
12,200.0	90.08	180.03	6,619.6	-5,328.3	-597.3	5,359.7	0.00	0.00	0.00
12,300.0	90.08	180.03	6,619.4	-5,428.3	-597.4	5,459.3	0.00	0.00	0.00
12,400.0	90.08	180.03	6,619.3	-5,528.3	-597.5	5,559.0	0.00	0.00	0.00
12,500.0	90.08	180.03	6,619.1	-5,628.3	-597.5	5,658.6	0.00	0.00	0.00
12,600.0	90.08	180.03	6,619.0	-5,728.3	-597.6	5,758.3	0.00	0.00	0.00
12,700.0	90.08	180.03	6,618.8	-5,828.3	-597.6	5,857.9	0.00	0.00	0.00
12,800.0	90.08	180.03	6,618.7	-5,928.3	-597.7	5,957.6	0.00	0.00	0.00
12,900.0	90.08	180.03	6,618.5	-6,028.3	-597.7	6,057.2	0.00	0.00	0.00
13,000.0	90.08	180.03	6,618.4	-6,128.3	-597.8	6,156.9	0.00	0.00	0.00
13,100.0	90.08	180.03	6,618.2	-6,228.3	-597.9	6,256.5	0.00	0.00	0.00
13,200.0	90.08	180.03	6,618.1	-6,328.3	-597.9	6,356.2	0.00	0.00	0.00
13,300.0	90.08	180.03	6,617.9	-6,428.3	-598.0	6,455.8	0.00	0.00	0.00
13,400.0	90.08	180.03	6,617.8	-6,528.3	-598.0	6,555.5	0.00	0.00	0.00

Database:	US_EDM	Local Co-ordinate Reference:	Well Ottenhoff 29R-143
Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	TVD Reference:	WELL @ 4686.0ft (RKB - 23')
Project:	SEC.29-T5N-R64W	MD Reference:	WELL @ 4686.0ft (RKB - 23')
Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	North Reference:	True
Well:	Ottenhoff 29R-143	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #2 (1-25-17)		

Planned 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)
13,500.0	90.08	180.03	6,617.6	-6,628.3	-598.1	6,655.1	0.00	0.00	0.00
13,600.0	90.08	180.03	6,617.5	-6,728.3	-598.2	6,754.8	0.00	0.00	0.00
13,700.0	90.08	180.03	6,617.4	-6,828.3	-598.2	6,854.4	0.00	0.00	0.00
13,800.0	90.08	180.03	6,617.2	-6,928.3	-598.3	6,954.1	0.00	0.00	0.00
13,900.0	90.08	180.03	6,617.1	-7,028.3	-598.3	7,053.7	0.00	0.00	0.00
13,938.9	90.08	180.03	6,617.0	-7,067.2	-598.4	7,092.5	0.00	0.00	0.00
TD at 13938.9									

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 558'FNL & 1020'FE - plan hits target center - Point	0.00	0.00	1.0	0.0	0.0	1,381,166.71	3,259,674.53	40.375958	-104.567944
BHL 2340'FNL & 1664'F - plan hits target center - Point	0.00	0.00	6,617.0	-7,067.2	-598.4	1,374,093.88	3,259,150.50	40.356559	-104.570091
LPL 815'FNL & 1616'FEI - plan hits target center - Point	0.00	0.00	6,627.0	-267.4	-594.3	1,380,893.10	3,259,083.09	40.375224	-104.570077

Formations					
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
3,566.9	3,530.0	Parkman Sandstone		0.00	
4,250.4	4,200.0	Sussex Sandstone		0.00	
6,552.5	6,415.0	Sharon Springs		0.00	
6,812.3	6,560.0	Niobrara A		0.00	

Plan Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
1,200.0	1,200.0	0.0	0.0	KOP - Start Build 1.50
5,201.5	5,132.2	48.7	-58.1	Start Drop -2.00
5,937.4	5,864.3	460.9	-550.3	Start Build 7.50
7,139.1	6,627.0	497.4	-593.9	Start DLS 0.50 TFO 42.50
7,140.2	6,627.0	497.4	-593.9	Start 6798.7 hold at 7140.2 MD
13,938.9	6,617.0	-266.4	-594.3	TD at 13938.9



PETROLEUM DEVELOPMENT CORP DJ Basin

SEC.29-T5N-R64W

Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W

Ottenhoff 29R-143

Wellbore #1

Plan #2 (1-25-17)

Anticollision Report

27 January, 2017



Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29R-143
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4686.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4686.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29R-143	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.45 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #2 (1-25-17)	Offset TVD Reference:	Offset Datum

Reference	Plan #2 (1-25-17)		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	Stations	Error Model:	ISCWSA
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 800.0 ft	Error Surface:	Elliptical Conic
Warning Levels Evaluated at:	2.45 Sigma	Casing Method:	Not applied

Survey Tool Program	Date	1/27/2017		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
0.0	13,938.9	Plan #2 (1-25-17) (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						
Bell Pad SEC.29-T5N-R64W						
Bell B29-22D - Bell B29-22D - Bell B29-22D	9,021.0	6,693.5	340.3	266.9	4.632	CC, ES, SF
Bell B29-24D - Bell B29-24D - Bell B29-24D						Out of range
Existing Wells Sec.29-T5N-R64W						
Blake #B 29-10X (Exist.) - Wellbore #1 - Wellbore #1	9,519.4	6,626.5	453.7	223.8	1.974	CC, ES, SF
Blake #B29-10 (D&A) - Wellbore #1 - Wellbore #1	9,670.5	6,626.3	379.7	146.5	1.628	CC, ES, SF
Carlson 29-1 (Exist.) - Wellbore #1 - Wellbore #1	8,419.1	6,638.1	286.8	227.9	4.870	CC, ES, SF
Chittenden #1-32 (Exist.) - Wellbore #1 - Wellbore #1						Out of range
DIC Cross #31-32 (P&A) - Wellbore #1 - Wellbore #1	12,280.8	6,645.4	285.2	-8.7	0.970	Level 1, CC, ES, SF
Ottenhoff #29-1 (Exist.) - Wellbore #1 - Wellbore #1	7,002.0	6,622.4	311.8	276.2	8.763	CC, ES, SF
Ottenhoff 41-6B (Exist.) - Wellbore #1 - Wellbore #1	6,072.3	6,100.7	324.7	284.7	8.127	CC, ES
Ottenhoff 41-6B (Exist.) - Wellbore #1 - Wellbore #1	6,150.0	6,173.7	326.4	285.9	8.069	SF
Pearlman #32-13 (Exist.) - Wellbore #1 - Wellbore #1	13,388.9	6,659.7	56.5	-117.0	0.326	Level 1, CC, ES, SF
Existing Wells Sec.29-T5N-R64W (GRID)						
Blake B 29-23 (Exist.) - Wellbore #1 - Wellbore #1	10,040.4	6,645.1	170.9	76.5	1.810	CC, ES, SF

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29R-143
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4686.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4686.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29R-143	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.45 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #2 (1-25-17)	Offset TVD Reference:	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						
Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W						
Ottenhoff 29M-203 - Wellbore #1 - Plan #2 (1-25-17)	200.0	200.0	60.2	59.4	72.864	CC, ES
Ottenhoff 29M-203 - Wellbore #1 - Plan #2 (1-25-17)	4,500.0	4,385.0	785.9	753.7	24.397	SF
Ottenhoff 29M-323 - Wellbore #1 - Plan #2 (1-25-17)	766.3	767.3	30.1	26.1	7.624	CC
Ottenhoff 29M-323 - Wellbore #1 - Plan #2 (1-25-17)	800.0	801.0	30.1	26.0	7.282	ES
Ottenhoff 29M-323 - Wellbore #1 - Plan #2 (1-25-17)	13,938.9	14,184.0	512.2	184.9	1.565	SF
Ottenhoff 29M-423 - Wellbore #1 - Plan #2 (1-25-17)	400.0	400.0	45.1	43.2	23.420	CC, ES
Ottenhoff 29M-423 - Wellbore #1 - Plan #2 (1-25-17)	13,938.9	14,287.2	761.1	440.1	2.371	SF
Ottenhoff 29R-203 - Wellbore #1 - Plan #2 (1-25-17)	1,200.0	1,200.0	29.8	23.5	4.708	CC, ES
Ottenhoff 29R-203 - Wellbore #1 - Plan #2 (1-25-17)	13,938.9	13,986.6	471.0	132.5	1.391	Level 3, SF
Ottenhoff 29R-243 - Wellbore #1 - Plan #2 (1-25-17)	1,000.0	1,000.0	15.0	9.8	2.876	CC
Ottenhoff 29R-243 - Wellbore #1 - Plan #2 (1-25-17)	13,938.9	14,065.4	245.5	-84.1	0.745	Level 1, ES, SF
Ottenhoff 29R-303 - Wellbore #1 - Plan #2 (1-25-17)	1,200.0	1,200.0	15.0	8.7	2.376	CC
Ottenhoff 29R-303 - Wellbore #1 - Plan #2 (1-25-17)	13,938.9	14,074.3	270.2	-30.3	0.899	Level 1, ES, SF
Ottenhoff 29R-323 - Wellbore #1 - Plan #2 (1-25-17)	800.0	800.0	59.9	55.8	14.505	CC, ES
Ottenhoff 29R-323 - Wellbore #1 - Plan #2 (1-25-17)	1,200.0	1,195.9	71.2	64.9	11.245	SF
Ottenhoff 29R-423 - Wellbore #1 - Plan #2 (1-25-17)	1,200.0	1,199.0	44.9	38.5	7.087	CC, ES
Ottenhoff 29R-423 - Wellbore #1 - Plan #2 (1-25-17)	13,938.9	14,145.2	726.9	403.5	2.248	SF
Ottenhoff 29U-243 - Wellbore #1 - Plan #2 (1-25-17)	400.0	400.0	75.0	73.0	38.889	CC, ES
Ottenhoff 29U-243 - Wellbore #1 - Plan #2 (1-25-17)	1,000.0	987.6	111.3	105.9	20.796	SF
Ottenhoff 29U-343 - Wellbore #1 - Plan #2 (1-25-17)	200.0	199.0	90.0	89.2	109.323	CC, ES
Ottenhoff 29U-343 - Wellbore #1 - Plan #2 (1-25-17)	1,100.0	1,067.4	182.0	175.6	28.613	SF

Offset Design Bell Pad SEC.29-T5N-R64W - Bell B29-22D - Bell B29-22D - Bell B29-22D												Offset Site Error:	0.0 ft
Survey Program: 559-Reference												Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Semi Major Axis 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
8,300.0	6,625.3	6,693.0	6,629.6	41.9	21.0	-88.89	-2,149.5	-255.2	797.3	739.3	57.94	13.761	
8,400.0	6,625.1	6,693.0	6,629.7	43.9	21.0	-88.90	-2,149.5	-255.2	708.1	648.1	60.03	11.797	
8,500.0	6,625.0	6,693.1	6,629.8	46.0	21.0	-88.91	-2,149.5	-255.2	622.3	560.2	62.15	10.013	
8,600.0	6,624.9	6,693.2	6,629.9	48.1	21.0	-88.93	-2,149.5	-255.2	541.3	477.1	64.29	8.421	
8,700.0	6,624.7	6,693.2	6,629.9	50.3	21.0	-88.94	-2,149.5	-255.2	467.8	401.4	66.45	7.041	
8,800.0	6,624.6	6,693.3	6,630.0	52.4	21.0	-88.95	-2,149.5	-255.2	405.8	337.2	68.62	5.913	
8,900.0	6,624.4	6,693.4	6,630.1	54.6	21.0	-88.97	-2,149.5	-255.1	361.2	290.4	70.81	5.101	
9,000.0	6,624.3	6,693.5	6,630.2	56.8	21.0	-88.98	-2,149.5	-255.1	341.0	268.0	73.02	4.670	
9,021.0	6,624.2	6,693.5	6,630.2	57.2	21.0	-88.98	-2,149.5	-255.1	340.3	266.9	73.48	4.632	CC, ES, SF
9,100.0	6,624.1	6,693.6	6,630.2	58.9	21.0	-88.99	-2,149.5	-255.1	349.4	274.2	75.23	4.644	
9,200.0	6,624.0	6,693.6	6,630.3	61.1	21.0	-89.01	-2,149.5	-255.1	384.5	307.1	77.46	4.965	
9,300.0	6,623.8	6,693.7	6,630.4	63.4	21.0	-89.02	-2,149.5	-255.1	440.1	360.4	79.69	5.522	
9,400.0	6,623.7	6,693.8	6,630.5	65.6	21.0	-89.03	-2,149.5	-255.1	509.4	427.5	81.94	6.217	
9,500.0	6,623.5	6,693.9	6,630.6	67.8	21.0	-89.05	-2,149.5	-255.1	587.6	503.4	84.19	6.980	
9,600.0	6,623.4	6,694.0	6,630.7	70.0	21.0	-89.06	-2,149.5	-255.1	671.6	585.2	86.45	7.769	
9,700.0	6,623.2	6,694.1	6,630.7	72.3	21.0	-89.08	-2,149.5	-255.1	759.5	670.8	88.71	8.562	

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29R-143
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4686.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4686.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29R-143	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.45 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #2 (1-25-17)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.29-T5N-R64W - Blake #B 29-10X (Exist.) - Wellbore #1 - Wellbore #1													Offset Site Error: 0.0 ft	
Survey Program: 7072-UNKNOWN													Offset Well Error: 0.0 ft	
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor		
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)			
8,900.0	6,624.4	6,627.4	6,627.4	54.6	162.4	90.12	-2,647.4	-1,049.4	767.8	551.7	216.07	3.553		
9,000.0	6,624.3	6,627.3	6,627.3	56.8	162.4	90.10	-2,647.4	-1,049.4	689.6	471.4	218.27	3.160		
9,100.0	6,624.1	6,627.1	6,627.1	58.9	162.4	90.08	-2,647.4	-1,049.4	617.8	397.3	220.48	2.802		
9,200.0	6,624.0	6,627.0	6,627.0	61.1	162.4	90.06	-2,647.4	-1,049.4	554.8	332.1	222.70	2.491		
9,300.0	6,623.8	6,626.8	6,626.8	63.4	162.4	90.04	-2,647.4	-1,049.4	503.9	279.0	224.93	2.240		
9,400.0	6,623.7	6,626.7	6,626.7	65.6	162.4	90.02	-2,647.4	-1,049.4	469.1	241.9	227.17	2.065		
9,500.0	6,623.5	6,626.5	6,626.5	67.8	162.3	90.00	-2,647.4	-1,049.4	454.1	224.7	229.42	1.979		
9,519.4	6,623.5	6,626.5	6,626.5	68.2	162.3	90.00	-2,647.4	-1,049.4	453.7	223.8	229.86	1.974	CC, ES, SF	
9,600.0	6,623.4	6,626.4	6,626.4	70.0	162.3	89.99	-2,647.4	-1,049.4	460.8	229.1	231.67	1.989		
9,700.0	6,623.2	6,626.2	6,626.2	72.3	162.3	89.97	-2,647.4	-1,049.4	488.3	254.4	233.93	2.087		
9,800.0	6,623.1	6,626.1	6,626.1	74.5	162.3	89.95	-2,647.4	-1,049.4	533.4	297.2	236.20	2.258		
9,900.0	6,622.9	6,625.9	6,625.9	76.8	162.3	89.93	-2,647.4	-1,049.4	592.2	353.7	238.47	2.483		
10,000.0	6,622.8	6,625.8	6,625.8	79.1	162.3	89.91	-2,647.4	-1,049.4	660.9	420.2	240.75	2.745		
10,100.0	6,622.6	6,625.6	6,625.6	81.3	162.3	89.89	-2,647.4	-1,049.4	736.8	493.8	243.02	3.032		

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29R-143
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4686.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4686.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29R-143	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.45 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #2 (1-25-17)	Offset TVD Reference:	Offset Datum

Offset Design		Existing Wells Sec.29-T5N-R64W - Blake #B29-10 (D&A) - Wellbore #1 - Wellbore #1											Offset Site Error:		0.0 ft
Survey Program:		7125-UNKNOWN											Offset Well Error:		0.0 ft
Reference		Offset		Semi Major Axis			Distance							Warning	
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor			
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)				
9,000.0	6,624.3	6,627.3	6,627.3	56.8	162.4	90.15	-2,798.6	-975.6	770.6	552.3	218.26	3.531	1.628 CC, ES, SF		
9,100.0	6,624.1	6,627.1	6,627.1	58.9	162.4	90.13	-2,798.6	-975.6	685.4	464.9	220.48	3.109			
9,200.0	6,624.0	6,627.0	6,627.0	61.1	162.4	90.10	-2,798.6	-975.6	604.7	382.0	222.70	2.715			
9,300.0	6,623.8	6,626.8	6,626.8	63.4	162.4	90.08	-2,798.6	-975.6	530.6	305.6	224.93	2.359			
9,400.0	6,623.7	6,626.7	6,626.7	65.6	162.4	90.06	-2,798.6	-975.6	466.3	239.1	227.17	2.052			
9,500.0	6,623.5	6,626.5	6,626.5	67.8	162.3	90.04	-2,798.6	-975.6	416.3	186.9	229.42	1.815			
9,600.0	6,623.4	6,626.4	6,626.4	70.0	162.3	90.02	-2,798.6	-975.6	386.2	154.6	231.67	1.667			
9,670.5	6,623.3	6,626.3	6,626.3	71.6	162.3	90.00	-2,798.6	-975.6	379.7	146.5	233.27				
9,700.0	6,623.2	6,626.2	6,626.2	72.3	162.3	89.99	-2,798.6	-975.6	380.9	147.0	233.93	1.628			
9,800.0	6,623.1	6,626.1	6,626.1	74.5	162.3	89.97	-2,798.6	-975.6	401.2	165.0	236.20	1.699			
9,900.0	6,622.9	6,625.9	6,625.9	76.8	162.3	89.95	-2,798.6	-975.6	443.7	205.2	238.47	1.861			
10,000.0	6,622.8	6,625.8	6,625.8	79.1	162.3	89.93	-2,798.6	-975.6	502.7	262.0	240.75	2.088			
10,100.0	6,622.6	6,625.6	6,625.6	81.3	162.3	89.90	-2,798.6	-975.6	573.3	330.2	243.02	2.359			
10,200.0	6,622.5	6,625.5	6,625.5	83.6	162.3	89.88	-2,798.6	-975.6	651.6	406.2	245.31	2.656			
10,300.0	6,622.4	6,625.4	6,625.4	85.9	162.3	89.86	-2,798.6	-975.6	735.1	487.5	247.59	2.969			

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29R-143
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4686.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4686.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29R-143	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.45 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #2 (1-25-17)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.29-T5N-R64W - Carlson 29-1 (Exist.) - Wellbore #1 - Wellbore #1													Offset Site Error:	0.0 ft
Survey Program: 100-NS-GYRO-MS													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
7,700.0	6,626.2	6,626.1	6,625.0	30.4	15.8	90.78	-1,547.0	-882.1	774.1	729.3	44.84	17.265		
7,800.0	6,626.0	6,627.8	6,626.7	32.2	15.8	91.11	-1,547.1	-882.0	682.2	635.6	46.63	14.630		
7,900.0	6,625.9	6,629.5	6,628.4	34.0	15.8	91.45	-1,547.1	-881.9	593.0	544.5	48.50	12.228		
8,000.0	6,625.7	6,631.1	6,630.0	35.9	15.8	91.78	-1,547.1	-881.8	507.8	457.4	50.42	10.072		
8,100.0	6,625.6	6,632.8	6,631.7	37.9	15.8	92.11	-1,547.2	-881.7	429.0	376.6	52.38	8.190		
8,200.0	6,625.4	6,634.4	6,633.3	39.9	15.8	92.44	-1,547.2	-881.6	360.9	306.5	54.39	6.635		
8,300.0	6,625.3	6,636.1	6,635.0	41.9	15.8	92.77	-1,547.2	-881.5	310.5	254.1	56.43	5.503		
8,400.0	6,625.1	6,637.7	6,636.6	43.9	15.8	93.10	-1,547.3	-881.4	287.4	228.9	58.49	4.914		
8,419.1	6,625.1	6,638.1	6,636.9	44.3	15.8	93.16	-1,547.3	-881.4	286.8	227.9	58.89	4.870	CC, ES, SF	
8,500.0	6,625.0	6,639.4	6,638.3	46.0	15.8	93.43	-1,547.3	-881.4	298.0	237.4	60.58	4.918		
8,600.0	6,624.9	6,641.1	6,639.9	48.1	15.8	93.76	-1,547.3	-881.3	339.1	276.4	62.69	5.408		
8,700.0	6,624.7	6,642.7	6,641.6	50.3	15.8	94.09	-1,547.3	-881.2	401.4	336.6	64.82	6.193		
8,800.0	6,624.6	6,644.4	6,643.2	52.4	15.8	94.42	-1,547.4	-881.1	476.7	409.8	66.96	7.120		
8,900.0	6,624.4	6,646.0	6,644.9	54.6	15.8	94.75	-1,547.4	-881.0	559.8	490.7	69.11	8.101		
9,000.0	6,624.3	6,647.7	6,646.5	56.8	15.8	95.08	-1,547.4	-880.9	647.7	576.5	71.26	9.089		
9,100.0	6,624.1	6,649.3	6,648.2	58.9	15.8	95.41	-1,547.5	-880.8	738.7	665.3	73.43	10.060		

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29R-143
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4686.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4686.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29R-143	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.45 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #2 (1-25-17)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.29-T5N-R64W - DIC Cross #31-32 (P&A) - Wellbore #1 - Wellbore #1													Offset Site Error: 0.0 ft	
Survey Program: 7025-UNKNOWN													Offset Well Error: 0.0 ft	
Reference		Offset		Semi Major Axis			Distance							
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
11,600.0	6,620.4	6,646.4	6,646.4	115.7	162.8	90.20	-5,408.9	-882.6	738.1	460.0	278.09	2.654		
11,700.0	6,620.3	6,646.3	6,646.3	118.0	162.8	90.17	-5,408.9	-882.6	647.0	366.6	280.40	2.307		
11,800.0	6,620.1	6,646.1	6,646.1	120.3	162.8	90.14	-5,408.9	-882.6	559.0	276.3	282.72	1.977		
11,900.0	6,620.0	6,646.0	6,646.0	122.7	162.8	90.11	-5,408.9	-882.6	475.7	190.7	285.04	1.669		
12,000.0	6,619.9	6,645.9	6,645.9	125.0	162.8	90.08	-5,408.9	-882.6	400.2	112.9	287.36	1.393	Level 3	
12,100.0	6,619.7	6,645.7	6,645.7	127.3	162.8	90.05	-5,408.9	-882.6	337.7	48.0	289.68	1.166	Level 2	
12,200.0	6,619.6	6,645.6	6,645.6	129.6	162.8	90.02	-5,408.9	-882.6	296.4	4.4	292.00	1.015	Level 2	
12,280.8	6,619.4	6,645.4	6,645.4	131.5	162.8	90.00	-5,408.9	-882.6	285.2	-8.7	293.88	0.970	Level 1, CC, ES, SF	
12,300.0	6,619.4	6,645.4	6,645.4	131.9	162.8	89.99	-5,408.9	-882.6	285.9	-8.5	294.33	0.971	Level 1	
12,400.0	6,619.3	6,645.3	6,645.3	134.2	162.8	89.96	-5,408.9	-882.6	309.1	12.5	296.65	1.042	Level 2	
12,500.0	6,619.1	6,645.1	6,645.1	136.6	162.8	89.94	-5,408.9	-882.6	359.7	60.7	298.98	1.203	Level 2	
12,600.0	6,619.0	6,645.0	6,645.0	138.9	162.8	89.91	-5,408.9	-882.6	428.1	126.8	301.30	1.421	Level 3	
12,700.0	6,618.8	6,644.8	6,644.8	141.2	162.8	89.88	-5,408.9	-882.6	507.0	203.4	303.63	1.670		
12,800.0	6,618.7	6,644.7	6,644.7	143.5	162.8	89.85	-5,408.9	-882.6	592.4	286.4	305.95	1.936		
12,900.0	6,618.5	6,644.5	6,644.5	145.9	162.8	89.82	-5,408.9	-882.6	681.7	373.5	308.28	2.211		
13,000.0	6,618.4	6,644.4	6,644.4	148.2	162.8	89.79	-5,408.9	-882.6	773.7	463.1	310.61	2.491		

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29R-143
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4686.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4686.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29R-143	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.45 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #2 (1-25-17)	Offset TVD Reference:	Offset Datum

Offset Design		Existing Wells Sec.29-T5N-R64W - Ottenhoff #29-1 (Exist.) - Wellbore #1 - Wellbore #1											Offset Site Error:		0.0 ft
Survey Program:		100-NS-GYRO-MS											Offset Well Error:		0.0 ft
Reference		Offset		Semi Major Axis			Distance							Warning	
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor			
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)				
3,000.0	2,974.4	2,971.1	2,971.0	10.4	7.1	-61.91	-109.7	-955.0	794.2	777.3	16.91	46.969			
3,100.0	3,072.4	3,071.6	3,071.5	10.9	7.4	-63.20	-109.6	-954.6	784.5	766.9	17.69	44.352			
3,200.0	3,170.4	3,170.3	3,170.2	11.4	7.6	-64.51	-109.4	-953.9	774.9	756.4	18.48	41.925			
3,300.0	3,268.4	3,270.1	3,269.9	11.9	7.9	-65.84	-108.9	-953.2	765.6	746.3	19.30	39.669			
3,400.0	3,366.4	3,369.1	3,368.9	12.4	8.2	-67.14	-107.7	-952.6	756.4	736.3	20.13	37.581			
3,500.0	3,464.4	3,467.6	3,467.5	12.9	8.5	-68.46	-106.4	-952.0	747.7	726.7	20.96	35.663			
3,600.0	3,562.5	3,567.7	3,567.6	13.4	8.8	-69.81	-104.9	-951.3	739.1	717.3	21.81	33.884			
3,700.0	3,660.5	3,668.5	3,668.3	13.9	9.2	-71.20	-103.1	-950.3	730.7	708.0	22.67	32.227			
3,800.0	3,758.5	3,767.8	3,767.6	14.5	9.5	-72.62	-101.3	-949.1	722.3	698.8	23.54	30.692			
3,900.0	3,856.5	3,864.6	3,864.4	15.0	9.8	-74.04	-99.7	-947.7	714.5	690.1	24.40	29.287			
4,000.0	3,954.5	3,958.1	3,957.9	15.5	10.1	-75.43	-98.2	-946.8	707.4	682.2	25.25	28.021			
4,100.0	4,052.5	4,052.4	4,052.1	16.0	10.3	-76.87	-97.4	-946.3	701.6	675.5	26.10	26.882			
4,200.0	4,150.6	4,149.2	4,148.9	16.6	10.6	-78.42	-97.0	-945.7	696.5	669.6	26.96	25.836			
4,300.0	4,248.6	4,244.9	4,244.7	17.1	10.9	-79.95	-96.6	-945.4	692.2	664.4	27.78	24.914			
4,400.0	4,346.6	4,338.7	4,338.5	17.6	11.1	-81.47	-96.6	-945.5	689.0	660.4	28.51	24.163			
4,500.0	4,444.6	4,433.1	4,432.8	18.1	11.1	-83.01	-96.9	-945.9	686.8	657.7	29.15	23.560			
4,600.0	4,542.6	4,526.8	4,526.6	18.7	11.2	-84.56	-97.7	-946.6	685.7	656.0	29.77	23.038			
4,626.7	4,568.8	4,551.1	4,550.9	18.8	11.2	-84.97	-98.1	-946.7	685.7	655.8	29.93	22.909			
4,700.0	4,640.6	4,617.5	4,617.3	19.2	11.3	-86.16	-99.9	-946.9	686.1	655.7	30.39	22.579			
4,800.0	4,738.7	4,708.3	4,708.0	19.7	11.3	-87.85	-103.5	-947.1	688.2	657.2	31.02	22.185			
4,900.0	4,836.7	4,806.9	4,806.4	20.2	11.4	-89.70	-108.0	-947.2	691.4	659.8	31.67	21.835			
5,000.0	4,934.7	4,907.3	4,906.7	20.8	11.5	-91.56	-112.2	-947.3	695.0	662.7	32.31	21.510			
5,100.0	5,032.7	5,005.8	5,005.2	21.3	11.7	-93.35	-116.1	-947.3	699.1	666.2	32.95	21.215			
5,201.5	5,132.2	5,113.5	5,112.8	21.8	11.8	-95.30	-119.8	-946.8	703.3	669.6	33.63	20.914			
5,300.0	5,229.0	5,219.1	5,218.4	22.3	12.0	-97.10	-122.2	-945.6	706.5	672.3	34.22	20.643			
5,400.0	5,328.0	5,324.7	5,323.9	22.6	12.2	-98.53	-123.2	-944.1	708.6	673.8	34.77	20.382			
5,500.0	5,427.3	5,424.7	5,424.0	22.9	12.5	-99.66	-124.3	-941.8	710.1	674.8	35.27	20.132			
5,600.0	5,527.0	5,526.9	5,526.0	23.2	12.7	-100.62	-125.7	-938.1	710.9	675.1	35.74	19.888			
5,700.0	5,626.9	5,623.9	5,622.9	23.4	13.0	-101.27	-127.1	-934.4	711.1	674.9	36.17	19.663			
5,773.1	5,700.0	5,692.0	5,691.0	23.5	13.1	-151.60	-128.3	-932.2	711.3	674.9	36.44	19.523			
5,800.0	5,726.9	5,718.4	5,717.5	23.5	13.2	-151.67	-128.9	-931.5	711.5	674.9	36.54	19.470			
5,900.0	5,826.9	5,819.3	5,818.3	23.7	13.5	-151.92	-130.7	-929.0	711.9	675.0	36.95	19.265			
5,937.4	5,864.3	5,857.4	5,856.3	23.8	13.5	-152.00	-131.3	-928.1	712.0	674.9	37.11	19.186			
5,950.0	5,876.9	5,870.2	5,869.1	23.8	13.6	-127.95	-131.5	-927.9	712.0	674.8	37.15	19.164			
6,000.0	5,926.8	5,922.6	5,921.5	23.8	13.7	-28.02	-132.1	-926.9	709.9	672.6	37.23	19.069			
6,050.0	5,976.5	5,976.8	5,975.7	23.9	13.9	-28.36	-132.4	-925.8	704.6	667.4	37.18	18.950			
6,100.0	6,025.7	6,029.0	6,027.9	23.9	14.0	-28.95	-132.5	-924.6	696.2	659.2	37.02	18.809			
6,150.0	6,074.2	6,079.3	6,078.2	23.8	14.2	-29.79	-132.5	-923.2	684.9	648.2	36.73	18.647			
6,200.0	6,121.8	6,128.2	6,127.1	23.8	14.3	-30.90	-132.4	-921.8	670.8	634.4	36.34	18.459			
6,250.0	6,168.2	6,175.5	6,174.4	23.7	14.4	-32.34	-132.2	-920.4	653.9	618.1	35.86	18.238			
6,300.0	6,213.4	6,221.5	6,220.3	23.6	14.6	-34.15	-131.9	-919.0	634.6	599.3	35.31	17.971			
6,350.0	6,257.1	6,265.9	6,264.7	23.5	14.7	-36.37	-131.6	-917.7	612.9	578.2	34.74	17.642			
6,400.0	6,299.1	6,308.3	6,307.1	23.4	14.8	-39.04	-131.3	-916.4	589.1	554.9	34.19	17.233			
6,450.0	6,339.3	6,348.3	6,347.1	23.3	14.9	-42.21	-131.0	-915.2	563.4	529.7	33.69	16.723			
6,500.0	6,377.4	6,386.3	6,385.1	23.1	15.1	-45.94	-130.7	-914.0	536.2	502.9	33.33	16.090			
6,550.0	6,413.3	6,421.7	6,420.4	23.0	15.2	-50.21	-130.4	-912.8	507.8	474.7	33.13	15.326			
6,600.0	6,446.8	6,454.5	6,453.2	22.9	15.3	-55.03	-130.3	-911.7	478.6	445.5	33.14	14.441			
6,650.0	6,477.9	6,485.1	6,483.8	22.7	15.4	-60.34	-130.1	-910.7	449.3	415.9	33.36	13.467			
6,700.0	6,506.3	6,513.2	6,511.9	22.6	15.4	-65.99	-130.1	-909.7	420.3	386.6	33.73	12.461			
6,750.0	6,532.0	6,538.8	6,537.5	22.5	15.5	-71.73	-130.0	-908.8	392.5	358.4	34.16	11.490			
6,800.0	6,554.8	6,561.5	6,560.2	22.3	15.6	-77.27	-130.0	-908.0	367.0	332.4	34.57	10.616			

