

# PDC Energy Inc. DJ Basin

Well Name: **Ottenhoff 29M-353**

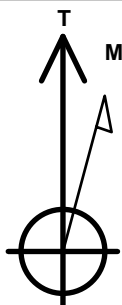
Surface Location: Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W  
North American Datum 1983 , US State Plane 1983 Colorado Northern Zone  
Ground Elevation: 4663.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1381166.58	3259629.39	40.375959	-104.568106	

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

## DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Shape
SHL 557'FNL & 1065'FEL, Sec.29	1.0	0.0	0.0	Point
BHL 2340'FNL & 2381'FEL, Sec.32	6796.0	-7074.8	-1270.3	Point
LPL 470'FNL & 2332'FEL, Sec.29	6816.0	63.9	-1265.2	Point



Azimuths to True North  
Magnetic North: 8.17°

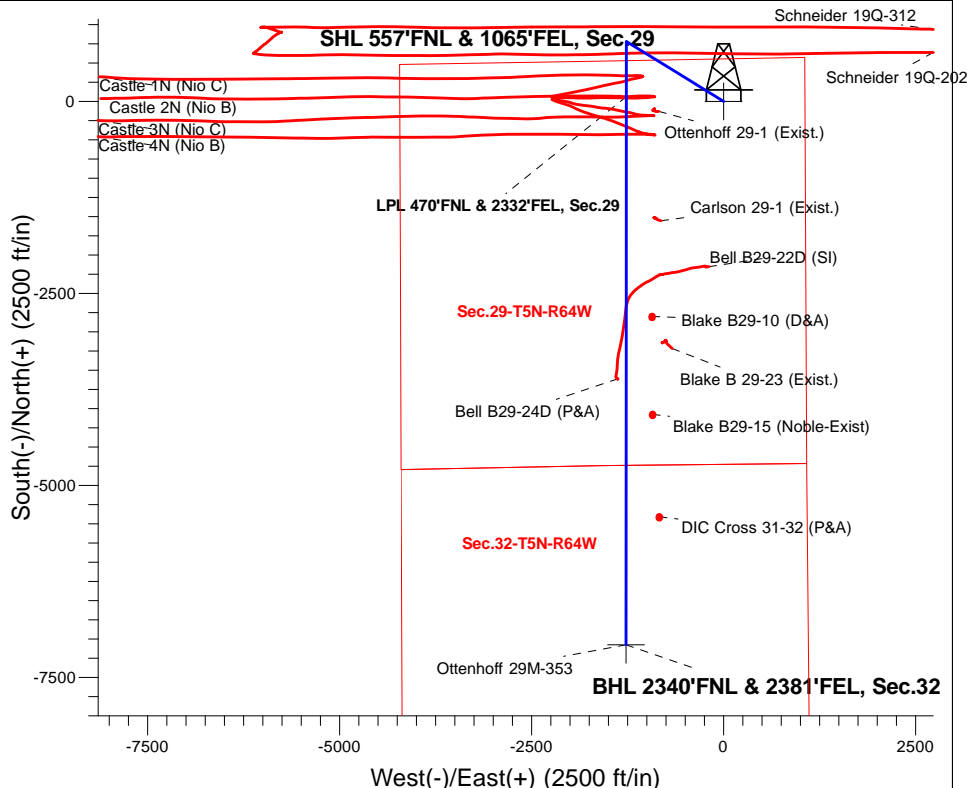
Magnetic Field  
Strength: 52250.6snT  
Dip Angle: 66.90°  
Date: 5/10/2018  
Model: HDGM

Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W  
Ottenhoff 29M-353  
Plan #5 (5-10-18)  
12:41, May 10 2018

## ANNOTATIONS

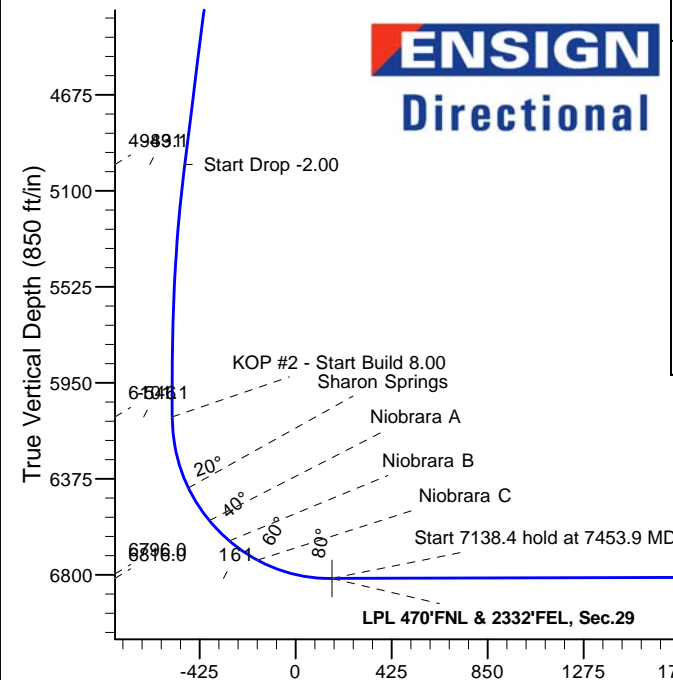
TVD	MD	Annotation
400.0	400.0	KOP - Start Build 1.50
4983.1	5191.6	Start Drop -2.00
6101.1	6326.0	KOP #2 - Start Build 8.00
6816.0	7453.9	Start 7138.4 hold at 7453.9 MD
6796.0	14592.3	TD at 14592.3

South(-)/North(+) (2500 ft/in)



## 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	400.0	0.00	0.00	400.0	0.0	0.0	0.00	0.00	0.0	
3	1644.4	18.67	301.72	1622.5	105.6	-170.9	1.50	301.72	-73.8	
4	5191.6	18.67	301.72	4983.2	702.6	-1136.5	0.00	0.00	-490.7	
5	6124.9	0.00	0.00	5900.0	781.8	-1264.7	2.00	180.00	-546.0	
6	6326.0	0.00	0.00	6101.1	781.8	-1264.7	0.00	0.00	-546.0	
7	7452.5	90.16	180.04	6816.0	64.9	-1265.2	8.00	180.04	159.7	
8	7453.5	90.16	180.04	6816.0	63.9	-1265.2	0.00	0.00	160.7	LPL 470'FNL & 2332'FEL, Sec.29
9	7453.9	90.16	180.04	6816.0	63.5	-1265.2	0.50	-72.78	161.1	
10	14592.3	90.16	180.04	6796.0	-7074.8	-1270.3	0.00	0.00	7188.0	BHL 2340'FNL & 2381'FEL, Sec.32



Vertical Section at 190.18° (850 ft/in)

BHL 2340'FNL & 2381'FEL, Sec.32

TD at 14592.3



## **PDC Energy Inc. DJ Basin**

**SEC.29-T5N-R64W**

**Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W**

**Ottenhoff 29M-353**

**Wellbore #1**

**Plan: Plan #5 (5-10-18)**

## **Standard Planning Report**

**10 May, 2018**

<b>Database:</b>	US_EDM	<b>Local Co-ordinate Reference:</b>	Well Ottenhoff 29M-353
<b>Company:</b>	PDC Energy Inc. DJ Basin	<b>TVD Reference:</b>	WWWELL @ 4686.0ft (RKB - 23')
<b>Project:</b>	SEC.29-T5N-R64W	<b>MD Reference:</b>	WWWELL @ 4686.0ft (RKB - 23')
<b>Site:</b>	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	<b>North Reference:</b>	True
<b>Well:</b>	Ottenhoff 29M-353	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Plan #5 (5-10-18)		

<b>Project</b>	SEC.29-T5N-R64W, Weld County, CO		
<b>Map System:</b>	US State Plane 1983	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		Using Well Reference Point
<b>Map Zone:</b>	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 29M-353					
Well Position	+N/-S	1.1 ft	Northing:	1,381,166.58 usft	Latitude:	40.375959
	+E/-W	-120.1 ft	Easting:	3,259,629.39 usft	Longitude:	-104.568106
Position Uncertainty		0.0 ft	Wellhead Elevation:	0.0 ft	Ground Level:	4,663.0 ft

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

<b>Design</b>	Plan #5 (5-10-18)			
<b>Audit Notes:</b>				
<b>Version:</b>	<b>Phase:</b>	PLAN	<b>Tie On Depth:</b>	0.0
<b>Vertical Section:</b>	<b>Depth From (TVD) (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Direction (°)</b>
	0.0	0.0	0.0	190.18

<b>Plan Sections</b>										
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	
400.0	0.00	0.00	400.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,644.4	18.67	301.72	1,622.5	105.6	-170.9	1.50	1.50	0.00	301.72	
5,191.6	18.67	301.72	4,983.2	702.6	-1,136.5	0.00	0.00	0.00	0.00	
6,124.9	0.00	0.00	5,900.0	781.8	-1,264.7	2.00	-2.00	0.00	180.00	
6,326.0	0.00	0.00	6,101.1	781.8	-1,264.7	0.00	0.00	0.00	0.00	
7,452.5	90.16	180.04	6,816.0	64.9	-1,265.2	8.00	8.00	0.00	180.04	
7,453.5	90.16	180.04	6,816.0	63.9	-1,265.2	0.00	0.00	0.00	0.00	LPL 470'FNL & 2332'
7,453.9	90.16	180.04	6,816.0	63.5	-1,265.2	0.50	0.15	-0.48	-72.78	
14,592.3	90.16	180.04	6,796.0	-7,074.8	-1,270.3	0.00	0.00	0.00	0.00	BHL 2340'FNL & 238'

Database:	US_EDM	Local Co-ordinate Reference:	Well Ottenhoff 29M-353
Company:	PDC Energy Inc. DJ Basin	TVD Reference:	WWWELL @ 4686.0ft (RKB - 23')
Project:	SEC.29-T5N-R64W	MD Reference:	WWWELL @ 4686.0ft (RKB - 23')
Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	North Reference:	True
Well:	Ottenhoff 29M-353	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #5 (5-10-18)		

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
1.0	0.00	0.00	1.0	0.0	0.0	0.0	0.00	0.00	0.00
SHL 557°FNL & 1065°FEL, Sec.29									
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
KOP - Start Build 1.50									
500.0	1.50	301.72	500.0	0.7	-1.1	-0.5	1.50	1.50	0.00
600.0	3.00	301.72	599.9	2.8	-4.5	-1.9	1.50	1.50	0.00
700.0	4.50	301.72	699.7	6.2	-10.0	-4.3	1.50	1.50	0.00
800.0	6.00	301.72	799.3	11.0	-17.8	-7.7	1.50	1.50	0.00
900.0	7.50	301.72	898.6	17.2	-27.8	-12.0	1.50	1.50	0.00
1,000.0	9.00	301.72	997.5	24.7	-40.0	-17.3	1.50	1.50	0.00
1,100.0	10.50	301.72	1,096.1	33.6	-54.4	-23.5	1.50	1.50	0.00
1,200.0	12.00	301.72	1,194.2	43.9	-71.0	-30.7	1.50	1.50	0.00
1,300.0	13.50	301.72	1,291.7	55.5	-89.8	-38.8	1.50	1.50	0.00
1,400.0	15.00	301.72	1,388.6	68.4	-110.7	-47.8	1.50	1.50	0.00
1,500.0	16.50	301.72	1,484.9	82.7	-133.8	-57.8	1.50	1.50	0.00
1,600.0	18.00	301.72	1,580.4	98.3	-159.0	-68.7	1.50	1.50	0.00
1,644.4	18.67	301.72	1,622.5	105.6	-170.9	-73.8	1.50	1.50	0.00
1,700.0	18.67	301.72	1,675.2	115.0	-186.0	-80.3	0.00	0.00	0.00
1,800.0	18.67	301.72	1,769.9	131.8	-213.3	-92.1	0.00	0.00	0.00
1,900.0	18.67	301.72	1,864.7	148.7	-240.5	-103.8	0.00	0.00	0.00
2,000.0	18.67	301.72	1,959.4	165.5	-267.7	-115.6	0.00	0.00	0.00
2,100.0	18.67	301.72	2,054.1	182.3	-294.9	-127.3	0.00	0.00	0.00
2,200.0	18.67	301.72	2,148.9	199.1	-322.1	-139.1	0.00	0.00	0.00
2,300.0	18.67	301.72	2,243.6	216.0	-349.4	-150.8	0.00	0.00	0.00
2,400.0	18.67	301.72	2,338.4	232.8	-376.6	-162.6	0.00	0.00	0.00
2,500.0	18.67	301.72	2,433.1	249.6	-403.8	-174.3	0.00	0.00	0.00
2,600.0	18.67	301.72	2,527.8	266.5	-431.0	-186.1	0.00	0.00	0.00
2,700.0	18.67	301.72	2,622.6	283.3	-458.3	-197.8	0.00	0.00	0.00
2,800.0	18.67	301.72	2,717.3	300.1	-485.5	-209.6	0.00	0.00	0.00
2,900.0	18.67	301.72	2,812.1	316.9	-512.7	-221.3	0.00	0.00	0.00
3,000.0	18.67	301.72	2,906.8	333.8	-539.9	-233.1	0.00	0.00	0.00
3,100.0	18.67	301.72	3,001.5	350.6	-567.1	-244.8	0.00	0.00	0.00
3,200.0	18.67	301.72	3,096.3	367.4	-594.4	-256.6	0.00	0.00	0.00
3,300.0	18.67	301.72	3,191.0	384.2	-621.6	-268.3	0.00	0.00	0.00
3,400.0	18.67	301.72	3,285.8	401.1	-648.8	-280.1	0.00	0.00	0.00
3,500.0	18.67	301.72	3,380.5	417.9	-676.0	-291.9	0.00	0.00	0.00
3,600.0	18.67	301.72	3,475.2	434.7	-703.3	-303.6	0.00	0.00	0.00
3,657.8	18.67	301.72	3,530.0	444.5	-719.0	-310.4	0.00	0.00	0.00
Parkman Sandstone									
3,700.0	18.67	301.72	3,570.0	451.6	-730.5	-315.4	0.00	0.00	0.00
3,800.0	18.67	301.72	3,664.7	468.4	-757.7	-327.1	0.00	0.00	0.00
3,900.0	18.67	301.72	3,759.5	485.2	-784.9	-338.9	0.00	0.00	0.00
4,000.0	18.67	301.72	3,854.2	502.0	-812.1	-350.6	0.00	0.00	0.00
4,100.0	18.67	301.72	3,949.0	518.9	-839.4	-362.4	0.00	0.00	0.00
4,200.0	18.67	301.72	4,043.7	535.7	-866.6	-374.1	0.00	0.00	0.00
4,300.0	18.67	301.72	4,138.4	552.5	-893.8	-385.9	0.00	0.00	0.00
4,365.0	18.67	301.72	4,200.0	563.5	-911.5	-393.5	0.00	0.00	0.00
Sussex Sandstone									
4,400.0	18.67	301.72	4,233.2	569.4	-921.0	-397.6	0.00	0.00	0.00