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29R-143
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4686.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4686.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29R-143	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.45 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #2 (1-25-17)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.29-T5N-R64W - Ottenhoff #29-1 (Exist.) - Wellbore #1 - Wellbore #1													Offset Site Error:	0.0 ft
Survey Program: 100-NS-GYRO-MS													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance							
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor	Warning	
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)			
6,850.0	6,574.7	6,581.3	6,579.9	22.2	15.6	82.28	-130.0	-907.3	344.8	309.9	34.90	9.882		
6,900.0	6,591.5	6,598.0	6,596.6	22.2	15.7	86.52	-129.9	-906.7	327.4	292.2	35.14	9.317		
6,950.0	6,605.2	6,611.6	6,610.2	22.1	15.7	89.79	-129.9	-906.2	316.0	280.7	35.34	8.942		
7,000.0	6,615.7	6,622.1	6,620.7	22.1	15.8	91.97	-129.9	-905.9	311.8	276.3	35.57	8.766		
7,002.0	6,616.1	6,622.4	6,621.0	22.1	15.8	92.04	-129.9	-905.9	311.8	276.2	35.58	8.763 CC, ES, SF		
7,050.0	6,623.0	6,629.3	6,627.9	22.2	15.8	93.01	-129.9	-905.6	315.5	279.6	35.89	8.789		
7,100.0	6,627.1	6,633.2	6,631.8	22.4	15.8	92.85	-129.9	-905.5	326.9	290.5	36.34	8.996		
7,138.1	6,627.0	6,633.1	6,631.7	22.6	15.8	91.93	-129.9	-905.5	340.0	303.2	36.76	9.249		
7,139.1	6,627.0	6,633.1	6,631.7	22.6	15.8	91.92	-129.9	-905.5	340.4	303.6	36.77	9.258		
7,140.2	6,627.0	6,633.1	6,631.6	22.6	15.8	91.92	-129.9	-905.5	340.8	304.1	36.78	9.268		
7,200.0	6,626.9	6,632.9	6,631.4	23.1	15.8	91.89	-129.9	-905.5	369.2	331.8	37.36	9.883		
7,300.0	6,626.8	6,632.5	6,631.1	24.2	15.8	91.82	-129.9	-905.5	431.2	392.7	38.56	11.183		
7,400.0	6,626.6	6,632.2	6,630.8	25.6	15.8	91.76	-129.9	-905.5	505.6	465.6	39.93	12.660		
7,500.0	6,626.5	6,631.8	6,630.4	27.1	15.8	91.70	-129.9	-905.5	587.6	546.1	41.45	14.176		
7,600.0	6,626.3	6,631.5	6,630.1	28.7	15.8	91.64	-129.9	-905.5	674.5	631.4	43.08	15.655		
7,700.0	6,626.2	6,631.2	6,629.8	30.4	15.8	91.58	-129.9	-905.6	764.6	719.7	44.82	17.060		

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29R-143
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4686.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4686.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29R-143	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.45 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #2 (1-25-17)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.29-T5N-R64W - Ottenhoff 41-6B (Exist) - Wellbore #1 - Wellbore #1													Offset Site Error:		0.0 ft
Survey Program: 488-NS-GYRO-MS													Offset Well Error:		0.0 ft
Reference		Offset		Semi Major Axis			Distance							Warning	
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor			
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)				
0.0	0.0	0.0	0.0	0.0	0.0	97.48	-50.3	382.8	386.3						
100.0	100.0	88.3	88.3	0.1	0.1	97.48	-50.3	382.8	386.1	385.8	0.28	1,371.573			
200.0	200.0	188.7	188.7	0.4	0.3	97.50	-50.3	382.6	385.9	385.2	0.72	536.059			
300.0	300.0	289.0	289.0	0.7	0.5	97.51	-50.4	382.4	385.7	384.6	1.16	332.963			
400.0	400.0	389.4	389.4	1.0	0.6	97.54	-50.6	382.1	385.4	383.8	1.60	241.339			
500.0	500.0	489.7	489.7	1.2	0.8	97.57	-50.7	381.6	385.0	383.0	2.04	189.087			
600.0	600.0	588.5	588.5	1.5	1.0	97.54	-50.5	381.4	384.7	382.2	2.51	153.227			
635.0	635.0	623.0	623.0	1.6	1.1	97.50	-50.2	381.4	384.7	382.0	2.68	143.710			
700.0	700.0	686.1	686.1	1.8	1.2	97.38	-49.5	381.6	384.8	381.9	2.95	130.309			
800.0	800.0	782.5	782.4	2.1	1.3	97.18	-48.2	382.7	385.8	382.4	3.35	115.084			
900.0	900.0	880.6	880.6	2.3	1.5	96.90	-46.5	384.6	387.5	383.7	3.81	101.839			
1,000.0	1,000.0	979.4	979.3	2.6	1.7	96.46	-43.8	387.0	389.6	385.3	4.28	90.925			
1,100.0	1,100.0	1,079.0	1,078.7	2.9	1.9	95.84	-39.9	389.8	391.9	387.1	4.82	81.308			
1,200.0	1,200.0	1,180.2	1,179.7	3.2	2.2	95.07	-34.8	392.6	394.2	388.8	5.38	73.271			
1,300.0	1,300.0	1,281.6	1,281.0	3.4	2.5	144.37	-29.2	394.9	397.1	391.2	5.95	66.776			
1,400.0	1,399.9	1,375.9	1,375.0	3.7	2.8	143.73	-23.1	397.7	402.8	396.3	6.50	61.996			
1,500.0	1,499.7	1,470.4	1,469.2	4.0	3.1	143.12	-16.0	401.8	411.9	404.9	7.05	58.423			
1,600.0	1,599.3	1,574.0	1,572.3	4.3	3.4	142.58	-7.3	406.4	423.2	415.6	7.64	55.401			
1,700.0	1,698.6	1,680.5	1,678.3	4.6	3.8	142.14	2.6	410.0	435.5	427.2	8.25	52.806			
1,800.0	1,797.5	1,794.1	1,791.1	4.9	4.1	141.58	16.1	410.7	447.1	438.2	8.89	50.301			
1,900.0	1,896.1	1,905.6	1,901.3	5.3	4.5	140.81	33.2	408.4	457.8	448.3	9.54	48.009			
1,962.1	1,957.1	1,977.4	1,972.1	5.5	4.7	140.43	44.5	405.2	464.1	454.1	9.95	46.630			
2,000.0	1,994.2	2,022.6	2,016.5	5.6	4.9	140.20	52.1	402.3	467.4	457.2	10.22	45.719			
2,100.0	2,092.2	2,140.0	2,131.4	6.1	5.3	139.39	73.7	391.5	473.3	462.4	10.95	43.239			
2,200.0	2,190.2	2,243.3	2,232.4	6.5	5.6	138.75	92.1	379.8	477.3	465.6	11.64	41.010			
2,300.0	2,288.3	2,346.7	2,333.3	7.0	5.9	138.11	110.7	367.4	480.6	468.3	12.35	38.931			
2,400.0	2,386.3	2,454.3	2,438.5	7.4	6.3	137.61	128.7	353.4	482.9	469.8	13.07	36.939			
2,500.0	2,484.3	2,568.6	2,550.0	7.9	6.7	137.22	146.5	335.9	482.9	469.1	13.82	34.937			
2,600.0	2,582.3	2,686.9	2,664.9	8.4	7.0	136.88	164.1	313.8	479.5	464.9	14.59	32.874			
2,700.0	2,680.3	2,797.1	2,771.2	8.9	7.4	136.52	180.5	289.6	472.8	457.4	15.33	30.838			
2,800.0	2,778.3	2,888.9	2,859.8	9.4	7.7	136.32	193.4	269.7	466.2	450.1	16.02	29.101			
2,900.0	2,876.3	2,995.5	2,963.0	9.8	8.1	136.23	207.0	246.4	459.4	442.7	16.75	27.424			
3,000.0	2,974.4	3,093.5	3,057.6	10.4	8.4	136.13	219.8	224.4	452.1	434.6	17.47	25.883			
3,100.0	3,072.4	3,184.8	3,146.1	10.9	8.7	136.08	231.3	205.1	446.0	427.9	18.17	24.552			
3,200.0	3,170.4	3,273.0	3,232.1	11.4	9.0	136.16	241.7	188.4	442.3	423.4	18.85	23.460			
3,290.7	3,259.3	3,353.0	3,310.6	11.8	9.3	136.40	249.9	175.5	441.2	421.7	19.46	22.667			
3,300.0	3,268.4	3,361.5	3,319.0	11.9	9.3	136.43	250.7	174.2	441.2	421.7	19.53	22.594			
3,400.0	3,366.4	3,455.8	3,411.9	12.4	9.6	136.91	259.1	161.0	442.2	422.0	20.21	21.884			
3,500.0	3,464.4	3,567.7	3,521.9	12.9	10.0	137.22	271.0	144.3	442.3	421.4	20.96	21.105			
3,600.0	3,562.5	3,678.5	3,630.1	13.4	10.4	137.26	284.7	124.7	439.8	418.1	21.74	20.234			
3,700.0	3,660.5	3,788.4	3,736.9	13.9	10.8	137.22	298.6	102.9	435.1	412.6	22.52	19.319			
3,800.0	3,758.5	3,895.3	3,839.9	14.5	11.2	136.76	315.1	79.3	428.2	404.9	23.35	18.341			
3,900.0	3,856.5	3,992.3	3,932.9	15.0	11.6	136.16	331.3	57.3	420.8	396.6	24.16	17.415			
4,000.0	3,954.5	4,086.7	4,024.0	15.5	12.0	135.70	346.2	36.9	414.5	389.6	24.96	16.607			
4,100.0	4,052.5	4,184.6	4,118.6	16.0	12.3	135.31	360.9	16.8	409.3	383.5	25.77	15.883			
4,200.0	4,150.6	4,282.6	4,213.7	16.6	12.7	135.10	374.4	-2.9	404.4	377.8	26.56	15.228			
4,300.0	4,248.6	4,379.7	4,308.2	17.1	13.1	135.16	385.9	-21.7	400.1	372.8	27.31	14.650			
4,400.0	4,346.6	4,477.4	4,403.4	17.6	13.4	135.11	398.3	-40.1	396.4	368.4	28.08	14.117			
4,500.0	4,444.6	4,576.9	4,500.2	18.1	13.8	134.97	411.6	-58.5	393.1	364.3	28.88	13.615			
4,600.0	4,542.6	4,673.0	4,594.0	18.7	14.2	134.95	423.7	-75.5	390.7	361.0	29.64	13.179			
4,700.0	4,640.6	4,776.3	4,694.9	19.2	14.6	134.93	436.8	-93.7	388.1	357.7	30.44	12.752			

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29R-143
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4686.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4686.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29R-143	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.45 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #2 (1-25-17)	Offset TVD Reference:	Offset Datum

Offset Design		Existing Wells Sec.29-T5N-R64W - Ottenhoff 41-6B (Exist) - Wellbore #1 - Wellbore #1											Offset Site Error:		0.0 ft
Survey Program:		488-NS-GYRO-MS											Offset Well Error:		0.0 ft
Reference		Offset		Semi Major Axis			Distance							Warning	
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor			
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)				
4,800.0	4,738.7	4,872.1	4,788.4	19.7	14.9	134.86	449.2	-110.7	385.6	354.4	31.22	12.353			
4,900.0	4,836.7	4,974.4	4,888.2	20.2	15.3	134.80	462.4	-128.6	383.3	351.3	32.02	11.973			
5,000.0	4,934.7	5,079.0	4,990.0	20.8	15.7	134.65	476.3	-148.1	379.9	347.1	32.84	11.569			
5,100.0	5,032.7	5,177.4	5,085.7	21.3	16.1	134.54	489.1	-166.8	376.1	342.4	33.64	11.180			
5,201.5	5,132.2	5,273.7	5,179.9	21.8	16.5	134.65	500.4	-184.0	373.3	338.9	34.40	10.853			
5,300.0	5,229.0	5,368.0	5,272.3	22.3	16.8	134.82	509.8	-199.5	370.5	335.5	35.08	10.564			
5,400.0	5,328.0	5,464.1	5,367.0	22.6	17.2	134.87	517.8	-214.1	366.6	330.9	35.69	10.271			
5,500.0	5,427.3	5,562.7	5,464.2	22.9	17.5	134.52	526.0	-228.5	360.7	324.4	36.32	9.930			
5,600.0	5,527.0	5,657.6	5,557.8	23.2	17.8	133.74	534.1	-241.8	353.0	316.0	36.96	9.550			
5,700.0	5,626.9	5,749.0	5,648.3	23.4	18.2	132.79	540.8	-252.6	345.1	307.5	37.56	9.186			
5,773.1	5,700.0	5,816.7	5,715.6	23.5	18.4	81.95	544.8	-259.2	339.2	301.2	37.99	8.928			
5,800.0	5,726.9	5,841.8	5,740.6	23.5	18.5	81.68	546.0	-261.3	337.1	298.9	38.16	8.833			
5,900.0	5,826.9	5,935.6	5,834.0	23.7	18.8	80.82	550.0	-268.3	330.4	291.6	38.78	8.520			
5,937.4	5,864.3	5,971.0	5,869.3	23.8	18.9	80.55	551.2	-270.4	328.3	289.3	39.00	8.419			
5,950.0	5,876.9	5,982.9	5,881.2	23.8	18.9	-99.63	551.6	-271.1	327.7	288.6	39.08	8.385			
6,000.0	5,926.8	6,031.1	5,929.3	23.8	19.0	-100.49	553.0	-273.6	325.8	286.4	39.44	8.262			
6,050.0	5,976.5	6,079.4	5,977.6	23.9	19.2	-101.78	554.0	-275.9	324.8	285.0	39.80	8.161			
6,072.3	5,998.5	6,100.7	5,998.9	23.9	19.2	-102.48	554.4	-276.9	324.7	284.7	39.95	8.127 CC, ES			
6,100.0	6,025.7	6,126.9	6,025.0	23.9	19.3	-103.43	554.8	-277.9	324.9	284.7	40.14	8.093			
6,150.0	6,074.2	6,173.7	6,071.8	23.8	19.4	-105.41	555.2	-279.6	326.4	285.9	40.45	8.069 SF			
6,200.0	6,121.8	6,219.8	6,117.8	23.8	19.6	-107.65	555.4	-280.9	329.5	288.8	40.69	8.099			
6,250.0	6,168.2	6,265.1	6,163.1	23.7	19.7	-110.07	555.3	-282.0	334.7	293.9	40.81	8.200			
6,300.0	6,213.4	6,309.6	6,207.6	23.6	19.7	-112.58	555.0	-282.8	342.1	301.3	40.79	8.388			
6,350.0	6,257.1	6,352.9	6,250.9	23.5	19.8	-115.09	554.5	-283.4	352.2	311.6	40.61	8.671			
6,400.0	6,299.1	6,394.8	6,292.8	23.4	19.8	-117.50	553.8	-283.7	365.0	324.8	40.28	9.062			
6,450.0	6,339.3	6,434.9	6,332.9	23.3	19.9	-119.71	553.0	-283.9	381.0	341.2	39.77	9.579			
6,500.0	6,377.4	6,473.0	6,371.0	23.1	19.9	-121.66	552.1	-283.9	400.1	360.9	39.13	10.224			
6,550.0	6,413.3	6,509.3	6,407.3	23.0	19.9	-123.29	551.2	-283.8	422.4	384.0	38.41	10.998			
6,600.0	6,446.8	6,543.4	6,441.3	22.9	19.9	-124.56	550.2	-283.6	447.9	410.2	37.65	11.896			
6,650.0	6,477.9	6,575.5	6,473.4	22.7	19.9	-125.43	549.3	-283.2	476.4	439.5	36.91	12.907			
6,700.0	6,506.3	6,605.4	6,503.4	22.6	19.9	-125.88	548.4	-282.9	507.8	471.5	36.25	14.008			
6,750.0	6,532.0	6,632.8	6,530.8	22.5	19.9	-125.80	547.5	-282.5	541.8	506.0	35.75	15.157			
6,800.0	6,554.8	6,657.5	6,555.4	22.3	19.9	-125.14	546.6	-282.2	578.3	542.8	35.47	16.301			
6,850.0	6,574.7	6,679.4	6,577.3	22.2	19.9	-123.79	545.8	-281.9	616.9	581.4	35.49	17.381			
6,900.0	6,591.5	6,698.2	6,596.1	22.2	19.9	-121.65	545.1	-281.6	657.5	621.7	35.85	18.340			
6,950.0	6,605.2	6,714.1	6,612.0	22.1	19.9	-118.53	544.5	-281.3	699.8	663.3	36.56	19.140			
7,000.0	6,615.7	6,726.8	6,624.6	22.1	19.9	-114.25	544.1	-281.1	743.5	706.0	37.57	19.789			
7,050.0	6,623.0	6,736.2	6,634.1	22.2	19.9	-108.57	543.7	-280.9	788.5	749.7	38.73	20.358			

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29R-143
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4686.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4686.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29R-143	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.45 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #2 (1-25-17)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.29-T5N-R64W - Pearlman #32-13 (Exist.) - Wellbore #1 - Wellbore #1												Offset Site Error: 0.0 ft	
Survey Program: 100-NS-GYRO-MS												Offset Well Error: 0.0 ft	
Reference		Offset		Semi Major Axis			Distance						
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor	Warning
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)		
12,600.0	6,619.0	6,657.5	6,656.5	138.9	16.8	89.66	-6,517.1	-654.6	790.9	635.7	155.25	5.094	
12,700.0	6,618.8	6,657.8	6,656.7	141.2	16.8	89.92	-6,517.1	-654.6	691.2	533.6	157.57	4.387	
12,800.0	6,618.7	6,658.0	6,657.0	143.5	16.8	90.18	-6,517.1	-654.6	591.6	431.7	159.90	3.700	
12,900.0	6,618.5	6,658.3	6,657.2	145.9	16.8	90.44	-6,517.1	-654.6	492.2	329.9	162.21	3.034	
13,000.0	6,618.4	6,658.6	6,657.5	148.2	16.8	90.72	-6,517.1	-654.6	393.0	228.5	164.53	2.389	
13,100.0	6,618.2	6,658.8	6,657.8	150.5	16.8	90.99	-6,517.2	-654.6	294.4	127.5	166.84	1.764	
13,200.0	6,618.1	6,659.1	6,658.1	152.8	16.8	91.28	-6,517.2	-654.5	197.2	28.0	169.15	1.166	Level 2
13,300.0	6,617.9	6,659.4	6,658.4	155.2	16.8	91.57	-6,517.2	-654.5	105.3	-66.1	171.46	0.614	Level 1
13,388.9	6,617.8	6,659.7	6,658.6	157.2	16.8	91.84	-6,517.2	-654.5	56.5	-117.0	173.50	0.326	Level 1, CC, ES, SF
13,400.0	6,617.8	6,659.7	6,658.7	157.5	16.8	91.87	-6,517.2	-654.5	57.6	-116.2	173.76	0.331	Level 1
13,500.0	6,617.6	6,660.0	6,659.0	159.8	16.8	92.18	-6,517.2	-654.5	124.6	-51.4	176.05	0.708	Level 1
13,600.0	6,617.5	6,660.3	6,659.3	162.2	16.8	92.49	-6,517.2	-654.5	218.5	40.2	178.34	1.225	Level 2
13,700.0	6,617.4	6,660.6	6,659.6	164.5	16.8	92.81	-6,517.2	-654.5	316.2	135.6	180.62	1.751	
13,800.0	6,617.2	6,661.0	6,659.9	166.8	16.8	93.14	-6,517.2	-654.5	415.0	232.1	182.90	2.269	
13,900.0	6,617.1	6,661.3	6,660.2	169.1	16.8	93.48	-6,517.2	-654.5	514.2	329.0	185.17	2.777	
13,938.9	6,617.0	6,661.4	6,660.4	170.1	16.8	93.61	-6,517.2	-654.5	552.9	366.9	186.05	2.972	

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29R-143
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4686.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4686.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29R-143	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.45 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #2 (1-25-17)	Offset TVD Reference:	Offset Datum

Offset Design		Existing Wells Sec.29-T5N-R64W (GRID) - Blake B 29-23 (Exist.) - Wellbore #1 - Wellbore #1											Offset Site Error:		0.0 ft
Survey Program:		100-NS-GYRO-MS											Offset Well Error:		0.0 ft
Reference		Offset		Semi Major Axis			Distance							Warning	
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor			
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)				
9,300.0	6,623.8	6,609.1	6,606.8	63.4	15.3	81.13	-3,166.8	-768.5	759.0	681.7	77.38	9.810			
9,400.0	6,623.7	6,613.9	6,611.6	65.6	15.3	82.68	-3,167.1	-768.3	662.1	582.3	79.81	8.296			
9,500.0	6,623.5	6,618.7	6,616.4	67.8	15.3	84.25	-3,167.3	-768.1	566.2	484.0	82.21	6.887			
9,600.0	6,623.4	6,623.6	6,621.3	70.0	15.3	85.84	-3,167.6	-767.8	471.9	387.4	84.58	5.580			
9,700.0	6,623.2	6,628.4	6,626.1	72.3	15.3	87.45	-3,167.8	-767.6	380.6	293.7	86.91	4.379			
9,800.0	6,623.1	6,633.3	6,630.9	74.5	15.3	89.07	-3,168.0	-767.3	294.8	205.6	89.19	3.305			
9,900.0	6,622.9	6,638.2	6,635.8	76.8	15.3	90.70	-3,168.3	-767.1	221.1	129.7	91.42	2.418			
10,000.0	6,622.8	6,643.1	6,640.7	79.1	15.4	92.34	-3,168.5	-766.8	175.6	82.0	93.59	1.877			
10,040.4	6,622.7	6,645.1	6,642.7	80.0	15.4	93.00	-3,168.6	-766.7	170.9	76.5	94.45	1.810 CC, ES, SF			
10,100.0	6,622.6	6,648.0	6,645.6	81.3	15.4	93.98	-3,168.8	-766.6	181.0	85.3	95.69	1.891			
10,200.0	6,622.5	6,652.9	6,650.5	83.6	15.4	95.61	-3,169.0	-766.3	233.7	136.0	97.73	2.391			
10,300.0	6,622.4	6,657.7	6,655.3	85.9	15.4	97.22	-3,169.2	-766.1	310.5	210.8	99.69	3.115			
10,400.0	6,622.2	6,662.5	6,660.1	88.1	15.4	98.83	-3,169.5	-765.8	397.8	296.2	101.58	3.915			
10,500.0	6,622.1	6,667.3	6,664.9	90.4	15.4	100.42	-3,169.7	-765.5	489.8	386.4	103.40	4.737			
10,600.0	6,621.9	6,672.2	6,669.7	92.7	15.4	102.01	-3,170.0	-765.3	584.5	479.3	105.13	5.559			
10,700.0	6,621.8	6,677.0	6,674.6	95.0	15.4	103.58	-3,170.2	-765.0	680.6	573.8	106.78	6.374			
10,800.0	6,621.6	6,681.8	6,679.4	97.3	15.5	105.14	-3,170.4	-764.8	777.7	669.3	108.36	7.177			

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29R-143
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4686.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4686.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29R-143	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.45 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #2 (1-25-17)	Offset TVD Reference:	Offset Datum

Offset Design Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29M-203 - Wellbore #1 - Plan #2 (1-25-17)													Offset Site Error: 0.0 ft		
Survey Program: 0-MWD														Offset Well Error: 0.0 ft	
Reference		Offset		Semi Major Axis			Distance							Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor			
0.0	0.0	0.0	0.0	0.0	0.0	-89.31	0.7	-60.2	60.2						
100.0	100.0	100.0	100.0	0.1	0.1	-89.31	0.7	-60.2	60.2	59.9	0.28	218.591			
200.0	200.0	200.0	200.0	0.4	0.4	-89.31	0.7	-60.2	60.2	59.4	0.83	72.864	CC, ES		
300.0	300.0	298.5	298.5	0.7	0.7	-88.96	1.1	-61.4	61.4	60.1	1.36	45.004			
400.0	400.0	396.9	396.8	1.0	0.9	-87.98	2.3	-65.0	65.1	63.2	1.91	34.116			
500.0	500.0	495.0	494.7	1.2	1.2	-86.57	4.3	-71.0	71.3	68.9	2.46	28.941			
600.0	600.0	592.7	592.0	1.5	1.5	-84.96	7.0	-79.3	80.1	77.0	3.03	26.390			
700.0	700.0	689.9	688.5	1.8	1.9	-83.36	10.5	-90.0	91.3	87.7	3.62	25.235			
800.0	800.0	786.5	784.2	2.1	2.3	-81.87	14.7	-102.9	105.1	100.9	4.23	24.881			
900.0	900.0	882.3	878.7	2.3	2.7	-80.56	19.6	-117.9	121.5	116.6	4.86	25.009			
1,000.0	1,000.0	977.2	971.9	2.6	3.1	-79.42	25.2	-135.1	140.3	134.7	5.51	25.433			
1,100.0	1,100.0	1,071.2	1,063.7	2.9	3.6	-78.46	31.5	-154.2	161.5	155.3	6.20	26.038			
1,200.0	1,200.0	1,164.2	1,154.0	3.2	4.2	-77.65	38.4	-175.2	185.2	178.3	6.92	26.752			
1,300.0	1,300.0	1,256.3	1,242.9	3.4	4.7	-26.90	45.8	-198.1	210.1	203.1	6.98	30.091			
1,400.0	1,399.9	1,347.8	1,330.6	3.7	5.4	-26.55	53.9	-222.9	235.1	227.5	7.56	31.113			
1,500.0	1,499.7	1,438.7	1,417.1	4.0	6.1	-26.44	62.6	-249.4	260.1	251.9	8.14	31.954			
1,600.0	1,599.3	1,530.8	1,504.1	4.3	6.8	-26.52	72.1	-278.2	285.0	276.3	8.74	32.620			
1,700.0	1,698.6	1,628.0	1,595.6	4.6	7.6	-26.79	82.2	-309.2	308.4	299.0	9.37	32.925			
1,800.0	1,797.5	1,725.7	1,687.7	4.9	8.4	-27.23	92.4	-340.4	329.5	319.5	10.01	32.921			
1,900.0	1,896.1	1,823.8	1,780.1	5.3	9.3	-27.82	102.6	-371.6	348.3	337.6	10.67	32.643			
1,962.1	1,957.1	1,885.0	1,837.7	5.5	9.8	-28.25	109.0	-391.1	358.9	347.8	11.09	32.351			
2,000.0	1,994.2	1,922.3	1,872.8	5.6	10.1	-28.57	112.9	-403.0	365.1	353.7	11.36	32.135			
2,100.0	2,092.2	2,020.8	1,965.6	6.1	10.9	-29.36	123.2	-434.4	381.5	369.5	12.08	31.584			
2,200.0	2,190.2	2,119.3	2,058.4	6.5	11.8	-30.09	133.4	-465.8	398.0	385.2	12.82	31.057			
2,300.0	2,288.3	2,217.8	2,151.2	7.0	12.6	-30.76	143.7	-497.3	414.6	401.0	13.57	30.557			
2,400.0	2,386.3	2,316.3	2,244.0	7.4	13.5	-31.38	154.0	-528.7	431.2	416.9	14.33	30.082			
2,500.0	2,484.3	2,414.8	2,336.8	7.9	14.3	-31.95	164.3	-560.1	447.8	432.7	15.11	29.633			
2,600.0	2,582.3	2,513.3	2,429.6	8.4	15.2	-32.48	174.5	-591.5	464.5	448.6	15.90	29.209			
2,700.0	2,680.3	2,611.8	2,522.4	8.9	16.1	-32.98	184.8	-622.9	481.3	464.6	16.70	28.809			
2,800.0	2,778.3	2,710.3	2,615.2	9.4	16.9	-33.44	195.1	-654.3	498.0	480.5	17.52	28.432			
2,900.0	2,876.3	2,808.8	2,708.0	9.8	17.8	-33.87	205.4	-685.7	514.8	496.5	18.34	28.075			
3,000.0	2,974.4	2,907.3	2,800.8	10.4	18.6	-34.27	215.6	-717.1	531.6	512.5	19.16	27.740			
3,100.0	3,072.4	3,005.8	2,893.7	10.9	19.5	-34.65	225.9	-748.5	548.5	528.5	20.00	27.422			
3,200.0	3,170.4	3,104.4	2,986.5	11.4	20.3	-35.01	236.2	-779.9	565.3	544.5	20.84	27.123			
3,300.0	3,268.4	3,202.9	3,079.3	11.9	21.2	-35.35	246.5	-811.3	582.2	560.5	21.69	26.840			
3,400.0	3,366.4	3,301.4	3,172.1	12.4	22.1	-35.66	256.7	-842.7	599.1	576.6	22.55	26.573			
3,500.0	3,464.4	3,399.9	3,264.9	12.9	22.9	-35.96	267.0	-874.1	616.0	592.6	23.40	26.320			
3,600.0	3,562.5	3,498.4	3,357.7	13.4	23.8	-36.25	277.3	-905.5	632.9	608.7	24.27	26.080			
3,700.0	3,660.5	3,596.9	3,450.5	13.9	24.6	-36.52	287.5	-936.9	649.9	624.8	25.14	25.853			
3,800.0	3,758.5	3,695.4	3,543.3	14.5	25.5	-36.77	297.8	-968.3	666.9	640.8	26.01	25.638			
3,900.0	3,856.5	3,793.9	3,636.1	15.0	26.4	-37.02	308.1	-999.8	683.8	656.9	26.89	25.433			
4,000.0	3,954.5	3,892.4	3,728.9	15.5	27.2	-37.25	318.4	-1,031.2	700.8	673.0	27.77	25.239			
4,100.0	4,052.5	3,990.9	3,821.7	16.0	28.1	-37.47	328.6	-1,062.6	717.8	689.2	28.65	25.054			
4,200.0	4,150.6	4,089.4	3,914.5	16.6	29.0	-37.68	338.9	-1,094.0	734.8	705.3	29.54	24.878			
4,300.0	4,248.6	4,188.0	4,007.3	17.1	29.8	-37.88	349.2	-1,125.4	751.8	721.4	30.43	24.710			
4,400.0	4,346.6	4,286.5	4,100.1	17.6	30.7	-38.07	359.5	-1,156.8	768.8	737.5	31.32	24.550			
4,500.0	4,444.6	4,385.0	4,192.9	18.1	31.5	-38.25	369.7	-1,188.2	785.9	753.7	32.21	24.397	SF		