Database:	US_EDM	Local Co-ordinate Reference:	Well Ottenhoff 29M-353
Company:	PDC Energy Inc. DJ Basin	TVD Reference:	WWWELL @ 4686.0ft (RKB - 23')
Project:	SEC.29-T5N-R64W	MD Reference:	WWWELL @ 4686.0ft (RKB - 23')
Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	North Reference:	True
Well:	Ottenhoff 29M-353	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #5 (5-10-18)		

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)
4,500.0	18.67	301.72	4,327.9	586.2	-948.3	-409.4	0.00	0.00	0.00
4,600.0	18.67	301.72	4,422.7	603.0	-975.5	-421.1	0.00	0.00	0.00
4,700.0	18.67	301.72	4,517.4	619.8	-1,002.7	-432.9	0.00	0.00	0.00
4,800.0	18.67	301.72	4,612.1	636.7	-1,029.9	-444.6	0.00	0.00	0.00
4,900.0	18.67	301.72	4,706.9	653.5	-1,057.2	-456.4	0.00	0.00	0.00
5,000.0	18.67	301.72	4,801.6	670.3	-1,084.4	-468.1	0.00	0.00	0.00
5,100.0	18.67	301.72	4,896.4	687.2	-1,111.6	-479.9	0.00	0.00	0.00
5,191.6	18.67	301.72	4,983.1	702.6	-1,136.5	-490.7	0.00	0.00	0.00
Start Drop -2.00									
5,200.0	18.50	301.72	4,991.1	704.0	-1,138.8	-491.6	2.00	-2.00	0.00
5,300.0	16.50	301.72	5,086.5	719.8	-1,164.4	-502.7	2.00	-2.00	0.00
5,400.0	14.50	301.72	5,182.8	733.8	-1,187.1	-512.5	2.00	-2.00	0.00
5,500.0	12.50	301.72	5,280.1	746.1	-1,207.0	-521.1	2.00	-2.00	0.00
5,600.0	10.50	301.72	5,378.0	756.6	-1,223.9	-528.4	2.00	-2.00	0.00
5,700.0	8.50	301.72	5,476.7	765.3	-1,237.9	-534.4	2.00	-2.00	0.00
5,800.0	6.50	301.72	5,575.8	772.1	-1,249.0	-539.2	2.00	-2.00	0.00
5,900.0	4.50	301.72	5,675.3	777.2	-1,257.2	-542.7	2.00	-2.00	0.00
6,000.0	2.50	301.72	5,775.2	780.4	-1,262.4	-545.0	2.00	-2.00	0.00
6,100.0	0.50	301.72	5,875.1	781.7	-1,264.6	-545.9	2.00	-2.00	0.00
6,124.9	0.00	0.00	5,900.0	781.8	-1,264.7	-546.0	2.00	-2.00	0.00
6,200.0	0.00	0.00	5,975.1	781.8	-1,264.7	-546.0	0.00	0.00	0.00
6,300.0	0.00	0.00	6,075.1	781.8	-1,264.7	-546.0	0.00	0.00	0.00
6,326.0	0.00	0.00	6,101.1	781.8	-1,264.7	-546.0	0.00	0.00	0.00
KOP #2 - Start Build 8.00									
6,400.0	5.92	180.04	6,175.0	778.0	-1,264.7	-542.2	8.01	8.01	0.00
6,500.0	13.93	180.04	6,273.4	760.8	-1,264.7	-525.3	8.00	8.00	0.00
6,600.0	21.93	180.04	6,368.5	730.0	-1,264.7	-495.0	8.00	8.00	0.00
6,650.9	26.01	180.04	6,415.0	709.3	-1,264.8	-474.6	8.00	8.00	0.00
Sharon Springs									
6,700.0	29.93	180.04	6,458.3	686.3	-1,264.8	-452.0	8.00	8.00	0.00
6,800.0	37.94	180.04	6,541.2	630.5	-1,264.8	-397.1	8.00	8.00	0.00
6,824.1	39.87	180.04	6,560.0	615.4	-1,264.8	-382.2	8.00	8.00	0.00
Niobrara A									
6,900.0	45.94	180.04	6,615.6	563.7	-1,264.9	-331.3	8.00	8.00	0.00
6,951.5	50.06	180.04	6,650.0	525.5	-1,264.9	-293.7	8.00	8.00	0.00
Niobrara B									
7,000.0	53.94	180.04	6,679.9	487.3	-1,264.9	-256.0	8.00	8.00	0.00
7,100.0	61.95	180.04	6,732.9	402.6	-1,265.0	-172.7	8.00	8.00	0.00
7,104.5	62.31	180.04	6,735.0	398.6	-1,265.0	-168.8	8.00	8.00	0.00
Niobrara C									
7,200.0	69.95	180.04	6,773.6	311.3	-1,265.0	-82.9	8.00	8.00	0.00
7,300.0	77.95	180.04	6,801.2	215.3	-1,265.1	11.7	8.00	8.00	0.00
7,400.0	85.96	180.04	6,815.2	116.4	-1,265.2	109.1	8.00	8.00	0.00
7,452.5	90.16	180.04	6,816.0	64.9	-1,265.2	159.7	8.00	8.00	0.00
7,453.5	90.16	180.04	6,816.0	63.9	-1,265.2	160.7	0.00	0.00	0.00
LPL 470'FNL & 2332'FEL, Sec.29									
7,453.9	90.16	180.04	6,816.0	63.5	-1,265.2	161.1	0.46	0.14	-0.44
Start 7138.4 hold at 7453.9 MD									
7,500.0	90.16	180.04	6,815.9	17.4	-1,265.3	206.5	0.00	0.00	0.00
7,600.0	90.16	180.04	6,815.6	-82.6	-1,265.3	304.9	0.00	0.00	0.00
7,700.0	90.16	180.04	6,815.3	-182.6	-1,265.4	403.3	0.00	0.00	0.00
7,800.0	90.16	180.04	6,815.0	-282.6	-1,265.5	501.8	0.00	0.00	0.00

<b>Database:</b>	US_EDM	<b>Local Co-ordinate Reference:</b>	Well Ottenhoff 29M-353
<b>Company:</b>	PDC Energy Inc. DJ Basin	<b>TVD Reference:</b>	WWWELL @ 4686.0ft (RKB - 23')
<b>Project:</b>	SEC.29-T5N-R64W	<b>MD Reference:</b>	WWWELL @ 4686.0ft (RKB - 23')
<b>Site:</b>	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	<b>North Reference:</b>	True
<b>Well:</b>	Ottenhoff 29M-353	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Plan #5 (5-10-18)		

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)
7,900.0	90.16	180.04	6,814.7	-382.6	-1,265.6	600.2	0.00	0.00	0.00
8,000.0	90.16	180.04	6,814.5	-482.6	-1,265.6	698.7	0.00	0.00	0.00
8,100.0	90.16	180.04	6,814.2	-582.6	-1,265.7	797.1	0.00	0.00	0.00
8,200.0	90.16	180.04	6,813.9	-682.6	-1,265.8	895.5	0.00	0.00	0.00
8,300.0	90.16	180.04	6,813.6	-782.6	-1,265.8	994.0	0.00	0.00	0.00
8,400.0	90.16	180.04	6,813.3	-882.6	-1,265.9	1,092.4	0.00	0.00	0.00
8,500.0	90.16	180.04	6,813.1	-982.6	-1,266.0	1,190.8	0.00	0.00	0.00
8,600.0	90.16	180.04	6,812.8	-1,082.6	-1,266.0	1,289.3	0.00	0.00	0.00
8,700.0	90.16	180.04	6,812.5	-1,182.6	-1,266.1	1,387.7	0.00	0.00	0.00
8,800.0	90.16	180.04	6,812.2	-1,282.6	-1,266.2	1,486.2	0.00	0.00	0.00
8,900.0	90.16	180.04	6,811.9	-1,382.6	-1,266.3	1,584.6	0.00	0.00	0.00
9,000.0	90.16	180.04	6,811.7	-1,482.6	-1,266.3	1,683.0	0.00	0.00	0.00
9,100.0	90.16	180.04	6,811.4	-1,582.6	-1,266.4	1,781.5	0.00	0.00	0.00
9,200.0	90.16	180.04	6,811.1	-1,682.6	-1,266.5	1,879.9	0.00	0.00	0.00
9,300.0	90.16	180.04	6,810.8	-1,782.6	-1,266.5	1,978.4	0.00	0.00	0.00
9,400.0	90.16	180.04	6,810.5	-1,882.6	-1,266.6	2,076.8	0.00	0.00	0.00
9,500.0	90.16	180.04	6,810.3	-1,982.6	-1,266.7	2,175.2	0.00	0.00	0.00
9,600.0	90.16	180.04	6,810.0	-2,082.6	-1,266.8	2,273.7	0.00	0.00	0.00
9,700.0	90.16	180.04	6,809.7	-2,182.6	-1,266.8	2,372.1	0.00	0.00	0.00
9,800.0	90.16	180.04	6,809.4	-2,282.6	-1,266.9	2,470.5	0.00	0.00	0.00
9,900.0	90.16	180.04	6,809.1	-2,382.6	-1,267.0	2,569.0	0.00	0.00	0.00
10,000.0	90.16	180.04	6,808.9	-2,482.6	-1,267.0	2,667.4	0.00	0.00	0.00
10,100.0	90.16	180.04	6,808.6	-2,582.6	-1,267.1	2,765.9	0.00	0.00	0.00
10,200.0	90.16	180.04	6,808.3	-2,682.6	-1,267.2	2,864.3	0.00	0.00	0.00
10,300.0	90.16	180.04	6,808.0	-2,782.6	-1,267.3	2,962.7	0.00	0.00	0.00
10,400.0	90.16	180.04	6,807.7	-2,882.6	-1,267.3	3,061.2	0.00	0.00	0.00
10,500.0	90.16	180.04	6,807.5	-2,982.6	-1,267.4	3,159.6	0.00	0.00	0.00
10,600.0	90.16	180.04	6,807.2	-3,082.6	-1,267.5	3,258.0	0.00	0.00	0.00
10,700.0	90.16	180.04	6,806.9	-3,182.6	-1,267.5	3,356.5	0.00	0.00	0.00
10,800.0	90.16	180.04	6,806.6	-3,282.6	-1,267.6	3,454.9	0.00	0.00	0.00
10,900.0	90.16	180.04	6,806.3	-3,382.6	-1,267.7	3,553.4	0.00	0.00	0.00
11,000.0	90.16	180.04	6,806.1	-3,482.6	-1,267.8	3,651.8	0.00	0.00	0.00
11,100.0	90.16	180.04	6,805.8	-3,582.6	-1,267.8	3,750.2	0.00	0.00	0.00
11,200.0	90.16	180.04	6,805.5	-3,682.6	-1,267.9	3,848.7	0.00	0.00	0.00
11,300.0	90.16	180.04	6,805.2	-3,782.6	-1,268.0	3,947.1	0.00	0.00	0.00
11,400.0	90.16	180.04	6,804.9	-3,882.6	-1,268.0	4,045.6	0.00	0.00	0.00
11,500.0	90.16	180.04	6,804.7	-3,982.6	-1,268.1	4,144.0	0.00	0.00	0.00
11,600.0	90.16	180.04	6,804.4	-4,082.6	-1,268.2	4,242.4	0.00	0.00	0.00
11,700.0	90.16	180.04	6,804.1	-4,182.6	-1,268.3	4,340.9	0.00	0.00	0.00
11,800.0	90.16	180.04	6,803.8	-4,282.6	-1,268.3	4,439.3	0.00	0.00	0.00
11,900.0	90.16	180.04	6,803.5	-4,382.6	-1,268.4	4,537.7	0.00	0.00	0.00
12,000.0	90.16	180.04	6,803.3	-4,482.6	-1,268.5	4,636.2	0.00	0.00	0.00
12,100.0	90.16	180.04	6,803.0	-4,582.6	-1,268.5	4,734.6	0.00	0.00	0.00
12,200.0	90.16	180.04	6,802.7	-4,682.6	-1,268.6	4,833.1	0.00	0.00	0.00
12,300.0	90.16	180.04	6,802.4	-4,782.6	-1,268.7	4,931.5	0.00	0.00	0.00
12,400.0	90.16	180.04	6,802.1	-4,882.6	-1,268.8	5,029.9	0.00	0.00	0.00
12,500.0	90.16	180.04	6,801.9	-4,982.6	-1,268.8	5,128.4	0.00	0.00	0.00
12,600.0	90.16	180.04	6,801.6	-5,082.6	-1,268.9	5,226.8	0.00	0.00	0.00
12,700.0	90.16	180.04	6,801.3	-5,182.6	-1,269.0	5,325.2	0.00	0.00	0.00
12,800.0	90.16	180.04	6,801.0	-5,282.6	-1,269.0	5,423.7	0.00	0.00	0.00
12,900.0	90.16	180.04	6,800.7	-5,382.6	-1,269.1	5,522.1	0.00	0.00	0.00
13,000.0	90.16	180.04	6,800.5	-5,482.6	-1,269.2	5,620.6	0.00	0.00	0.00
13,100.0	90.16	180.04	6,800.2	-5,582.6	-1,269.3	5,719.0	0.00	0.00	0.00

<b>Database:</b>	US_EDM	<b>Local Co-ordinate Reference:</b>	Well Ottenhoff 29M-353
<b>Company:</b>	PDC Energy Inc. DJ Basin	<b>TVD Reference:</b>	WWWELL @ 4686.0ft (RKB - 23')
<b>Project:</b>	SEC.29-T5N-R64W	<b>MD Reference:</b>	WWWELL @ 4686.0ft (RKB - 23')
<b>Site:</b>	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	<b>North Reference:</b>	True
<b>Well:</b>	Ottenhoff 29M-353	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Plan #5 (5-10-18)		