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29R-143
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4686.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4686.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29R-143	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.45 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #2 (1-25-17)	Offset TVD Reference:	Offset Datum

Offset Design Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29M-323 - Wellbore #1 - Plan #2 (1-25-17)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
0.0	0.0	1.0	1.0	0.0	0.0	-89.32	0.4	-30.1	30.1	30.1	0.00	N/A		
100.0	100.0	101.0	101.0	0.1	0.1	-89.32	0.4	-30.1	30.1	29.8	0.28	108.213		
200.0	200.0	201.0	201.0	0.4	0.4	-89.32	0.4	-30.1	30.1	29.3	0.83	36.311		
300.0	300.0	301.0	301.0	0.7	0.7	-89.32	0.4	-30.1	30.1	28.7	1.38	21.815		
400.0	400.0	401.0	401.0	1.0	1.0	-89.32	0.4	-30.1	30.1	28.2	1.93	15.591		
500.0	500.0	501.0	501.0	1.2	1.2	-89.32	0.4	-30.1	30.1	27.6	2.48	12.130		
600.0	600.0	601.0	601.0	1.5	1.5	-89.32	0.4	-30.1	30.1	27.1	3.03	9.927		
700.0	700.0	701.0	701.0	1.8	1.8	-89.32	0.4	-30.1	30.1	26.5	3.58	8.401		
766.3	766.3	767.3	767.3	2.0	2.0	-89.32	0.4	-30.1	30.1	26.1	3.95	7.624 CC		
800.0	800.0	801.0	801.0	2.1	2.1	-89.32	0.4	-30.1	30.1	26.0	4.13	7.282 ES		
900.0	900.0	900.0	900.0	2.3	2.3	-88.34	0.9	-31.3	31.3	26.6	4.67	6.702		
1,000.0	1,000.0	999.4	999.3	2.6	2.6	-85.82	2.5	-34.8	34.9	29.7	5.21	6.710		
1,100.0	1,100.0	1,098.2	1,097.9	2.9	2.9	-82.64	5.2	-40.7	41.1	35.4	5.75	7.146		
1,200.0	1,200.0	1,196.7	1,196.0	3.2	3.2	-79.54	9.0	-48.8	49.8	43.5	6.30	7.908		
1,300.0	1,300.0	1,294.8	1,293.4	3.4	3.5	-27.29	13.8	-59.1	60.0	53.2	6.82	8.802		
1,400.0	1,399.9	1,392.6	1,390.2	3.7	3.8	-26.26	19.6	-71.7	70.4	63.1	7.35	9.581		
1,500.0	1,499.7	1,490.1	1,486.4	4.0	4.2	-25.94	26.5	-86.5	81.0	73.1	7.89	10.269		
1,600.0	1,599.3	1,587.4	1,581.8	4.3	4.6	-26.08	34.3	-103.5	91.8	83.3	8.44	10.878		
1,700.0	1,698.6	1,684.4	1,676.5	4.6	5.0	-26.54	43.2	-122.6	102.6	93.7	8.99	11.414		
1,800.0	1,797.5	1,781.1	1,770.3	4.9	5.5	-27.22	53.0	-143.8	113.7	104.1	9.57	11.884		
1,900.0	1,896.1	1,878.9	1,864.6	5.3	6.1	-28.10	63.9	-167.2	124.6	114.5	10.16	12.265		
1,962.1	1,957.1	1,940.7	1,924.2	5.5	6.5	-28.83	70.8	-182.2	130.6	120.0	10.55	12.374		
2,000.0	1,994.2	1,978.4	1,960.5	5.6	6.7	-29.33	75.1	-191.4	133.9	123.1	10.80	12.396		
2,100.0	2,092.2	2,078.0	2,056.5	6.1	7.3	-30.54	86.3	-215.5	142.8	131.3	11.48	12.435		
2,200.0	2,190.2	2,177.5	2,152.4	6.5	7.9	-31.61	97.5	-239.7	151.7	139.5	12.19	12.450		
2,300.0	2,288.3	2,277.1	2,248.3	7.0	8.6	-32.57	108.7	-263.9	160.7	147.8	12.91	12.447		
2,400.0	2,386.3	2,376.6	2,344.3	7.4	9.2	-33.42	119.9	-288.1	169.7	156.1	13.65	12.430		
2,500.0	2,484.3	2,476.2	2,440.2	7.9	9.9	-34.18	131.1	-312.3	178.8	164.4	14.41	12.403		
2,600.0	2,582.3	2,575.8	2,536.1	8.4	10.6	-34.87	142.3	-336.4	187.8	172.7	15.19	12.368		
2,700.0	2,680.3	2,675.3	2,632.1	8.9	11.2	-35.50	153.5	-360.6	197.0	181.0	15.98	12.328		
2,800.0	2,778.3	2,774.9	2,728.0	9.4	11.9	-36.07	164.6	-384.8	206.1	189.3	16.78	12.284		
2,900.0	2,876.3	2,874.5	2,823.9	9.8	12.6	-36.59	175.8	-409.0	215.2	197.6	17.59	12.238		
3,000.0	2,974.4	2,974.0	2,919.9	10.4	13.2	-37.07	187.0	-433.1	224.4	206.0	18.41	12.190		
3,100.0	3,072.4	3,073.6	3,015.8	10.9	13.9	-37.52	198.2	-457.3	233.6	214.3	19.24	12.142		
3,200.0	3,170.4	3,173.1	3,111.7	11.4	14.6	-37.93	209.4	-481.5	242.8	222.7	20.07	12.094		
3,300.0	3,268.4	3,272.7	3,207.6	11.9	15.3	-38.31	220.6	-505.7	252.0	231.1	20.92	12.046		
3,400.0	3,366.4	3,372.3	3,303.6	12.4	16.0	-38.66	231.8	-529.8	261.2	239.4	21.77	11.999		
3,500.0	3,464.4	3,471.8	3,399.5	12.9	16.6	-38.99	243.0	-554.0	270.4	247.8	22.62	11.953		
3,600.0	3,562.5	3,571.4	3,495.4	13.4	17.3	-39.29	254.2	-578.2	279.6	256.2	23.48	11.909		
3,700.0	3,660.5	3,671.0	3,591.4	13.9	18.0	-39.58	265.4	-602.4	288.9	264.5	24.35	11.865		
3,800.0	3,758.5	3,770.5	3,687.3	14.5	18.7	-39.85	276.6	-626.5	298.1	272.9	25.22	11.823		
3,900.0	3,856.5	3,870.1	3,783.2	15.0	19.4	-40.10	287.8	-650.7	307.4	281.3	26.09	11.782		
4,000.0	3,954.5	3,969.6	3,879.2	15.5	20.1	-40.34	299.0	-674.9	316.6	289.7	26.96	11.742		
4,100.0	4,052.5	4,069.2	3,975.1	16.0	20.8	-40.57	310.2	-699.1	325.9	298.0	27.84	11.704		
4,200.0	4,150.6	4,168.8	4,071.0	16.6	21.5	-40.78	321.4	-723.3	335.1	306.4	28.73	11.667		
4,300.0	4,248.6	4,268.3	4,167.0	17.1	22.1	-40.98	332.6	-747.4	344.4	314.8	29.61	11.632		
4,400.0	4,346.6	4,367.9	4,262.9	17.6	22.8	-41.17	343.8	-771.6	353.7	323.2	30.50	11.597		
4,500.0	4,444.6	4,467.5	4,358.8	18.1	23.5	-41.35	355.0	-795.8	363.0	331.6	31.39	11.564		
4,600.0	4,542.6	4,567.0	4,454.7	18.7	24.2	-41.52	366.2	-820.0	372.3	340.0	32.28	11.532		
4,700.0	4,640.6	4,666.6	4,550.7	19.2	24.9	-41.69	377.4	-844.1	381.5	348.4	33.17	11.502		
4,800.0	4,738.7	4,766.1	4,646.6	19.7	25.6	-41.84	388.6	-868.3	390.8	356.8	34.07	11.472		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29R-143
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4686.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4686.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29R-143	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.45 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #2 (1-25-17)	Offset TVD Reference:	Offset Datum

Offset Design Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29M-323 - Wellbore #1 - Plan #2 (1-25-17)													Offset Site Error:	0.0 ft	
Survey Program: 0-MWD														Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance							Warning	
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor			
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)				
4,900.0	4,836.7	4,865.7	4,742.5	20.2	26.3	-41.99	399.8	-892.5	400.1	365.1	34.96	11.443			
5,000.0	4,934.7	4,965.3	4,838.5	20.8	27.0	-42.13	411.0	-916.7	409.4	373.5	35.86	11.416			
5,100.0	5,032.7	5,064.8	4,934.4	21.3	27.7	-42.27	422.2	-940.8	418.7	381.9	36.76	11.389			
5,201.5	5,132.2	5,165.9	5,031.8	21.8	28.4	-42.40	433.6	-965.4	428.1	390.5	37.68	11.363			
5,300.0	5,229.0	5,263.8	5,126.1	22.3	29.1	-42.51	444.6	-989.2	438.5	400.1	38.49	11.395			
5,400.0	5,328.0	5,377.8	5,236.5	22.6	29.7	-42.41	456.6	-1,015.1	450.1	411.0	39.14	11.501			
5,500.0	5,427.3	5,493.6	5,349.6	22.9	30.2	-42.23	466.9	-1,037.4	460.7	421.1	39.68	11.613			
5,600.0	5,527.0	5,609.9	5,464.2	23.2	30.6	-41.98	475.3	-1,055.5	470.4	430.3	40.10	11.729			
5,700.0	5,626.9	5,726.8	5,580.0	23.4	31.0	-41.66	481.8	-1,069.5	479.0	438.6	40.42	11.849			
5,773.1	5,700.0	5,812.5	5,665.4	23.5	31.2	-91.43	485.3	-1,077.1	484.6	444.0	40.60	11.937			
5,800.0	5,726.9	5,844.2	5,696.9	23.5	31.3	-91.31	486.3	-1,079.3	486.5	445.8	40.68	11.960			
5,900.0	5,826.9	5,962.2	5,814.8	23.7	31.5	-91.00	488.8	-1,084.6	491.0	450.0	41.01	11.971			
5,937.4	5,864.3	6,006.4	5,858.9	23.8	31.6	-90.95	489.2	-1,085.5	491.7	450.6	41.16	11.948			
5,950.0	5,876.9	6,021.3	5,873.9	23.8	31.6	-89.03	489.3	-1,085.7	491.9	450.7	41.19	11.941			
6,000.0	5,926.8	6,075.2	5,927.8	23.8	31.7	-89.33	489.4	-1,085.8	491.9	450.7	41.25	11.925			
6,050.0	5,976.5	6,124.9	5,977.5	23.9	31.7	-90.00	489.4	-1,085.8	491.9	450.7	41.15	11.953			
6,050.1	5,976.6	6,125.0	5,977.6	23.9	31.7	-90.00	489.4	-1,085.8	491.9	450.7	41.15	11.953			
6,100.0	6,025.7	6,174.1	6,026.7	23.9	31.8	-91.02	489.4	-1,085.8	492.0	451.1	40.91	12.027			
6,150.0	6,074.2	6,223.5	6,076.0	23.8	31.8	-92.31	488.6	-1,085.8	492.3	451.8	40.54	12.144			
6,200.0	6,121.8	6,273.8	6,126.2	23.8	31.9	-93.63	484.8	-1,085.8	492.9	452.8	40.12	12.286			
6,250.0	6,168.2	6,325.0	6,176.9	23.7	31.9	-94.94	477.6	-1,085.8	493.8	454.1	39.68	12.447			
6,300.0	6,213.4	6,377.0	6,227.7	23.6	31.9	-96.23	466.7	-1,085.8	495.0	455.8	39.21	12.624			
6,350.0	6,257.1	6,429.9	6,278.6	23.5	31.8	-97.50	452.2	-1,085.8	496.4	457.6	38.73	12.815			
6,400.0	6,299.1	6,483.7	6,329.2	23.4	31.8	-98.75	433.8	-1,085.8	498.0	459.7	38.26	13.017			
6,450.0	6,339.3	6,538.5	6,379.2	23.3	31.7	-99.97	411.5	-1,085.8	499.8	462.0	37.79	13.226			
6,500.0	6,377.4	6,594.2	6,428.3	23.1	31.6	-101.14	385.2	-1,085.9	501.8	464.4	37.34	13.438			
6,550.0	6,413.3	6,650.9	6,476.1	23.0	31.5	-102.27	354.8	-1,085.9	503.9	467.0	36.92	13.646			
6,600.0	6,446.8	6,708.5	6,522.3	22.9	31.4	-103.34	320.4	-1,085.9	506.1	469.5	36.55	13.846			
6,650.0	6,477.9	6,767.2	6,566.5	22.7	31.3	-104.36	281.9	-1,085.9	508.3	472.1	36.23	14.029			
6,700.0	6,506.3	6,826.7	6,608.3	22.6	31.2	-105.31	239.4	-1,086.0	510.5	474.5	35.98	14.189			
6,750.0	6,532.0	6,887.2	6,647.2	22.5	31.1	-106.18	193.1	-1,086.0	512.7	476.9	35.81	14.318			
6,800.0	6,554.8	6,948.6	6,682.8	22.3	30.9	-106.98	143.1	-1,086.0	514.8	479.1	35.73	14.407			
6,850.0	6,574.7	7,010.8	6,714.6	22.2	30.8	-107.69	89.7	-1,086.1	516.7	481.0	35.77	14.446			
6,900.0	6,591.5	7,073.7	6,742.3	22.2	30.7	-108.31	33.2	-1,086.1	518.5	482.6	35.93	14.431			
6,950.0	6,605.2	7,137.3	6,765.5	22.1	30.7	-108.83	-26.0	-1,086.2	520.0	483.8	36.21	14.360			
7,000.0	6,615.7	7,201.5	6,783.8	22.1	30.6	-109.26	-87.5	-1,086.2	521.3	484.7	36.63	14.230			
7,050.0	6,623.0	7,266.1	6,796.9	22.2	30.6	-109.58	-150.7	-1,086.3	522.3	485.1	37.20	14.040			
7,100.0	6,627.1	7,331.1	6,804.7	22.4	30.7	-109.79	-215.2	-1,086.3	523.0	485.0	37.91	13.796			
7,138.1	6,627.0	7,379.4	6,806.9	22.6	30.8	-109.98	-263.4	-1,086.3	523.6	485.1	38.49	13.604			
7,139.1	6,627.0	7,380.7	6,807.0	22.6	30.8	-109.99	-264.7	-1,086.3	523.6	485.1	38.51	13.597			
7,140.2	6,627.0	7,382.2	6,807.0	22.6	30.8	-109.99	-266.2	-1,086.3	523.6	485.1	38.53	13.590			
7,200.0	6,626.9	7,445.2	6,806.6	23.1	31.0	-109.96	-329.2	-1,086.4	523.5	483.8	39.66	13.198			
7,300.0	6,626.8	7,545.2	6,805.9	24.2	31.4	-109.90	-429.2	-1,086.5	523.3	481.4	41.88	12.495			
7,400.0	6,626.6	7,645.2	6,805.2	25.6	32.1	-109.84	-529.2	-1,086.5	523.1	478.7	44.44	11.771			
7,500.0	6,626.5	7,745.2	6,804.4	27.1	33.0	-109.78	-629.2	-1,086.6	522.9	475.7	47.29	11.058			
7,600.0	6,626.3	7,845.2	6,803.7	28.7	34.1	-109.72	-729.2	-1,086.7	522.8	472.4	50.38	10.376			
7,700.0	6,626.2	7,945.2	6,803.0	30.4	35.3	-109.66	-829.2	-1,086.8	522.6	468.9	53.67	9.737			
7,800.0	6,626.0	8,045.2	6,802.2	32.2	36.7	-109.60	-929.2	-1,086.8	522.4	465.3	57.12	9.146			
7,900.0	6,625.9	8,145.2	6,801.5	34.0	38.3	-109.53	-1,029.2	-1,086.9	522.2	461.5	60.71	8.602			
8,000.0	6,625.7	8,245.2	6,800.7	35.9	39.9	-109.47	-1,129.2	-1,087.0	522.0	457.6	64.42	8.104			

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29R-143
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4686.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4686.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29R-143	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.45 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #2 (1-25-17)	Offset TVD Reference:	Offset Datum

Offset Design Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29M-323 - Wellbore #1 - Plan #2 (1-25-17)													Offset Site Error: 0.0 ft		
Survey Program: 0-MWD														Offset Well Error: 0.0 ft	
Reference		Offset		Semi Major Axis			Distance							Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor			
8,100.0	6,625.6	8,345.2	6,800.0	37.9	41.6	109.41	-1,229.2	-1,087.1	521.8	453.6	68.22	7.649			
8,200.0	6,625.4	8,445.2	6,799.3	39.9	43.4	109.35	-1,329.2	-1,087.1	521.7	449.6	72.11	7.235			
8,300.0	6,625.3	8,545.2	6,798.5	41.9	45.3	109.29	-1,429.2	-1,087.2	521.5	445.4	76.06	6.856			
8,400.0	6,625.1	8,645.2	6,797.8	43.9	47.2	109.23	-1,529.2	-1,087.3	521.3	441.2	80.08	6.510			
8,500.0	6,625.0	8,745.2	6,797.1	46.0	49.1	109.16	-1,629.2	-1,087.4	521.1	437.0	84.14	6.193			
8,600.0	6,624.9	8,845.1	6,796.3	48.1	51.1	109.10	-1,729.2	-1,087.4	520.9	432.7	88.26	5.902			
8,700.0	6,624.7	8,945.1	6,795.6	50.3	53.1	109.04	-1,829.2	-1,087.5	520.8	428.3	92.41	5.635			
8,800.0	6,624.6	9,045.1	6,794.9	52.4	55.1	108.98	-1,929.2	-1,087.6	520.6	424.0	96.60	5.389			
8,900.0	6,624.4	9,145.1	6,794.1	54.6	57.2	108.92	-2,029.2	-1,087.7	520.4	419.6	100.82	5.162			
9,000.0	6,624.3	9,245.1	6,793.4	56.8	59.3	108.86	-2,129.2	-1,087.7	520.2	415.2	105.06	4.952			
9,100.0	6,624.1	9,345.1	6,792.7	58.9	61.4	108.79	-2,229.2	-1,087.8	520.0	410.7	109.33	4.757			
9,200.0	6,624.0	9,445.1	6,791.9	61.1	63.5	108.73	-2,329.2	-1,087.9	519.9	406.2	113.63	4.575			
9,300.0	6,623.8	9,545.1	6,791.2	63.4	65.6	108.67	-2,429.1	-1,087.9	519.7	401.8	117.94	4.406			
9,400.0	6,623.7	9,645.1	6,790.4	65.6	67.8	108.61	-2,529.1	-1,088.0	519.5	397.3	122.27	4.249			
9,500.0	6,623.5	9,745.1	6,789.7	67.8	69.9	108.55	-2,629.1	-1,088.1	519.3	392.7	126.62	4.102			
9,600.0	6,623.4	9,845.1	6,789.0	70.0	72.1	108.48	-2,729.1	-1,088.2	519.2	388.2	130.98	3.964			
9,700.0	6,623.2	9,945.1	6,788.2	72.3	74.3	108.42	-2,829.1	-1,088.2	519.0	383.6	135.36	3.834			
9,800.0	6,623.1	10,045.1	6,787.5	74.5	76.5	108.36	-2,929.1	-1,088.3	518.8	379.1	139.75	3.713			
9,900.0	6,622.9	10,145.1	6,786.8	76.8	78.7	108.30	-3,029.1	-1,088.4	518.7	374.5	144.15	3.598			
10,000.0	6,622.8	10,245.1	6,786.0	79.1	80.9	108.23	-3,129.1	-1,088.5	518.5	369.9	148.56	3.490			
10,100.0	6,622.6	10,345.1	6,785.3	81.3	83.1	108.17	-3,229.1	-1,088.5	518.3	365.3	152.99	3.388			
10,200.0	6,622.5	10,445.1	6,784.6	83.6	85.3	108.11	-3,329.1	-1,088.6	518.1	360.7	157.42	3.291			
10,300.0	6,622.4	10,545.1	6,783.8	85.9	87.6	108.05	-3,429.1	-1,088.7	518.0	356.1	161.86	3.200			
10,400.0	6,622.2	10,645.1	6,783.1	88.1	89.8	107.98	-3,529.1	-1,088.8	517.8	351.5	166.31	3.113			
10,500.0	6,622.1	10,745.1	6,782.3	90.4	92.0	107.92	-3,629.1	-1,088.8	517.6	346.9	170.77	3.031			
10,600.0	6,621.9	10,845.1	6,781.6	92.7	94.3	107.86	-3,729.1	-1,088.9	517.5	342.2	175.24	2.953			
10,700.0	6,621.8	10,945.1	6,780.9	95.0	96.5	107.80	-3,829.1	-1,089.0	517.3	337.6	179.71	2.879			
10,800.0	6,621.6	11,045.1	6,780.1	97.3	98.8	107.73	-3,929.1	-1,089.1	517.1	332.9	184.20	2.808			
10,900.0	6,621.5	11,145.1	6,779.4	99.6	101.0	107.67	-4,029.1	-1,089.1	517.0	328.3	188.68	2.740			
11,000.0	6,621.3	11,245.1	6,778.7	101.9	103.3	107.61	-4,129.1	-1,089.2	516.8	323.6	193.18	2.675			
11,100.0	6,621.2	11,345.1	6,777.9	104.2	105.6	107.55	-4,229.1	-1,089.3	516.6	319.0	197.68	2.614			
11,200.0	6,621.0	11,445.1	6,777.2	106.5	107.9	107.48	-4,329.1	-1,089.4	516.5	314.3	202.18	2.555			
11,300.0	6,620.9	11,545.1	6,776.5	108.8	110.1	107.42	-4,429.1	-1,089.4	516.3	309.6	206.70	2.498			
11,400.0	6,620.7	11,645.1	6,775.7	111.1	112.4	107.36	-4,529.1	-1,089.5	516.2	304.9	211.21	2.444			
11,500.0	6,620.6	11,745.1	6,775.0	113.4	114.7	107.29	-4,629.0	-1,089.6	516.0	300.3	215.74	2.392			
11,600.0	6,620.4	11,845.1	6,774.2	115.7	117.0	107.23	-4,729.0	-1,089.7	515.8	295.6	220.26	2.342			
11,700.0	6,620.3	11,945.1	6,773.5	118.0	119.3	107.17	-4,829.0	-1,089.7	515.7	290.9	224.80	2.294			
11,800.0	6,620.1	12,045.1	6,772.8	120.3	121.5	107.11	-4,929.0	-1,089.8	515.5	286.2	229.33	2.248			
11,900.0	6,620.0	12,145.1	6,772.0	122.7	123.8	107.04	-5,029.0	-1,089.9	515.4	281.5	233.87	2.204			
12,000.0	6,619.9	12,245.1	6,771.3	125.0	126.1	106.98	-5,129.0	-1,090.0	515.2	276.8	238.42	2.161			
12,100.0	6,619.7	12,345.1	6,770.6	127.3	128.4	106.92	-5,229.0	-1,090.0	515.0	272.1	242.97	2.120			
12,200.0	6,619.6	12,445.1	6,769.8	129.6	130.7	106.85	-5,329.0	-1,090.1	514.9	267.4	247.52	2.080			
12,300.0	6,619.4	12,545.1	6,769.1	131.9	133.0	106.79	-5,429.0	-1,090.2	514.7	262.6	252.08	2.042			
12,400.0	6,619.3	12,645.1	6,768.4	134.2	135.3	106.73	-5,529.0	-1,090.2	514.6	257.9	256.64	2.005			
12,500.0	6,619.1	12,745.1	6,767.6	136.6	137.6	106.66	-5,629.0	-1,090.3	514.4	253.2	261.21	1.969			
12,600.0	6,619.0	12,845.1	6,766.9	138.9	139.9	106.60	-5,729.0	-1,090.4	514.3	248.5	265.78	1.935			
12,700.0	6,618.8	12,945.1	6,766.2	141.2	142.2	106.54	-5,829.0	-1,090.5	514.1	243.8	270.36	1.902			
12,800.0	6,618.7	13,045.1	6,765.4	143.5	144.5	106.47	-5,929.0	-1,090.5	514.0	239.0	274.93	1.869			
12,900.0	6,618.5	13,145.1	6,764.7	145.9	146.8	106.41	-6,029.0	-1,090.6	513.8	234.3	279.51	1.838			
13,000.0	6,618.4	13,245.1	6,763.9	148.2	149.2	106.35	-6,129.0	-1,090.7	513.6	229.5	284.10	1.808			
13,100.0	6,618.2	13,345.1	6,763.2	150.5	151.5	106.28	-6,229.0	-1,090.8	513.5	224.8	288.69	1.779			

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29R-143
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4686.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4686.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29R-143	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.45 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #2 (1-25-17)	Offset TVD Reference:	Offset Datum

Offset Design		Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29M-323 - Wellbore #1 - Plan #2 (1-25-17)										Offset Site Error:		0.0 ft	
Survey Program: 0-MWD												Offset Well Error:		0.0 ft	
Reference		Offset		Semi Major Axis			Distance							Warning	
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor			
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)				
13,200.0	6,618.1	13,445.1	6,762.5	152.8	153.8	106.22	-6,329.0	-1,090.8	513.3	220.1	293.28	1.750			
13,300.0	6,617.9	13,545.1	6,761.7	155.2	156.1	106.16	-6,429.0	-1,090.9	513.2	215.3	297.87	1.723			
13,400.0	6,617.8	13,645.1	6,761.0	157.5	158.4	106.09	-6,529.0	-1,091.0	513.0	210.6	302.47	1.696			
13,500.0	6,617.6	13,745.1	6,760.3	159.8	160.7	106.03	-6,629.0	-1,091.1	512.9	205.8	307.07	1.670			
13,600.0	6,617.5	13,845.1	6,759.5	162.2	163.0	105.96	-6,729.0	-1,091.1	512.7	201.1	311.67	1.645			
13,700.0	6,617.4	13,945.1	6,758.8	164.5	165.4	105.90	-6,828.9	-1,091.2	512.6	196.3	316.28	1.621			
13,800.0	6,617.2	14,045.1	6,758.1	166.8	167.7	105.84	-6,928.9	-1,091.3	512.5	191.6	320.89	1.597			
13,900.0	6,617.1	14,145.1	6,757.3	169.1	170.0	105.77	-7,028.9	-1,091.4	512.3	186.8	325.50	1.574			
13,938.9	6,617.0	14,184.0	6,757.0	170.1	170.9	105.75	-7,067.9	-1,091.4	512.2	184.9	327.30	1.565 SF			

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29R-143
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4686.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4686.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29R-143	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.45 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #2 (1-25-17)	Offset TVD Reference:	Offset Datum