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)
13,200.0	90.16	180.04	6,799.9	-5,682.6	-1,269.3	5,817.4	0.00	0.00	0.00
13,300.0	90.16	180.04	6,799.6	-5,782.6	-1,269.4	5,915.9	0.00	0.00	0.00
13,400.0	90.16	180.04	6,799.3	-5,882.6	-1,269.5	6,014.3	0.00	0.00	0.00
13,500.0	90.16	180.04	6,799.1	-5,982.6	-1,269.5	6,112.8	0.00	0.00	0.00
13,600.0	90.16	180.04	6,798.8	-6,082.6	-1,269.6	6,211.2	0.00	0.00	0.00
13,700.0	90.16	180.04	6,798.5	-6,182.6	-1,269.7	6,309.6	0.00	0.00	0.00
13,800.0	90.16	180.04	6,798.2	-6,282.6	-1,269.8	6,408.1	0.00	0.00	0.00
13,900.0	90.16	180.04	6,797.9	-6,382.6	-1,269.8	6,506.5	0.00	0.00	0.00
14,000.0	90.16	180.04	6,797.7	-6,482.6	-1,269.9	6,604.9	0.00	0.00	0.00
14,100.0	90.16	180.04	6,797.4	-6,582.6	-1,270.0	6,703.4	0.00	0.00	0.00
14,200.0	90.16	180.04	6,797.1	-6,682.6	-1,270.0	6,801.8	0.00	0.00	0.00
14,300.0	90.16	180.04	6,796.8	-6,782.6	-1,270.1	6,900.3	0.00	0.00	0.00
14,400.0	90.16	180.04	6,796.5	-6,882.6	-1,270.2	6,998.7	0.00	0.00	0.00
14,500.0	90.16	180.04	6,796.3	-6,982.6	-1,270.3	7,097.1	0.00	0.00	0.00
14,592.3	90.16	180.04	6,796.0	-7,074.8	-1,270.3	7,188.0	0.00	0.00	0.00
TD at 14592.3 - BHL 2340'FNL & 2381'FEL, Sec.32									

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude
- hit/miss target									
- Shape									
SHL 557'FNL & 1065'FE - plan hits target center - Point	0.00	0.00	1.0	0.0	0.0	1,381,166.60	3,259,629.39	40.375959	-104.568106
BHL 2340'FNL & 2381'F - plan hits target center - Point	0.00	0.00	6,796.0	-7,074.8	-1,270.3	1,374,079.08	3,258,433.55	40.356539	-104.572664
LPL 470'FNL & 2332'FEI - plan hits target center - Point	0.00	0.00	6,816.0	63.9	-1,265.2	1,381,217.18	3,258,363.61	40.376134	-104.572647

Formations						
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)	
3,657.8	3,530.0	Parkman Sandstone		0.00		
4,365.0	4,200.0	Sussex Sandstone		0.00		
6,650.9	6,415.0	Sharon Springs		0.00		
6,824.1	6,560.0	Niobrara A		0.00		
6,951.5	6,650.0	Niobrara B		0.00		
7,104.5	6,735.0	Niobrara C		0.00		

<b>Database:</b>	US_EDM	<b>Local Co-ordinate Reference:</b>	Well Ottenhoff 29M-353
<b>Company:</b>	PDC Energy Inc. DJ Basin	<b>TVD Reference:</b>	WWWELL @ 4686.0ft (RKB - 23')
<b>Project:</b>	SEC.29-T5N-R64W	<b>MD Reference:</b>	WWWELL @ 4686.0ft (RKB - 23')
<b>Site:</b>	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	<b>North Reference:</b>	True
<b>Well:</b>	Ottenhoff 29M-353	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Plan #5 (5-10-18)		

Plan Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
400.0	400.0	0.0	0.0	KOP - Start Build 1.50
5,191.6	4,983.1	702.6	-1,136.5	Start Drop -2.00
6,326.0	6,101.1	781.8	-1,264.7	KOP #2 - Start Build 8.00
7,453.9	6,816.0	63.5	-1,265.2	Start 7138.4 hold at 7453.9 MD
14,592.3	6,796.0	-7,074.8	-1,270.3	TD at 14592.3





## **PDC Energy Inc. DJ Basin**

**SEC.29-T5N-R64W**

**Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W**

**Ottenhoff 29M-353**

**Wellbore #1**

**Plan #5 (5-10-18)**

## **Anticollision Report**

**10 May, 2018**

<b>Company:</b>	PDC Energy Inc. DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Ottenhoff 29M-353
<b>Project:</b>	SEC.29-T5N-R64W	<b>TVD Reference:</b>	WWWELL @ 4686.0ft (RKB - 23')
<b>Reference Site:</b>	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	<b>MD Reference:</b>	WWWELL @ 4686.0ft (RKB - 23')
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Ottenhoff 29M-353	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.45 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #5 (5-10-18)	<b>Offset TVD Reference:</b>	Offset Datum

<b>Reference</b>	Plan #5 (5-10-18)		
<b>Filter type:</b>	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
<b>Interpolation Method:</b>	MD Interval 100.0ft	<b>Error Model:</b>	ISCWSA
<b>Depth Range:</b>	Unlimited	<b>Scan Method:</b>	Closest Approach 3D
<b>Results Limited by:</b>	Maximum center-center distance of 500.0 ft	<b>Error Surface:</b>	Elliptical Conic
<b>Warning Levels Evaluated at:</b>	2.45 Sigma	<b>Casing Method:</b>	Not applied

<b>Survey Tool Program</b>	<b>Date</b>	5/10/2018		
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>
0.0	14,592.3	Plan #5 (5-10-18) (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
<b>Offset Well - Wellbore - Design</b>						
Bell (Exist.) Pad SEC.29-T5N-R64W						
Bell B29-22D (SI) - Bell B29-22D - Bell B29-22D						Out of range
Bell B29-24D (P&A) - Bell B29-24D - Bell B29-24D	11,122.8	7,126.7	120.1	-5.8	0.954	Level 1, CC, ES, SF
Castle 5N64W29 1-4 Pad Sec.29-T5N-R64W						
Castle 1N (Nio C) - Wellbore #1 - Wellbore #1	7,169.0	6,979.2	20.9	-11.7	0.640	Level 1, CC, ES, SF
Castle 2N (Nio B) - Wellbore #1 - Wellbore #1	7,447.9	7,047.8	163.3	141.4	7.460	CC, ES, SF
Castle 3N (Nio C) - Wellbore #1 - Wellbore #1	7,718.4	7,113.0	81.5	56.3	3.241	CC, ES, SF
Castle 4N (Nio B) - Wellbore #1 - Wellbore #1	7,945.1	7,083.6	133.8	106.9	4.976	CC, ES, SF
Existing Wells Sec.29-T5N-R64W						
Blake B29-10 (D&A) - Wellbore #1 - Wellbore #1	10,316.2	6,811.0	336.9	96.1	1.399	Level 3, CC, ES, SF
Blake B29-15 (Noble-Exist) - Wellbore #1 - Wellbore #1	11,589.8	6,822.4	341.9	72.0	1.267	Level 3, CC
Blake B29-15 (Noble-Exist) - Wellbore #1 - Wellbore #1	11,600.0	6,822.4	342.0	71.9	1.266	Level 3, ES, SF
Carlson 29-1 (Exist.) - Wellbore #1 - Wellbore #1	9,067.5	6,784.6	438.8	376.0	6.983	CC, ES
Carlson 29-1 (Exist.) - Wellbore #1 - Wellbore #1	9,100.0	6,785.1	440.1	376.5	6.928	SF
DIC Cross 31-32 (P&A) - Wellbore #1 - Wellbore #1	12,926.4	6,826.7	431.7	130.9	1.435	Level 3, CC, ES, SF
Ottenhoff 29-1 (Exist.) - Wellbore #1 - Wellbore #1	7,647.1	6,796.6	411.0	370.2	10.084	CC, ES
Ottenhoff 29-1 (Exist.) - Wellbore #1 - Wellbore #1	7,700.0	6,796.3	414.4	373.3	10.078	SF
Existing Wells Sec.29-T5N-R64W (GRID)						
Blake B 29-23 (Exist.) - Wellbore #1 - Wellbore #1						Out of range

<b>Company:</b>	PDC Energy Inc. DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Ottenhoff 29M-353
<b>Project:</b>	SEC.29-T5N-R64W	<b>TVD Reference:</b>	WWWELL @ 4686.0ft (RKB - 23')
<b>Reference Site:</b>	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	<b>MD Reference:</b>	WWWELL @ 4686.0ft (RKB - 23')
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Ottenhoff 29M-353	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.45 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #5 (5-10-18)	<b>Offset TVD Reference:</b>	Offset Datum

Summary						
Site Name	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W						
Ottenhoff 29M-263 - Wellbore #1 - Plan #5 (5-10-18)	400.0	401.0	15.0	13.1	7.795	CC
Ottenhoff 29M-263 - Wellbore #1 - Plan #5 (5-10-18)	14,592.3	14,444.2	241.9	-78.2	0.756	Level 1, ES, SF
Ottenhoff 29R-203 - Wellbore #1 - Plan #3 (6-27-17)	400.0	400.0	75.0	73.0	38.889	CC, ES
Ottenhoff 29R-203 - Wellbore #1 - Plan #3 (6-27-17)	900.0	898.6	104.3	99.6	22.196	SF
Ottenhoff 29R-253 - Wellbore #1 - Plan #5 (5-10-18)	400.0	400.0	45.1	43.2	23.420	CC, ES
Ottenhoff 29R-253 - Wellbore #1 - Plan #5 (5-10-18)	800.0	799.3	64.0	59.8	15.460	SF
Ottenhoff 29R-303 - Wellbore #1 - Plan #3 (6-27-17)	400.0	400.0	60.2	58.3	31.226	CC, ES
Ottenhoff 29R-303 - Wellbore #1 - Plan #3 (6-27-17)	800.0	799.3	78.8	74.7	19.051	SF
Ottenhoff 29R-323 - Wellbore #1 - Plan #3 (6-27-17)	400.0	400.0	105.0	103.1	54.502	CC, ES
Ottenhoff 29R-323 - Wellbore #1 - Plan #3 (6-27-17)	1,000.0	996.5	148.0	142.7	28.109	SF
Ottenhoff 29R-353 - Wellbore #1 - Plan #4 (3-28-18)	400.0	400.0	30.1	28.2	15.614	CC, ES
Ottenhoff 29R-353 - Wellbore #1 - Plan #4 (3-28-18)	14,592.3	14,108.5	479.5	138.4	1.406	Level 3, SF
Ottenhoff 29R-423 - Wellbore #1 - Plan #3 (6-27-17)	400.0	399.0	90.0	88.1	46.761	CC, ES
Ottenhoff 29R-423 - Wellbore #1 - Plan #3 (6-27-17)	1,000.0	996.5	132.5	127.2	25.177	SF
Ottenhoff 29U-243 - Wellbore #1 - Plan #3 (6-27-17)	400.0	400.0	120.1	118.2	62.308	CC, ES
Ottenhoff 29U-243 - Wellbore #1 - Plan #3 (6-27-17)	1,100.0	1,080.0	204.0	197.9	33.600	SF
Ottenhoff 29U-343 - Wellbore #1 - Plan #3 (6-27-17)	200.0	199.0	135.1	134.3	164.151	CC, ES
Ottenhoff 29U-343 - Wellbore #1 - Plan #3 (6-27-17)	1,100.0	1,058.9	257.5	251.3	41.473	SF
Schneider 19Q-HZ Pad Sec.19-T5N-R64W						
Schneider 19Q-202 - Wellbore #1 - Wellbore #1	6,900.0	11,380.8	116.1	-23.6	0.831	Level 1, ES, SF
Schneider 19Q-202 - Wellbore #1 - Wellbore #1	6,920.0	11,380.0	114.0	-21.8	0.839	Level 1, CC
Schneider 19Q-312 - Wellbore #1 - Wellbore #1	6,700.0	11,265.5	440.4	271.5	2.608	SF
Schneider 19Q-312 - Wellbore #1 - Wellbore #1	6,792.6	11,264.5	424.6	268.9	2.726	CC, ES

Offset Design													Offset Site Error:	0.0 ft
Bell (Exist.) Pad SEC.29-T5N-R64W - Bell B29-24D (P&A) - Bell B29-24D - Bell B29-24D													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Minimum Separation (ft)	Separation Factor	Warning			
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)		Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)						
10,700.0	6,806.9	7,119.9	6,813.5	85.0	35.8	88.01	-3,605.1	-1,388.0	439.4	322.8	116.59	3.769		
10,800.0	6,806.6	7,121.4	6,815.1	87.2	35.8	88.75	-3,605.2	-1,388.0	344.3	225.5	118.79	2.899		
10,900.0	6,806.3	7,123.0	6,816.7	89.4	35.8	89.51	-3,605.2	-1,388.0	253.0	132.1	120.99	2.091		
11,000.0	6,806.1	7,124.6	6,818.3	91.7	35.8	90.29	-3,605.2	-1,387.9	171.7	48.5	123.16	1.394	Level 3	
11,100.0	6,805.8	7,126.3	6,820.0	93.9	35.8	91.09	-3,605.3	-1,387.9	122.2	-3.1	125.32	0.975	Level 1	
11,122.8	6,805.7	7,126.7	6,820.4	94.4	35.8	91.27	-3,605.3	-1,387.9	120.1	-5.8	125.81	0.954	Level 1, CC, ES, SF	
11,200.0	6,805.5	7,128.0	6,821.7	96.1	35.8	91.91	-3,605.3	-1,387.8	142.7	15.3	127.46	1.120	Level 2	
11,300.0	6,805.2	7,129.8	6,823.5	98.3	35.8	92.76	-3,605.3	-1,387.8	214.0	84.5	129.58	1.652		
11,400.0	6,804.9	7,131.6	6,825.3	100.6	35.8	93.62	-3,605.4	-1,387.8	302.1	170.4	131.67	2.294		
11,500.0	6,804.7	7,133.5	6,827.2	102.8	35.8	94.52	-3,605.4	-1,387.7	395.8	262.1	133.73	2.960		
11,600.0	6,804.4	7,135.4	6,829.1	105.1	35.8	95.43	-3,605.4	-1,387.7	492.0	356.3	135.75	3.624		

<b>Company:</b>	PDC Energy Inc. DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Ottenhoff 29M-353
<b>Project:</b>	SEC.29-T5N-R64W	<b>TVD Reference:</b>	WWWELL @ 4686.0ft (RKB - 23')
<b>Reference Site:</b>	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	<b>MD Reference:</b>	WWWELL @ 4686.0ft (RKB - 23')
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Ottenhoff 29M-353	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.45 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #5 (5-10-18)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design													Offset Site Error:	0.0 ft
Survey Program: 155-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		
4,600.0	4,422.7	4,658.1	4,551.2	30.4	24.1	-82.18	258.4	-1,306.9	488.0	439.2	48.79	10.001		
4,700.0	4,517.4	4,751.1	4,641.4	31.3	24.6	-87.37	264.3	-1,285.1	463.5	412.3	51.18	9.055		
4,800.0	4,612.1	4,828.0	4,716.2	32.1	25.1	-91.93	269.2	-1,267.8	443.8	390.6	53.20	8.343		
4,900.0	4,706.9	4,912.8	4,798.9	32.9	25.5	-97.14	274.0	-1,250.1	430.1	375.0	55.11	7.803		
5,000.0	4,801.6	5,008.4	4,892.4	33.7	26.0	-103.19	279.9	-1,230.6	421.1	364.3	56.84	7.409		
5,100.0	4,896.4	5,098.8	4,980.3	34.6	26.5	-109.16	286.5	-1,210.9	416.2	358.0	58.15	7.157		
5,137.0	4,931.4	5,130.0	5,010.6	34.9	26.7	-111.29	288.7	-1,203.6	415.7	357.2	58.53	7.103		
5,200.0	4,991.1	5,180.3	5,059.3	35.4	27.0	-114.81	291.8	-1,191.5	417.2	358.2	59.05	7.066		
5,300.0	5,086.5	5,263.2	5,139.6	36.0	27.5	-120.48	295.9	-1,171.3	424.5	365.1	59.41	7.146		
5,400.0	5,182.8	5,349.3	5,223.7	36.5	28.0	-125.61	299.7	-1,153.0	435.6	376.1	59.47	7.325		
5,500.0	5,280.1	5,437.4	5,309.6	37.0	28.5	-130.34	302.6	-1,134.1	449.5	390.2	59.26	7.584		
5,600.0	5,378.0	5,534.7	5,405.3	37.5	29.0	-134.57	305.5	-1,116.5	463.8	404.8	58.92	7.871		
5,700.0	5,476.7	5,634.0	5,503.5	37.8	29.4	-137.92	308.5	-1,102.2	476.5	417.9	58.58	8.135		
5,800.0	5,575.8	5,733.6	5,602.4	38.1	29.7	-140.48	311.2	-1,090.6	487.4	429.1	58.31	8.360		
5,900.0	5,675.3	5,835.8	5,704.1	38.4	30.0	-142.47	314.0	-1,080.8	495.6	437.5	58.10	8.530		
6,500.0	6,273.4	6,459.8	6,327.0	38.9	31.4	-26.91	326.6	-1,054.0	483.1	427.5	55.63	8.685		
6,600.0	6,368.5	6,604.1	6,469.4	38.8	31.2	-29.10	333.2	-1,074.8	445.4	393.1	52.34	8.510		
6,700.0	6,458.3	6,708.8	6,568.0	38.5	30.9	-30.63	337.4	-1,109.3	390.0	341.5	48.43	8.052		
6,800.0	6,541.2	6,793.7	6,642.5	38.2	30.5	-31.55	337.7	-1,149.8	322.4	278.2	44.14	7.303		
6,900.0	6,615.6	6,865.5	6,700.4	37.8	30.1	-31.43	336.5	-1,192.2	244.6	204.9	39.65	6.168		
7,000.0	6,679.9	6,921.9	6,741.2	37.4	29.8	-27.62	335.1	-1,231.0	158.8	123.9	34.92	4.548		
7,100.0	6,732.9	6,960.4	6,766.0	36.9	29.5	-8.38	333.9	-1,260.5	68.9	39.2	29.65	2.322		
7,169.0	6,762.3	6,979.2	6,776.9	36.6	29.5	31.28	333.4	-1,275.9	20.9	-11.7	32.59	0.640	Level 1, CC, ES, SF	
7,200.0	6,773.6	6,985.3	6,780.2	36.5	29.4	45.81	333.3	-1,280.9	36.5	0.1	36.44	1.002	Level 2	
7,300.0	6,801.2	6,997.6	6,786.6	36.1	29.4	52.82	333.3	-1,291.5	129.2	92.0	37.23	3.470		
7,400.0	6,815.2	7,002.5	6,789.0	35.8	29.4	36.29	333.3	-1,295.7	226.4	197.2	29.17	7.763		
7,500.0	6,815.9	7,002.4	6,788.9	35.5	29.4	27.47	333.3	-1,295.6	322.6	297.3	25.24	12.780		
7,600.0	6,815.6	7,002.0	6,788.8	35.3	29.4	27.13	333.3	-1,295.3	420.9	395.2	25.78	16.326		

<b>Company:</b>	PDC Energy Inc. DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Ottenhoff 29M-353
<b>Project:</b>	SEC.29-T5N-R64W	<b>TVD Reference:</b>	WWWELL @ 4686.0ft (RKB - 23')
<b>Reference Site:</b>	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	<b>MD Reference:</b>	WWWELL @ 4686.0ft (RKB - 23')
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Ottenhoff 29M-353	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.45 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #5 (5-10-18)	<b>Offset TVD Reference:</b>	Offset Datum

<b>Offset Design</b> Castle 5N64W29 1-4 Pad Sec.29-T5N-R64W - Castle 2N (Nio B) - Wellbore #1 - Wellbore #1													<b>Offset Site Error:</b>	0.0 ft
<b>Survey Program:</b> 156-MWD													<b>Offset Well Error:</b>	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		
6,900.0	6,615.6	6,957.6	6,659.1	37.8	31.7	-3.17	64.9	-1,246.5	499.4	453.8	45.55	10.963		
7,000.0	6,679.9	6,995.9	6,676.7	37.4	31.7	3.18	64.4	-1,280.6	424.5	384.4	40.14	10.575		
7,100.0	6,732.9	7,021.1	6,687.4	36.9	31.7	9.57	64.5	-1,303.4	348.7	314.4	34.28	10.172		
7,200.0	6,773.6	7,036.7	6,693.7	36.5	31.7	15.52	64.7	-1,317.7	275.5	246.7	28.76	9.578		
7,300.0	6,801.2	7,045.1	6,697.0	36.1	31.7	20.19	64.9	-1,325.4	211.1	186.7	24.41	8.647		
7,400.0	6,815.2	7,048.0	6,698.1	35.8	31.7	22.52	65.0	-1,328.0	168.9	147.0	21.97	7.688		
7,447.9	6,817.8	7,047.8	6,698.0	35.6	31.7	22.58	65.0	-1,327.9	163.3	141.4	21.89	7.460 CC, ES, SF		
7,500.0	6,815.9	7,046.3	6,697.4	35.5	31.7	22.27	64.9	-1,326.5	168.3	146.4	21.99	7.655		
7,600.0	6,815.6	7,044.4	6,696.7	35.3	31.7	21.61	64.9	-1,324.8	218.5	196.1	22.45	9.732		
7,700.0	6,815.3	7,042.7	6,696.0	35.2	31.7	21.01	64.9	-1,323.2	295.2	272.2	22.99	12.839		
7,800.0	6,815.0	7,041.2	6,695.4	35.2	31.7	20.45	64.8	-1,321.8	382.8	359.2	23.60	16.224		
7,900.0	6,814.7	7,039.7	6,694.9	35.4	31.7	19.93	64.8	-1,320.4	475.3	451.1	24.25	19.600		

<b>Company:</b>	PDC Energy Inc. DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Ottenhoff 29M-353
<b>Project:</b>	SEC.29-T5N-R64W	<b>TVD Reference:</b>	WWWELL @ 4686.0ft (RKB - 23')
<b>Reference Site:</b>	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	<b>MD Reference:</b>	WWWELL @ 4686.0ft (RKB - 23')
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Ottenhoff 29M-353	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.45 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #5 (5-10-18)	<b>Offset TVD Reference:</b>	Offset Datum

<b>Offset Design</b> Castle 5N64W29 1-4 Pad Sec.29-T5N-R64W - Castle 3N (Nio C) - Wellbore #1 - Wellbore #1												<b>Offset Site Error:</b>	0.0 ft
Survey Program: 156-MWD												<b>Offset Well Error:</b>	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)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
7,300.0	6,801.2	7,091.2	6,762.9	36.1	32.3	5.32	-199.8	-1,279.8	421.1	399.8	21.33	19.744	
7,400.0	6,815.2	7,100.6	6,767.0	35.8	32.2	12.68	-200.2	-1,288.2	327.2	307.9	19.26	16.986	
7,500.0	6,815.9	7,104.7	6,768.7	35.5	32.2	18.87	-200.4	-1,291.9	232.9	212.1	20.88	11.158	
7,600.0	6,815.6	7,108.5	6,770.3	35.3	32.2	21.52	-200.5	-1,295.4	143.6	120.9	22.74	6.318	
7,700.0	6,815.3	7,112.3	6,771.9	35.2	32.2	24.19	-200.7	-1,298.8	83.5	58.8	24.75	3.374	
7,718.4	6,815.3	7,113.0	6,772.2	35.2	32.2	24.69	-200.7	-1,299.5	81.5	56.3	25.14	3.241	CC, ES, SF
7,800.0	6,815.0	7,116.1	6,773.5	35.2	32.2	26.88	-200.9	-1,302.3	115.3	88.4	26.90	4.285	
7,900.0	6,814.7	7,122.0	6,775.9	35.4	32.2	30.99	-201.1	-1,307.7	198.9	169.0	29.88	6.657	
8,000.0	6,814.5	7,122.0	6,775.9	35.8	32.2	30.99	-201.1	-1,307.7	292.9	262.1	30.85	9.497	
8,100.0	6,814.2	7,122.0	6,775.9	36.5	32.2	30.99	-201.1	-1,307.7	390.0	358.1	31.86	12.241	
8,200.0	6,813.9	7,122.0	6,775.9	37.3	32.2	30.99	-201.1	-1,307.7	488.2	455.3	32.91	14.834	

<b>Company:</b>	PDC Energy Inc. DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Ottenhoff 29M-353
<b>Project:</b>	SEC.29-T5N-R64W	<b>TVD Reference:</b>	WWWELL @ 4686.0ft (RKB - 23')
<b>Reference Site:</b>	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	<b>MD Reference:</b>	WWWELL @ 4686.0ft (RKB - 23')
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Ottenhoff 29M-353	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.45 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #5 (5-10-18)	<b>Offset TVD Reference:</b>	Offset Datum

<b>Offset Design</b>												<b>Offset Site Error:</b>	0.0 ft
Survey Program: 156-MWD												<b>Offset Well Error:</b>	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
7,500.0	6,815.9	7,077.4	6,719.2	35.5	33.4	19.36	-427.2	-1,310.0	464.7	442.7	22.00	21.126	
7,600.0	6,815.6	7,078.8	6,719.7	35.3	33.4	19.93	-427.2	-1,311.2	370.1	347.1	23.01	16.086	
7,700.0	6,815.3	7,080.2	6,720.3	35.2	33.4	20.52	-427.2	-1,312.5	279.2	255.1	24.07	11.601	
7,800.0	6,815.0	7,081.6	6,720.8	35.2	33.4	21.12	-427.3	-1,313.8	197.4	172.2	25.18	7.838	
7,900.0	6,814.7	7,083.0	6,721.3	35.4	33.4	21.73	-427.3	-1,315.1	141.2	114.8	26.34	5.360	
7,945.1	6,814.6	7,083.6	6,721.6	35.6	33.4	22.01	-427.3	-1,315.7	133.8	106.9	26.89	4.976	CC, ES, SF
8,000.0	6,814.5	7,084.4	6,721.9	35.8	33.4	22.35	-427.3	-1,316.5	144.6	117.1	27.55	5.248	
8,100.0	6,814.2	7,085.9	6,722.4	36.5	33.4	22.98	-427.3	-1,317.8	204.7	175.9	28.81	7.103	
8,200.0	6,813.9	7,087.4	6,723.0	37.3	33.4	23.62	-427.4	-1,319.2	287.8	257.7	30.12	9.556	
8,300.0	6,813.6	7,088.9	6,723.5	38.4	33.4	24.27	-427.4	-1,320.6	379.2	347.8	31.48	12.048	
8,400.0	6,813.3	7,090.5	6,724.1	39.7	33.4	24.93	-427.4	-1,322.1	474.1	441.2	32.88	14.419	

<b>Company:</b>	PDC Energy Inc. DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Ottenhoff 29M-353
<b>Project:</b>	SEC.29-T5N-R64W	<b>TVD Reference:</b>	WWWELL @ 4686.0ft (RKB - 23')
<b>Reference Site:</b>	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	<b>MD Reference:</b>	WWWELL @ 4686.0ft (RKB - 23')
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Ottenhoff 29M-353	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.45 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #5 (5-10-18)	<b>Offset TVD Reference:</b>	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)						
10,000.0	6,808.9	6,811.9	6,811.9	69.9	166.9	-90.15	-2,799.0	-930.4	462.0	228.2	233.82	1.976					
10,100.0	6,808.6	6,811.6	6,811.6	72.0	166.9	-90.10	-2,799.0	-930.4	400.2	164.2	236.01	1.696					
10,200.0	6,808.3	6,811.3	6,811.3	74.2	166.9	-90.06	-2,799.0	-930.4	356.3	118.1	238.22	1.496	Level 3				
10,300.0	6,808.0	6,811.0	6,811.0	76.3	166.9	-90.01	-2,799.0	-930.4	337.2	96.8	240.43	1.403	Level 3				
10,316.2	6,808.0	6,811.0	6,811.0	76.7	166.9	-90.00	-2,799.0	-930.4	336.9	96.1	240.79	1.399	Level 3, CC, ES, SF				
10,400.0	6,807.7	6,810.7	6,810.7	78.5	166.9	-89.96	-2,799.0	-930.4	347.1	104.5	242.64	1.431	Level 3				
10,500.0	6,807.5	6,810.5	6,810.5	80.7	166.9	-89.91	-2,799.0	-930.4	383.7	138.9	244.87	1.567					
10,600.0	6,807.2	6,810.2	6,810.2	82.8	166.8	-89.86	-2,799.0	-930.4	440.5	193.4	247.10	1.783					