Offset Design Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29M-423 - Wellbore #1 - Plan #2 (1-25-17)													Offset Site Error:	0.0 ft	
Survey Program: 0-MWD														Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance							Warning	
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor			
Depth (ft)	Depth (ft)	Depth (ft)	Depth (ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)				
0.0	0.0	0.0	0.0	0.0	0.0	-89.54	0.4	-45.1	45.1						
100.0	100.0	100.0	100.0	0.1	0.1	-89.54	0.4	-45.1	45.1	44.9	0.28	163.937	CC, ES		
200.0	200.0	200.0	200.0	0.4	0.4	-89.54	0.4	-45.1	45.1	44.3	0.83	54.646			
300.0	300.0	300.0	300.0	0.7	0.7	-89.54	0.4	-45.1	45.1	43.8	1.38	32.787			
400.0	400.0	400.0	400.0	1.0	1.0	-89.54	0.4	-45.1	45.1	43.2	1.93	23.420			
500.0	500.0	498.9	498.9	1.2	1.2	-88.98	0.8	-46.3	46.4	43.9	2.47	18.796			
600.0	600.0	597.6	597.5	1.5	1.5	-87.48	2.2	-49.9	50.0	47.0	3.00	16.646			
700.0	700.0	696.1	695.8	1.8	1.8	-85.42	4.5	-55.8	56.2	52.6	3.55	15.810			
800.0	800.0	794.2	793.5	2.1	2.1	-83.20	7.6	-64.1	64.9	60.8	4.11	15.773			
900.0	900.0	891.8	890.4	2.3	2.4	-81.10	11.7	-74.7	76.2	71.5	4.69	16.241			
1,000.0	1,000.0	988.7	986.4	2.6	2.7	-79.26	16.6	-87.4	90.0	84.7	5.29	17.030			
1,100.0	1,100.0	1,084.9	1,081.2	2.9	3.1	-77.71	22.3	-102.3	106.4	100.5	5.90	18.018			
1,200.0	1,200.0	1,180.2	1,174.8	3.2	3.6	-76.43	28.8	-119.3	125.3	118.7	6.55	19.124			
1,300.0	1,300.0	1,274.8	1,267.2	3.4	4.1	-25.41	36.1	-138.3	145.5	138.6	6.88	21.136			
1,400.0	1,399.9	1,368.9	1,358.5	3.7	4.6	-24.94	44.1	-159.3	165.8	158.3	7.44	22.278			
1,500.0	1,499.7	1,462.5	1,448.9	4.0	5.2	-24.80	52.9	-182.2	186.1	178.1	8.01	23.244			
1,600.0	1,599.3	1,559.5	1,542.0	4.3	5.8	-24.92	62.6	-207.5	205.8	197.2	8.59	23.961			
1,700.0	1,698.6	1,658.0	1,636.5	4.6	6.5	-25.31	72.5	-233.3	223.3	214.1	9.19	24.295			
1,800.0	1,797.5	1,756.8	1,731.4	4.9	7.1	-25.91	82.4	-259.1	238.4	228.6	9.80	24.319			
1,900.0	1,896.1	1,855.9	1,826.5	5.3	7.8	-26.71	92.3	-285.0	251.3	240.8	10.44	24.076			
1,962.1	1,957.1	1,917.5	1,885.7	5.5	8.3	-27.31	98.5	-301.1	258.1	247.3	10.84	23.809			
2,000.0	1,994.2	1,955.2	1,921.8	5.6	8.5	-27.72	102.3	-310.9	262.1	251.0	11.10	23.609			
2,100.0	2,092.2	2,054.5	2,017.2	6.1	9.2	-28.73	112.3	-336.9	272.5	260.7	11.79	23.103			
2,200.0	2,190.2	2,153.9	2,112.6	6.5	9.9	-29.67	122.2	-362.9	283.0	270.4	12.51	22.625			
2,300.0	2,288.3	2,253.2	2,208.0	7.0	10.6	-30.55	132.2	-388.8	293.5	280.3	13.24	22.174			
2,400.0	2,386.3	2,352.5	2,303.3	7.4	11.4	-31.36	142.1	-414.8	304.1	290.2	13.98	21.750			
2,500.0	2,484.3	2,451.9	2,398.7	7.9	12.1	-32.12	152.1	-440.8	314.8	300.1	14.74	21.351			
2,600.0	2,582.3	2,551.2	2,494.1	8.4	12.8	-32.82	162.0	-466.7	325.6	310.0	15.52	20.976			
2,700.0	2,680.3	2,650.6	2,589.4	8.9	13.5	-33.49	172.0	-492.7	336.3	320.0	16.31	20.623			
2,800.0	2,778.3	2,749.9	2,684.8	9.4	14.2	-34.11	182.0	-518.7	347.1	330.0	17.11	20.292			
2,900.0	2,876.3	2,849.3	2,780.2	9.8	14.9	-34.69	191.9	-544.6	358.0	340.1	17.92	19.980			
3,000.0	2,974.4	2,948.6	2,875.6	10.4	15.7	-35.24	201.9	-570.6	368.9	350.2	18.74	19.687			
3,100.0	3,072.4	3,048.0	2,970.9	10.9	16.4	-35.76	211.8	-596.6	379.8	360.3	19.57	19.411			
3,200.0	3,170.4	3,147.3	3,066.3	11.4	17.1	-36.25	221.8	-622.5	390.8	370.4	20.40	19.151			
3,300.0	3,268.4	3,246.6	3,161.7	11.9	17.8	-36.71	231.7	-648.5	401.7	380.5	21.25	18.907			
3,400.0	3,366.4	3,346.0	3,257.1	12.4	18.5	-37.15	241.7	-674.5	412.8	390.7	22.10	18.676			
3,500.0	3,464.4	3,445.3	3,352.4	12.9	19.3	-37.57	251.7	-700.4	423.8	400.8	22.96	18.457			
3,600.0	3,562.5	3,544.7	3,447.8	13.4	20.0	-37.96	261.6	-726.4	434.8	411.0	23.82	18.251			
3,700.0	3,660.5	3,644.0	3,543.2	13.9	20.7	-38.33	271.6	-752.4	445.9	421.2	24.69	18.056			
3,800.0	3,758.5	3,743.4	3,638.5	14.5	21.4	-38.69	281.5	-778.3	457.0	431.4	25.57	17.872			
3,900.0	3,856.5	3,842.7	3,733.9	15.0	22.2	-39.03	291.5	-804.3	468.1	441.6	26.45	17.697			
4,000.0	3,954.5	3,942.1	3,829.3	15.5	22.9	-39.35	301.4	-830.2	479.2	451.9	27.33	17.531			
4,100.0	4,052.5	4,041.4	3,924.7	16.0	23.6	-39.66	311.4	-856.2	490.3	462.1	28.22	17.374			
4,200.0	4,150.6	4,140.7	4,020.0	16.6	24.3	-39.96	321.4	-882.2	501.5	472.4	29.11	17.224			
4,300.0	4,248.6	4,240.1	4,115.4	17.1	25.1	-40.24	331.3	-908.1	512.6	482.6	30.01	17.082			
4,400.0	4,346.6	4,339.4	4,210.8	17.6	25.8	-40.51	341.3	-934.1	523.8	492.9	30.91	16.946			
4,500.0	4,444.6	4,438.8	4,306.2	18.1	26.5	-40.77	351.2	-960.1	535.0	503.2	31.81	16.817			
4,600.0	4,542.6	4,538.1	4,401.5	18.7	27.2	-41.02	361.2	-986.0	546.2	513.4	32.72	16.694			
4,700.0	4,640.6	4,637.5	4,496.9	19.2	28.0	-41.26	371.2	-1,012.0	557.4	523.7	33.62	16.576			
4,800.0	4,738.7	4,736.8	4,592.3	19.7	28.7	-41.49	381.1	-1,038.0	568.6	534.0	34.53	16.464			
4,900.0	4,836.7	4,836.2	4,687.6	20.2	29.4	-41.71	391.1	-1,063.9	579.8	544.3	35.45	16.356			

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29R-143
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4686.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4686.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29R-143	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.45 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #2 (1-25-17)	Offset TVD Reference:	Offset Datum

Offset Design Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29M-423 - Wellbore #1 - Plan #2 (1-25-17)													Offset Site Error:	0.0 ft	
Survey Program: 0-MWD														Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance							Warning	
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor			
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)				
5,000.0	4,934.7	4,935.5	4,783.0	20.8	30.1	-41.92	401.0	-1,089.9	591.0	554.6	36.36	16.253			
5,100.0	5,032.7	5,034.8	4,878.4	21.3	30.9	-42.12	411.0	-1,115.9	602.2	565.0	37.28	16.155			
5,201.5	5,132.2	5,135.7	4,975.2	21.8	31.6	-42.32	421.1	-1,142.2	613.7	575.4	38.21	16.059			
5,300.0	5,229.0	5,233.4	5,069.0	22.3	32.3	-42.57	430.9	-1,167.8	626.0	586.9	39.04	16.033			
5,400.0	5,328.0	5,332.2	5,163.9	22.6	33.0	-42.65	440.8	-1,193.6	641.0	601.3	39.74	16.130			
5,500.0	5,427.3	5,447.4	5,274.7	22.9	33.7	-42.52	451.9	-1,222.7	657.8	617.4	40.34	16.306			
5,600.0	5,527.0	5,572.8	5,396.7	23.2	34.3	-42.29	462.4	-1,249.9	673.4	632.6	40.82	16.497			
5,700.0	5,626.9	5,699.3	5,521.0	23.4	34.9	-41.99	470.9	-1,272.2	687.7	646.5	41.19	16.694			
5,773.1	5,700.0	5,792.5	5,613.0	23.5	35.2	-91.78	476.0	-1,285.3	697.2	655.8	41.40	16.840			
5,800.0	5,726.9	5,826.9	5,647.2	23.5	35.3	-91.63	477.6	-1,289.5	700.4	658.9	41.48	16.884			
5,900.0	5,826.9	5,955.7	5,775.4	23.7	35.6	-91.23	482.2	-1,301.6	709.7	667.9	41.84	16.965			
5,937.4	5,864.3	6,004.2	5,823.7	23.8	35.7	-91.13	483.4	-1,304.8	712.2	670.2	41.98	16.965			
5,950.0	5,876.9	6,020.5	5,840.0	23.8	35.7	88.83	483.8	-1,305.7	712.8	670.8	42.03	16.962			
6,000.0	5,926.8	6,085.4	5,904.8	23.8	35.8	89.02	484.8	-1,308.4	714.9	672.7	42.15	16.962			
6,050.0	5,976.5	6,150.0	5,969.4	23.9	35.9	89.58	485.3	-1,309.7	715.8	673.7	42.08	17.010			
6,100.0	6,025.7	6,206.3	6,025.7	23.9	36.0	90.38	485.4	-1,309.8	715.9	674.1	41.89	17.092			
6,150.0	6,074.2	6,254.8	6,074.2	23.8	36.1	91.31	485.4	-1,309.8	716.1	674.5	41.61	17.210			
6,200.0	6,121.8	6,302.5	6,121.9	23.8	36.1	92.44	485.4	-1,309.8	716.7	675.4	41.25	17.374			
6,250.0	6,168.2	6,352.3	6,171.7	23.7	36.2	93.69	483.5	-1,309.8	717.6	676.8	40.82	17.580			
6,300.0	6,213.4	6,403.3	6,222.4	23.6	36.2	94.93	478.2	-1,309.8	718.9	678.6	40.37	17.810			
6,350.0	6,257.1	6,455.5	6,273.8	23.5	36.2	96.18	469.3	-1,309.8	720.6	680.7	39.90	18.060			
6,400.0	6,299.1	6,509.1	6,325.8	23.4	36.2	97.40	456.6	-1,309.9	722.7	683.2	39.43	18.327			
6,450.0	6,339.3	6,564.1	6,378.2	23.3	36.1	98.62	439.7	-1,309.9	725.0	686.1	38.96	18.608			
6,500.0	6,377.4	6,620.6	6,430.6	23.1	36.1	99.80	418.5	-1,309.9	727.7	689.2	38.51	18.896			
6,550.0	6,413.3	6,678.7	6,482.6	23.0	36.0	100.96	392.8	-1,309.9	730.6	692.5	38.07	19.188			
6,600.0	6,446.8	6,738.5	6,533.9	22.9	35.9	102.09	362.2	-1,309.9	733.6	696.0	37.67	19.474			
6,650.0	6,477.9	6,799.9	6,584.1	22.7	35.8	103.17	326.8	-1,309.9	736.8	699.5	37.31	19.748			
6,700.0	6,506.3	6,863.0	6,632.5	22.6	35.7	104.19	286.2	-1,310.0	740.1	703.1	37.01	19.997			
6,750.0	6,532.0	6,927.9	6,678.5	22.5	35.6	105.16	240.6	-1,310.0	743.3	706.5	36.78	20.212			
6,800.0	6,554.8	6,994.5	6,721.6	22.3	35.5	106.06	189.8	-1,310.0	746.5	709.8	36.63	20.379			
6,850.0	6,574.7	7,062.8	6,761.0	22.2	35.3	106.88	134.1	-1,310.1	749.4	712.9	36.59	20.482			
6,900.0	6,591.5	7,132.6	6,796.0	22.2	35.2	107.60	73.6	-1,310.1	752.2	715.5	36.67	20.510			
6,950.0	6,605.2	7,203.9	6,825.8	22.1	35.1	108.23	9.0	-1,310.2	754.6	717.7	36.89	20.455			
7,000.0	6,615.7	7,276.4	6,849.9	22.1	35.1	108.74	-59.4	-1,310.2	756.6	719.3	37.27	20.300			
7,050.0	6,623.0	7,349.9	6,867.6	22.2	35.1	109.13	-130.8	-1,310.3	758.2	720.4	37.79	20.061			
7,100.0	6,627.1	7,424.2	6,878.4	22.4	35.1	109.40	-204.2	-1,310.3	759.3	720.8	38.50	19.722			
7,138.1	6,627.0	7,479.6	6,881.8	22.6	35.2	109.58	-259.5	-1,310.4	760.1	721.0	39.10	19.438			
7,139.1	6,627.0	7,481.1	6,881.8	22.6	35.2	109.59	-261.0	-1,310.4	760.1	720.9	39.12	19.428			
7,140.2	6,627.0	7,482.9	6,881.8	22.6	35.2	109.59	-262.8	-1,310.4	760.1	720.9	39.14	19.418			
7,200.0	6,626.9	7,548.2	6,881.9	23.1	35.4	109.60	-328.1	-1,310.4	760.1	719.9	40.23	18.896			
7,300.0	6,626.8	7,648.2	6,881.8	24.2	35.7	109.60	-428.1	-1,310.5	760.1	717.8	42.35	17.951			
7,400.0	6,626.6	7,748.2	6,881.6	25.6	36.2	109.60	-528.1	-1,310.6	760.1	715.3	44.84	16.953			
7,500.0	6,626.5	7,848.2	6,881.5	27.1	36.9	109.60	-628.1	-1,310.6	760.2	712.5	47.62	15.962			
7,600.0	6,626.3	7,948.2	6,881.3	28.7	37.8	109.60	-728.1	-1,310.7	760.2	709.5	50.65	15.009			
7,700.0	6,626.2	8,048.2	6,881.2	30.4	38.8	109.60	-828.1	-1,310.8	760.2	706.3	53.88	14.110			
7,800.0	6,626.0	8,148.2	6,881.0	32.2	40.0	109.60	-928.1	-1,310.9	760.2	702.9	57.27	13.274			
7,900.0	6,625.9	8,248.2	6,880.9	34.0	41.3	109.60	-1,028.1	-1,310.9	760.2	699.4	60.80	12.503			
8,000.0	6,625.7	8,348.2	6,880.8	35.9	42.7	109.60	-1,128.1	-1,311.0	760.2	695.8	64.45	11.795			
8,100.0	6,625.6	8,448.2	6,880.6	37.9	44.3	109.60	-1,228.1	-1,311.1	760.2	692.0	68.20	11.147			
8,200.0	6,625.4	8,548.2	6,880.5	39.9	45.9	109.60	-1,328.1	-1,311.2	760.3	688.2	72.03	10.554			

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29R-143
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4686.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4686.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29R-143	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.45 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #2 (1-25-17)	Offset TVD Reference:	Offset Datum

Offset Design Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29M-423 - Wellbore #1 - Plan #2 (1-25-17)													Offset Site Error: 0.0 ft		
Survey Program: 0-MWD														Offset Well Error: 0.0 ft	
Reference		Offset		Semi Major Axis			Distance							Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor			
8,300.0	6,625.3	8,648.2	6,880.3	41.9	47.6	109.60	-1,428.1	-1,311.2	760.3	684.3	75.93	10.012			
8,400.0	6,625.1	8,748.2	6,880.2	43.9	49.4	109.60	-1,528.1	-1,311.3	760.3	680.4	79.90	9.516			
8,500.0	6,625.0	8,848.2	6,880.0	46.0	51.2	109.60	-1,628.1	-1,311.4	760.3	676.4	83.91	9.061			
8,600.0	6,624.9	8,948.2	6,879.9	48.1	53.0	109.60	-1,728.1	-1,311.5	760.3	672.4	87.96	8.644			
8,700.0	6,624.7	9,048.2	6,879.7	50.3	55.0	109.60	-1,828.1	-1,311.5	760.3	668.3	92.06	8.259			
8,800.0	6,624.6	9,148.2	6,879.6	52.4	56.9	109.60	-1,928.1	-1,311.6	760.3	664.2	96.19	7.905			
8,900.0	6,624.4	9,248.2	6,879.4	54.6	58.9	109.60	-2,028.1	-1,311.7	760.4	660.0	100.35	7.577			
9,000.0	6,624.3	9,348.2	6,879.3	56.8	60.9	109.60	-2,128.1	-1,311.8	760.4	655.8	104.53	7.274			
9,100.0	6,624.1	9,448.2	6,879.1	58.9	62.9	109.60	-2,228.1	-1,311.8	760.4	651.7	108.74	6.993			
9,200.0	6,624.0	9,548.2	6,879.0	61.1	65.0	109.59	-2,328.1	-1,311.9	760.4	647.4	112.96	6.731			
9,300.0	6,623.8	9,648.2	6,878.8	63.4	67.1	109.59	-2,428.1	-1,312.0	760.4	643.2	117.21	6.488			
9,400.0	6,623.7	9,748.2	6,878.7	65.6	69.2	109.59	-2,528.1	-1,312.1	760.4	639.0	121.47	6.260			
9,500.0	6,623.5	9,848.2	6,878.5	67.8	71.3	109.59	-2,628.1	-1,312.1	760.4	634.7	125.75	6.047			
9,600.0	6,623.4	9,948.2	6,878.4	70.0	73.4	109.59	-2,728.1	-1,312.2	760.5	630.4	130.04	5.848			
9,700.0	6,623.2	10,048.2	6,878.2	72.3	75.5	109.59	-2,828.1	-1,312.3	760.5	626.1	134.34	5.661			
9,800.0	6,623.1	10,148.2	6,878.1	74.5	77.7	109.59	-2,928.1	-1,312.4	760.5	621.8	138.65	5.485			
9,900.0	6,622.9	10,248.2	6,878.0	76.8	79.9	109.59	-3,028.1	-1,312.4	760.5	617.5	142.97	5.319			
10,000.0	6,622.8	10,348.2	6,877.8	79.1	82.0	109.59	-3,128.1	-1,312.5	760.5	613.2	147.30	5.163			
10,100.0	6,622.6	10,448.2	6,877.7	81.3	84.2	109.59	-3,228.1	-1,312.6	760.5	608.9	151.64	5.015			
10,200.0	6,622.5	10,548.2	6,877.5	83.6	86.4	109.59	-3,328.1	-1,312.7	760.5	604.6	155.99	4.876			
10,300.0	6,622.4	10,648.2	6,877.4	85.9	88.6	109.59	-3,428.1	-1,312.7	760.6	600.2	160.34	4.743			
10,400.0	6,622.2	10,748.2	6,877.2	88.1	90.8	109.59	-3,528.1	-1,312.8	760.6	595.9	164.70	4.618			
10,500.0	6,622.1	10,848.2	6,877.1	90.4	93.0	109.59	-3,628.1	-1,312.9	760.6	591.5	169.07	4.499			
10,600.0	6,621.9	10,948.2	6,876.9	92.7	95.3	109.59	-3,728.1	-1,313.0	760.6	587.2	173.44	4.385			
10,700.0	6,621.8	11,048.2	6,876.8	95.0	97.5	109.59	-3,828.1	-1,313.0	760.6	582.8	177.82	4.278			
10,800.0	6,621.6	11,148.2	6,876.6	97.3	99.7	109.59	-3,928.1	-1,313.1	760.6	578.4	182.20	4.175			
10,900.0	6,621.5	11,248.2	6,876.5	99.6	102.0	109.59	-4,028.1	-1,313.2	760.7	574.1	186.58	4.077			
11,000.0	6,621.3	11,348.2	6,876.3	101.9	104.2	109.59	-4,128.1	-1,313.3	760.7	569.7	190.97	3.983			
11,100.0	6,621.2	11,448.2	6,876.2	104.2	106.4	109.59	-4,228.1	-1,313.3	760.7	565.3	195.37	3.894			
11,200.0	6,621.0	11,548.2	6,876.0	106.5	108.7	109.59	-4,328.1	-1,313.4	760.7	560.9	199.76	3.808			
11,300.0	6,620.9	11,648.2	6,875.9	108.8	111.0	109.59	-4,428.1	-1,313.5	760.7	556.5	204.16	3.726			
11,400.0	6,620.7	11,748.2	6,875.7	111.1	113.2	109.59	-4,528.1	-1,313.6	760.7	552.2	208.57	3.647			
11,500.0	6,620.6	11,848.2	6,875.6	113.4	115.5	109.59	-4,628.1	-1,313.6	760.7	547.8	212.97	3.572			
11,600.0	6,620.4	11,948.2	6,875.5	115.7	117.7	109.59	-4,728.1	-1,313.7	760.8	543.4	217.38	3.500			
11,700.0	6,620.3	12,048.2	6,875.3	118.0	120.0	109.59	-4,828.1	-1,313.8	760.8	539.0	221.79	3.430			
11,800.0	6,620.1	12,148.2	6,875.2	120.3	122.3	109.58	-4,928.1	-1,313.9	760.8	534.6	226.20	3.363			
11,900.0	6,620.0	12,248.2	6,875.0	122.7	124.6	109.58	-5,028.1	-1,313.9	760.8	530.2	230.62	3.299			
12,000.0	6,619.9	12,348.2	6,874.9	125.0	126.8	109.58	-5,128.1	-1,314.0	760.8	525.8	235.04	3.237			
12,100.0	6,619.7	12,448.2	6,874.7	127.3	129.1	109.58	-5,228.1	-1,314.1	760.8	521.4	239.46	3.177			
12,200.0	6,619.6	12,548.2	6,874.6	129.6	131.4	109.58	-5,328.1	-1,314.2	760.8	517.0	243.88	3.120			
12,300.0	6,619.4	12,648.2	6,874.4	131.9	133.7	109.58	-5,428.1	-1,314.2	760.9	512.5	248.30	3.064			
12,400.0	6,619.3	12,748.2	6,874.3	134.2	136.0	109.58	-5,528.1	-1,314.3	760.9	508.1	252.73	3.011			
12,500.0	6,619.1	12,848.2	6,874.1	136.6	138.3	109.58	-5,628.1	-1,314.4	760.9	503.7	257.16	2.959			
12,600.0	6,619.0	12,948.2	6,874.0	138.9	140.6	109.58	-5,728.1	-1,314.5	760.9	499.3	261.59	2.909			
12,700.0	6,618.8	13,048.2	6,873.8	141.2	142.9	109.58	-5,828.1	-1,314.5	760.9	494.9	266.02	2.860			
12,800.0	6,618.7	13,148.2	6,873.7	143.5	145.2	109.58	-5,928.1	-1,314.6	760.9	490.5	270.45	2.814			
12,900.0	6,618.5	13,248.2	6,873.5	145.9	147.5	109.58	-6,028.1	-1,314.7	760.9	486.1	274.88	2.768			
13,000.0	6,618.4	13,348.2	6,873.4	148.2	149.8	109.58	-6,128.1	-1,314.8	761.0	481.6	279.32	2.724			
13,100.0	6,618.2	13,448.2	6,873.2	150.5	152.1	109.58	-6,228.1	-1,314.8	761.0	477.2	283.75	2.682			
13,200.0	6,618.1	13,548.2	6,873.1	152.8	154.4	109.58	-6,328.1	-1,314.9	761.0	472.8	288.19	2.641			
13,300.0	6,617.9	13,648.2	6,873.0	155.2	156.7	109.58	-6,428.1	-1,315.0	761.0	468.4	292.62	2.601			

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29R-143
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4686.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4686.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29R-143	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.45 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #2 (1-25-17)	Offset TVD Reference:	Offset Datum

Offset Design Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29M-423 - Wellbore #1 - Plan #2 (1-25-17)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance							Warning
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)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
13,400.0	6,617.8	13,748.2	6,872.8	157.5	159.0	109.58	-6,528.1	-1,315.1	761.0	463.9	297.06	2.562		
13,500.0	6,617.6	13,848.2	6,872.7	159.8	161.3	109.58	-6,628.1	-1,315.1	761.0	459.5	301.50	2.524		
13,600.0	6,617.5	13,948.2	6,872.5	162.2	163.6	109.58	-6,728.1	-1,315.2	761.0	455.1	305.94	2.488		
13,700.0	6,617.4	14,048.2	6,872.4	164.5	165.9	109.58	-6,828.1	-1,315.3	761.1	450.7	310.39	2.452		
13,800.0	6,617.2	14,148.2	6,872.2	166.8	168.2	109.58	-6,928.1	-1,315.4	761.1	446.2	314.83	2.417		
13,900.0	6,617.1	14,248.2	6,872.1	169.1	170.5	109.58	-7,028.1	-1,315.4	761.1	441.8	319.27	2.384		
13,938.9	6,617.0	14,287.2	6,872.0	170.1	171.4	109.58	-7,067.1	-1,315.5	761.1	440.1	321.00	2.371 SF		

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29R-143
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4686.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4686.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29R-143	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.45 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #2 (1-25-17)	Offset TVD Reference:	Offset Datum

Offset Design Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29R-203 - Wellbore #1 - Plan #2 (1-25-17)													Offset Site Error:	0.0 ft	
Survey Program: 0-MWD														Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance							Warning	
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor			
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)				
0.0	0.0	0.0	0.0	0.0	0.0	90.70	-0.4	29.8	29.8						
100.0	100.0	100.0	100.0	0.1	0.1	90.70	-0.4	29.8	29.8	29.5	0.28	108.284			
200.0	200.0	200.0	200.0	0.4	0.4	90.70	-0.4	29.8	29.8	29.0	0.83	36.095			
300.0	300.0	300.0	300.0	0.7	0.7	90.70	-0.4	29.8	29.8	28.4	1.38	21.657			
400.0	400.0	400.0	400.0	1.0	1.0	90.70	-0.4	29.8	29.8	27.9	1.93	15.469			
500.0	500.0	500.0	500.0	1.2	1.2	90.70	-0.4	29.8	29.8	27.3	2.48	12.032			
600.0	600.0	600.0	600.0	1.5	1.5	90.70	-0.4	29.8	29.8	26.8	3.03	9.844			
700.0	700.0	700.0	700.0	1.8	1.8	90.70	-0.4	29.8	29.8	26.2	3.58	8.330			
800.0	800.0	800.0	800.0	2.1	2.1	90.70	-0.4	29.8	29.8	25.7	4.13	7.219			
900.0	900.0	900.0	900.0	2.3	2.3	90.70	-0.4	29.8	29.8	25.1	4.68	6.370			
1,000.0	1,000.0	1,000.0	1,000.0	2.6	2.6	90.70	-0.4	29.8	29.8	24.6	5.23	5.699			
1,100.0	1,100.0	1,100.0	1,100.0	2.9	2.9	90.70	-0.4	29.8	29.8	24.0	5.78	5.156			
1,200.0	1,200.0	1,200.0	1,200.0	3.2	3.2	90.70	-0.4	29.8	29.8	23.5	6.33	4.708 CC, ES			
1,300.0	1,300.0	1,300.0	1,300.0	3.4	3.4	142.28	-0.4	29.8	30.8	24.0	6.88	4.485			
1,400.0	1,399.9	1,399.9	1,399.9	3.7	3.7	146.30	-0.4	29.8	34.0	26.6	7.41	4.590			
1,500.0	1,499.7	1,499.7	1,499.7	4.0	4.0	151.51	-0.4	29.8	39.6	31.7	7.95	4.987			
1,600.0	1,599.3	1,599.3	1,599.3	4.3	4.3	156.69	-0.4	29.8	47.9	39.4	8.48	5.646			
1,700.0	1,698.6	1,698.6	1,698.6	4.6	4.5	161.16	-0.4	29.8	58.9	49.9	9.01	6.534			
1,800.0	1,797.5	1,797.5	1,797.5	4.9	4.8	164.76	-0.4	29.8	72.6	63.1	9.53	7.616			
1,900.0	1,896.1	1,896.1	1,896.1	5.3	5.1	167.57	-0.4	29.8	89.1	79.0	10.05	8.860			
1,962.1	1,957.1	1,957.1	1,957.1	5.5	5.3	168.99	-0.4	29.8	100.7	90.3	10.37	9.703			
2,000.0	1,994.2	1,994.2	1,994.2	5.6	5.4	169.75	-0.4	29.8	108.0	97.5	10.58	10.210			
2,100.0	2,092.2	2,094.6	2,094.5	6.1	5.6	171.00	0.8	29.5	126.7	115.6	11.13	11.383			
2,200.0	2,190.2	2,195.8	2,195.7	6.5	5.9	171.23	4.4	28.4	143.6	131.9	11.69	12.276			
2,300.0	2,288.3	2,297.7	2,297.4	7.0	6.2	170.75	10.7	26.4	158.4	146.2	12.26	12.919			
2,400.0	2,386.3	2,400.0	2,399.3	7.4	6.5	169.73	19.7	23.7	171.3	158.5	12.84	13.343			
2,500.0	2,484.3	2,502.8	2,501.3	7.9	6.8	168.25	31.3	20.2	182.4	169.0	13.44	13.574			
2,600.0	2,582.3	2,605.3	2,602.8	8.4	7.1	166.36	45.4	15.9	191.7	177.7	14.06	13.641			
2,700.0	2,680.3	2,704.7	2,701.0	8.9	7.4	164.47	60.2	11.4	200.5	185.9	14.69	13.652			
2,800.0	2,778.3	2,804.1	2,799.2	9.4	7.7	162.74	74.9	7.0	209.5	194.2	15.34	13.657			
2,900.0	2,876.3	2,903.5	2,897.4	9.8	8.1	161.15	89.7	2.5	218.7	202.7	16.02	13.656			
3,000.0	2,974.4	3,002.9	2,995.6	10.4	8.4	159.69	104.4	-2.0	228.0	211.3	16.70	13.650			
3,100.0	3,072.4	3,102.3	3,093.8	10.9	8.8	158.35	119.2	-6.5	237.5	220.1	17.41	13.640			
3,200.0	3,170.4	3,201.7	3,192.0	11.4	9.2	157.11	133.9	-10.9	247.1	228.9	18.13	13.625			
3,300.0	3,268.4	3,301.1	3,290.2	11.9	9.5	155.96	148.7	-15.4	256.7	237.9	18.87	13.607			
3,400.0	3,366.4	3,400.5	3,388.4	12.4	9.9	154.90	163.4	-19.9	266.5	246.9	19.62	13.587			
3,500.0	3,464.4	3,499.9	3,486.6	12.9	10.3	153.91	178.2	-24.4	276.4	256.0	20.38	13.564			
3,600.0	3,562.5	3,599.3	3,584.8	13.4	10.7	152.99	192.9	-28.8	286.3	265.2	21.15	13.540			
3,700.0	3,660.5	3,698.7	3,683.0	13.9	11.1	152.13	207.7	-33.3	296.3	274.4	21.93	13.514			
3,800.0	3,758.5	3,798.1	3,781.2	14.5	11.5	151.33	222.4	-37.8	306.4	283.7	22.72	13.488			
3,900.0	3,856.5	3,897.5	3,879.4	15.0	11.9	150.57	237.2	-42.3	316.5	293.0	23.51	13.462			
4,000.0	3,954.5	3,996.9	3,977.6	15.5	12.3	149.87	251.9	-46.7	326.7	302.4	24.32	13.435			
4,100.0	4,052.5	4,096.3	4,075.8	16.0	12.7	149.21	266.7	-51.2	336.9	311.8	25.13	13.408			
4,200.0	4,150.6	4,195.7	4,174.0	16.6	13.1	148.58	281.4	-55.7	347.2	321.2	25.95	13.381			
4,300.0	4,248.6	4,295.1	4,272.2	17.1	13.5	148.00	296.2	-60.1	357.5	330.7	26.77	13.355			
4,400.0	4,346.6	4,394.5	4,370.4	17.6	13.9	147.44	310.9	-64.6	367.8	340.2	27.60	13.329			
4,500.0	4,444.6	4,494.0	4,468.6	18.1	14.3	146.92	325.7	-69.1	378.2	349.8	28.43	13.304			
4,600.0	4,542.6	4,593.4	4,566.8	18.7	14.7	146.42	340.4	-73.6	388.6	359.3	29.26	13.279			
4,700.0	4,640.6	4,692.8	4,665.0	19.2	15.2	145.95	355.2	-78.0	399.0	368.9	30.11	13.254			
4,800.0	4,738.7	4,792.2	4,763.2	19.7	15.6	145.51	369.9	-82.5	409.5	378.5	30.95	13.231			
4,900.0	4,836.7	4,891.6	4,861.4	20.2	16.0	145.08	384.7	-87.0	420.0	388.2	31.80	13.208			

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29R-143
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4686.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4686.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29R-143	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.45 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #2 (1-25-17)	Offset TVD Reference:	Offset Datum