<b>Company:</b>	PDC Energy Inc. DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Ottenhoff 29M-353
<b>Project:</b>	SEC.29-T5N-R64W	<b>TVD Reference:</b>	WWWELL @ 4686.0ft (RKB - 23')
<b>Reference Site:</b>	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	<b>MD Reference:</b>	WWWELL @ 4686.0ft (RKB - 23')
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Ottenhoff 29M-353	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.45 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #5 (5-10-18)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design Existing Wells Sec.29-T5N-R64W - Blake B29-15 (Noble-Exist) - Wellbore #1 - Wellbore #1													Offset Site Error:	0.0 ft
Survey Program: 7092-UNKNOWN													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		
11,300.0	6,805.2	6,823.2	6,823.2	98.3	167.2	-90.14	-4,072.6	-926.3	448.2	184.9	263.30	1.702		
11,400.0	6,804.9	6,822.9	6,822.9	100.6	167.2	-90.09	-4,072.6	-926.3	391.0	125.5	265.57	1.472	Level 3	
11,500.0	6,804.7	6,822.7	6,822.7	102.8	167.2	-90.04	-4,072.6	-926.3	353.5	85.6	267.84	1.320	Level 3	
11,589.8	6,804.4	6,822.4	6,822.4	104.8	167.1	-90.00	-4,072.6	-926.3	341.9	72.0	269.88	1.267	Level 3, CC	
11,600.0	6,804.4	6,822.4	6,822.4	105.1	167.1	-90.00	-4,072.6	-926.3	342.0	71.9	270.12	1.266	Level 3, ES, SF	
11,700.0	6,804.1	6,822.1	6,822.1	107.3	167.1	-89.95	-4,072.6	-926.3	359.2	86.8	272.40	1.319	Level 3	
11,800.0	6,803.8	6,821.8	6,821.8	109.6	167.1	-89.90	-4,072.6	-926.3	401.3	126.7	274.68	1.461	Level 3	
11,900.0	6,803.5	6,821.5	6,821.5	111.8	167.1	-89.85	-4,072.6	-926.3	461.7	184.7	276.96	1.667		

<b>Company:</b>	PDC Energy Inc. DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Ottenhoff 29M-353
<b>Project:</b>	SEC.29-T5N-R64W	<b>TVD Reference:</b>	WWWELL @ 4686.0ft (RKB - 23')
<b>Reference Site:</b>	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	<b>MD Reference:</b>	WWWELL @ 4686.0ft (RKB - 23')
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Ottenhoff 29M-353	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.45 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #5 (5-10-18)	<b>Offset TVD Reference:</b>	Offset Datum

<b>Offset Design</b> Existing Wells Sec.29-T5N-R64W - Carlson 29-1 (Exist.) - Wellbore #1 - Wellbore #1												<b>Offset Site Error:</b>	0.0 ft
<b>Survey Program:</b> 100-NS-GYRO-MS												<b>Offset Well Error:</b>	0.0 ft
<b>Reference</b>		<b>Offset</b>		<b>Semi Major Axis</b>		<b>Distance</b>							<b>Warning</b>
<b>Measured Depth (ft)</b>	<b>Vertical Depth (ft)</b>	<b>Measured Depth (ft)</b>	<b>Vertical Depth (ft)</b>	<b>Reference (ft)</b>	<b>Offset (ft)</b>	<b>Highside Toolface (°)</b>	<b>Offset Wellbore Centre +N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Between Centres (ft)</b>	<b>Between Ellipses (ft)</b>	<b>Minimum Separation (ft)</b>	<b>Separation Factor</b>	
8,900.0	6,811.9	6,782.1	6,780.7	47.8	16.2	-86.50	-1,550.2	-828.3	469.7	410.3	59.42	7.905	
9,000.0	6,811.7	6,783.6	6,782.2	49.7	16.2	-86.70	-1,550.3	-828.3	444.0	382.5	61.45	7.225	
9,067.5	6,811.5	6,784.6	6,783.3	50.9	16.2	-86.84	-1,550.3	-828.2	438.8	376.0	62.85	6.983 CC, ES	
9,100.0	6,811.4	6,785.1	6,783.8	51.6	16.2	-86.90	-1,550.3	-828.2	440.1	376.5	63.52	6.928 SF	
9,200.0	6,811.1	6,786.6	6,785.3	53.5	16.3	-87.10	-1,550.3	-828.1	458.4	392.8	65.61	6.987	
9,300.0	6,810.8	6,788.2	6,786.8	55.4	16.3	-87.30	-1,550.3	-828.0	496.6	428.9	67.73	7.332	

<b>Company:</b>	PDC Energy Inc. DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Ottenhoff 29M-353
<b>Project:</b>	SEC.29-T5N-R64W	<b>TVD Reference:</b>	WWWELL @ 4686.0ft (RKB - 23')
<b>Reference Site:</b>	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	<b>MD Reference:</b>	WWWELL @ 4686.0ft (RKB - 23')
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Ottenhoff 29M-353	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.45 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #5 (5-10-18)	<b>Offset TVD Reference:</b>	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							Warning				
Measured	Vertical	Measured	Vertical	Reference	Offset	Highside	Offset Wellbore Centre		Between	Between	Minimum	Separation						
Depth	Depth	Depth	Depth			Toolface	+N/-S	+E/-W	Centres	Ellipses	Separation	Factor						
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	(ft)	(ft)	(ft)	(ft)	(ft)							
12,700.0	6,801.3	6,827.3	6,827.3	130.0	167.3	-90.08	-5,409.2	-837.4	487.4	191.9	295.55	1.649						
12,800.0	6,801.0	6,827.0	6,827.0	132.3	167.3	-90.05	-5,409.2	-837.4	449.8	152.0	297.86	1.510						
12,900.0	6,800.7	6,826.7	6,826.7	134.6	167.3	-90.01	-5,409.2	-837.4	432.5	132.3	300.16	1.441	Level 3					
12,926.4	6,800.7	6,826.7	6,826.7	135.2	167.3	-90.00	-5,409.2	-837.4	431.7	130.9	300.77	1.435	Level 3, CC, ES, SF					
13,000.0	6,800.5	6,826.5	6,826.5	136.9	167.2	-89.97	-5,409.2	-837.4	437.9	135.5	302.46	1.448	Level 3					
13,100.0	6,800.2	6,826.2	6,826.2	139.2	167.2	-89.94	-5,409.2	-837.4	465.3	160.5	304.77	1.527						

<b>Company:</b>	PDC Energy Inc. DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Ottenhoff 29M-353
<b>Project:</b>	SEC.29-T5N-R64W	<b>TVD Reference:</b>	WWWELL @ 4686.0ft (RKB - 23')
<b>Reference Site:</b>	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	<b>MD Reference:</b>	WWWELL @ 4686.0ft (RKB - 23')
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Ottenhoff 29M-353	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.45 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #5 (5-10-18)	<b>Offset TVD Reference:</b>	Offset Datum

<b>Offset Design</b> Existing Wells Sec.29-T5N-R64W - Ottenhoff 29-1 (Exist.) - Wellbore #1 - Wellbore #1												<b>Offset Site Error:</b>	0.0 ft
Survey Program: 100-NS-GYRO-MS												<b>Offset Well Error:</b>	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
7,400.0	6,815.2	6,796.8	6,795.3	35.8	16.3	-85.65	-129.9	-854.6	479.0	439.6	39.34	12.175	
7,500.0	6,815.9	6,797.3	6,795.8	35.5	16.3	-88.09	-129.9	-854.6	436.5	396.6	39.97	10.921	
7,600.0	6,815.6	6,796.8	6,795.3	35.3	16.3	-88.02	-129.9	-854.6	413.7	373.3	40.44	10.230	
7,647.1	6,815.5	6,796.6	6,795.1	35.2	16.3	-87.99	-129.9	-854.6	411.0	370.2	40.76	10.084	CC, ES
7,700.0	6,815.3	6,796.3	6,794.8	35.2	16.3	-87.96	-129.9	-854.6	414.4	373.3	41.12	10.078	SF
7,800.0	6,815.0	6,795.9	6,794.3	35.2	16.3	-87.89	-129.9	-854.6	438.5	396.5	42.00	10.442	
7,900.0	6,814.7	6,795.4	6,793.9	35.4	16.3	-87.83	-129.9	-854.7	482.6	439.5	43.05	11.209	

<b>Company:</b>	PDC Energy Inc. DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Ottenhoff 29M-353
<b>Project:</b>	SEC.29-T5N-R64W	<b>TVD Reference:</b>	WWWELL @ 4686.0ft (RKB - 23')
<b>Reference Site:</b>	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	<b>MD Reference:</b>	WWWELL @ 4686.0ft (RKB - 23')
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Ottenhoff 29M-353	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.45 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #5 (5-10-18)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29M-263 - Wellbore #1 - Plan #5 (5-10-18)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
0.0	0.0	1.0	1.0	0.0	0.0	90.02	0.0	15.0	15.0	15.0	0.00	9,291.716		
100.0	100.0	101.0	101.0	0.1	0.1	90.02	0.0	15.0	15.0	14.8	0.28	54.103		
200.0	200.0	201.0	201.0	0.4	0.4	90.02	0.0	15.0	15.0	14.2	0.83	18.154		
300.0	300.0	301.0	301.0	0.7	0.7	90.02	0.0	15.0	15.0	13.7	1.38	10.907		
400.0	400.0	401.0	401.0	1.0	1.0	90.02	0.0	15.0	15.0	13.1	1.93	7.795 CC		
500.0	500.0	501.0	501.0	1.2	1.2	150.72	0.0	15.0	16.2	13.7	2.48	6.528		
600.0	599.9	600.9	600.9	1.5	1.5	156.29	0.0	15.0	19.7	16.7	3.03	6.506		
700.0	699.7	700.7	700.7	1.8	1.8	162.11	0.0	15.0	25.8	22.2	3.58	7.207		
800.0	799.3	800.3	800.3	2.1	2.1	166.73	0.0	15.0	34.6	30.5	4.14	8.367		
900.0	898.6	900.7	900.7	2.4	2.3	169.68	0.8	14.0	44.9	40.2	4.69	9.571		
1,000.0	997.5	1,001.5	1,001.4	2.8	2.6	171.34	3.1	10.7	55.2	50.0	5.23	10.552		
1,100.0	1,096.1	1,102.5	1,102.2	3.2	2.9	172.31	7.0	5.3	65.6	59.8	5.78	11.342		
1,200.0	1,194.2	1,203.8	1,203.0	3.7	3.2	172.88	12.4	-2.3	76.0	69.6	6.34	11.982		
1,300.0	1,291.7	1,305.4	1,303.9	4.2	3.5	173.19	19.4	-12.1	86.4	79.5	6.91	12.501		
1,400.0	1,388.6	1,407.2	1,404.7	4.8	3.9	173.32	28.1	-24.1	96.7	89.3	7.49	12.919		
1,500.0	1,484.9	1,509.4	1,505.3	5.4	4.2	173.32	38.3	-38.3	107.1	99.0	8.08	13.251		
1,600.0	1,580.4	1,611.8	1,605.7	6.1	4.7	173.22	50.1	-54.8	117.4	108.7	8.69	13.508		
1,700.0	1,675.2	1,714.5	1,705.8	6.8	5.2	173.04	63.5	-73.5	127.3	117.9	9.34	13.629		
1,800.0	1,769.9	1,817.7	1,805.7	7.6	5.7	172.69	78.5	-94.5	134.8	124.7	10.02	13.452		
1,900.0	1,864.7	1,921.3	1,905.2	8.4	6.4	172.14	95.2	-117.7	139.6	128.9	10.73	13.009		
2,000.0	1,959.4	2,023.5	2,002.7	9.2	7.0	171.42	113.1	-142.7	142.0	130.5	11.47	12.382		
2,100.0	2,054.1	2,123.4	2,097.9	10.0	7.7	170.70	130.9	-167.5	144.0	131.7	12.22	11.777		
2,200.0	2,148.9	2,223.4	2,193.1	10.8	8.4	170.00	148.6	-192.2	145.9	132.9	13.00	11.227		
2,300.0	2,243.6	2,323.4	2,288.3	11.6	9.1	169.31	166.4	-217.0	147.9	134.1	13.79	10.726		
2,400.0	2,338.4	2,423.3	2,383.5	12.4	9.9	168.65	184.2	-241.8	149.9	135.3	14.60	10.269		
2,500.0	2,433.1	2,523.3	2,478.7	13.2	10.6	168.00	201.9	-266.6	152.0	136.5	15.43	9.849		
2,600.0	2,527.8	2,623.3	2,573.9	14.0	11.4	167.37	219.7	-291.4	154.0	137.8	16.28	9.464		
2,700.0	2,622.6	2,723.2	2,669.1	14.8	12.1	166.75	237.5	-316.1	156.1	139.0	17.14	9.109		
2,800.0	2,717.3	2,823.2	2,764.3	15.6	12.9	166.15	255.3	-340.9	158.2	140.2	18.01	8.781		
2,900.0	2,812.1	2,923.2	2,859.5	16.5	13.6	165.57	273.0	-365.7	160.3	141.4	18.91	8.478		
3,000.0	2,906.8	3,023.1	2,954.7	17.3	14.4	165.00	290.8	-390.5	162.4	142.6	19.82	8.196		
3,100.0	3,001.5	3,123.1	3,049.9	18.1	15.1	164.45	308.6	-415.3	164.6	143.8	20.74	7.935		
3,200.0	3,096.3	3,223.1	3,145.1	18.9	15.9	163.91	326.3	-440.1	166.7	145.0	21.67	7.691		
3,300.0	3,191.0	3,323.0	3,240.3	19.7	16.7	163.39	344.1	-464.8	168.9	146.2	22.62	7.464		
3,400.0	3,285.8	3,423.0	3,335.5	20.6	17.5	162.87	361.9	-489.6	171.1	147.5	23.59	7.252		
3,500.0	3,380.5	3,522.9	3,430.7	21.4	18.2	162.38	379.6	-514.4	173.2	148.7	24.56	7.053		
3,600.0	3,475.2	3,622.9	3,525.9	22.2	19.0	161.89	397.4	-539.2	175.5	149.9	25.55	6.867		
3,700.0	3,570.0	3,722.9	3,621.1	23.0	19.8	161.42	415.2	-564.0	177.7	151.1	26.55	6.692		
3,800.0	3,664.7	3,822.8	3,716.3	23.8	20.5	160.95	432.9	-588.7	179.9	152.3	27.56	6.527		
3,900.0	3,759.5	3,922.8	3,811.5	24.7	21.3	160.50	450.7	-613.5	182.1	153.6	28.59	6.372		
4,000.0	3,854.2	4,022.8	3,906.7	25.5	22.1	160.06	468.5	-638.3	184.4	154.8	29.62	6.226		
4,100.0	3,949.0	4,122.7	4,001.9	26.3	22.9	159.63	486.3	-663.1	186.7	156.0	30.66	6.088		
4,200.0	4,043.7	4,222.7	4,097.1	27.1	23.6	159.21	504.0	-687.9	188.9	157.2	31.72	5.957		
4,300.0	4,138.4	4,322.7	4,192.3	28.0	24.4	158.80	521.8	-712.7	191.2	158.4	32.78	5.833		
4,400.0	4,233.2	4,422.6	4,287.5	28.8	25.2	158.40	539.6	-737.4	193.5	159.7	33.85	5.716		
4,500.0	4,327.9	4,522.6	4,382.7	29.6	26.0	158.01	557.3	-762.2	195.8	160.9	34.93	5.605		
4,600.0	4,422.7	4,622.6	4,477.9	30.4	26.8	157.63	575.1	-787.0	198.1	162.1	36.02	5.500		
4,700.0	4,517.4	4,722.5	4,573.1	31.3	27.5	157.26	592.9	-811.8	200.4	163.3	37.12	5.399		
4,800.0	4,612.1	4,822.5	4,668.3	32.1	28.3	156.90	610.6	-836.6	202.8	164.5	38.23	5.304		
4,900.0	4,706.9	4,922.5	4,763.5	32.9	29.1	156.54	628.4	-861.3	205.1	165.8	39.34	5.213		
5,000.0	4,801.6	5,022.4	4,858.7	33.7	29.9	156.19	646.2	-886.1	207.4	167.0	40.47	5.127		

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

<b>Company:</b>	PDC Energy Inc. DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Ottenhoff 29M-353
<b>Project:</b>	SEC.29-T5N-R64W	<b>TVD Reference:</b>	WWWELL @ 4686.0ft (RKB - 23')
<b>Reference Site:</b>	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	<b>MD Reference:</b>	WWWELL @ 4686.0ft (RKB - 23')
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Ottenhoff 29M-353	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.45 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #5 (5-10-18)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29M-263 - Wellbore #1 - Plan #5 (5-10-18)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													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 Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
5,100.0	4,896.4	5,122.4	4,953.9	34.6	30.7	155.86	664.0	-910.9	209.8	168.2	41.59	5.044		
5,200.0	4,991.1	5,220.9	5,047.7	35.4	31.4	155.54	681.4	-935.2	212.2	169.5	42.70	4.970		
5,300.0	5,086.5	5,314.7	5,137.7	36.0	31.9	155.33	696.8	-956.7	214.9	171.3	43.63	4.925		
5,400.0	5,182.8	5,408.4	5,228.5	36.5	32.4	155.16	710.5	-975.8	217.2	172.8	44.46	4.886		
5,500.0	5,280.1	5,500.0	5,317.9	37.0	32.8	155.01	722.2	-992.1	219.3	174.1	45.19	4.853		
5,600.0	5,378.0	5,595.8	5,412.0	37.5	33.2	154.88	732.6	-1,006.6	221.1	175.2	45.83	4.824		
5,700.0	5,476.7	5,689.5	5,504.5	37.8	33.6	154.78	741.0	-1,018.4	222.5	176.2	46.36	4.800		
5,800.0	5,575.8	5,783.1	5,597.4	38.1	33.8	154.70	747.7	-1,027.6	223.7	176.9	46.79	4.781		
5,900.0	5,675.3	5,876.7	5,690.7	38.4	34.1	154.64	752.5	-1,034.4	224.6	177.5	47.12	4.766		
6,000.0	5,775.2	5,970.3	5,784.1	38.6	34.2	154.61	755.6	-1,038.7	225.1	177.8	47.35	4.754		
6,100.0	5,875.1	6,063.9	5,877.7	38.7	34.4	154.59	756.9	-1,040.6	225.4	177.9	47.49	4.746		
6,200.0	5,975.1	6,162.3	5,976.1	38.8	34.5	96.32	757.0	-1,040.7	225.4	177.6	47.78	4.718		
6,227.3	6,002.4	6,189.6	6,003.4	38.8	34.5	96.32	757.0	-1,040.7	225.4	177.5	47.87	4.709		
6,300.0	6,075.1	6,260.4	6,074.1	38.9	34.6	96.84	754.9	-1,040.7	225.7	177.9	47.79	4.722		
6,400.0	6,175.0	6,355.6	6,168.3	39.0	34.6	-80.63	741.4	-1,040.7	227.1	180.7	46.38	4.897		
6,500.0	6,273.4	6,450.0	6,259.1	38.9	34.4	-78.12	715.8	-1,040.7	229.0	184.2	44.82	5.109		
6,600.0	6,368.5	6,542.4	6,343.9	38.8	34.2	-75.90	679.5	-1,040.7	231.1	187.8	43.29	5.338		
6,700.0	6,458.3	6,634.3	6,423.0	38.5	33.9	-73.96	632.7	-1,040.8	233.2	191.4	41.83	5.574		
6,800.0	6,541.2	6,725.3	6,494.8	38.2	33.6	-72.33	576.8	-1,040.8	235.2	194.7	40.51	5.806		
6,900.0	6,615.6	6,815.8	6,558.5	37.8	33.2	-71.02	512.7	-1,040.8	237.0	197.6	39.38	6.018		
7,000.0	6,679.9	6,905.7	6,613.4	37.4	32.8	-70.04	441.5	-1,040.9	238.4	199.9	38.52	6.189		
7,100.0	6,732.9	6,995.3	6,658.8	36.9	32.4	-69.40	364.4	-1,041.0	239.4	201.3	38.02	6.296		
7,200.0	6,773.6	7,084.7	6,694.1	36.5	32.0	-69.10	282.3	-1,041.0	239.8	201.9	37.97	6.317		
7,300.0	6,801.2	7,174.0	6,718.9	36.1	31.6	-69.13	196.6	-1,041.1	239.8	201.4	38.40	6.245		
7,400.0	6,815.2	7,263.4	6,732.8	35.8	31.3	-69.50	108.3	-1,041.2	239.2	199.9	39.29	6.087		
7,498.9	6,818.6	7,354.1	6,735.9	35.5	31.0	-69.52	17.8	-1,041.2	239.2	199.2	40.00	5.978		
7,500.0	6,815.9	7,354.2	6,735.9	35.5	31.0	-70.13	17.6	-1,041.2	238.2	197.9	40.28	5.915		
7,600.0	6,815.6	7,454.2	6,735.5	35.3	30.8	-70.10	-82.4	-1,041.3	238.3	197.2	41.09	5.798		
7,700.0	6,815.3	7,554.2	6,735.1	35.2	30.7	-70.07	-182.4	-1,041.4	238.3	196.0	42.35	5.627		
7,800.0	6,815.0	7,654.2	6,734.6	35.2	30.8	-70.04	-282.4	-1,041.4	238.4	194.3	44.03	5.414		
7,900.0	6,814.7	7,754.2	6,734.2	35.4	31.1	-70.00	-382.4	-1,041.5	238.4	192.3	46.08	5.174		
8,000.0	6,814.5	7,854.2	6,733.8	35.8	31.7	-69.97	-482.4	-1,041.6	238.5	190.0	48.45	4.922		
8,100.0	6,814.2	7,954.2	6,733.4	36.5	32.6	-69.94	-582.4	-1,041.7	238.5	187.4	51.10	4.668		
8,200.0	6,813.9	8,054.2	6,733.0	37.3	33.8	-69.91	-682.4	-1,041.7	238.6	184.6	53.99	4.419		
8,300.0	6,813.6	8,154.2	6,732.5	38.4	35.2	-69.88	-782.4	-1,041.8	238.6	181.5	57.07	4.181		
8,400.0	6,813.3	8,254.2	6,732.1	39.7	36.8	-69.84	-882.4	-1,041.9	238.7	178.3	60.33	3.956		
8,500.0	6,813.1	8,354.2	6,731.7	41.1	38.4	-69.81	-982.4	-1,041.9	238.7	175.0	63.73	3.746		
8,600.0	6,812.8	8,454.2	6,731.3	42.6	40.1	-69.78	-1,082.4	-1,042.0	238.8	171.5	67.25	3.550		
8,700.0	6,812.5	8,554.2	6,730.9	44.3	41.9	-69.75	-1,182.4	-1,042.1	238.8	167.9	70.88	3.369		
8,800.0	6,812.2	8,654.2	6,730.4	46.0	43.8	-69.72	-1,282.4	-1,042.2	238.9	164.3	74.59	3.202		
8,900.0	6,811.9	8,754.2	6,730.0	47.8	45.7	-69.69	-1,382.4	-1,042.2	238.9	160.5	78.37	3.048		
9,000.0	6,811.7	8,854.2	6,729.6	49.7	47.6	-69.65	-1,482.4	-1,042.3	238.9	156.7	82.23	2.906		
9,100.0	6,811.4	8,954.2	6,729.2	51.6	49.6	-69.62	-1,582.4	-1,042.4	239.0	152.9	86.13	2.775		
9,200.0	6,811.1	9,054.2	6,728.7	53.5	51.6	-69.59	-1,682.4	-1,042.4	239.0	149.0	90.09	2.654		
9,300.0	6,810.8	9,154.2	6,728.3	55.4	53.6	-69.56	-1,782.4	-1,042.5	239.1	145.0	94.08	2.541		
9,400.0	6,810.5	9,254.2	6,727.9	57.4	55.7	-69.53	-1,882.4	-1,042.6	239.1	141.0	98.11	2.437		
9,500.0	6,810.3	9,354.2	6,727.5	59.5	57.8	-69.49	-1,982.4	-1,042.6	239.2	137.0	102.18	2.341		
9,600.0	6,810.0	9,454.2	6,727.1	61.5	59.9	-69.46	-2,082.4	-1,042.7	239.3	133.0	106.27	2.251		
9,700.0	6,809.7	9,554.2	6,726.6	63.6	62.0	-69.43	-2,182.4	-1,042.8	239.3	128.9	110.39	2.168		
9,800.0	6,809.4	9,654.2	6,726.2	65.7	64.1	-69.40	-2,282.4	-1,042.9	239.4	124.8	114.53	2.090		
9,900.0	6,809.1	9,754.2	6,725.8	67.8	66.2	-69.37	-2,382.4	-1,042.9	239.4	120.7	118.69	2.017		