Offset Design Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29R-203 - Wellbore #1 - Plan #2 (1-25-17)													Offset Site Error: 0.0 ft		
Survey Program: 0-MWD														Offset Well Error: 0.0 ft	
Reference		Offset		Semi Major Axis			Distance							Warning	
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor			
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)				
5,000.0	4,934.7	4,991.0	4,959.6	20.8	16.4	144.68	399.4	-91.5	430.5	397.8	32.65	13.185			
5,100.0	5,032.7	5,090.4	5,057.8	21.3	16.8	144.29	414.2	-95.9	441.0	407.5	33.50	13.163			
5,201.5	5,132.2	5,191.3	5,157.4	21.8	17.3	143.92	429.2	-100.5	451.7	417.3	34.37	13.142			
5,300.0	5,229.0	5,289.3	5,254.3	22.3	17.7	143.56	443.7	-104.9	460.7	425.5	35.23	13.076			
5,400.0	5,328.0	5,388.9	5,352.7	22.6	18.1	142.92	458.5	-109.4	467.2	431.1	36.07	12.951			
5,500.0	5,427.3	5,488.2	5,450.8	22.9	18.5	142.02	473.2	-113.9	470.9	434.0	36.90	12.761			
5,600.0	5,527.0	5,582.9	5,544.6	23.2	18.8	141.10	485.6	-117.6	472.7	435.1	37.58	12.577			
5,700.0	5,626.9	5,677.9	5,639.1	23.4	19.1	140.27	495.1	-120.5	472.9	434.7	38.16	12.390			
5,773.1	5,700.0	5,747.5	5,708.5	23.5	19.3	89.67	500.1	-122.0	472.0	433.4	38.54	12.248			
5,800.0	5,726.9	5,773.2	5,734.1	23.5	19.4	89.49	501.6	-122.5	471.5	432.8	38.68	12.192			
5,900.0	5,826.9	5,868.8	5,829.6	23.7	19.6	89.07	505.0	-123.5	470.5	431.3	39.15	12.017			
5,937.4	5,864.3	5,904.5	5,865.4	23.8	19.6	89.01	505.5	-123.7	470.3	431.0	39.31	11.964			
5,950.0	5,876.9	5,916.6	5,877.5	23.8	19.7	-91.04	505.6	-123.7	470.3	430.9	39.35	11.950			
5,957.7	5,884.6	5,924.0	5,884.8	23.8	19.7	-91.07	505.6	-123.7	470.3	430.9	39.38	11.942			
6,000.0	5,926.8	5,966.0	5,926.8	23.8	19.8	-91.34	505.6	-123.7	470.3	430.8	39.56	11.890			
6,050.0	5,976.5	6,016.4	5,977.2	23.9	19.8	-91.94	504.9	-123.7	470.5	430.7	39.76	11.833			
6,100.0	6,025.7	6,067.4	6,028.0	23.9	19.9	-92.56	500.9	-123.7	470.7	430.8	39.89	11.800			
6,150.0	6,074.2	6,118.7	6,078.8	23.8	19.9	-93.17	493.5	-123.7	470.9	431.0	39.94	11.790			
6,200.0	6,121.8	6,170.4	6,129.4	23.8	19.9	-93.76	482.6	-123.7	471.2	431.3	39.93	11.802			
6,250.0	6,168.2	6,222.5	6,179.4	23.7	19.8	-94.34	468.2	-123.7	471.6	431.7	39.84	11.835			
6,300.0	6,213.4	6,274.9	6,228.6	23.6	19.7	-94.91	450.3	-123.7	471.9	432.2	39.70	11.888			
6,350.0	6,257.1	6,327.6	6,276.8	23.5	19.6	-95.45	428.9	-123.7	472.3	432.8	39.50	11.957			
6,400.0	6,299.1	6,380.7	6,323.8	23.4	19.5	-95.97	404.0	-123.8	472.8	433.5	39.27	12.040			
6,450.0	6,339.3	6,434.2	6,369.1	23.3	19.4	-96.46	375.8	-123.8	473.2	434.2	39.00	12.133			
6,500.0	6,377.4	6,487.9	6,412.6	23.1	19.3	-96.93	344.3	-123.8	473.7	434.9	38.72	12.231			
6,550.0	6,413.3	6,542.0	6,454.1	23.0	19.1	-97.36	309.6	-123.8	474.1	435.6	38.45	12.329			
6,600.0	6,446.8	6,596.3	6,493.1	22.9	19.0	-97.77	271.8	-123.9	474.5	436.3	38.21	12.419			
6,650.0	6,477.9	6,650.9	6,529.6	22.7	18.9	-98.13	231.2	-123.9	474.9	436.9	38.01	12.495			
6,700.0	6,506.3	6,705.8	6,563.2	22.6	18.8	-98.46	187.8	-123.9	475.3	437.4	37.88	12.547			
6,750.0	6,532.0	6,760.9	6,593.7	22.5	18.8	-98.75	142.0	-124.0	475.7	437.8	37.85	12.569			
6,800.0	6,554.8	6,816.2	6,621.0	22.3	18.8	-99.00	93.9	-124.0	476.0	438.1	37.92	12.553			
6,850.0	6,574.7	6,871.6	6,644.7	22.2	18.8	-99.21	43.8	-124.0	476.2	438.1	38.11	12.495			
6,900.0	6,591.5	6,927.2	6,664.8	22.2	19.0	-99.37	-8.0	-124.1	476.5	438.0	38.45	12.392			
6,950.0	6,605.2	6,982.9	6,681.2	22.1	19.2	-99.49	-61.2	-124.1	476.6	437.7	38.93	12.243			
7,000.0	6,615.7	7,038.6	6,693.6	22.1	19.6	-99.56	-115.6	-124.2	476.7	437.1	39.56	12.049			
7,050.0	6,623.0	7,094.4	6,702.0	22.2	20.0	-99.59	-170.7	-124.2	476.7	436.4	40.34	11.817			
7,100.0	6,627.1	7,150.2	6,706.3	22.4	20.5	-99.58	-226.3	-124.2	476.7	435.4	41.26	11.553			
7,107.3	6,627.4	7,158.4	6,706.6	22.4	20.6	-99.57	-234.5	-124.2	476.7	435.3	41.41	11.510			
7,138.1	6,627.0	7,191.2	6,707.0	22.6	20.9	-99.66	-267.3	-124.3	476.8	434.8	42.02	11.346			
7,139.1	6,627.0	7,192.2	6,707.0	22.6	20.9	-99.66	-268.3	-124.3	476.8	434.7	42.04	11.341			
7,140.2	6,627.0	7,193.3	6,707.0	22.6	20.9	-99.65	-269.4	-124.3	476.8	434.7	42.06	11.336			
7,200.0	6,626.9	7,253.1	6,706.6	23.1	21.6	-99.62	-329.2	-124.3	476.7	433.4	43.29	11.011			
7,300.0	6,626.8	7,353.1	6,705.9	24.2	22.8	-99.56	-429.2	-124.4	476.6	430.9	45.72	10.425			
7,400.0	6,626.6	7,453.1	6,705.2	25.6	24.2	-99.50	-529.2	-124.5	476.5	428.0	48.47	9.831			
7,500.0	6,626.5	7,553.1	6,704.6	27.1	25.8	-99.44	-629.2	-124.6	476.4	424.9	51.50	9.252			
7,600.0	6,626.3	7,653.1	6,703.9	28.7	27.4	-99.38	-729.2	-124.6	476.3	421.6	54.75	8.700			
7,700.0	6,626.2	7,753.1	6,703.3	30.4	29.2	-99.32	-829.2	-124.7	476.2	418.0	58.19	8.183			
7,800.0	6,626.0	7,853.1	6,702.6	32.2	31.0	-99.25	-929.2	-124.8	476.1	414.3	61.80	7.704			
7,900.0	6,625.9	7,953.1	6,701.9	34.0	32.9	-99.19	-1,029.2	-124.9	476.0	410.5	65.54	7.263			
8,000.0	6,625.7	8,053.1	6,701.3	35.9	34.9	-99.13	-1,129.2	-124.9	475.9	406.5	69.39	6.859			

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29R-143
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4686.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4686.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29R-143	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.45 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #2 (1-25-17)	Offset TVD Reference:	Offset Datum

Offset Design Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29R-203 - Wellbore #1 - Plan #2 (1-25-17)													Offset Site Error: 0.0 ft		
Survey Program: 0-MWD														Offset Well Error: 0.0 ft	
Reference		Offset		Semi Major Axis			Distance							Warning	
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor			
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)				
8,100.0	6,625.6	8,153.1	6,700.6	37.9	36.8	-99.07	-1,229.2	-125.0	475.8	402.5	73.33	6.488			
8,200.0	6,625.4	8,253.1	6,699.9	39.9	38.9	-99.01	-1,329.1	-125.1	475.7	398.4	77.36	6.150			
8,300.0	6,625.3	8,353.1	6,699.3	41.9	41.0	-98.95	-1,429.1	-125.2	475.6	394.2	81.45	5.839			
8,400.0	6,625.1	8,453.1	6,698.6	43.9	43.1	-98.89	-1,529.1	-125.3	475.5	389.9	85.60	5.555			
8,500.0	6,625.0	8,553.1	6,698.0	46.0	45.2	-98.83	-1,629.1	-125.3	475.4	385.6	89.81	5.294			
8,600.0	6,624.9	8,653.1	6,697.3	48.1	47.3	-98.77	-1,729.1	-125.4	475.3	381.3	94.05	5.054			
8,700.0	6,624.7	8,753.1	6,696.6	50.3	49.5	-98.71	-1,829.1	-125.5	475.2	376.9	98.34	4.832			
8,800.0	6,624.6	8,853.1	6,696.0	52.4	51.7	-98.65	-1,929.1	-125.6	475.1	372.5	102.66	4.628			
8,900.0	6,624.4	8,953.1	6,695.3	54.6	53.9	-98.58	-2,029.1	-125.7	475.0	368.0	107.01	4.439			
9,000.0	6,624.3	9,053.1	6,694.7	56.8	56.1	-98.52	-2,129.1	-125.7	474.9	363.5	111.39	4.264			
9,100.0	6,624.1	9,153.1	6,694.0	58.9	58.3	-98.46	-2,229.1	-125.8	474.8	359.1	115.79	4.101			
9,200.0	6,624.0	9,253.1	6,693.3	61.1	60.5	-98.40	-2,329.1	-125.9	474.7	354.5	120.21	3.949			
9,300.0	6,623.8	9,353.1	6,692.7	63.4	62.8	-98.34	-2,429.1	-126.0	474.7	350.0	124.65	3.808			
9,400.0	6,623.7	9,453.1	6,692.0	65.6	65.0	-98.28	-2,529.1	-126.0	474.6	345.4	129.11	3.676			
9,500.0	6,623.5	9,553.1	6,691.3	67.8	67.3	-98.22	-2,629.1	-126.1	474.5	340.9	133.59	3.552			
9,600.0	6,623.4	9,653.1	6,690.7	70.0	69.5	-98.16	-2,729.1	-126.2	474.4	336.3	138.08	3.436			
9,700.0	6,623.2	9,753.1	6,690.0	72.3	71.8	-98.09	-2,829.1	-126.3	474.3	331.7	142.58	3.327			
9,800.0	6,623.1	9,853.1	6,689.4	74.5	74.0	-98.03	-2,929.1	-126.4	474.2	327.1	147.09	3.224			
9,900.0	6,622.9	9,953.1	6,688.7	76.8	76.3	-97.97	-3,029.1	-126.4	474.1	322.5	151.62	3.127			
10,000.0	6,622.8	10,053.1	6,688.0	79.1	78.6	-97.91	-3,129.1	-126.5	474.0	317.9	156.15	3.036			
10,100.0	6,622.6	10,153.1	6,687.4	81.3	80.9	-97.85	-3,229.1	-126.6	473.9	313.2	160.69	2.949			
10,200.0	6,622.5	10,253.1	6,686.7	83.6	83.2	-97.79	-3,329.1	-126.7	473.8	308.6	165.25	2.867			
10,300.0	6,622.4	10,353.0	6,686.0	85.9	85.5	-97.73	-3,429.1	-126.7	473.7	303.9	169.81	2.790			
10,400.0	6,622.2	10,453.0	6,685.4	88.1	87.8	-97.67	-3,529.1	-126.8	473.7	299.3	174.37	2.716			
10,500.0	6,622.1	10,553.0	6,684.7	90.4	90.1	-97.60	-3,629.1	-126.9	473.6	294.6	178.95	2.646			
10,600.0	6,621.9	10,653.0	6,684.1	92.7	92.4	-97.54	-3,729.1	-127.0	473.5	290.0	183.53	2.580			
10,700.0	6,621.8	10,753.0	6,683.4	95.0	94.7	-97.48	-3,829.1	-127.1	473.4	285.3	188.12	2.517			
10,800.0	6,621.6	10,853.0	6,682.7	97.3	97.0	-97.42	-3,929.1	-127.1	473.3	280.6	192.71	2.456			
10,900.0	6,621.5	10,953.0	6,682.1	99.6	99.3	-97.36	-4,029.1	-127.2	473.2	275.9	197.31	2.398			
11,000.0	6,621.3	11,053.0	6,681.4	101.9	101.6	-97.30	-4,129.0	-127.3	473.1	271.2	201.91	2.343			
11,100.0	6,621.2	11,153.0	6,680.8	104.2	103.9	-97.24	-4,229.0	-127.4	473.1	266.5	206.52	2.291			
11,200.0	6,621.0	11,253.0	6,680.1	106.5	106.2	-97.17	-4,329.0	-127.5	473.0	261.9	211.13	2.240			
11,300.0	6,620.9	11,353.0	6,679.4	108.8	108.5	-97.11	-4,429.0	-127.5	472.9	257.2	215.75	2.192			
11,400.0	6,620.7	11,453.0	6,678.8	111.1	110.8	-97.05	-4,529.0	-127.6	472.8	252.4	220.37	2.146			
11,500.0	6,620.6	11,553.0	6,678.1	113.4	113.1	-96.99	-4,629.0	-127.7	472.7	247.7	224.99	2.101			
11,600.0	6,620.4	11,653.0	6,677.4	115.7	115.5	-96.93	-4,729.0	-127.8	472.7	243.0	229.62	2.058			
11,700.0	6,620.3	11,753.0	6,676.8	118.0	117.8	-96.87	-4,829.0	-127.8	472.6	238.3	234.25	2.017			
11,800.0	6,620.1	11,853.0	6,676.1	120.3	120.1	-96.80	-4,929.0	-127.9	472.5	233.6	238.89	1.978			
11,900.0	6,620.0	11,953.0	6,675.5	122.7	122.4	-96.74	-5,029.0	-128.0	472.4	228.9	243.53	1.940			
12,000.0	6,619.9	12,053.0	6,674.8	125.0	124.7	-96.68	-5,129.0	-128.1	472.3	224.2	248.17	1.903			
12,100.0	6,619.7	12,153.0	6,674.1	127.3	127.1	-96.62	-5,229.0	-128.2	472.3	219.4	252.81	1.868			
12,200.0	6,619.6	12,253.0	6,673.5	129.6	129.4	-96.56	-5,329.0	-128.2	472.2	214.7	257.46	1.834			
12,300.0	6,619.4	12,353.0	6,672.8	131.9	131.7	-96.49	-5,429.0	-128.3	472.1	210.0	262.11	1.801			
12,400.0	6,619.3	12,453.0	6,672.1	134.2	134.1	-96.43	-5,529.0	-128.4	472.0	205.3	266.76	1.769			
12,500.0	6,619.1	12,553.0	6,671.5	136.6	136.4	-96.37	-5,629.0	-128.5	472.0	200.5	271.41	1.739			
12,600.0	6,619.0	12,653.0	6,670.8	138.9	138.7	-96.31	-5,729.0	-128.6	471.9	195.8	276.07	1.709			
12,700.0	6,618.8	12,753.0	6,670.2	141.2	141.0	-96.25	-5,829.0	-128.6	471.8	191.1	280.73	1.681			
12,800.0	6,618.7	12,853.0	6,669.5	143.5	143.4	-96.19	-5,929.0	-128.7	471.7	186.3	285.39	1.653			
12,900.0	6,618.5	12,953.0	6,668.8	145.9	145.7	-96.12	-6,029.0	-128.8	471.7	181.6	290.05	1.626			
13,000.0	6,618.4	13,053.0	6,668.2	148.2	148.0	-96.06	-6,129.0	-128.9	471.6	176.9	294.72	1.600			
13,100.0	6,618.2	13,153.0	6,667.5	150.5	150.4	-96.00	-6,229.0	-128.9	471.5	172.1	299.38	1.575			

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29R-143
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4686.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4686.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29R-143	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.45 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #2 (1-25-17)	Offset TVD Reference:	Offset Datum

Offset Design Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29R-203 - Wellbore #1 - Plan #2 (1-25-17)														Offset Site Error:	0.0 ft
Survey Program: 0-MWD														Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance								
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning		
13,200.0	6,618.1	13,253.0	6,666.9	152.8	152.7	-95.94	-6,329.0	-129.0	471.4	167.4	304.05	1.551			
13,300.0	6,617.9	13,353.0	6,666.2	155.2	155.0	-95.88	-6,429.0	-129.1	471.4	162.6	308.72	1.527			
13,400.0	6,617.8	13,453.0	6,665.5	157.5	157.4	-95.81	-6,529.0	-129.2	471.3	157.9	313.39	1.504			
13,500.0	6,617.6	13,553.0	6,664.9	159.8	159.7	-95.75	-6,629.0	-129.3	471.2	153.2	318.07	1.482	Level 3		
13,600.0	6,617.5	13,653.0	6,664.2	162.2	162.0	-95.69	-6,729.0	-129.3	471.2	148.4	322.74	1.460	Level 3		
13,700.0	6,617.4	13,753.0	6,663.5	164.5	164.4	-95.63	-6,829.0	-129.4	471.1	143.7	327.42	1.439	Level 3		
13,800.0	6,617.2	13,853.0	6,662.9	166.8	166.7	-95.57	-6,929.0	-129.5	471.0	138.9	332.09	1.418	Level 3		
13,900.0	6,617.1	13,953.0	6,662.2	169.1	169.0	-95.50	-7,028.9	-129.6	470.9	134.2	336.77	1.398	Level 3		
13,930.3	6,617.0	13,983.3	6,662.0	169.9	169.7	-95.48	-7,059.2	-129.6	470.9	132.7	338.19	1.392	Level 3		
13,938.9	6,617.0	13,986.6	6,662.0	170.1	169.8	-95.48	-7,062.5	-129.6	471.0	132.5	338.47	1.391	Level 3, SF		

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29R-143
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4686.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4686.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29R-143	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.45 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #2 (1-25-17)	Offset TVD Reference:	Offset Datum

Offset Design Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29R-243 - Wellbore #1 - Plan #2 (1-25-17)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
0.0	0.0	0.0	0.0	0.0	0.0	-90.02	0.0	-15.0	15.0	15.0	0.00	N/A		
100.0	100.0	100.0	100.0	0.1	0.1	-90.02	0.0	-15.0	15.0	14.8	0.28	54.644		
200.0	200.0	200.0	200.0	0.4	0.4	-90.02	0.0	-15.0	15.0	14.2	0.83	18.215		
300.0	300.0	300.0	300.0	0.7	0.7	-90.02	0.0	-15.0	15.0	13.7	1.38	10.929		
400.0	400.0	400.0	400.0	1.0	1.0	-90.02	0.0	-15.0	15.0	13.1	1.93	7.806		
500.0	500.0	500.0	500.0	1.2	1.2	-90.02	0.0	-15.0	15.0	12.6	2.48	6.072		
600.0	600.0	600.0	600.0	1.5	1.5	-90.02	0.0	-15.0	15.0	12.0	3.03	4.968		
700.0	700.0	700.0	700.0	1.8	1.8	-90.02	0.0	-15.0	15.0	11.5	3.58	4.203		
800.0	800.0	800.0	800.0	2.1	2.1	-90.02	0.0	-15.0	15.0	10.9	4.13	3.643		
900.0	900.0	900.0	900.0	2.3	2.3	-90.02	0.0	-15.0	15.0	10.4	4.68	3.214		
1,000.0	1,000.0	1,000.0	1,000.0	2.6	2.6	-90.02	0.0	-15.0	15.0	9.8	5.23	2.876 CC		
1,100.0	1,100.0	1,099.6	1,099.6	2.9	2.9	-87.63	0.7	-16.2	16.2	10.4	5.77	2.802		
1,200.0	1,200.0	1,199.1	1,199.1	3.2	3.1	-82.17	2.7	-19.5	19.7	13.4	6.31	3.120		
1,300.0	1,300.0	1,298.5	1,298.2	3.4	3.4	-27.72	6.0	-25.0	24.6	17.8	6.84	3.602		
1,400.0	1,399.9	1,397.7	1,396.9	3.7	3.7	-25.53	10.7	-32.7	29.8	22.4	7.37	4.046		
1,500.0	1,499.7	1,496.7	1,495.3	4.0	4.0	-24.60	16.7	-42.6	35.1	27.2	7.89	4.447		
1,600.0	1,599.3	1,595.6	1,593.2	4.3	4.3	-24.44	24.0	-54.7	40.5	32.1	8.43	4.809		
1,700.0	1,698.6	1,694.4	1,690.6	4.6	4.7	-24.79	32.6	-68.9	46.1	37.1	8.97	5.135		
1,800.0	1,797.5	1,793.0	1,787.3	4.9	5.1	-25.47	42.4	-85.2	51.7	42.2	9.53	5.428		
1,900.0	1,896.1	1,891.5	1,883.4	5.3	5.5	-26.38	53.6	-103.7	57.5	47.4	10.10	5.690		
1,962.1	1,957.1	1,953.6	1,943.8	5.5	5.9	-27.20	61.0	-116.0	60.6	50.2	10.47	5.789		
2,000.0	1,994.2	1,991.4	1,980.6	5.6	6.0	-27.80	65.5	-123.4	62.3	51.6	10.72	5.813		
2,100.0	2,092.2	2,091.3	2,077.8	6.1	6.6	-29.24	77.5	-143.2	66.7	55.3	11.38	5.864		
2,200.0	2,190.2	2,191.2	2,175.0	6.5	7.1	-30.50	89.4	-163.0	71.2	59.1	12.06	5.901		
2,300.0	2,288.3	2,291.0	2,272.2	7.0	7.6	-31.61	101.4	-182.7	75.7	62.9	12.77	5.927		
2,400.0	2,386.3	2,390.9	2,369.3	7.4	8.2	-32.59	113.3	-202.5	80.2	66.7	13.49	5.942		
2,500.0	2,484.3	2,490.8	2,466.5	7.9	8.7	-33.47	125.3	-222.2	84.7	70.5	14.23	5.950		
2,600.0	2,582.3	2,590.7	2,563.7	8.4	9.3	-34.26	137.2	-242.0	89.3	74.3	14.99	5.953		
2,700.0	2,680.3	2,690.6	2,660.9	8.9	9.9	-34.98	149.2	-261.8	93.8	78.1	15.77	5.950		
2,800.0	2,778.3	2,790.5	2,758.1	9.4	10.4	-35.63	161.1	-281.5	98.4	81.8	16.55	5.945		
2,900.0	2,876.3	2,890.4	2,855.3	9.8	11.0	-36.22	173.0	-301.3	103.0	85.6	17.35	5.936		
3,000.0	2,974.4	2,990.3	2,952.4	10.4	11.6	-36.75	185.0	-321.1	107.6	89.4	18.16	5.926		
3,100.0	3,072.4	3,090.2	3,049.6	10.9	12.2	-37.25	196.9	-340.8	112.2	93.2	18.97	5.914		
3,200.0	3,170.4	3,190.1	3,146.8	11.4	12.8	-37.71	208.9	-360.6	116.8	97.0	19.80	5.901		
3,300.0	3,268.4	3,289.9	3,244.0	11.9	13.4	-38.13	220.8	-380.3	121.5	100.8	20.63	5.888		
3,400.0	3,366.4	3,389.8	3,341.2	12.4	14.0	-38.52	232.8	-400.1	126.1	104.6	21.46	5.874		
3,500.0	3,464.4	3,489.7	3,438.4	12.9	14.6	-38.88	244.7	-419.9	130.7	108.4	22.31	5.860		
3,600.0	3,562.5	3,589.6	3,535.5	13.4	15.2	-39.22	256.7	-439.6	135.4	112.2	23.16	5.846		
3,700.0	3,660.5	3,689.5	3,632.7	13.9	15.7	-39.53	268.6	-459.4	140.0	116.0	24.01	5.831		
3,800.0	3,758.5	3,789.4	3,729.9	14.5	16.3	-39.83	280.6	-479.2	144.7	119.8	24.87	5.817		
3,900.0	3,856.5	3,889.3	3,827.1	15.0	16.9	-40.11	292.5	-498.9	149.3	123.6	25.73	5.804		
4,000.0	3,954.5	3,989.2	3,924.3	15.5	17.5	-40.37	304.5	-518.7	154.0	127.4	26.59	5.790		
4,100.0	4,052.5	4,089.1	4,021.5	16.0	18.1	-40.61	316.4	-538.4	158.6	131.2	27.46	5.777		
4,200.0	4,150.6	4,188.9	4,118.6	16.6	18.7	-40.84	328.4	-558.2	163.3	135.0	28.33	5.764		
4,300.0	4,248.6	4,288.8	4,215.8	17.1	19.3	-41.06	340.3	-578.0	168.0	138.7	29.20	5.751		
4,400.0	4,346.6	4,388.7	4,313.0	17.6	20.0	-41.27	352.3	-597.7	172.6	142.5	30.08	5.739		
4,500.0	4,444.6	4,488.6	4,410.2	18.1	20.6	-41.46	364.2	-617.5	177.3	146.3	30.96	5.727		
4,600.0	4,542.6	4,588.5	4,507.4	18.7	21.2	-41.65	376.2	-637.3	182.0	150.1	31.84	5.715		
4,700.0	4,640.6	4,688.4	4,604.5	19.2	21.8	-41.82	388.1	-657.0	186.6	153.9	32.72	5.704		
4,800.0	4,738.7	4,788.3	4,701.7	19.7	22.4	-41.99	400.0	-676.8	191.3	157.7	33.61	5.693		
4,900.0	4,836.7	4,888.2	4,798.9	20.2	23.0	-42.15	412.0	-696.5	196.0	161.5	34.49	5.682		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29R-143
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4686.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4686.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29R-143	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.45 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #2 (1-25-17)	Offset TVD Reference:	Offset Datum

Offset Design Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29R-243 - Wellbore #1 - Plan #2 (1-25-17)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance							
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor	Warning	
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)			
5,000.0	4,934.7	4,988.1	4,896.1	20.8	23.6	-42.30	423.9	-716.3	200.7	165.3	35.38	5.672		
5,100.0	5,032.7	5,087.9	4,993.3	21.3	24.2	-42.45	435.9	-736.1	205.3	169.1	36.27	5.662		
5,201.5	5,132.2	5,189.3	5,091.9	21.8	24.8	-42.59	448.0	-756.1	210.1	172.9	37.17	5.652		
5,300.0	5,229.0	5,291.1	5,191.0	22.3	25.4	-42.55	459.9	-775.8	215.5	177.6	37.94	5.681		
5,400.0	5,328.0	5,397.7	5,295.6	22.6	25.8	-42.38	470.6	-793.5	220.9	182.4	38.53	5.734		
5,500.0	5,427.3	5,504.5	5,401.1	22.9	26.2	-42.12	479.4	-808.0	225.8	186.8	39.01	5.788		
5,600.0	5,527.0	5,611.5	5,507.3	23.2	26.5	-41.80	486.0	-819.0	230.1	190.7	39.39	5.842		
5,700.0	5,626.9	5,718.7	5,614.1	23.4	26.8	-41.41	490.7	-826.7	233.9	194.3	39.66	5.898		
5,773.1	5,700.0	5,797.2	5,692.5	23.5	26.9	-91.13	492.8	-830.1	236.4	196.6	39.81	5.937		
5,800.0	5,726.9	5,826.1	5,721.4	23.5	27.0	-91.01	493.2	-830.9	237.1	197.2	39.88	5.946		
5,900.0	5,826.9	5,931.6	5,826.9	23.7	27.1	-90.87	493.8	-831.8	238.0	197.7	40.24	5.914		
5,937.4	5,864.3	5,969.0	5,864.3	23.8	27.2	-90.87	493.8	-831.8	238.0	197.6	40.39	5.892		
5,950.0	5,876.9	5,981.6	5,876.9	23.8	27.2	89.13	493.8	-831.8	238.0	197.6	40.42	5.888		
6,000.0	5,926.8	6,031.6	5,926.8	23.8	27.3	89.72	493.8	-831.8	237.9	197.5	40.41	5.888		
6,012.9	5,939.7	6,044.4	5,939.7	23.8	27.3	90.00	493.8	-831.8	237.9	197.6	40.36	5.895		
6,050.0	5,976.5	6,081.3	5,976.6	23.9	27.4	91.06	493.7	-831.8	238.0	197.8	40.15	5.927		
6,100.0	6,025.7	6,131.4	6,026.6	23.9	27.4	92.60	491.2	-831.8	238.2	198.4	39.77	5.989		
6,150.0	6,074.2	6,181.9	6,076.7	23.8	27.4	94.14	485.3	-831.8	238.6	199.2	39.35	6.063		
6,200.0	6,121.8	6,232.9	6,126.9	23.8	27.4	95.66	476.0	-831.9	239.1	200.2	38.89	6.148		
6,250.0	6,168.2	6,284.3	6,176.7	23.7	27.4	97.15	463.3	-831.9	239.8	201.4	38.41	6.244		
6,300.0	6,213.4	6,336.1	6,225.9	23.6	27.4	98.61	447.2	-831.9	240.7	202.8	37.91	6.349		
6,350.0	6,257.1	6,388.5	6,274.4	23.5	27.3	100.04	427.5	-831.9	241.7	204.3	37.41	6.460		
6,400.0	6,299.1	6,441.3	6,321.8	23.4	27.2	101.41	404.3	-831.9	242.8	205.9	36.92	6.576		
6,450.0	6,339.3	6,494.5	6,367.9	23.3	27.1	102.72	377.7	-831.9	244.0	207.6	36.44	6.696		
6,500.0	6,377.4	6,548.2	6,412.4	23.1	27.0	103.98	347.7	-831.9	245.3	209.3	35.99	6.815		
6,550.0	6,413.3	6,602.3	6,455.0	23.0	26.9	105.16	314.3	-831.9	246.6	211.0	35.58	6.932		
6,600.0	6,446.8	6,656.9	6,495.5	22.9	26.7	106.28	277.7	-832.0	248.0	212.8	35.21	7.042		
6,650.0	6,477.9	6,711.9	6,533.5	22.7	26.6	107.31	238.0	-832.0	249.3	214.4	34.91	7.142		
6,700.0	6,506.3	6,767.2	6,568.8	22.6	26.5	108.26	195.4	-832.0	250.6	216.0	34.68	7.228		
6,750.0	6,532.0	6,823.0	6,601.1	22.5	26.3	109.12	150.0	-832.0	251.9	217.4	34.53	7.296		
6,800.0	6,554.8	6,879.0	6,630.2	22.3	26.2	109.90	102.1	-832.1	253.1	218.6	34.47	7.342		
6,850.0	6,574.7	6,935.4	6,655.8	22.2	26.1	110.58	51.8	-832.1	254.2	219.7	34.53	7.363		
6,900.0	6,591.5	6,992.1	6,677.8	22.2	26.0	111.16	-0.4	-832.1	255.2	220.5	34.69	7.355		
6,950.0	6,605.2	7,049.0	6,695.9	22.1	25.9	111.65	-54.3	-832.1	256.0	221.0	34.98	7.319		
7,000.0	6,615.7	7,106.1	6,710.0	22.1	25.9	112.04	-109.6	-832.2	256.7	221.3	35.41	7.250		
7,050.0	6,623.0	7,163.4	6,719.9	22.2	26.0	112.33	-166.0	-832.2	257.2	221.3	35.96	7.154		
7,100.0	6,627.1	7,220.7	6,725.6	22.4	26.1	112.52	-223.1	-832.2	257.6	220.9	36.64	7.030		
7,138.1	6,627.0	7,263.3	6,727.0	22.6	26.2	112.80	-265.7	-832.2	258.1	221.0	37.15	6.947		
7,139.1	6,627.0	7,264.5	6,727.0	22.6	26.2	112.80	-266.8	-832.2	258.1	220.9	37.17	6.944		
7,140.2	6,627.0	7,265.8	6,727.0	22.6	26.2	112.80	-268.1	-832.2	258.1	220.9	37.19	6.940		
7,200.0	6,626.9	7,326.5	6,726.6	23.1	26.5	112.73	-328.9	-832.3	258.0	219.7	38.29	6.737		
7,300.0	6,626.8	7,426.5	6,725.9	24.2	27.2	112.61	-428.9	-832.3	257.8	217.2	40.55	6.356		
7,400.0	6,626.6	7,526.5	6,725.1	25.6	28.2	112.49	-528.9	-832.4	257.5	214.4	43.15	5.969		
7,500.0	6,626.5	7,626.5	6,724.4	27.1	29.4	112.37	-628.9	-832.5	257.3	211.3	46.03	5.591		
7,600.0	6,626.3	7,726.5	6,723.7	28.7	30.8	112.25	-728.9	-832.5	257.1	207.9	49.14	5.232		
7,700.0	6,626.2	7,826.5	6,722.9	30.4	32.3	112.13	-828.9	-832.6	256.9	204.4	52.45	4.897		
7,800.0	6,626.0	7,926.5	6,722.2	32.2	34.0	112.01	-928.9	-832.6	256.6	200.7	55.92	4.589		
7,900.0	6,625.9	8,026.5	6,721.5	34.0	35.7	111.88	-1,028.8	-832.7	256.4	196.9	59.53	4.308		
8,000.0	6,625.7	8,126.5	6,720.7	35.9	37.5	111.76	-1,128.8	-832.8	256.2	193.0	63.25	4.051		
8,100.0	6,625.6	8,226.5	6,720.0	37.9	39.4	111.64	-1,228.8	-832.8	256.0	188.9	67.06	3.817		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29R-143
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4686.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4686.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29R-143	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.45 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #2 (1-25-17)	Offset TVD Reference:	Offset Datum