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

<b>Company:</b>	PDC Energy Inc. DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Ottenhoff 29M-353
<b>Project:</b>	SEC.29-T5N-R64W	<b>TVD Reference:</b>	WWWELL @ 4686.0ft (RKB - 23')
<b>Reference Site:</b>	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	<b>MD Reference:</b>	WWWELL @ 4686.0ft (RKB - 23')
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Ottenhoff 29M-353	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.45 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #5 (5-10-18)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29M-263 - Wellbore #1 - Plan #5 (5-10-18)													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		
10,000.0	6,808.9	9,854.2	6,725.4	69.9	68.4	-69.34	-2,482.4	-1,043.0	239.5	116.6	122.86	1.949		
10,100.0	6,808.6	9,954.2	6,724.9	72.0	70.6	-69.30	-2,582.4	-1,043.1	239.5	112.5	127.05	1.885		
10,200.0	6,808.3	10,054.2	6,724.5	74.2	72.7	-69.27	-2,682.4	-1,043.1	239.6	108.3	131.26	1.825		
10,300.0	6,808.0	10,154.2	6,724.1	76.3	74.9	-69.24	-2,782.4	-1,043.2	239.6	104.1	135.47	1.769		
10,400.0	6,807.7	10,254.2	6,723.7	78.5	77.1	-69.21	-2,882.4	-1,043.3	239.7	100.0	139.70	1.715		
10,500.0	6,807.5	10,354.2	6,723.3	80.7	79.3	-69.18	-2,982.4	-1,043.4	239.7	95.8	143.94	1.665		
10,600.0	6,807.2	10,454.2	6,722.8	82.8	81.6	-69.15	-3,082.4	-1,043.4	239.8	91.6	148.19	1.618		
10,700.0	6,806.9	10,554.2	6,722.4	85.0	83.8	-69.11	-3,182.4	-1,043.5	239.8	87.4	152.44	1.573		
10,800.0	6,806.6	10,654.2	6,722.0	87.2	86.0	-69.08	-3,282.4	-1,043.6	239.9	83.2	156.70	1.531		
10,900.0	6,806.3	10,754.2	6,721.6	89.4	88.2	-69.05	-3,382.4	-1,043.6	239.9	78.9	160.97	1.490 Level 3		
11,000.0	6,806.1	10,854.2	6,721.1	91.7	90.5	-69.02	-3,482.4	-1,043.7	240.0	74.7	165.25	1.452 Level 3		
11,100.0	6,805.8	10,954.2	6,720.7	93.9	92.7	-68.99	-3,582.4	-1,043.8	240.0	70.5	169.53	1.416 Level 3		
11,200.0	6,805.5	11,054.2	6,720.3	96.1	95.0	-68.96	-3,682.4	-1,043.8	240.1	66.3	173.81	1.381 Level 3		
11,300.0	6,805.2	11,154.2	6,719.9	98.3	97.2	-68.93	-3,782.4	-1,043.9	240.1	62.0	178.10	1.348 Level 3		
11,400.0	6,804.9	11,254.2	6,719.5	100.6	99.5	-68.89	-3,882.4	-1,044.0	240.2	57.8	182.39	1.317 Level 3		
11,500.0	6,804.7	11,354.2	6,719.0	102.8	101.7	-68.86	-3,982.4	-1,044.1	240.2	53.5	186.69	1.287 Level 3		
11,600.0	6,804.4	11,454.2	6,718.6	105.1	104.0	-68.83	-4,082.4	-1,044.1	240.3	49.3	190.99	1.258 Level 3		
11,700.0	6,804.1	11,554.2	6,718.2	107.3	106.3	-68.80	-4,182.4	-1,044.2	240.3	45.0	195.29	1.231 Level 2		
11,800.0	6,803.8	11,654.2	6,717.8	109.6	108.5	-68.77	-4,282.4	-1,044.3	240.4	40.8	199.60	1.204 Level 2		
11,900.0	6,803.5	11,754.2	6,717.4	111.8	110.8	-68.74	-4,382.4	-1,044.3	240.4	36.5	203.90	1.179 Level 2		
12,000.0	6,803.3	11,854.2	6,716.9	114.1	113.1	-68.70	-4,482.4	-1,044.4	240.5	32.3	208.21	1.155 Level 2		
12,100.0	6,803.0	11,954.2	6,716.5	116.4	115.4	-68.67	-4,582.4	-1,044.5	240.5	28.0	212.53	1.132 Level 2		
12,200.0	6,802.7	12,054.2	6,716.1	118.6	117.7	-68.64	-4,682.4	-1,044.6	240.6	23.7	216.84	1.109 Level 2		
12,300.0	6,802.4	12,154.2	6,715.7	120.9	119.9	-68.61	-4,782.3	-1,044.6	240.6	19.5	221.15	1.088 Level 2		
12,400.0	6,802.1	12,254.2	6,715.2	123.2	122.2	-68.58	-4,882.3	-1,044.7	240.7	15.2	225.47	1.067 Level 2		
12,500.0	6,801.9	12,354.2	6,714.8	125.5	124.5	-68.55	-4,982.3	-1,044.8	240.7	11.0	229.79	1.048 Level 2		
12,600.0	6,801.6	12,454.2	6,714.4	127.7	126.8	-68.52	-5,082.3	-1,044.8	240.8	6.7	234.10	1.029 Level 2		
12,700.0	6,801.3	12,554.2	6,714.0	130.0	129.1	-68.49	-5,182.3	-1,044.9	240.8	2.4	238.42	1.010 Level 2		
12,800.0	6,801.0	12,654.2	6,713.6	132.3	131.4	-68.45	-5,282.3	-1,045.0	240.9	-1.8	242.74	0.992 Level 1		
12,900.0	6,800.7	12,754.2	6,713.1	134.6	133.7	-68.42	-5,382.3	-1,045.0	240.9	-6.1	247.06	0.975 Level 1		
13,000.0	6,800.5	12,854.2	6,712.7	136.9	136.0	-68.39	-5,482.3	-1,045.1	241.0	-10.4	251.38	0.959 Level 1		
13,100.0	6,800.2	12,954.2	6,712.3	139.2	138.3	-68.36	-5,582.3	-1,045.2	241.1	-14.6	255.70	0.943 Level 1		
13,200.0	6,799.9	13,054.2	6,711.9	141.5	140.6	-68.33	-5,682.3	-1,045.3	241.1	-18.9	260.02	0.927 Level 1		
13,300.0	6,799.6	13,154.2	6,711.4	143.8	142.9	-68.30	-5,782.3	-1,045.3	241.2	-23.2	264.34	0.912 Level 1		
13,400.0	6,799.3	13,254.2	6,711.0	146.1	145.2	-68.27	-5,882.3	-1,045.4	241.2	-27.5	268.66	0.898 Level 1		
13,500.0	6,799.1	13,354.2	6,710.6	148.4	147.5	-68.24	-5,982.3	-1,045.5	241.3	-31.7	272.98	0.884 Level 1		
13,600.0	6,798.8	13,454.2	6,710.2	150.7	149.8	-68.20	-6,082.3	-1,045.5	241.3	-36.0	277.31	0.870 Level 1		
13,700.0	6,798.5	13,554.2	6,709.8	153.0	152.1	-68.17	-6,182.3	-1,045.6	241.4	-40.3	281.63	0.857 Level 1		
13,800.0	6,798.2	13,654.2	6,709.3	155.3	154.5	-68.14	-6,282.3	-1,045.7	241.4	-44.5	285.95	0.844 Level 1		
13,900.0	6,797.9	13,754.2	6,708.9	157.6	156.8	-68.11	-6,382.3	-1,045.8	241.5	-48.8	290.27	0.832 Level 1		
14,000.0	6,797.7	13,854.2	6,708.5	159.9	159.1	-68.08	-6,482.3	-1,045.8	241.5	-53.1	294.59	0.820 Level 1		
14,100.0	6,797.4	13,954.2	6,708.1	162.2	161.4	-68.05	-6,582.3	-1,045.9	241.6	-57.3	298.90	0.808 Level 1		
14,200.0	6,797.1	14,054.2	6,707.6	164.5	163.7	-68.02	-6,682.3	-1,046.0	241.6	-61.6	303.22	0.797 Level 1		
14,300.0	6,796.8	14,154.2	6,707.2	166.8	166.0	-67.99	-6,782.3	-1,046.0	241.7	-65.8	307.54	0.786 Level 1		
14,400.0	6,796.5	14,254.2	6,706.8	169.1	168.3	-67.95	-6,882.3	-1,046.1	241.7	-70.1	311.86	0.775 Level 1		
14,500.0	6,796.3	14,354.2	6,706.4	171.4	170.7	-67.92	-6,982.3	-1,046.2	241.8	-74.4	316.18	0.765 Level 1		
14,552.3	6,796.1	14,406.6	6,706.2	172.6	171.9	-67.91	-7,034.7	-1,046.2	241.8	-76.6	318.43	0.759 Level 1		
14,592.3	6,796.0	14,444.2	6,706.0	173.5	172.7	-67.90	-7,072.3	-1,046.2	241.9	-78.2	320.11	0.756 Level 1, ES, SF		

<b>Company:</b>	PDC Energy Inc. DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Ottenhoff 29M-353
<b>Project:</b>	SEC.29-T5N-R64W	<b>TVD Reference:</b>	WWWELL @ 4686.0ft (RKB - 23')
<b>Reference Site:</b>	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	<b>MD Reference:</b>	WWWELL @ 4686.0ft (RKB - 23')
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Ottenhoff 29M-353	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.45 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #5 (5-10-18)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design												Offset Site Error:	0.0 ft
Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29R-203 - Wellbore #1 - Plan #3 (6-27-17)												Offset Well Error:	0.0 ft
Survey Program: 0-MWD													
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
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	500.0	500.0	1.2	1.2	149.33	-0.7	74.9	76.1	73.6	2.47	30.743	
600.0	599.9	599.9	599.9	1.5	1.5	150.75	-0.7	74.9	79.5	76.5	3.02	26.292	
700.0	699.7	699.7	699.7	1.8	1.8	152.86	-0.7	74.9	85.2	81.7	3.58	23.829	
800.0	799.3	799.3	799.3	2.1	2.1	155.36	-0.7	74.9	93.5	89.3	4.14	22.600	
900.0	898.6	898.6	898.6	2.4	2.3	157.99	-0.7	74.9	104.3	99.6	4.70	22.196 SF	
1,000.0	997.5	997.5	997.5	2.8	2.6	160.54	-0.7	74.9	117.7	112.5	5.26	22.373	
1,100.0	1,096.1	1,096.1	1,096.1	3.2	2.9	162.88	-0.7	74.9	133.8	128.0	5.83	22.972	
1,200.0	1,194.2	1,194.2	1,194.2	3.7	3.2	164.96	-0.7	74.9	152.6	146.2	6.39	23.884	
1,300.0	1,291.7	1,291.7	1,291.7	4.2	3.4	166.77	-0.7	74.9	174.0	167.1	6.95	25.033	
1,400.0	1,388.6	1,388.6	1,388.6	4.8	3.7	168.32	-0.7	74.9	198.1	190.6	7.52	26.363	
1,500.0	1,484.9	1,484.9	1,484.9	5.4	4.0	169.64	-0.7	74.9	224.8	216.7	8.08	27.832	
1,600.0	1,580.4	1,580.4	1,580.4	6.1	4.2	170.77	-0.7	74.9	254.1	245.4	8.64	29.410	
1,700.0	1,675.2	1,678.4	1,678.4	6.8	4.5	171.65	0.1	74.8	285.1	275.8	9.22	30.914	
1,800.0	1,769.9	1,778.0	1,778.0	7.6	4.8	172.00	3.4	74.3	315.0	305.2	9.83	32.061	
1,900.0	1,864.7	1,878.6	1,878.3	8.4	5.0	171.90	9.3	73.3	343.6	333.2	10.45	32.897	
2,000.0	1,959.4	1,979.9	1,979.3	9.2	5.3	171.46	17.9	72.0	370.9	359.8	11.09	33.455	
2,100.0	2,054.1	2,081.9	2,080.6	10.0	5.6	170.74	29.3	70.2	396.7	385.0	11.75	33.766	
2,200.0	2,148.9	2,184.4	2,182.1	10.8	5.9	169.78	43.3	67.9	421.3	408.9	12.45	33.852	
2,300.0	2,243.6	2,287.2	2,283.5	11.6	6.3	168.62	60.2	65.2	444.7	431.5	13.18	33.729	
2,400.0	2,338.4	2,390.3	2,384.6	12.4	6.6	167.27	79.7	62.1	466.9	452.9	13.97	33.412	
2,500.0	2,433.1	2,493.4	2,485.2	13.2	7.1	165.75	102.0	58.5	488.1	473.3	14.83	32.917	



<b>Company:</b>	PDC Energy Inc. DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Ottenhoff 29M-353
<b>Project:</b>	SEC.29-T5N-R64W	<b>TVD Reference:</b>	WWWELL @ 4686.0ft (RKB - 23')
<b>Reference Site:</b>	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	<b>MD Reference:</b>	WWWELL @ 4686.0ft (RKB - 23')
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Ottenhoff 29M-353	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.45 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #5 (5-10-18)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design													Offset Site Error:	0.0 ft
Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29R-253 - Wellbore #1 - Plan #5 (5-10-18)													Offset Well Error:	0.0 ft
Survey Program: 0-MWD														
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	90.46	-0.4	45.1		45.1				
100.0	100.0	100.0	100.0	0.1	0.1	90.46	-0.4	45.1		45.1	44.9	0.28	163.937	
200.0	200.0	200.0	200.0	0.4	0.4	90.46	-0.4	45.1		45.1	44.3	0.83	54.646	
300.0	300.0	300.0	300.0	0.7	0.7	90.46	-0.4	45.1		45.1	43.8	1.38	32.787	
400.0	400.0	400.0	400.0	1.0	1.0	90.46	-0.4	45.1		45.1	43.2	1.93	23.420 CC, ES	
500.0	500.0	500.0	500.0	1.2	1.2	149.57	-0.4	45.1		46.3	43.8	2.47	18.695	
600.0	599.9	599.9	599.9	1.5	1.5	151.84	-0.4	45.1		49.7	46.7	3.02	16.436	
700.0	699.7	699.7	699.7	1.8	1.8	154.98	-0.4	45.1		55.5	52.0	3.58	15.523	
800.0	799.3	799.3	799.3	2.1	2.1	158.40	-0.4	45.1		64.0	59.8	4.14	15.460 SF	
900.0	898.6	898.6	898.6	2.4	2.3	161.66	-0.4	45.1		75.0	70.3	4.70	15.970	
1,000.0	997.5	997.5	997.5	2.8	2.6	164.51	-0.4	45.1		88.8	83.5	5.26	16.880	
1,100.0	1,096.1	1,096.1	1,096.1	3.2	2.9	166.92	-0.4	45.1		105.2	99.4	5.82	18.076	
1,200.0	1,194.2	1,194.2	1,194.2	3.7	3.2	168.90	-0.4	45.1		124.3	117.9	6.38	19.482	
1,300.0	1,291.7	1,295.2	1,295.2	4.2	3.4	170.44	0.4	44.2		144.9	138.0	6.94	20.889	
1,400.0	1,388.6	1,397.0	1,396.9	4.8	3.7	171.51	2.7	41.1		165.6	158.1	7.49	22.117	
1,500.0	1,484.9	1,499.4	1,499.1	5.4	4.0	172.26	6.7	35.8		186.4	178.3	8.05	23.158	
1,600.0	1,580.4	1,602.4	1,601.6	6.1	4.3	172.78	12.4	28.3		207.1	198.5	8.62	24.037	
1,700.0	1,675.2	1,706.0	1,704.6	6.8	4.6	173.15	19.9	18.5		227.5	218.2	9.22	24.683	
1,800.0	1,769.9	1,810.7	1,808.1	7.6	4.9	173.33	29.1	6.3		245.4	235.6	9.84	24.930	
1,900.0	1,864.7	1,914.5	1,910.4	8.4	5.3	173.37	39.9	-7.9		260.8	250.3	10.49	24.870	
2,000.0	1,959.4	2,013.4	2,007.7	9.2	5.7	173.37	50.6	-22.0		275.5	264.4	11.13	24.746	
2,100.0	2,054.1	2,112.3	2,105.0	10.0	6.1	173.36	61.3	-36.1		290.2	278.4	11.79	24.622	
2,200.0	2,148.9	2,211.2	2,202.3	10.8	6.5	173.36	72.0	-50.2		304.9	292.5	12.45	24.494	
2,300.0	2,243.6	2,310.2	2,299.6	11.6	6.9	173.36	82.7	-64.3		319.6	306.5	13.12	24.369	
2,400.0	2,338.4	2,409.1	2,396.9	12.4	7.4	173.36	93.4	-78.4		334.3	320.5	13.79	24.247	
2,500.0	2,433.1	2,508.0	2,494.3	13.2	7.8	173.35	104.2	-92.5		349.0	334.5	14.46	24.131	
2,600.0	2,527.8	2,606.9	2,591.6	14.0	8.2	173.35	114.9	-106.6		363.7	348.6	15.14	24.018	
2,700.0	2,622.6	2,705.8	2,688.9	14.8	8.7	173.35	125.6	-120.7		378.4	362.6	15.83	23.911	
2,800.0	2,717.3	2,804.7	2,786.2	15.6	9.1	173.35	136.3	-134.8		393.1	376.6	16.51	23.809	
2,900.0	2,812.1	2,903.6	2,883.5	16.5	9.6	173.35	147.0	-148.9		407.8	390.6	17.20	23.711	
3,000.0	2,906.8	3,002.6	2,980.8	17.3	10.1	173.34	157.7	-163.0		422.5	404.6	17.89	23.618	
3,100.0	3,001.5	3,101.5	3,078.1	18.1	10.5	173.34	168.4	-177.2		437.2	418.6	18.58	23.530	
3,200.0	3,096.3	3,200.4	3,175.5	18.9	11.0	173.34	179.2	-191.3		451.9	432.6	19.27	23.446	
3,300.0	3,191.0	3,299.3	3,272.8	19.7	11.5	173.34	189.9	-205.4		466.6	446.6	19.97	23.366	
3,400.0	3,285.8	3,398.2	3,370.1	20.6	11.9	173.34	200.6	-219.5		481.3	460.6	20.67	23.289	
3,500.0	3,380.5	3,497.1	3,467.4	21.4	12.4	173.34	211.3	-233.6		496.0	474.6	21.36	23.217	