Offset Design		Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29R-243 - Wellbore #1 - Plan #2 (1-25-17)											Offset Site Error:		0.0 ft
Survey Program:		0-MWD											Offset Well Error:		0.0 ft
Reference		Offset		Semi Major Axis			Distance							Warning	
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre	Offset Wellbore Centre	Between Centres	Between Ellipses	Minimum Separation	Separation Factor			
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)				
8,200.0	6,625.4	8,326.5	6,719.2	39.9	41.3	111.52	-1,328.8	-832.9	255.8	184.8	70.96	3.605			
8,300.0	6,625.3	8,426.5	6,718.5	41.9	43.2	111.39	-1,428.8	-833.0	255.6	180.6	74.92	3.411			
8,400.0	6,625.1	8,526.5	6,717.8	43.9	45.2	111.27	-1,528.8	-833.0	255.3	176.4	78.95	3.234			
8,500.0	6,625.0	8,626.5	6,717.0	46.0	47.3	111.15	-1,628.8	-833.1	255.1	172.1	83.03	3.073			
8,600.0	6,624.9	8,726.5	6,716.3	48.1	49.3	111.02	-1,728.8	-833.1	254.9	167.8	87.15	2.925			
8,700.0	6,624.7	8,826.5	6,715.6	50.3	51.4	110.90	-1,828.8	-833.2	254.7	163.4	91.32	2.789			
8,800.0	6,624.6	8,926.5	6,714.8	52.4	53.5	110.78	-1,928.8	-833.3	254.5	159.0	95.52	2.664			
8,900.0	6,624.4	9,026.5	6,714.1	54.6	55.6	110.65	-2,028.8	-833.3	254.3	154.5	99.75	2.549			
9,000.0	6,624.3	9,126.5	6,713.4	56.8	57.8	110.53	-2,128.8	-833.4	254.1	150.1	104.02	2.443			
9,100.0	6,624.1	9,226.5	6,712.6	58.9	59.9	110.40	-2,228.8	-833.4	253.9	145.6	108.30	2.344			
9,200.0	6,624.0	9,326.5	6,711.9	61.1	62.1	110.28	-2,328.8	-833.5	253.7	141.1	112.62	2.253			
9,300.0	6,623.8	9,426.5	6,711.2	63.4	64.3	110.15	-2,428.8	-833.6	253.5	136.5	116.95	2.167			
9,400.0	6,623.7	9,526.5	6,710.4	65.6	66.4	110.03	-2,528.8	-833.6	253.3	132.0	121.31	2.088			
9,500.0	6,623.5	9,626.5	6,709.7	67.8	68.6	109.90	-2,628.8	-833.7	253.1	127.4	125.68	2.014			
9,600.0	6,623.4	9,726.5	6,708.9	70.0	70.9	109.78	-2,728.8	-833.7	252.9	122.8	130.07	1.944			
9,700.0	6,623.2	9,826.5	6,708.2	72.3	73.1	109.65	-2,828.8	-833.8	252.7	118.2	134.48	1.879			
9,800.0	6,623.1	9,926.5	6,707.5	74.5	75.3	109.53	-2,928.8	-833.9	252.5	113.6	138.90	1.818			
9,900.0	6,622.9	10,026.5	6,706.7	76.8	77.5	109.40	-3,028.8	-833.9	252.3	109.0	143.33	1.760			
10,000.0	6,622.8	10,126.5	6,706.0	79.1	79.8	109.27	-3,128.8	-834.0	252.1	104.3	147.78	1.706			
10,100.0	6,622.6	10,226.5	6,705.3	81.3	82.0	109.15	-3,228.7	-834.0	251.9	99.7	152.25	1.655			
10,200.0	6,622.5	10,326.5	6,704.5	83.6	84.3	109.02	-3,328.7	-834.1	251.7	95.0	156.72	1.606			
10,300.0	6,622.4	10,426.5	6,703.8	85.9	86.5	108.89	-3,428.7	-834.2	251.5	90.3	161.21	1.560			
10,400.0	6,622.2	10,526.5	6,703.1	88.1	88.8	108.77	-3,528.7	-834.2	251.3	85.6	165.70	1.517			
10,500.0	6,622.1	10,626.5	6,702.3	90.4	91.1	108.64	-3,628.7	-834.3	251.1	80.9	170.21	1.476 Level 3			
10,600.0	6,621.9	10,726.5	6,701.6	92.7	93.3	108.51	-3,728.7	-834.3	251.0	76.2	174.73	1.436 Level 3			
10,700.0	6,621.8	10,826.5	6,700.9	95.0	95.6	108.38	-3,828.7	-834.4	250.8	71.5	179.25	1.399 Level 3			
10,800.0	6,621.6	10,926.5	6,700.1	97.3	97.9	108.26	-3,928.7	-834.5	250.6	66.8	183.79	1.363 Level 3			
10,900.0	6,621.5	11,026.5	6,699.4	99.6	100.2	108.13	-4,028.7	-834.5	250.4	62.1	188.33	1.330 Level 3			
11,000.0	6,621.3	11,126.5	6,698.6	101.9	102.4	108.00	-4,128.7	-834.6	250.2	57.3	192.89	1.297 Level 3			
11,100.0	6,621.2	11,226.5	6,697.9	104.2	104.7	107.87	-4,228.7	-834.7	250.0	52.6	197.45	1.266 Level 3			
11,200.0	6,621.0	11,326.5	6,697.2	106.5	107.0	107.74	-4,328.7	-834.7	249.9	47.8	202.02	1.237 Level 2			
11,300.0	6,620.9	11,426.5	6,696.4	108.8	109.3	107.61	-4,428.7	-834.8	249.7	43.1	206.59	1.209 Level 2			
11,400.0	6,620.7	11,526.5	6,695.7	111.1	111.6	107.48	-4,528.7	-834.8	249.5	38.3	211.18	1.182 Level 2			
11,500.0	6,620.6	11,626.5	6,695.0	113.4	113.9	107.36	-4,628.7	-834.9	249.3	33.6	215.77	1.156 Level 2			
11,600.0	6,620.4	11,726.5	6,694.2	115.7	116.2	107.23	-4,728.7	-835.0	249.2	28.8	220.37	1.131 Level 2			
11,700.0	6,620.3	11,826.5	6,693.5	118.0	118.5	107.10	-4,828.7	-835.0	249.0	24.0	224.98	1.107 Level 2			
11,800.0	6,620.1	11,926.5	6,692.8	120.3	120.8	106.97	-4,928.7	-835.1	248.8	19.2	229.59	1.084 Level 2			
11,900.0	6,620.0	12,026.5	6,692.0	122.7	123.1	106.84	-5,028.7	-835.1	248.6	14.4	234.21	1.062 Level 2			
12,000.0	6,619.9	12,126.5	6,691.3	125.0	125.4	106.71	-5,128.7	-835.2	248.5	9.6	238.83	1.040 Level 2			
12,100.0	6,619.7	12,226.5	6,690.5	127.3	127.7	106.58	-5,228.7	-835.3	248.3	4.8	243.47	1.020 Level 2			
12,200.0	6,619.6	12,326.5	6,689.8	129.6	130.0	106.45	-5,328.7	-835.3	248.1	0.0	248.10	1.000 Level 2			
12,300.0	6,619.4	12,426.5	6,689.1	131.9	132.3	106.32	-5,428.7	-835.4	248.0	-4.8	252.75	0.981 Level 1			
12,400.0	6,619.3	12,526.5	6,688.3	134.2	134.6	106.19	-5,528.6	-835.4	247.8	-9.6	257.40	0.963 Level 1			
12,500.0	6,619.1	12,626.4	6,687.6	136.6	137.0	106.05	-5,628.6	-835.5	247.7	-14.4	262.05	0.945 Level 1			
12,600.0	6,619.0	12,726.4	6,686.9	138.9	139.3	105.92	-5,728.6	-835.6	247.5	-19.2	266.71	0.928 Level 1			
12,700.0	6,618.8	12,826.4	6,686.1	141.2	141.6	105.79	-5,828.6	-835.6	247.3	-24.0	271.38	0.911 Level 1			
12,800.0	6,618.7	12,926.4	6,685.4	143.5	143.9	105.66	-5,928.6	-835.7	247.2	-28.9	276.05	0.895 Level 1			
12,900.0	6,618.5	13,026.4	6,684.7	145.9	146.2	105.53	-6,028.6	-835.7	247.0	-33.7	280.73	0.880 Level 1			
13,000.0	6,618.4	13,126.4	6,683.9	148.2	148.5	105.40	-6,128.6	-835.8	246.9	-38.5	285.41	0.865 Level 1			
13,100.0	6,618.2	13,226.4	6,683.2	150.5	150.9	105.27	-6,228.6	-835.9	246.7	-43.4	290.09	0.850 Level 1			
13,200.0	6,618.1	13,326.4	6,682.5	152.8	153.2	105.13	-6,328.6	-835.9	246.6	-48.2	294.79	0.836 Level 1			

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29R-143
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4686.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4686.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29R-143	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.45 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #2 (1-25-17)	Offset TVD Reference:	Offset Datum

Offset Design Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29R-243 - Wellbore #1 - Plan #2 (1-25-17)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
13,300.0	6,617.9	13,426.4	6,681.7	155.2	155.5	105.00	-6,428.6	-836.0	246.4	-53.1	299.48	0.823	Level 1	
13,400.0	6,617.8	13,526.4	6,681.0	157.5	157.8	104.87	-6,528.6	-836.1	246.2	-57.9	304.18	0.810	Level 1	
13,500.0	6,617.6	13,626.4	6,680.2	159.8	160.1	104.74	-6,628.6	-836.1	246.1	-62.8	308.89	0.797	Level 1	
13,600.0	6,617.5	13,726.4	6,679.5	162.2	162.5	104.60	-6,728.6	-836.2	246.0	-67.6	313.60	0.784	Level 1	
13,700.0	6,617.4	13,826.4	6,678.8	164.5	164.8	104.47	-6,828.6	-836.2	245.8	-72.5	318.31	0.772	Level 1	
13,800.0	6,617.2	13,926.4	6,678.0	166.8	167.1	104.34	-6,928.6	-836.3	245.7	-77.4	323.03	0.760	Level 1	
13,900.0	6,617.1	14,026.4	6,677.3	169.1	169.5	104.20	-7,028.6	-836.4	245.5	-82.2	327.75	0.749	Level 1	
13,938.9	6,617.0	14,065.4	6,677.0	170.1	170.4	104.15	-7,067.5	-836.4	245.5	-84.1	329.59	0.745	Level 1, ES, SF	

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29R-143
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4686.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4686.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29R-143	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.45 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #2 (1-25-17)	Offset TVD Reference:	Offset Datum

Offset Design		Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29R-303 - Wellbore #1 - Plan #2 (1-25-17)											Offset Site Error:		0.0 ft
Survey Program: 0-MWD													Offset Well Error:		0.0 ft
Reference		Offset		Semi Major Axis			Distance							Warning	
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor			
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)				
0.0	0.0	0.0	0.0	0.0	0.0	90.03	0.0	15.0	15.0	15.0	0.00	N/A			
100.0	100.0	100.0	100.0	0.1	0.1	90.03	0.0	15.0	15.0	14.8	0.28	54.644			
200.0	200.0	200.0	200.0	0.4	0.4	90.03	0.0	15.0	15.0	14.2	0.83	18.215			
300.0	300.0	300.0	300.0	0.7	0.7	90.03	0.0	15.0	15.0	13.7	1.38	10.929			
400.0	400.0	400.0	400.0	1.0	1.0	90.03	0.0	15.0	15.0	13.1	1.93	7.806			
500.0	500.0	500.0	500.0	1.2	1.2	90.03	0.0	15.0	15.0	12.6	2.48	6.072			
600.0	600.0	600.0	600.0	1.5	1.5	90.03	0.0	15.0	15.0	12.0	3.03	4.968			
700.0	700.0	700.0	700.0	1.8	1.8	90.03	0.0	15.0	15.0	11.5	3.58	4.203			
800.0	800.0	800.0	800.0	2.1	2.1	90.03	0.0	15.0	15.0	10.9	4.13	3.643			
900.0	900.0	900.0	900.0	2.3	2.3	90.03	0.0	15.0	15.0	10.4	4.68	3.214			
1,000.0	1,000.0	1,000.0	1,000.0	2.6	2.6	90.03	0.0	15.0	15.0	9.8	5.23	2.876			
1,100.0	1,100.0	1,100.0	1,100.0	2.9	2.9	90.03	0.0	15.0	15.0	9.3	5.78	2.602			
1,200.0	1,200.0	1,200.0	1,200.0	3.2	3.2	90.03	0.0	15.0	15.0	8.7	6.33	2.376 CC			
1,300.0	1,300.0	1,300.0	1,300.0	3.4	3.4	143.07	0.0	15.0	16.1	9.2	6.88	2.337			
1,400.0	1,399.9	1,399.9	1,399.9	3.7	3.7	150.04	0.0	15.0	19.4	11.9	7.41	2.611			
1,500.0	1,499.7	1,500.2	1,500.2	4.0	4.0	155.67	1.0	14.3	24.2	16.2	7.94	3.044			
1,600.0	1,599.3	1,600.6	1,600.5	4.3	4.3	158.35	4.2	11.9	29.4	21.0	8.47	3.475			
1,700.0	1,698.6	1,701.2	1,700.9	4.6	4.5	159.32	9.5	7.9	35.0	26.0	9.00	3.889			
1,800.0	1,797.5	1,801.8	1,801.1	4.9	4.8	159.26	16.9	2.3	40.8	31.3	9.53	4.283			
1,900.0	1,896.1	1,902.6	1,901.2	5.3	5.1	158.54	26.4	-4.8	46.9	36.8	10.06	4.656			
1,962.1	1,957.1	1,965.3	1,963.2	5.5	5.3	157.88	33.3	-10.1	50.8	40.4	10.41	4.878			
2,000.0	1,994.2	2,003.5	2,001.0	5.6	5.5	157.34	38.0	-13.6	53.0	42.4	10.63	4.987			
2,100.0	2,092.2	2,103.5	2,099.7	6.1	5.8	155.66	50.8	-23.2	58.4	47.1	11.25	5.190			
2,200.0	2,190.2	2,203.3	2,198.2	6.5	6.2	154.26	63.6	-32.9	63.7	51.9	11.88	5.365			
2,300.0	2,288.3	2,303.2	2,296.8	7.0	6.5	153.07	76.4	-42.5	69.1	56.6	12.54	5.515			
2,400.0	2,386.3	2,403.0	2,395.3	7.4	6.9	152.06	89.2	-52.2	74.6	61.4	13.21	5.645			
2,500.0	2,484.3	2,502.9	2,493.9	7.9	7.3	151.18	102.0	-61.8	80.0	66.1	13.90	5.758			
2,600.0	2,582.3	2,602.7	2,592.4	8.4	7.7	150.42	114.8	-71.5	85.5	70.9	14.60	5.855			
2,700.0	2,680.3	2,702.6	2,691.0	8.9	8.1	149.74	127.6	-81.1	90.9	75.6	15.31	5.940			
2,800.0	2,778.3	2,802.4	2,789.5	9.4	8.5	149.15	140.4	-90.8	96.4	80.4	16.03	6.014			
2,900.0	2,876.3	2,902.2	2,888.1	9.8	8.9	148.62	153.3	-100.5	101.9	85.2	16.76	6.079			
3,000.0	2,974.4	3,002.1	2,986.6	10.4	9.3	148.14	166.1	-110.1	107.4	89.9	17.51	6.136			
3,100.0	3,072.4	3,101.9	3,085.2	10.9	9.8	147.71	178.9	-119.8	112.9	94.7	18.25	6.186			
3,200.0	3,170.4	3,201.8	3,183.7	11.4	10.2	147.32	191.7	-129.4	118.4	99.4	19.01	6.231			
3,300.0	3,268.4	3,301.6	3,282.3	11.9	10.6	146.96	204.5	-139.1	124.0	104.2	19.77	6.270			
3,400.0	3,366.4	3,401.5	3,380.8	12.4	11.0	146.63	217.3	-148.7	129.5	108.9	20.54	6.305			
3,500.0	3,464.4	3,501.3	3,479.4	12.9	11.5	146.34	230.1	-158.4	135.0	113.7	21.31	6.336			
3,600.0	3,562.5	3,601.2	3,577.9	13.4	11.9	146.06	242.9	-168.0	140.5	118.5	22.08	6.364			
3,700.0	3,660.5	3,701.0	3,676.5	13.9	12.4	145.81	255.7	-177.7	146.1	123.2	22.86	6.390			
3,800.0	3,758.5	3,800.8	3,775.0	14.5	12.8	145.57	268.5	-187.3	151.6	128.0	23.64	6.412			
3,900.0	3,856.5	3,900.7	3,873.6	15.0	13.2	145.35	281.3	-197.0	157.1	132.7	24.43	6.433			
4,000.0	3,954.5	4,000.5	3,972.1	15.5	13.7	145.15	294.1	-206.6	162.7	137.5	25.22	6.452			
4,100.0	4,052.5	4,100.4	4,070.7	16.0	14.1	144.95	306.9	-216.3	168.2	142.2	26.01	6.468			
4,200.0	4,150.6	4,200.2	4,169.2	16.6	14.6	144.78	319.7	-225.9	173.8	147.0	26.80	6.484			
4,300.0	4,248.6	4,300.1	4,267.8	17.1	15.0	144.61	332.6	-235.6	179.3	151.7	27.60	6.498			
4,400.0	4,346.6	4,399.9	4,366.3	17.6	15.4	144.45	345.4	-245.2	184.9	156.5	28.39	6.511			
4,500.0	4,444.6	4,499.8	4,464.8	18.1	15.9	144.30	358.2	-254.9	190.4	161.2	29.19	6.522			
4,600.0	4,542.6	4,599.6	4,563.4	18.7	16.3	144.16	371.0	-264.5	196.0	166.0	30.00	6.533			
4,700.0	4,640.6	4,699.5	4,661.9	19.2	16.8	144.03	383.8	-274.2	201.5	170.7	30.80	6.543			
4,800.0	4,738.7	4,799.3	4,760.5	19.7	17.2	143.90	396.6	-283.8	207.1	175.5	31.60	6.552			
4,900.0	4,836.7	4,899.1	4,859.0	20.2	17.7	143.78	409.4	-293.5	212.6	180.2	32.41	6.561			

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29R-143
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4686.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4686.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29R-143	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.45 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #2 (1-25-17)	Offset TVD Reference:	Offset Datum

Offset Design Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29R-303 - Wellbore #1 - Plan #2 (1-25-17)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance							
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor	Warning	
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)			
5,000.0	4,934.7	4,999.0	4,957.6	20.8	18.1	143.67	422.2	-303.1	218.2	185.0	33.21	6.569		
5,100.0	5,032.7	5,098.8	5,056.1	21.3	18.6	143.57	435.0	-312.8	223.7	189.7	34.02	6.576		
5,201.5	5,132.2	5,200.2	5,156.2	21.8	19.0	143.46	448.0	-322.6	229.4	194.5	34.84	6.583		
5,300.0	5,229.0	5,298.6	5,253.3	22.3	19.5	143.17	460.6	-332.1	233.5	197.8	35.68	6.545		
5,400.0	5,328.0	5,397.9	5,351.3	22.6	19.9	142.35	473.4	-341.7	234.9	198.4	36.53	6.431		
5,500.0	5,427.3	5,492.9	5,445.4	22.9	20.2	141.42	484.0	-349.7	235.0	197.7	37.27	6.305		
5,600.0	5,527.0	5,588.0	5,540.0	23.2	20.5	140.59	492.1	-355.8	234.4	196.5	37.92	6.183		
5,700.0	5,626.9	5,683.3	5,635.0	23.4	20.8	139.83	497.8	-360.1	233.2	194.8	38.47	6.063		
5,773.1	5,700.0	5,753.0	5,704.6	23.5	20.9	89.28	500.3	-362.0	232.0	193.1	38.82	5.975		
5,800.0	5,726.9	5,778.6	5,730.2	23.5	21.0	89.13	500.9	-362.4	231.5	192.6	38.95	5.943		
5,900.0	5,826.9	5,875.3	5,826.9	23.7	21.1	88.96	501.6	-363.0	231.0	191.6	39.38	5.866		
5,937.4	5,864.3	5,912.7	5,864.3	23.8	21.2	88.96	501.6	-363.0	231.0	191.5	39.53	5.843		
5,950.0	5,876.9	5,925.3	5,876.9	23.8	21.2	-91.10	501.6	-363.0	231.0	191.4	39.58	5.836		
6,000.0	5,926.8	5,975.3	5,926.8	23.8	21.3	-91.70	501.6	-363.0	231.0	191.2	39.87	5.795		
6,050.0	5,976.5	6,024.9	5,976.5	23.9	21.4	-93.09	501.6	-363.0	231.3	191.0	40.27	5.743		
6,100.0	6,025.7	6,074.2	6,025.7	23.9	21.5	-95.22	501.6	-363.0	231.9	191.2	40.77	5.690		
6,150.0	6,074.2	6,124.9	6,076.4	23.8	21.6	-97.71	499.7	-363.0	233.1	191.9	41.23	5.655		
6,200.0	6,121.8	6,176.3	6,127.5	23.8	21.6	-100.15	494.4	-363.0	234.8	193.2	41.56	5.649		
6,250.0	6,168.2	6,228.5	6,178.9	23.7	21.6	-102.54	485.5	-363.0	236.8	195.1	41.74	5.674		
6,300.0	6,213.4	6,281.4	6,230.4	23.6	21.6	-104.85	473.0	-363.0	239.3	197.5	41.77	5.728		
6,350.0	6,257.1	6,335.2	6,281.6	23.5	21.5	-107.08	456.6	-363.0	242.0	200.4	41.64	5.812		
6,400.0	6,299.1	6,389.8	6,332.2	23.4	21.5	-109.20	436.3	-363.0	245.0	203.7	41.35	5.925		
6,450.0	6,339.3	6,445.2	6,382.1	23.3	21.3	-111.20	412.0	-363.0	248.3	207.3	40.92	6.067		
6,500.0	6,377.4	6,501.5	6,430.7	23.1	21.2	-113.09	383.8	-363.0	251.7	211.3	40.37	6.234		
6,550.0	6,413.3	6,558.5	6,477.8	23.0	21.1	-114.84	351.6	-363.0	255.1	215.4	39.71	6.424		
6,600.0	6,446.8	6,616.4	6,523.0	22.9	20.9	-116.46	315.4	-363.0	258.6	219.6	38.99	6.633		
6,650.0	6,477.9	6,675.1	6,565.8	22.7	20.8	-117.94	275.3	-363.1	262.0	223.8	38.23	6.853		
6,700.0	6,506.3	6,734.5	6,606.0	22.6	20.6	-119.27	231.5	-363.1	265.3	227.8	37.49	7.077		
6,750.0	6,532.0	6,794.7	6,643.0	22.5	20.4	-120.46	184.2	-363.1	268.4	231.6	36.81	7.293		
6,800.0	6,554.8	6,855.5	6,676.5	22.3	20.3	-121.50	133.5	-363.1	271.3	235.0	36.23	7.487		
6,850.0	6,574.7	6,916.9	6,706.2	22.2	20.1	-122.38	79.7	-363.2	273.8	238.0	35.82	7.643		
6,900.0	6,591.5	6,978.8	6,731.6	22.2	20.0	-123.12	23.3	-363.2	276.0	240.4	35.62	7.749		
6,950.0	6,605.2	7,041.2	6,752.6	22.1	19.9	-123.70	-35.4	-363.2	277.8	242.1	35.65	7.792		
7,000.0	6,615.7	7,103.9	6,768.7	22.1	19.8	-124.14	-96.0	-363.2	279.1	243.2	35.95	7.764		
7,050.0	6,623.0	7,166.8	6,779.9	22.2	20.2	-124.42	-158.0	-363.3	280.0	243.5	36.55	7.661		
7,100.0	6,627.1	7,230.0	6,785.9	22.4	20.9	-124.54	-220.8	-363.3	280.4	243.0	37.42	7.494		
7,138.1	6,627.0	7,276.4	6,787.0	22.6	21.4	-124.71	-267.2	-363.3	281.0	242.8	38.19	7.357		
7,139.1	6,627.0	7,277.4	6,787.0	22.6	21.4	-124.71	-268.2	-363.3	281.0	242.8	38.21	7.353		
7,140.2	6,627.0	7,278.6	6,787.0	22.6	21.4	-124.71	-269.4	-363.3	281.0	242.7	38.23	7.349		
7,200.0	6,626.9	7,338.3	6,786.7	23.1	22.1	-124.68	-329.1	-363.4	280.9	241.5	39.37	7.134		
7,300.0	6,626.8	7,438.3	6,786.3	24.2	23.3	-124.63	-429.1	-363.4	280.7	239.1	41.58	6.751		
7,400.0	6,626.6	7,538.3	6,785.8	25.6	24.8	-124.58	-529.1	-363.5	280.5	236.5	44.04	6.370		
7,500.0	6,626.5	7,638.3	6,785.4	27.1	26.3	-124.53	-629.1	-363.5	280.4	233.7	46.72	6.002		
7,600.0	6,626.3	7,738.3	6,785.0	28.7	28.0	-124.48	-729.1	-363.6	280.2	230.6	49.58	5.652		
7,700.0	6,626.2	7,838.3	6,784.5	30.4	29.7	-124.43	-829.1	-363.7	280.0	227.4	52.59	5.325		
7,800.0	6,626.0	7,938.3	6,784.1	32.2	31.5	-124.38	-929.1	-363.7	279.9	224.1	55.74	5.021		
7,900.0	6,625.9	8,038.3	6,783.6	34.0	33.4	-124.33	-1,029.1	-363.8	279.7	220.7	59.00	4.741		
8,000.0	6,625.7	8,138.3	6,783.2	35.9	35.3	-124.28	-1,129.1	-363.8	279.5	217.2	62.35	4.484		
8,100.0	6,625.6	8,238.3	6,782.7	37.9	37.3	-124.23	-1,229.1	-363.9	279.4	213.6	65.77	4.248		
8,200.0	6,625.4	8,338.3	6,782.3	39.9	39.3	-124.18	-1,329.1	-364.0	279.2	209.9	69.27	4.031		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29R-143
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4686.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4686.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29R-143	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.45 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #2 (1-25-17)	Offset TVD Reference:	Offset Datum

Offset Design		Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29R-303 - Wellbore #1 - Plan #2 (1-25-17)											Offset Site Error:		0.0 ft
Survey Program:		0-MWD											Offset Well Error:		0.0 ft
Reference		Offset		Semi Major Axis			Distance							Warning	
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor			
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)				
8,300.0	6,625.3	8,438.3	6,781.9	41.9	41.3	-124.13	-1,429.1	-364.0	279.1	206.2	72.83	3.832			
8,400.0	6,625.1	8,538.3	6,781.4	43.9	43.4	-124.08	-1,529.1	-364.1	278.9	202.5	76.44	3.649			
8,500.0	6,625.0	8,638.3	6,781.0	46.0	45.5	-124.03	-1,629.1	-364.1	278.7	198.6	80.09	3.480			
8,600.0	6,624.9	8,738.3	6,780.5	48.1	47.7	-123.98	-1,729.1	-364.2	278.6	194.8	83.78	3.325			
8,700.0	6,624.7	8,838.3	6,780.1	50.3	49.8	-123.93	-1,829.1	-364.2	278.4	190.9	87.51	3.181			
8,800.0	6,624.6	8,938.3	6,779.7	52.4	52.0	-123.88	-1,929.1	-364.3	278.2	187.0	91.27	3.048			
8,900.0	6,624.4	9,038.3	6,779.2	54.6	54.2	-123.83	-2,029.1	-364.4	278.1	183.0	95.06	2.925			
9,000.0	6,624.3	9,138.3	6,778.8	56.8	56.3	-123.78	-2,129.1	-364.4	277.9	179.0	98.88	2.811			
9,100.0	6,624.1	9,238.3	6,778.3	58.9	58.6	-123.73	-2,229.1	-364.5	277.7	175.0	102.71	2.704			
9,200.0	6,624.0	9,338.3	6,777.9	61.1	60.8	-123.68	-2,329.1	-364.5	277.6	171.0	106.57	2.605			
9,300.0	6,623.8	9,438.3	6,777.5	63.4	63.0	-123.63	-2,429.1	-364.6	277.4	167.0	110.45	2.512			
9,400.0	6,623.7	9,538.3	6,777.0	65.6	65.2	-123.58	-2,529.1	-364.7	277.3	162.9	114.35	2.425			
9,500.0	6,623.5	9,638.3	6,776.6	67.8	67.5	-123.53	-2,629.1	-364.7	277.1	158.8	118.26	2.343			
9,600.0	6,623.4	9,738.3	6,776.1	70.0	69.7	-123.47	-2,729.1	-364.8	276.9	154.8	122.19	2.267			
9,700.0	6,623.2	9,838.3	6,775.7	72.3	72.0	-123.42	-2,829.1	-364.8	276.8	150.6	126.13	2.194			
9,800.0	6,623.1	9,938.3	6,775.2	74.5	74.2	-123.37	-2,929.1	-364.9	276.6	146.5	130.08	2.126			
9,900.0	6,622.9	10,038.3	6,774.8	76.8	76.5	-123.32	-3,029.1	-365.0	276.5	142.4	134.05	2.062			
10,000.0	6,622.8	10,138.3	6,774.4	79.1	78.8	-123.27	-3,129.1	-365.0	276.3	138.3	138.03	2.002			
10,100.0	6,622.6	10,238.3	6,773.9	81.3	81.0	-123.22	-3,229.1	-365.1	276.1	134.1	142.02	1.944			
10,200.0	6,622.5	10,338.3	6,773.5	83.6	83.3	-123.17	-3,329.1	-365.1	276.0	130.0	146.01	1.890			
10,300.0	6,622.4	10,438.3	6,773.0	85.9	85.6	-123.12	-3,429.1	-365.2	275.8	125.8	150.02	1.838			
10,400.0	6,622.2	10,538.3	6,772.6	88.1	87.9	-123.07	-3,529.1	-365.2	275.7	121.6	154.04	1.789			
10,500.0	6,622.1	10,638.3	6,772.2	90.4	90.2	-123.01	-3,629.1	-365.3	275.5	117.4	158.07	1.743			
10,600.0	6,621.9	10,738.3	6,771.7	92.7	92.5	-122.96	-3,729.1	-365.4	275.3	113.2	162.11	1.698			
10,700.0	6,621.8	10,838.3	6,771.3	95.0	94.8	-122.91	-3,829.1	-365.4	275.2	109.0	166.15	1.656			
10,800.0	6,621.6	10,938.3	6,770.8	97.3	97.1	-122.86	-3,929.1	-365.5	275.0	104.8	170.21	1.616			
10,900.0	6,621.5	11,038.3	6,770.4	99.6	99.4	-122.81	-4,029.1	-365.5	274.9	100.6	174.27	1.577			
11,000.0	6,621.3	11,138.3	6,770.0	101.9	101.7	-122.76	-4,129.1	-365.6	274.7	96.4	178.33	1.540			
11,100.0	6,621.2	11,238.3	6,769.5	104.2	104.0	-122.70	-4,229.1	-365.7	274.5	92.1	182.41	1.505			
11,200.0	6,621.0	11,338.3	6,769.1	106.5	106.3	-122.65	-4,329.1	-365.7	274.4	87.9	186.49	1.471 Level 3			
11,300.0	6,620.9	11,438.3	6,768.6	108.8	108.6	-122.60	-4,429.1	-365.8	274.2	83.6	190.58	1.439 Level 3			
11,400.0	6,620.7	11,538.3	6,768.2	111.1	110.9	-122.55	-4,529.1	-365.8	274.1	79.4	194.68	1.408 Level 3			
11,500.0	6,620.6	11,638.3	6,767.7	113.4	113.2	-122.50	-4,629.1	-365.9	273.9	75.1	198.78	1.378 Level 3			
11,600.0	6,620.4	11,738.3	6,767.3	115.7	115.5	-122.45	-4,729.1	-366.0	273.8	70.9	202.89	1.349 Level 3			
11,700.0	6,620.3	11,838.3	6,766.9	118.0	117.9	-122.39	-4,829.1	-366.0	273.6	66.6	207.00	1.322 Level 3			
11,800.0	6,620.1	11,938.3	6,766.4	120.3	120.2	-122.34	-4,929.1	-366.1	273.4	62.3	211.12	1.295 Level 3			
11,900.0	6,620.0	12,038.3	6,766.0	122.7	122.5	-122.29	-5,029.1	-366.1	273.3	58.0	215.25	1.270 Level 3			
12,000.0	6,619.9	12,138.3	6,765.5	125.0	124.8	-122.24	-5,129.1	-366.2	273.1	53.7	219.38	1.245 Level 2			
12,100.0	6,619.7	12,238.3	6,765.1	127.3	127.1	-122.18	-5,229.1	-366.2	273.0	49.5	223.52	1.221 Level 2			
12,200.0	6,619.6	12,338.3	6,764.7	129.6	129.5	-122.13	-5,329.1	-366.3	272.8	45.2	227.66	1.198 Level 2			
12,300.0	6,619.4	12,438.3	6,764.2	131.9	131.8	-122.08	-5,429.1	-366.4	272.7	40.9	231.81	1.176 Level 2			
12,400.0	6,619.3	12,538.3	6,763.8	134.2	134.1	-122.03	-5,529.1	-366.4	272.5	36.5	235.96	1.155 Level 2			
12,500.0	6,619.1	12,638.3	6,763.3	136.6	136.4	-121.97	-5,629.1	-366.5	272.3	32.2	240.12	1.134 Level 2			
12,600.0	6,619.0	12,738.3	6,762.9	138.9	138.8	-121.92	-5,729.1	-366.5	272.2	27.9	244.28	1.114 Level 2			
12,700.0	6,618.8	12,838.3	6,762.5	141.2	141.1	-121.87	-5,829.1	-366.6	272.0	23.6	248.45	1.095 Level 2			
12,800.0	6,618.7	12,938.3	6,762.0	143.5	143.4	-121.82	-5,929.0	-366.7	271.9	19.3	252.63	1.076 Level 2			
12,900.0	6,618.5	13,038.3	6,761.6	145.9	145.7	-121.76	-6,029.0	-366.7	271.7	14.9	256.81	1.058 Level 2			
13,000.0	6,618.4	13,138.3	6,761.1	148.2	148.1	-121.71	-6,129.0	-366.8	271.6	10.6	260.99	1.041 Level 2			
13,100.0	6,618.2	13,238.3	6,760.7	150.5	150.4	-121.66	-6,229.0	-366.8	271.4	6.2	265.18	1.024 Level 2			
13,200.0	6,618.1	13,338.3	6,760.2	152.8	152.7	-121.60	-6,329.0	-366.9	271.3	1.9	269.38	1.007 Level 2			
13,300.0	6,617.9	13,438.3	6,759.8	155.2	155.1	-121.55	-6,429.0	-367.0	271.1	-2.5	273.57	0.991 Level 1			

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29R-143
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4686.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4686.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29R-143	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.45 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #2 (1-25-17)	Offset TVD Reference:	Offset Datum

Offset Design Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29R-303 - Wellbore #1 - Plan #2 (1-25-17)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance							Warning
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)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
13,400.0	6,617.8	13,538.3	6,759.4	157.5	157.4	-121.50	-6,529.0	-367.0	271.0	-6.8	277.78	0.975	Level 1	
13,500.0	6,617.6	13,638.3	6,758.9	159.8	159.7	-121.45	-6,629.0	-367.1	270.8	-11.2	281.99	0.960	Level 1	
13,600.0	6,617.5	13,738.3	6,758.5	162.2	162.0	-121.39	-6,729.0	-367.1	270.7	-15.5	286.20	0.946	Level 1	
13,700.0	6,617.4	13,838.3	6,758.0	164.5	164.4	-121.34	-6,829.0	-367.2	270.5	-19.9	290.42	0.931	Level 1	
13,800.0	6,617.2	13,938.3	6,757.6	166.8	166.7	-121.29	-6,929.0	-367.2	270.4	-24.3	294.64	0.918	Level 1	
13,900.0	6,617.1	14,038.3	6,757.2	169.1	169.0	-121.23	-7,029.0	-367.3	270.2	-28.7	298.86	0.904	Level 1	
13,932.7	6,617.0	14,071.0	6,757.0	169.9	169.8	-121.21	-7,061.7	-367.3	270.2	-30.1	300.25	0.900	Level 1	
13,938.9	6,617.0	14,074.3	6,757.0	170.1	169.9	-121.21	-7,065.0	-367.3	270.2	-30.3	300.45	0.899	Level 1, ES, SF	

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29R-143
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4686.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4686.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29R-143	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.45 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #2 (1-25-17)	Offset TVD Reference:	Offset Datum

Offset Design Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29R-323 - Wellbore #1 - Plan #2 (1-25-17)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
0.0	0.0	0.0	0.0	0.0	0.0	90.69	-0.7	59.9	59.9					
100.0	100.0	100.0	100.0	0.1	0.1	90.69	-0.7	59.9	59.9	59.6	0.28	217.579		
200.0	200.0	200.0	200.0	0.4	0.4	90.69	-0.7	59.9	59.9	59.1	0.83	72.526		
300.0	300.0	300.0	300.0	0.7	0.7	90.69	-0.7	59.9	59.9	58.5	1.38	43.516		
400.0	400.0	400.0	400.0	1.0	1.0	90.69	-0.7	59.9	59.9	58.0	1.93	31.083		
500.0	500.0	500.0	500.0	1.2	1.2	90.69	-0.7	59.9	59.9	57.4	2.48	24.175		
600.0	600.0	600.0	600.0	1.5	1.5	90.69	-0.7	59.9	59.9	56.9	3.03	19.780		
700.0	700.0	700.0	700.0	1.8	1.8	90.69	-0.7	59.9	59.9	56.3	3.58	16.737		
800.0	800.0	800.0	800.0	2.1	2.1	90.69	-0.7	59.9	59.9	55.8	4.13	14.505 CC, ES		
900.0	900.0	899.3	899.3	2.3	2.3	89.59	0.4	60.5	60.5	55.8	4.68	12.930		
1,000.0	1,000.0	998.5	998.4	2.6	2.6	86.39	3.9	62.1	62.3	57.1	5.22	11.926		
1,100.0	1,100.0	1,097.4	1,097.1	2.9	2.9	81.51	9.7	64.9	65.7	60.0	5.77	11.383		
1,200.0	1,200.0	1,195.9	1,195.2	3.2	3.2	75.55	17.7	68.8	71.2	64.9	6.33	11.245 SF		
1,300.0	1,300.0	1,294.0	1,292.6	3.4	3.5	119.97	28.0	73.8	79.9	73.0	6.88	11.609		
1,400.0	1,399.9	1,391.4	1,389.0	3.7	3.8	115.86	40.4	79.8	92.3	84.8	7.44	12.398		
1,500.0	1,499.7	1,488.0	1,484.3	4.0	4.2	113.10	54.9	86.8	108.0	100.0	8.02	13.473		
1,600.0	1,599.3	1,584.5	1,579.0	4.3	4.5	111.41	71.5	94.8	126.8	118.2	8.61	14.725		
1,700.0	1,698.6	1,682.4	1,675.0	4.6	5.0	110.86	88.9	103.2	147.0	137.8	9.23	15.936		
1,800.0	1,797.5	1,780.2	1,770.8	4.9	5.4	111.22	106.2	111.6	168.2	158.4	9.87	17.037		
1,900.0	1,896.1	1,877.6	1,866.3	5.3	5.8	112.16	123.5	120.0	190.4	179.8	10.56	18.036		
1,962.1	1,957.1	1,938.0	1,925.5	5.5	6.1	112.95	134.2	125.2	204.7	193.7	11.00	18.610		
2,000.0	1,994.2	1,974.7	1,961.6	5.6	6.3	113.57	140.8	128.3	213.6	202.3	11.28	18.932		
2,100.0	2,092.2	2,071.8	2,056.7	6.1	6.8	114.97	158.0	136.7	237.1	225.1	12.04	19.692		
2,200.0	2,190.2	2,168.8	2,151.8	6.5	7.2	116.13	175.2	145.0	260.7	247.9	12.82	20.339		
2,300.0	2,288.3	2,265.8	2,247.0	7.0	7.7	117.09	192.5	153.3	284.5	270.8	13.62	20.893		
2,400.0	2,386.3	2,362.9	2,342.1	7.4	8.2	117.90	209.7	161.7	308.2	293.8	14.42	21.370		
2,500.0	2,484.3	2,459.9	2,437.2	7.9	8.7	118.60	226.9	170.0	332.1	316.8	15.24	21.785		
2,600.0	2,582.3	2,557.0	2,532.4	8.4	9.2	119.21	244.2	178.3	355.9	339.9	16.07	22.147		
2,700.0	2,680.3	2,654.0	2,627.5	8.9	9.6	119.73	261.4	186.7	379.8	362.9	16.91	22.466		
2,800.0	2,778.3	2,751.1	2,722.7	9.4	10.1	120.20	278.6	195.0	403.8	386.0	17.75	22.747		
2,900.0	2,876.3	2,848.1	2,817.8	9.8	10.6	120.61	295.9	203.3	427.7	409.1	18.60	22.997		
3,000.0	2,974.4	2,945.2	2,912.9	10.4	11.1	120.98	313.1	211.7	451.7	432.3	19.45	23.221		
3,100.0	3,072.4	3,042.2	3,008.1	10.9	11.6	121.32	330.3	220.0	475.7	455.4	20.31	23.422		
3,200.0	3,170.4	3,139.2	3,103.2	11.4	12.1	121.62	347.6	228.4	499.7	478.5	21.17	23.603		
3,300.0	3,268.4	3,236.3	3,198.3	11.9	12.6	121.89	364.8	236.7	523.7	501.7	22.04	23.767		
3,400.0	3,366.4	3,333.3	3,293.5	12.4	13.1	122.14	382.0	245.0	547.7	524.8	22.90	23.916		
3,500.0	3,464.4	3,430.4	3,388.6	12.9	13.6	122.37	399.3	253.4	571.8	548.0	23.77	24.052		
3,600.0	3,562.5	3,527.4	3,483.8	13.4	14.1	122.58	416.5	261.7	595.8	571.2	24.64	24.177		
3,700.0	3,660.5	3,624.5	3,578.9	13.9	14.6	122.77	433.7	270.0	619.9	594.3	25.52	24.291		
3,800.0	3,758.5	3,721.5	3,674.0	14.5	15.1	122.95	451.0	278.4	643.9	617.5	26.39	24.397		
3,900.0	3,856.5	3,825.0	3,775.5	15.0	15.6	123.15	469.1	287.1	667.8	640.5	27.27	24.493		
4,000.0	3,954.5	3,940.5	3,889.5	15.5	16.0	123.58	486.1	295.3	689.7	661.6	28.10	24.547		
4,100.0	4,052.5	4,057.0	4,005.1	16.0	16.4	124.28	499.0	301.6	708.9	680.1	28.89	24.540		
4,200.0	4,150.6	4,174.0	4,121.7	16.6	16.7	125.23	507.7	305.8	725.7	696.1	29.64	24.485		
4,300.0	4,248.6	4,291.1	4,238.6	17.1	16.9	126.43	512.1	307.9	740.2	709.8	30.34	24.394		
4,400.0	4,346.6	4,399.0	4,346.6	17.6	17.1	127.71	512.7	308.2	752.6	721.6	30.98	24.291		
4,500.0	4,444.6	4,497.0	4,444.6	18.1	17.3	128.87	512.7	308.2	765.0	733.4	31.61	24.201		
4,600.0	4,542.6	4,595.0	4,542.6	18.7	17.5	129.99	512.7	308.2	777.8	745.6	32.23	24.131		
4,700.0	4,640.6	4,693.1	4,640.6	19.2	17.7	131.08	512.7	308.2	790.8	758.0	32.84	24.078		

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29R-143
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4686.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4686.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29R-143	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.45 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #2 (1-25-17)	Offset TVD Reference:	Offset Datum

Offset Design		Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29R-423 - Wellbore #1 - Plan #2 (1-25-17)											Offset Site Error:		0.0 ft
Survey Program:		0-MWD											Offset Well Error:		0.0 ft
Reference		Offset		Semi Major Axis			Distance							Warning	
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor			
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)				
0.0	0.0	0.0	0.0	0.0	0.0	90.48	-0.4	44.9	44.9						
100.0	100.0	99.0	99.0	0.1	0.1	90.48	-0.4	44.9	44.9	44.6	0.27	163.742			
200.0	200.0	199.0	199.0	0.4	0.4	90.48	-0.4	44.9	44.9	44.0	0.82	54.490			
300.0	300.0	299.0	299.0	0.7	0.7	90.48	-0.4	44.9	44.9	43.5	1.37	32.650			
400.0	400.0	399.0	399.0	1.0	1.0	90.48	-0.4	44.9	44.9	42.9	1.92	23.308			
500.0	500.0	499.0	499.0	1.2	1.2	90.48	-0.4	44.9	44.9	42.4	2.48	18.123			
600.0	600.0	599.0	599.0	1.5	1.5	90.48	-0.4	44.9	44.9	41.8	3.03	14.825			
700.0	700.0	699.0	699.0	1.8	1.8	90.48	-0.4	44.9	44.9	41.3	3.58	12.542			
800.0	800.0	799.0	799.0	2.1	2.1	90.48	-0.4	44.9	44.9	40.7	4.13	10.869			
900.0	900.0	899.0	899.0	2.3	2.3	90.48	-0.4	44.9	44.9	40.2	4.68	9.589			
1,000.0	1,000.0	999.0	999.0	2.6	2.6	90.48	-0.4	44.9	44.9	39.6	5.23	8.580			
1,100.0	1,100.0	1,099.0	1,099.0	2.9	2.9	90.48	-0.4	44.9	44.9	39.1	5.78	7.762			
1,200.0	1,200.0	1,199.0	1,199.0	3.2	3.2	90.48	-0.4	44.9	44.9	38.5	6.33	7.087 CC, ES			
1,300.0	1,300.0	1,299.0	1,299.0	3.4	3.4	141.56	-0.4	44.9	45.9	39.0	6.87	6.674			
1,400.0	1,399.9	1,398.9	1,398.9	3.7	3.7	144.38	-0.4	44.9	49.0	41.6	7.41	6.614			
1,500.0	1,499.7	1,498.7	1,498.7	4.0	4.0	148.35	-0.4	44.9	54.5	46.5	7.95	6.854			
1,600.0	1,599.3	1,598.3	1,598.3	4.3	4.3	152.70	-0.4	44.9	62.4	54.0	8.48	7.363			
1,700.0	1,698.6	1,697.6	1,697.6	4.6	4.5	156.86	-0.4	44.9	73.1	64.1	9.01	8.112			
1,800.0	1,797.5	1,796.5	1,796.5	4.9	4.8	160.53	-0.4	44.9	86.5	77.0	9.54	9.070			
1,900.0	1,896.1	1,895.1	1,895.1	5.3	5.1	163.61	-0.4	44.9	102.6	92.6	10.06	10.205			
1,962.1	1,957.1	1,956.1	1,956.1	5.5	5.2	165.24	-0.4	44.9	114.0	103.7	10.38	10.988			
2,000.0	1,994.2	1,993.2	1,993.2	5.6	5.4	166.14	-0.4	44.9	121.3	110.7	10.59	11.461			
2,100.0	2,092.2	2,091.2	2,091.2	6.1	5.6	168.07	-0.4	44.9	140.7	129.5	11.14	12.631			
2,200.0	2,190.2	2,189.2	2,189.2	6.5	5.9	169.54	-0.4	44.9	160.1	148.4	11.69	13.697			
2,300.0	2,288.3	2,287.3	2,287.3	7.0	6.2	170.69	-0.4	44.9	179.7	167.4	12.25	14.668			
2,400.0	2,386.3	2,385.3	2,385.3	7.4	6.4	171.61	-0.4	44.9	199.2	186.4	12.81	15.556			
2,500.0	2,484.3	2,483.3	2,483.3	7.9	6.7	172.36	-0.4	44.9	218.9	205.5	13.37	16.369			
2,600.0	2,582.3	2,583.7	2,583.7	8.4	7.0	172.81	0.5	44.9	238.1	224.2	13.94	17.078			
2,700.0	2,680.3	2,685.1	2,685.1	8.9	7.3	172.67	4.1	45.3	256.2	241.7	14.52	17.645			
2,800.0	2,778.3	2,786.9	2,786.6	9.4	7.5	172.03	10.4	45.8	273.1	258.0	15.10	18.080			
2,900.0	2,876.3	2,888.9	2,888.2	9.8	7.8	170.98	19.3	46.6	288.8	273.1	15.70	18.399			
3,000.0	2,974.4	2,990.9	2,989.6	10.4	8.1	169.57	31.0	47.7	303.5	287.2	16.31	18.613			
3,100.0	3,072.4	3,092.9	3,090.5	10.9	8.4	167.84	45.4	49.0	317.3	300.4	16.94	18.733			
3,200.0	3,170.4	3,193.6	3,189.9	11.4	8.7	165.87	62.1	50.5	330.5	312.9	17.60	18.778			
3,300.0	3,268.4	3,292.1	3,286.9	11.9	9.0	163.99	79.0	52.1	343.8	325.5	18.28	18.806			
3,400.0	3,366.4	3,390.6	3,383.9	12.4	9.4	162.25	95.9	53.6	357.5	338.5	18.99	18.827			
3,500.0	3,464.4	3,489.1	3,480.9	12.9	9.7	160.64	112.9	55.1	371.4	351.7	19.71	18.842			
3,600.0	3,562.5	3,587.6	3,577.9	13.4	10.1	159.14	129.8	56.7	385.6	365.2	20.46	18.852			
3,700.0	3,660.5	3,686.1	3,674.9	13.9	10.4	157.75	146.7	58.2	400.1	378.9	21.22	18.857			
3,800.0	3,758.5	3,784.6	3,772.0	14.5	10.8	156.46	163.7	59.7	414.8	392.8	21.99	18.859			
3,900.0	3,856.5	3,883.1	3,869.0	15.0	11.2	155.26	180.6	61.3	429.6	406.8	22.78	18.857			
4,000.0	3,954.5	3,981.6	3,966.0	15.5	11.6	154.13	197.5	62.8	444.7	421.1	23.59	18.854			
4,100.0	4,052.5	4,080.1	4,063.0	16.0	12.0	153.08	214.5	64.3	459.9	435.5	24.40	18.848			
4,200.0	4,150.6	4,178.6	4,160.0	16.6	12.4	152.10	231.4	65.9	475.2	450.0	25.22	18.841			
4,300.0	4,248.6	4,277.1	4,257.0	17.1	12.8	151.18	248.4	67.4	490.7	464.6	26.06	18.833			
4,400.0	4,346.6	4,375.6	4,354.1	17.6	13.2	150.31	265.3	68.9	506.3	479.4	26.90	18.824			
4,500.0	4,444.6	4,474.1	4,451.1	18.1	13.6	149.50	282.2	70.5	522.0	494.2	27.74	18.815			
4,600.0	4,542.6	4,572.6	4,548.1	18.7	14.0	148.73	299.2	72.0	537.8	509.2	28.60	18.806			
4,700.0	4,640.6	4,671.1	4,645.1	19.2	14.4	148.01	316.1	73.6	553.7	524.2	29.46	18.796			
4,800.0	4,738.7	4,769.6	4,742.1	19.7	14.8	147.33	333.0	75.1	569.6	539.3	30.32	18.787			
4,900.0	4,836.7	4,868.1	4,839.1	20.2	15.3	146.68	350.0	76.6	585.7	554.5	31.19	18.777			

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29R-143
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4686.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4686.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29R-143	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.45 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #2 (1-25-17)	Offset TVD Reference:	Offset Datum

Offset Design Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29R-423 - Wellbore #1 - Plan #2 (1-25-17)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance							
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor	Warning	
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)			
5,000.0	4,934.7	4,966.6	4,936.2	20.8	15.7	146.07	366.9	78.2	601.8	569.7	32.06	18.768		
5,100.0	5,032.7	5,065.1	5,033.2	21.3	16.1	145.49	383.8	79.7	617.9	585.0	32.94	18.760		
5,201.5	5,132.2	5,165.0	5,131.6	21.8	16.5	144.94	401.0	81.3	634.4	600.6	33.83	18.751		
5,300.0	5,229.0	5,262.2	5,227.3	22.3	17.0	144.51	417.7	82.8	649.1	614.4	34.73	18.691		
5,400.0	5,328.0	5,361.1	5,324.7	22.6	17.4	143.89	434.7	84.3	661.3	625.7	35.58	18.587		
5,500.0	5,427.3	5,460.0	5,422.2	22.9	17.8	143.09	451.8	85.9	670.8	634.4	36.41	18.427		
5,600.0	5,527.0	5,559.2	5,519.9	23.2	18.3	142.12	468.8	87.4	677.8	640.6	37.20	18.221		
5,700.0	5,626.9	5,659.8	5,619.4	23.4	18.6	141.12	483.8	88.8	682.1	644.2	37.86	18.016		
5,773.1	5,700.0	5,733.8	5,692.9	23.5	18.9	90.40	492.7	89.6	683.5	645.2	38.28	17.855		
5,800.0	5,726.9	5,761.2	5,720.0	23.5	18.9	90.16	495.5	89.8	683.7	645.3	38.44	17.789		
5,900.0	5,826.9	5,863.1	5,821.7	23.7	19.2	89.48	503.6	90.6	684.5	645.5	38.99	17.557		
5,937.4	5,864.3	5,901.4	5,859.9	23.8	19.3	89.30	505.7	90.7	684.7	645.5	39.18	17.476		
5,950.0	5,876.9	5,914.3	5,872.8	23.8	19.3	-90.78	506.3	90.8	684.8	645.5	39.23	17.454		
6,000.0	5,926.8	5,965.4	5,923.8	23.8	19.4	-91.12	508.1	91.0	685.0	645.6	39.44	17.367		
6,050.0	5,976.5	6,016.4	5,974.8	23.9	19.5	-91.67	509.0	91.0	685.2	645.6	39.63	17.290		
6,100.0	6,025.7	6,066.3	6,024.7	23.9	19.6	-92.40	509.1	91.1	685.6	645.8	39.80	17.227		
6,150.0	6,074.2	6,114.7	6,073.2	23.8	19.7	-93.33	509.1	91.1	686.2	646.3	39.95	17.176		
6,200.0	6,121.8	6,164.1	6,122.5	23.8	19.8	-94.48	508.7	91.1	687.3	647.2	40.08	17.148		
6,250.0	6,168.2	6,216.1	6,174.4	23.7	19.9	-95.70	505.3	91.1	688.7	648.6	40.13	17.161		
6,300.0	6,213.4	6,269.3	6,227.1	23.6	19.9	-96.90	498.2	91.0	690.4	650.3	40.11	17.215		
6,350.0	6,257.1	6,323.8	6,280.4	23.5	19.9	-98.08	487.1	91.0	692.5	652.5	40.00	17.311		
6,400.0	6,299.1	6,379.6	6,334.1	23.4	19.8	-99.24	471.8	91.0	694.8	654.9	39.82	17.447		
6,450.0	6,339.3	6,436.8	6,387.8	23.3	19.8	-100.37	452.2	91.0	697.3	657.7	39.57	17.620		
6,500.0	6,377.4	6,495.4	6,441.2	23.1	19.6	-101.47	427.9	91.0	700.0	660.7	39.27	17.825		
6,550.0	6,413.3	6,555.6	6,493.8	23.0	19.5	-102.52	398.8	91.0	702.8	663.8	38.92	18.056		
6,600.0	6,446.8	6,617.2	6,545.2	22.9	19.4	-103.52	364.8	91.0	705.6	667.1	38.55	18.303		
6,650.0	6,477.9	6,680.4	6,594.8	22.7	19.2	-104.47	325.7	90.9	708.5	670.3	38.19	18.554		
6,700.0	6,506.3	6,745.0	6,642.1	22.6	19.1	-105.35	281.7	90.9	711.3	673.5	37.85	18.792		
6,750.0	6,532.0	6,811.1	6,686.4	22.5	18.9	-106.15	232.6	90.9	714.0	676.4	37.58	18.998		
6,800.0	6,554.8	6,878.6	6,727.1	22.3	18.9	-106.87	178.9	90.8	716.5	679.1	37.42	19.148		
6,850.0	6,574.7	6,947.3	6,763.5	22.2	18.9	-107.49	120.6	90.8	718.7	681.3	37.38	19.225		
6,900.0	6,591.5	7,017.2	6,795.0	22.2	19.0	-108.01	58.3	90.8	720.6	683.1	37.53	19.201		
6,950.0	6,605.2	7,087.9	6,820.9	22.1	19.3	-108.43	-7.5	90.7	722.2	684.3	37.87	19.069		
7,000.0	6,615.7	7,159.4	6,840.9	22.1	19.6	-108.73	-76.1	90.7	723.3	684.8	38.43	18.821		
7,050.0	6,623.0	7,231.4	6,854.4	22.2	20.1	-108.91	-146.8	90.6	723.9	684.7	39.21	18.461		
7,100.0	6,627.1	7,303.6	6,861.2	22.4	20.7	-108.96	-218.7	90.6	724.2	683.9	40.21	18.008		
7,105.7	6,627.4	7,311.9	6,861.5	22.4	20.8	-108.96	-227.0	90.6	724.1	683.8	40.34	17.949		
7,138.1	6,627.0	7,351.8	6,862.0	22.6	21.1	-109.01	-266.9	90.5	724.4	683.4	41.01	17.662		
7,139.1	6,627.0	7,352.8	6,862.0	22.6	21.1	-109.01	-267.9	90.5	724.4	683.3	41.03	17.654		
7,140.2	6,627.0	7,354.0	6,862.0	22.6	21.1	-109.01	-269.0	90.5	724.4	683.3	41.05	17.646		
7,200.0	6,626.9	7,413.7	6,862.0	23.1	21.7	-109.02	-328.8	90.5	724.4	682.2	42.16	17.180		
7,300.0	6,626.8	7,513.7	6,862.0	24.2	22.9	-109.03	-428.8	90.4	724.4	679.9	44.51	16.275		
7,400.0	6,626.6	7,613.7	6,862.0	25.6	24.3	-109.04	-528.8	90.4	724.5	677.3	47.17	15.359		
7,500.0	6,626.5	7,713.7	6,862.0	27.1	25.8	-109.05	-628.8	90.3	724.5	674.4	50.09	14.465		
7,600.0	6,626.3	7,813.7	6,862.0	28.7	27.5	-109.07	-728.8	90.2	724.5	671.3	53.22	13.613		
7,700.0	6,626.2	7,913.7	6,862.0	30.4	29.2	-109.08	-828.8	90.1	724.6	668.0	56.54	12.815		
7,800.0	6,626.0	8,013.7	6,862.0	32.2	31.0	-109.09	-928.8	90.1	724.6	664.6	60.01	12.075		
7,900.0	6,625.9	8,113.7	6,862.0	34.0	32.9	-109.10	-1,028.8	90.0	724.6	661.0	63.60	11.394		
8,000.0	6,625.7	8,213.7	6,862.0	35.9	34.9	-109.11	-1,128.8	89.9	724.7	657.4	67.30	10.768		
8,100.0	6,625.6	8,313.7	6,862.0	37.9	36.8	-109.12	-1,228.8	89.8	724.7	653.6	71.09	10.194		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29R-143
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4686.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4686.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29R-143	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.45 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #2 (1-25-17)	Offset TVD Reference:	Offset Datum

Offset Design		Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29R-423 - Wellbore #1 - Plan #2 (1-25-17)										Offset Site Error:		0.0 ft
Survey Program: 0-MWD												Offset Well Error:		0.0 ft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor		
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)			
8,200.0	6,625.4	8,413.7	6,862.0	39.9	38.9	-109.13	-1,328.8	89.8	724.7	649.8	74.96	9.669		
8,300.0	6,625.3	8,513.7	6,862.0	41.9	40.9	-109.15	-1,428.8	89.7	724.8	645.9	78.88	9.188		
8,400.0	6,625.1	8,613.7	6,862.0	43.9	43.0	-109.16	-1,528.8	89.6	724.8	641.9	82.87	8.747		
8,500.0	6,625.0	8,713.7	6,862.0	46.0	45.2	-109.17	-1,628.8	89.5	724.9	638.0	86.90	8.341		
8,600.0	6,624.9	8,813.7	6,862.0	48.1	47.3	-109.18	-1,728.8	89.5	724.9	633.9	90.97	7.968		
8,700.0	6,624.7	8,913.7	6,862.0	50.3	49.5	-109.19	-1,828.8	89.4	724.9	629.8	95.08	7.624		
8,800.0	6,624.6	9,013.7	6,862.0	52.4	51.6	-109.20	-1,928.8	89.3	725.0	625.7	99.22	7.306		
8,900.0	6,624.4	9,113.7	6,862.0	54.6	53.8	-109.21	-2,028.8	89.3	725.0	621.6	103.39	7.012		
9,000.0	6,624.3	9,213.7	6,862.0	56.8	56.0	-109.23	-2,128.8	89.2	725.0	617.4	107.58	6.739		
9,100.0	6,624.1	9,313.7	6,862.0	58.9	58.3	-109.24	-2,228.8	89.1	725.1	613.3	111.80	6.486		
9,200.0	6,624.0	9,413.7	6,862.0	61.1	60.5	-109.25	-2,328.8	89.0	725.1	609.1	116.03	6.249		
9,300.0	6,623.8	9,513.7	6,862.0	63.4	62.7	-109.26	-2,428.8	89.0	725.1	604.9	120.28	6.029		
9,400.0	6,623.7	9,613.7	6,862.0	65.6	65.0	-109.27	-2,528.8	88.9	725.2	600.6	124.54	5.823		
9,500.0	6,623.5	9,713.7	6,862.0	67.8	67.2	-109.28	-2,628.8	88.8	725.2	596.4	128.82	5.630		
9,600.0	6,623.4	9,813.7	6,862.0	70.0	69.5	-109.29	-2,728.8	88.7	725.2	592.1	133.11	5.449		
9,700.0	6,623.2	9,913.7	6,862.0	72.3	71.7	-109.30	-2,828.8	88.7	725.3	587.9	137.41	5.278		
9,800.0	6,623.1	10,013.7	6,862.0	74.5	74.0	-109.32	-2,928.8	88.6	725.3	583.6	141.72	5.118		
9,900.0	6,622.9	10,113.7	6,862.0	76.8	76.3	-109.33	-3,028.8	88.5	725.4	579.3	146.04	4.967		
10,000.0	6,622.8	10,213.7	6,862.0	79.1	78.6	-109.34	-3,128.8	88.4	725.4	575.0	150.37	4.824		
10,100.0	6,622.6	10,313.7	6,862.0	81.3	80.8	-109.35	-3,228.8	88.4	725.4	570.7	154.70	4.689		
10,200.0	6,622.5	10,413.7	6,862.0	83.6	83.1	-109.36	-3,328.8	88.3	725.5	566.4	159.05	4.561		
10,300.0	6,622.4	10,513.7	6,862.0	85.9	85.4	-109.37	-3,428.8	88.2	725.5	562.1	163.39	4.440		
10,400.0	6,622.2	10,613.7	6,862.0	88.1	87.7	-109.38	-3,528.8	88.2	725.5	557.8	167.75	4.325		
10,500.0	6,622.1	10,713.7	6,862.0	90.4	90.0	-109.39	-3,628.8	88.1	725.6	553.5	172.11	4.216		
10,600.0	6,621.9	10,813.7	6,862.0	92.7	92.3	-109.41	-3,728.8	88.0	725.6	549.1	176.47	4.112		
10,700.0	6,621.8	10,913.7	6,862.0	95.0	94.6	-109.42	-3,828.8	87.9	725.6	544.8	180.84	4.013		
10,800.0	6,621.6	11,013.7	6,862.0	97.3	96.9	-109.43	-3,928.8	87.9	725.7	540.5	185.21	3.918		
10,900.0	6,621.5	11,113.7	6,862.0	99.6	99.2	-109.44	-4,028.8	87.8	725.7	536.1	189.59	3.828		
11,000.0	6,621.3	11,213.7	6,862.0	101.9	101.5	-109.45	-4,128.8	87.7	725.7	531.8	193.97	3.742		
11,100.0	6,621.2	11,313.7	6,862.0	104.2	103.8	-109.46	-4,228.8	87.6	725.8	527.4	198.35	3.659		
11,200.0	6,621.0	11,413.7	6,862.0	106.5	106.2	-109.47	-4,328.8	87.6	725.8	523.1	202.74	3.580		
11,300.0	6,620.9	11,513.7	6,862.0	108.8	108.5	-109.49	-4,428.8	87.5	725.9	518.7	207.13	3.504		
11,400.0	6,620.7	11,613.7	6,862.0	111.1	110.8	-109.50	-4,528.8	87.4	725.9	514.4	211.52	3.432		
11,500.0	6,620.6	11,713.7	6,862.0	113.4	113.1	-109.51	-4,628.8	87.3	725.9	510.0	215.91	3.362		
11,600.0	6,620.4	11,813.7	6,862.0	115.7	115.4	-109.52	-4,728.8	87.3	726.0	505.7	220.31	3.295		
11,700.0	6,620.3	11,913.7	6,862.0	118.0	117.7	-109.53	-4,828.8	87.2	726.0	501.3	224.71	3.231		
11,800.0	6,620.1	12,013.7	6,862.0	120.3	120.1	-109.54	-4,928.8	87.1	726.0	496.9	229.11	3.169		
11,900.0	6,620.0	12,113.7	6,862.0	122.7	122.4	-109.55	-5,028.8	87.1	726.1	492.6	233.51	3.109		
12,000.0	6,619.9	12,213.7	6,862.0	125.0	124.7	-109.56	-5,128.8	87.0	726.1	488.2	237.91	3.052		
12,100.0	6,619.7	12,313.7	6,862.0	127.3	127.0	-109.58	-5,228.8	86.9	726.1	483.8	242.32	2.997		
12,200.0	6,619.6	12,413.7	6,862.0	129.6	129.4	-109.59	-5,328.8	86.8	726.2	479.5	246.72	2.943		
12,300.0	6,619.4	12,513.7	6,862.0	131.9	131.7	-109.60	-5,428.8	86.8	726.2	475.1	251.13	2.892		
12,400.0	6,619.3	12,613.7	6,862.0	134.2	134.0	-109.61	-5,528.8	86.7	726.3	470.7	255.54	2.842		
12,500.0	6,619.1	12,713.7	6,862.0	136.6	136.3	-109.62	-5,628.8	86.6	726.3	466.3	259.95	2.794		
12,600.0	6,619.0	12,813.7	6,862.0	138.9	138.7	-109.63	-5,728.8	86.5	726.3	462.0	264.36	2.748		
12,700.0	6,618.8	12,913.7	6,862.0	141.2	141.0	-109.64	-5,828.8	86.5	726.4	457.6	268.77	2.703		
12,800.0	6,618.7	13,013.7	6,862.0	143.5	143.3	-109.65	-5,928.8	86.4	726.4	453.2	273.18	2.659		
12,900.0	6,618.5	13,113.7	6,862.0	145.9	145.7	-109.67	-6,028.8	86.3	726.4	448.8	277.60	2.617		
13,000.0	6,618.4	13,213.7	6,862.0	148.2	148.0	-109.68	-6,128.8	86.2	726.5	444.5	282.01	2.576		
13,100.0	6,618.2	13,313.7	6,862.0	150.5	150.3	-109.69	-6,228.8	86.2	726.5	440.1	286.43	2.536		
13,200.0	6,618.1	13,413.7	6,862.0	152.8	152.7	-109.70	-6,328.8	86.1	726.5	435.7	290.84	2.498		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29R-143
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4686.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4686.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29R-143	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.45 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #2 (1-25-17)	Offset TVD Reference:	Offset Datum

Offset Design		Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29R-423 - Wellbore #1 - Plan #2 (1-25-17)										Offset Site Error:		0.0 ft
Survey Program: 0-MWD												Offset Well Error:		0.0 ft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor		
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)			
13,300.0	6,617.9	13,513.7	6,862.0	155.2	155.0	-109.71	-6,428.8	86.0	726.6	431.3	295.26	2.461		
13,400.0	6,617.8	13,613.7	6,862.0	157.5	157.3	-109.72	-6,528.8	86.0	726.6	427.0	299.67	2.425		
13,500.0	6,617.6	13,713.7	6,862.0	159.8	159.7	-109.73	-6,628.8	85.9	726.7	422.6	304.09	2.390		
13,600.0	6,617.5	13,813.7	6,862.0	162.2	162.0	-109.74	-6,728.8	85.8	726.7	418.2	308.51	2.356		
13,700.0	6,617.4	13,913.7	6,862.0	164.5	164.3	-109.76	-6,828.8	85.7	726.7	413.8	312.92	2.322		
13,800.0	6,617.2	14,013.7	6,862.0	166.8	166.7	-109.77	-6,928.8	85.7	726.8	409.4	317.34	2.290		
13,900.0	6,617.1	14,113.7	6,862.0	169.1	169.0	-109.78	-7,028.8	85.6	726.8	405.0	321.76	2.259		
13,916.3	6,617.0	14,130.0	6,862.0	169.5	169.4	-109.78	-7,045.1	85.6	726.8	404.3	322.48	2.254		
13,938.9	6,617.0	14,145.2	6,862.0	170.1	169.7	-109.78	-7,060.3	85.6	726.9	403.5	323.32	2.248 SF		

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29R-143
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4686.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4686.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29R-143	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.45 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #2 (1-25-17)	Offset TVD Reference:	Offset Datum

Offset Design Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29U-243 - Wellbore #1 - Plan #2 (1-25-17)													Offset Site Error:	0.0 ft	
Survey Program: 0-MWVD														Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance						Warning		
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor			
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)				
0.0	0.0	0.0	0.0	0.0	0.0	90.55	-0.7	74.9	75.0						
100.0	100.0	100.0	100.0	0.1	0.1	90.55	-0.7	74.9	75.0	74.7	0.28	272.220			
200.0	200.0	200.0	200.0	0.4	0.4	90.55	-0.7	74.9	75.0	74.1	0.83	90.740			
300.0	300.0	300.0	300.0	0.7	0.7	90.55	-0.7	74.9	75.0	73.6	1.38	54.444			
400.0	400.0	400.0	400.0	1.0	1.0	90.55	-0.7	74.9	75.0	73.0	1.93	38.889 CC, ES			
500.0	500.0	498.7	498.7	1.2	1.2	89.84	0.2	75.8	75.8	73.4	2.47	30.692			
600.0	600.0	597.2	597.1	1.5	1.5	87.79	3.0	78.4	78.5	75.5	3.01	26.043			
700.0	700.0	695.5	695.2	1.8	1.8	84.68	7.7	82.7	83.2	79.6	3.57	23.307			
800.0	800.0	793.4	792.7	2.1	2.1	80.89	14.2	88.6	90.0	85.9	4.14	21.758			
900.0	900.0	890.8	889.5	2.3	2.4	76.83	22.5	96.2	99.4	94.6	4.73	21.000			
1,000.0	1,000.0	987.6	985.2	2.6	2.7	72.84	32.5	105.4	111.3	105.9	5.35	20.796 SF			
1,100.0	1,100.0	1,083.6	1,079.9	2.9	3.1	69.13	44.3	116.1	125.9	119.9	6.00	20.982			
1,200.0	1,200.0	1,178.7	1,173.3	3.2	3.6	65.82	57.6	128.4	143.2	136.5	6.68	21.443			
1,300.0	1,300.0	1,274.4	1,266.8	3.4	4.0	113.12	72.6	142.1	163.5	156.5	6.97	23.445			
1,400.0	1,399.9	1,371.9	1,362.0	3.7	4.5	111.56	88.2	156.3	185.3	177.8	7.54	24.566			
1,500.0	1,499.7	1,469.3	1,457.1	4.0	5.0	110.94	103.7	170.6	208.1	200.0	8.12	25.618			
1,600.0	1,599.3	1,566.4	1,551.9	4.3	5.5	110.99	119.2	184.8	231.9	223.1	8.72	26.590			
1,700.0	1,698.6	1,663.2	1,646.4	4.6	6.1	111.51	134.7	198.9	256.5	247.2	9.34	27.475			
1,800.0	1,797.5	1,759.7	1,740.6	4.9	6.6	112.37	150.1	213.0	282.2	272.2	9.98	28.279			
1,900.0	1,896.1	1,855.8	1,834.4	5.3	7.1	113.47	165.5	227.0	309.0	298.4	10.65	29.005			
1,962.1	1,957.1	1,915.2	1,892.5	5.5	7.4	114.23	174.9	235.7	326.3	315.2	11.09	29.421			
2,000.0	1,994.2	1,951.4	1,927.8	5.6	7.6	114.85	180.7	241.0	337.0	325.6	11.37	29.637			
2,100.0	2,092.2	2,046.9	2,021.0	6.1	8.2	116.31	196.0	255.0	365.3	353.2	12.12	30.140			
2,200.0	2,190.2	2,142.4	2,114.2	6.5	8.7	117.55	211.2	268.9	393.9	381.0	12.89	30.558			
2,300.0	2,288.3	2,237.9	2,207.5	7.0	9.2	118.63	226.5	282.9	422.6	409.0	13.67	30.911			
2,400.0	2,386.3	2,333.4	2,300.7	7.4	9.8	119.57	241.7	296.8	451.5	437.0	14.47	31.210			
2,500.0	2,484.3	2,428.9	2,394.0	7.9	10.3	120.40	257.0	310.8	480.4	465.1	15.27	31.466			
2,600.0	2,582.3	2,524.4	2,487.2	8.4	10.8	121.14	272.2	324.8	509.4	493.3	16.08	31.689			
2,700.0	2,680.3	2,619.9	2,580.4	8.9	11.4	121.80	287.5	338.7	538.5	521.6	16.89	31.883			
2,800.0	2,778.3	2,715.4	2,673.7	9.4	11.9	122.38	302.7	352.7	567.6	549.9	17.71	32.053			
2,900.0	2,876.3	2,810.9	2,766.9	9.8	12.4	122.92	318.0	366.6	596.8	578.3	18.53	32.204			
3,000.0	2,974.4	2,906.4	2,860.2	10.4	13.0	123.40	333.2	380.6	626.1	606.7	19.36	32.339			
3,100.0	3,072.4	3,001.9	2,953.4	10.9	13.5	123.84	348.5	394.5	655.3	635.2	20.19	32.459			
3,200.0	3,170.4	3,097.4	3,046.6	11.4	14.1	124.24	363.7	408.5	684.7	663.6	21.02	32.568			
3,300.0	3,268.4	3,192.9	3,139.9	11.9	14.6	124.61	379.0	422.5	714.0	692.1	21.86	32.666			
3,400.0	3,366.4	3,288.4	3,233.1	12.4	15.1	124.95	394.2	436.4	743.3	720.7	22.69	32.755			
3,500.0	3,464.4	3,383.9	3,326.4	12.9	15.7	125.26	409.5	450.4	772.7	749.2	23.53	32.836			

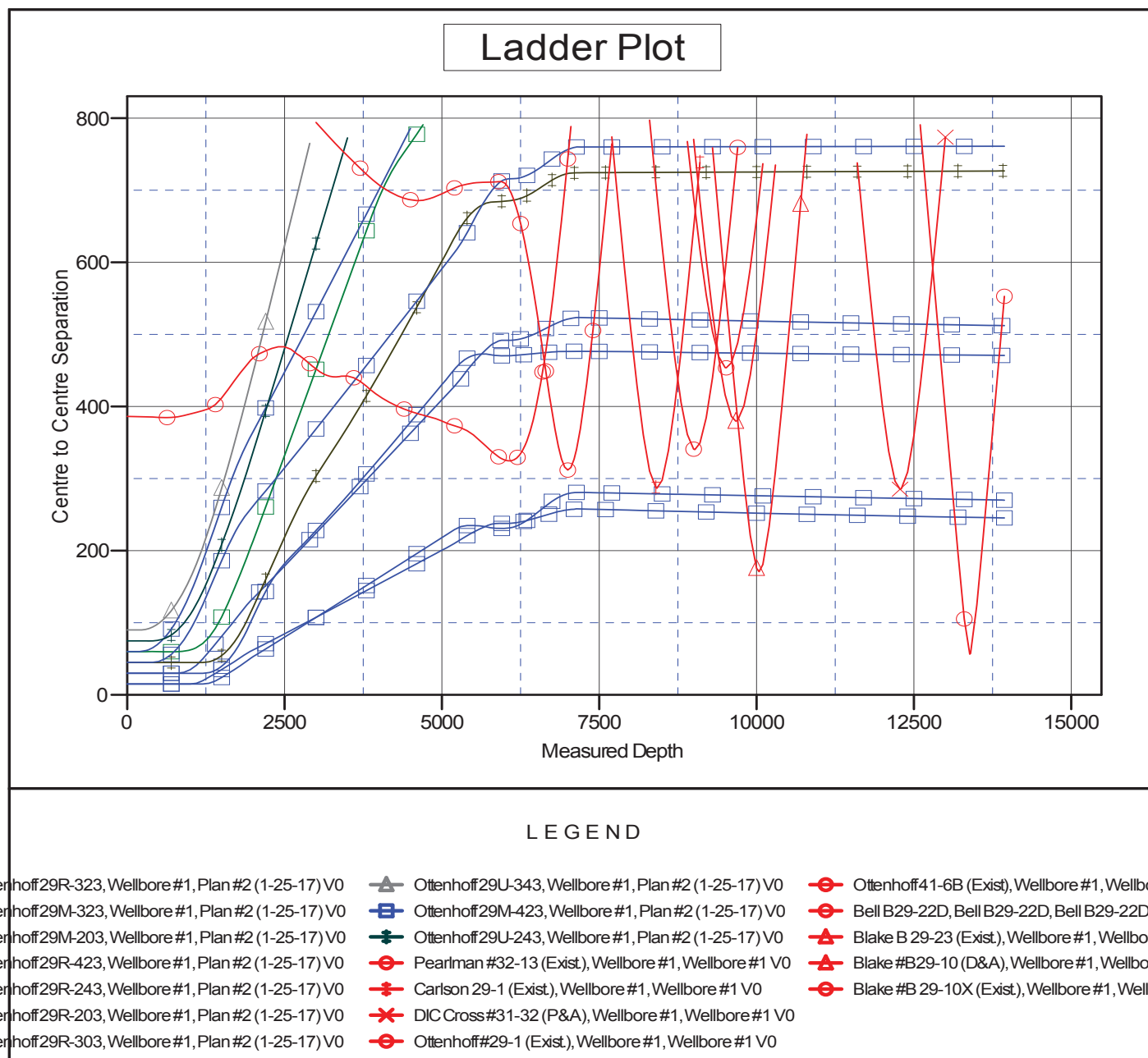
Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29R-143
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4686.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4686.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29R-143	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.45 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #2 (1-25-17)	Offset TVD Reference:	Offset Datum

Offset Design		Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29U-343 - Wellbore #1 - Plan #2 (1-25-17)											Offset Site Error:		0.0 ft
Survey Program: 0-MWD													Offset Well Error:		0.0 ft
Reference		Offset		Semi Major Axis			Distance							Warning	
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor			
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)				
0.0	0.0	0.0	0.0	0.0	0.0	90.70	-1.1	90.0	90.0						
100.0	100.0	99.0	99.0	0.1	0.1	90.70	-1.1	90.0	90.0	89.7	0.27	328.515			
200.0	200.0	199.0	199.0	0.4	0.4	90.70	-1.1	90.0	90.0	89.2	0.82	109.323	CC, ES		
300.0	300.0	297.2	297.2	0.7	0.7	90.21	-0.3	91.0	91.0	89.6	1.36	66.714			
400.0	400.0	395.2	395.1	1.0	0.9	88.81	1.9	94.0	94.1	92.1	1.91	49.286			
500.0	500.0	493.0	492.7	1.2	1.2	86.67	5.7	98.9	99.3	96.8	2.47	40.237			
600.0	600.0	590.4	589.7	1.5	1.5	84.04	11.0	105.8	106.8	103.7	3.05	35.055			
700.0	700.0	687.3	685.9	1.8	1.9	81.17	17.8	114.6	116.7	113.1	3.65	31.971			
800.0	800.0	783.5	781.3	2.1	2.2	78.28	26.0	125.3	129.2	124.9	4.28	30.155			
900.0	900.0	879.0	875.5	2.3	2.6	75.52	35.6	137.7	144.2	139.2	4.95	29.153			
1,000.0	1,000.0	973.7	968.4	2.6	3.1	73.00	46.5	151.9	161.8	156.2	5.64	28.697			
1,100.0	1,100.0	1,067.4	1,060.0	2.9	3.6	70.74	58.6	167.8	182.0	175.6	6.36	28.613	SF		
1,200.0	1,200.0	1,160.1	1,150.0	3.2	4.1	68.76	72.0	185.2	204.7	197.5	7.11	28.789			
1,300.0	1,300.0	1,252.6	1,239.3	3.4	4.7	117.01	86.6	204.3	230.3	223.3	7.05	32.687			
1,400.0	1,399.9	1,348.6	1,331.9	3.7	5.3	115.90	102.3	224.6	258.0	250.4	7.63	33.825			
1,500.0	1,499.7	1,444.4	1,424.2	4.0	5.9	115.41	117.9	245.0	286.7	278.5	8.21	34.919			
1,600.0	1,599.3	1,539.8	1,516.1	4.3	6.5	115.37	133.4	265.2	316.6	307.8	8.81	35.938			
1,700.0	1,698.6	1,634.8	1,607.7	4.6	7.2	115.65	148.9	285.3	347.5	338.1	9.42	36.877			
1,800.0	1,797.5	1,729.4	1,698.8	4.9	7.8	116.17	164.2	305.4	379.6	369.6	10.06	37.734			
1,900.0	1,896.1	1,823.3	1,789.3	5.3	8.4	116.86	179.5	325.3	412.9	402.2	10.72	38.509			
1,962.1	1,957.1	1,881.4	1,845.3	5.5	8.8	117.35	189.0	337.6	434.2	423.1	11.15	38.949			
2,000.0	1,994.2	1,916.8	1,879.3	5.6	9.0	117.83	194.8	345.1	447.4	436.0	11.43	39.158			
2,100.0	2,092.2	2,010.1	1,969.2	6.1	9.7	118.99	209.9	364.9	482.3	470.1	12.17	39.629			
2,200.0	2,190.2	2,103.4	2,059.1	6.5	10.3	119.98	225.1	384.7	517.4	504.4	12.93	40.004			
2,300.0	2,288.3	2,196.7	2,149.0	7.0	10.9	120.85	240.3	404.5	552.5	538.8	13.71	40.305			
2,400.0	2,386.3	2,290.0	2,238.9	7.4	11.6	121.62	255.5	424.3	587.8	573.3	14.50	40.550			
2,500.0	2,484.3	2,383.3	2,328.8	7.9	12.2	122.30	270.7	444.0	623.2	607.9	15.29	40.751			
2,600.0	2,582.3	2,476.6	2,418.7	8.4	12.8	122.91	285.9	463.8	658.6	642.5	16.10	40.917			
2,700.0	2,680.3	2,569.9	2,508.6	8.9	13.5	123.46	301.1	483.6	694.1	677.2	16.91	41.056			
2,800.0	2,778.3	2,663.1	2,598.6	9.4	14.1	123.95	316.3	503.4	729.6	711.9	17.72	41.173			
2,900.0	2,876.3	2,756.4	2,688.5	9.8	14.7	124.40	331.4	523.2	765.2	746.6	18.54	41.272			

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29R-143
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4686.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4686.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29R-143	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.45 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #2 (1-25-17)	Offset TVD Reference:	Offset Datum

Reference Depths are relative to WELL @ 4686.0ft (RKB - 23')
 Offset Depths are relative to Offset Datum
 Central Meridian is -105.500000

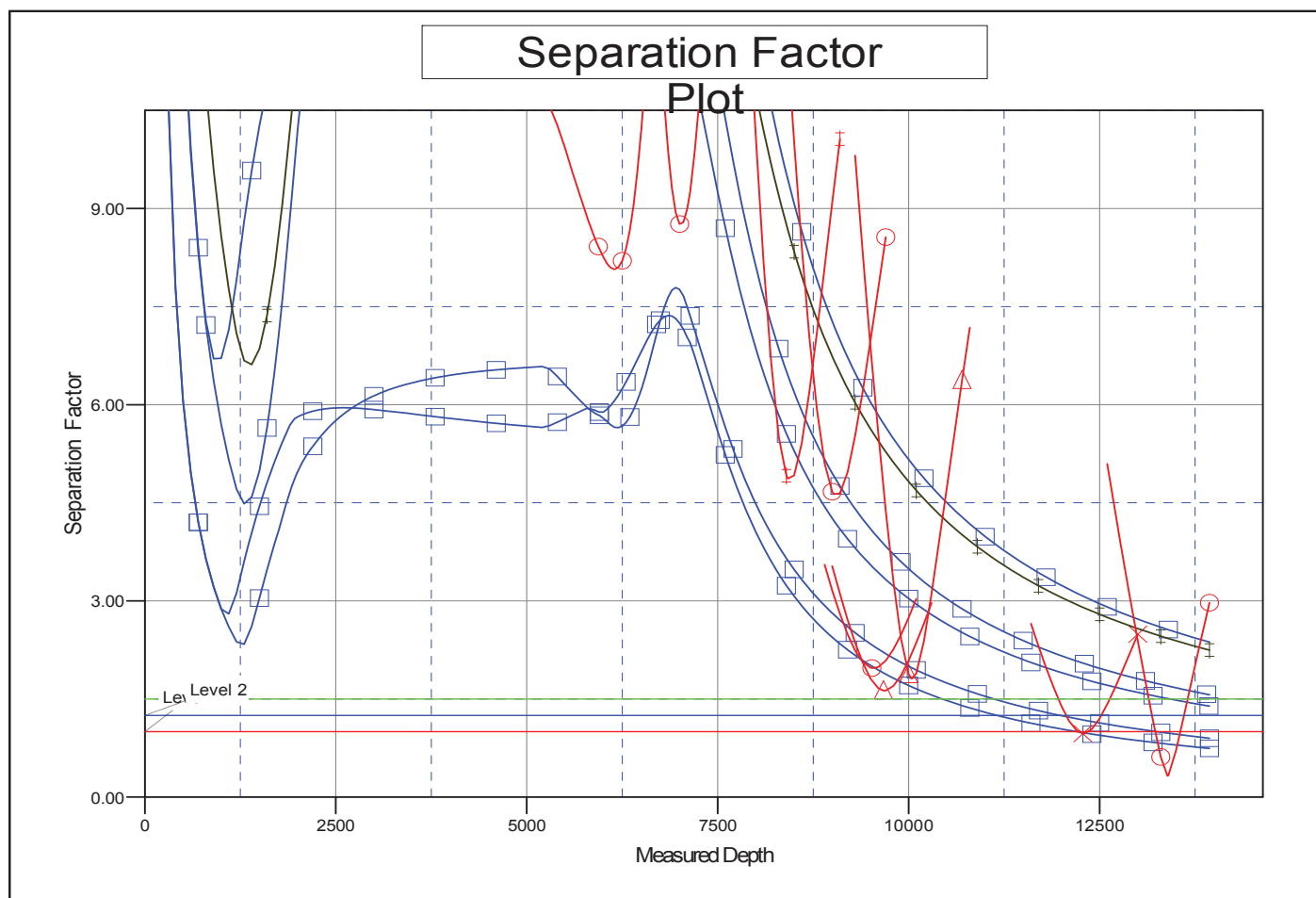
Coordinates are relative to: Ottenhoff 29R-143
 Coordinate System is US State Plane 1983, Colorado Northern Zone
 Grid Convergence at Surface is: 0.60°



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Reference Design:	Plan #2 (1-25-17)	Offset TVD Reference:	Offset Datum

Reference Depths are relative to WELL @ 4686.0ft (RKB - 23')
Offset Depths are relative to Offset Datum
Central Meridian is -105.500000

Coordinates are relative to: Ottenhoff 29R-143
Coordinate System is US State Plane 1983, Colorado Northern Zone
Grid Convergence at Surface is: 0.60°



LEGEND

Ottenhoff29R-323, Wellbore #1, Plan #2 (1-25-17) V0	Ottenhoff29U-343, Wellbore #1, Plan #2 (1-25-17) V0	Ottenhoff41-6B (Exist), Wellbore #1, Wellbore:
Ottenhoff29M-323, Wellbore #1, Plan #2 (1-25-17) V0	Ottenhoff29M-423, Wellbore #1, Plan #2 (1-25-17) V0	Bell B29-22D, Bell B29-22D, Bell B29-22D V0
Ottenhoff29M-203, Wellbore #1, Plan #2 (1-25-17) V0	Ottenhoff29U-243, Wellbore #1, Plan #2 (1-25-17) V0	Blake B 29-23 (Exist), Wellbore #1, Wellbore #
Ottenhoff29R-423, Wellbore #1, Plan #2 (1-25-17) V0	Pearlman #32-13 (Exist), Wellbore #1, Wellbore #1 V0	Blake #B29-10 (D&A), Wellbore #1, Wellbore #
Ottenhoff29R-243, Wellbore #1, Plan #2 (1-25-17) V0	Carlson 29-1 (Exist), Wellbore #1, Wellbore #1 V0	Blake #B 29-10X (Exist), Wellbore #1, Wellbor
Ottenhoff29R-203, Wellbore #1, Plan #2 (1-25-17) V0	DIC Cross#31-32 (P&A), Wellbore #1, Wellbore #1 V0	
Ottenhoff29R-303, Wellbore #1, Plan #2 (1-25-17) V0	Ottenhoff#29-1 (Exist), Wellbore #1, Wellbore #1 V0	