<b>Company:</b>	PDC Energy Inc. DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Ottenhoff 29M-353
<b>Project:</b>	SEC.29-T5N-R64W	<b>TVD Reference:</b>	WWWELL @ 4686.0ft (RKB - 23')
<b>Reference Site:</b>	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	<b>MD Reference:</b>	WWWELL @ 4686.0ft (RKB - 23')
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Ottenhoff 29M-353	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.45 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #5 (5-10-18)	<b>Offset TVD Reference:</b>	Offset Datum

<b>Offset Design</b>												Offset Site Error:	0.0 ft
Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29R-303 - Wellbore #1 - Plan #3 (6-27-17)												Offset Well Error:	0.0 ft
Survey Program: 0-MWD													
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	90.35	-0.4	60.2	60.2				
100.0	100.0	100.0	100.0	0.1	0.1	90.35	-0.4	60.2	60.2	59.9	0.28	218.579	
200.0	200.0	200.0	200.0	0.4	0.4	90.35	-0.4	60.2	60.2	59.4	0.83	72.860	
300.0	300.0	300.0	300.0	0.7	0.7	90.35	-0.4	60.2	60.2	58.8	1.38	43.716	
400.0	400.0	400.0	400.0	1.0	1.0	90.35	-0.4	60.2	60.2	58.3	1.93	31.226 CC, ES	
500.0	500.0	500.0	500.0	1.2	1.2	149.25	-0.4	60.2	61.3	58.8	2.47	24.774	
600.0	599.9	599.9	599.9	1.5	1.5	151.00	-0.4	60.2	64.7	61.7	3.02	21.406	
700.0	699.7	699.7	699.7	1.8	1.8	153.54	-0.4	60.2	70.5	66.9	3.58	19.707	
800.0	799.3	799.3	799.3	2.1	2.1	156.46	-0.4	60.2	78.8	74.7	4.14	19.051 SF	
900.0	898.6	898.6	898.6	2.4	2.3	159.39	-0.4	60.2	89.7	85.0	4.70	19.096	
1,000.0	997.5	997.5	997.5	2.8	2.6	162.13	-0.4	60.2	103.3	98.0	5.26	19.633	
1,100.0	1,096.1	1,096.1	1,096.1	3.2	2.9	164.55	-0.4	60.2	119.5	113.7	5.82	20.526	
1,200.0	1,194.2	1,194.2	1,194.2	3.7	3.2	166.64	-0.4	60.2	138.4	132.1	6.38	21.683	
1,300.0	1,291.7	1,291.7	1,291.7	4.2	3.4	168.40	-0.4	60.2	160.0	153.1	6.95	23.037	
1,400.0	1,388.6	1,388.6	1,388.6	4.8	3.7	169.87	-0.4	60.2	184.2	176.7	7.51	24.540	
1,500.0	1,484.9	1,488.4	1,488.4	5.4	4.0	170.95	0.6	59.8	210.3	202.2	8.07	26.052	
1,600.0	1,580.4	1,589.1	1,589.0	6.1	4.2	171.44	3.9	58.3	237.1	228.4	8.64	27.443	
1,700.0	1,675.2	1,690.3	1,690.0	6.8	4.5	171.53	9.7	55.7	264.1	254.8	9.23	28.608	
1,800.0	1,769.9	1,792.5	1,791.8	7.6	4.8	171.26	18.0	51.9	289.4	279.6	9.86	29.368	
1,900.0	1,864.7	1,895.6	1,894.3	8.4	5.1	170.68	28.9	47.1	312.9	302.4	10.50	29.784	
2,000.0	1,959.4	1,999.6	1,997.1	9.2	5.4	169.84	42.5	41.0	334.4	323.2	11.18	29.899	
2,100.0	2,054.1	2,104.2	2,100.2	10.0	5.8	168.78	58.7	33.7	354.1	342.2	11.91	29.746	
2,200.0	2,148.9	2,209.3	2,203.3	10.8	6.2	167.51	77.6	25.3	372.1	359.4	12.68	29.352	
2,300.0	2,243.6	2,314.8	2,306.1	11.6	6.6	166.04	99.1	15.6	388.3	374.8	13.51	28.748	
2,400.0	2,338.4	2,415.1	2,403.3	12.4	7.1	164.55	121.4	5.6	403.4	389.0	14.38	28.052	
2,500.0	2,433.1	2,513.4	2,498.7	13.2	7.6	163.18	143.3	-4.2	418.7	403.4	15.29	27.386	
2,600.0	2,527.8	2,611.7	2,594.1	14.0	8.1	161.91	165.2	-14.0	434.2	418.0	16.23	26.749	
2,700.0	2,622.6	2,710.1	2,689.4	14.8	8.6	160.72	187.2	-23.8	449.9	432.7	17.21	26.144	
2,800.0	2,717.3	2,808.4	2,784.8	15.6	9.1	159.62	209.1	-33.6	465.8	447.6	18.22	25.572	
2,900.0	2,812.1	2,906.8	2,880.1	16.5	9.7	158.58	231.0	-43.4	481.9	462.6	19.25	25.036	
3,000.0	2,906.8	3,005.1	2,975.5	17.3	10.2	157.62	252.9	-53.3	498.1	477.8	20.30	24.533	

<b>Company:</b>	PDC Energy Inc. DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Ottenhoff 29M-353
<b>Project:</b>	SEC.29-T5N-R64W	<b>TVD Reference:</b>	WWWELL @ 4686.0ft (RKB - 23')
<b>Reference Site:</b>	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	<b>MD Reference:</b>	WWWELL @ 4686.0ft (RKB - 23')
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Ottenhoff 29M-353	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.45 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #5 (5-10-18)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design													Offset Site Error:	0.0 ft
Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29R-323 - Wellbore #1 - Plan #3 (6-27-17)													Offset Well Error:	0.0 ft
Survey Program: 0-MWD														
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)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
0.0	0.0	0.0	0.0	0.0	0.0	90.59	-1.1	105.0	105.0					
100.0	100.0	100.0	100.0	0.1	0.1	90.59	-1.1	105.0	105.0	104.8	0.28	381.515		
200.0	200.0	200.0	200.0	0.4	0.4	90.59	-1.1	105.0	105.0	104.2	0.83	127.172		
300.0	300.0	300.0	300.0	0.7	0.7	90.59	-1.1	105.0	105.0	103.7	1.38	76.303		
400.0	400.0	400.0	400.0	1.0	1.0	90.59	-1.1	105.0	105.0	103.1	1.93	54.502 CC, ES		
500.0	500.0	500.0	500.0	1.2	1.2	149.22	-1.1	105.0	106.2	103.7	2.47	42.904		
600.0	599.9	599.9	599.9	1.5	1.5	150.25	-1.1	105.0	109.6	106.5	3.02	36.245		
700.0	699.7	699.7	699.7	1.8	1.8	151.82	-1.1	105.0	115.3	111.7	3.58	32.228		
800.0	799.3	799.3	799.3	2.1	2.1	153.77	-1.1	105.0	123.4	119.3	4.14	29.839		
900.0	898.6	898.0	898.0	2.4	2.3	155.38	0.1	105.4	134.3	129.6	4.70	28.585		
1,000.0	997.5	996.5	996.4	2.8	2.6	156.13	3.8	106.5	148.0	142.7	5.26	28.109 SF		
1,100.0	1,096.1	1,094.6	1,094.3	3.2	2.9	156.21	9.8	108.3	164.4	158.6	5.84	28.143		
1,200.0	1,194.2	1,192.0	1,191.4	3.7	3.2	155.78	18.2	110.8	183.6	177.2	6.44	28.503		
1,300.0	1,291.7	1,288.8	1,287.5	4.2	3.5	155.00	28.9	114.0	205.5	198.4	7.07	29.062		
1,400.0	1,388.6	1,384.8	1,382.5	4.8	3.8	153.99	41.7	117.8	230.1	222.4	7.74	29.728		
1,500.0	1,484.9	1,479.8	1,476.2	5.4	4.1	152.85	56.7	122.2	257.5	249.0	8.46	30.434		
1,600.0	1,580.4	1,574.0	1,568.7	6.1	4.5	151.64	73.8	127.3	287.6	278.4	9.24	31.140		
1,700.0	1,675.2	1,668.6	1,661.4	6.8	4.9	150.78	91.6	132.6	319.8	309.7	10.07	31.756		
1,800.0	1,769.9	1,763.1	1,754.1	7.6	5.3	150.19	109.4	137.9	352.3	341.3	10.94	32.192		
1,900.0	1,864.7	1,857.6	1,846.8	8.4	5.7	149.70	127.3	143.2	384.7	372.9	11.84	32.506		
2,000.0	1,959.4	1,952.2	1,939.5	9.2	6.2	149.29	145.1	148.5	417.2	404.5	12.75	32.727		
2,100.0	2,054.1	2,046.7	2,032.2	10.0	6.6	148.93	162.9	153.8	449.7	436.1	13.68	32.883		
2,200.0	2,148.9	2,141.2	2,124.9	10.8	7.1	148.62	180.8	159.2	482.3	467.6	14.62	32.993		

<b>Company:</b>	PDC Energy Inc. DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Ottenhoff 29M-353
<b>Project:</b>	SEC.29-T5N-R64W	<b>TVD Reference:</b>	WWWELL @ 4686.0ft (RKB - 23')
<b>Reference Site:</b>	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	<b>MD Reference:</b>	WWWELL @ 4686.0ft (RKB - 23')
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Ottenhoff 29M-353	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.45 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #5 (5-10-18)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29R-353 - Wellbore #1 - Plan #4 (3-28-18)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													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 Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
0.0	0.0	0.0	0.0	0.0	0.0	90.69	-0.4	30.1	30.1					
100.0	100.0	100.0	100.0	0.1	0.1	90.69	-0.4	30.1	30.1	29.8	0.28	109.296		
200.0	200.0	200.0	200.0	0.4	0.4	90.69	-0.4	30.1	30.1	29.3	0.83	36.432		
300.0	300.0	300.0	300.0	0.7	0.7	90.69	-0.4	30.1	30.1	28.7	1.38	21.859		
400.0	400.0	400.0	400.0	1.0	1.0	90.69	-0.4	30.1	30.1	28.2	1.93	15.614 CC, ES		
500.0	500.0	500.0	500.0	1.2	1.2	150.20	-0.4	30.1	31.2	28.7	2.47	12.617		
600.0	599.9	599.9	599.9	1.5	1.5	153.40	-0.4	30.1	34.7	31.7	3.02	11.472		
700.0	699.7	699.7	699.7	1.8	1.8	157.50	-0.4	30.1	40.6	37.1	3.58	11.357		
800.0	799.3	799.3	799.3	2.1	2.1	161.53	-0.4	30.1	49.2	45.1	4.14	11.898		
900.0	898.6	898.6	898.6	2.4	2.3	165.02	-0.4	30.1	60.5	55.8	4.70	12.880		
1,000.0	997.5	997.5	997.5	2.8	2.6	167.83	-0.4	30.1	74.4	69.2	5.26	14.165		
1,100.0	1,096.1	1,098.4	1,098.4	3.2	2.9	169.98	0.2	29.0	89.8	84.0	5.81	15.471		
1,200.0	1,194.2	1,199.7	1,199.6	3.7	3.1	171.59	2.1	25.5	105.3	98.9	6.35	16.579		
1,300.0	1,291.7	1,301.5	1,301.2	4.2	3.4	172.85	5.3	19.6	120.7	113.8	6.90	17.494		
1,400.0	1,388.6	1,403.7	1,403.0	4.8	3.7	173.89	9.8	11.4	136.2	128.7	7.46	18.250		
1,500.0	1,484.9	1,506.4	1,504.9	5.4	4.0	174.78	15.6	0.6	151.6	143.5	8.03	18.873		
1,600.0	1,580.4	1,609.5	1,606.9	6.1	4.4	175.55	22.8	-12.5	166.9	158.3	8.61	19.382		
1,700.0	1,675.2	1,713.1	1,708.9	6.8	4.8	176.24	31.3	-28.2	181.8	172.6	9.22	19.711		
1,800.0	1,769.9	1,817.4	1,811.2	7.6	5.2	176.84	41.2	-46.5	194.2	184.4	9.86	19.691		
1,900.0	1,864.7	1,917.9	1,909.3	8.4	5.7	177.35	51.7	-65.7	204.8	194.3	10.51	19.481		
2,000.0	1,959.4	2,017.4	2,006.3	9.2	6.1	177.80	62.0	-84.7	215.4	204.2	11.17	19.281		
2,100.0	2,054.1	2,116.8	2,103.4	10.0	6.6	178.22	72.4	-103.7	226.0	214.1	11.84	19.088		
2,200.0	2,148.9	2,216.2	2,200.4	10.8	7.2	178.59	82.7	-122.8	236.6	224.0	12.51	18.906		
2,300.0	2,243.6	2,315.6	2,297.5	11.6	7.7	178.93	93.0	-141.8	247.1	234.0	13.19	18.736		
2,400.0	2,338.4	2,415.1	2,394.5	12.4	8.2	179.25	103.4	-160.9	257.7	243.9	13.88	18.575		
2,500.0	2,433.1	2,514.5	2,491.5	13.2	8.7	179.54	113.7	-179.9	268.4	253.8	14.57	18.424		
2,600.0	2,527.8	2,613.9	2,588.6	14.0	9.3	179.81	124.1	-198.9	279.0	263.7	15.26	18.282		
2,700.0	2,622.6	2,713.3	2,685.6	14.8	9.8	-179.94	134.4	-218.0	289.6	273.6	15.96	18.149		
2,800.0	2,717.3	2,812.8	2,782.6	15.6	10.4	-179.71	144.8	-237.0	300.2	283.6	16.66	18.024		
2,900.0	2,812.1	2,912.2	2,879.7	16.5	10.9	-179.50	155.1	-256.1	310.8	293.5	17.36	17.906		
3,000.0	2,906.8	3,011.6	2,976.7	17.3	11.5	-179.30	165.5	-275.1	321.5	303.4	18.07	17.794		
3,100.0	3,001.5	3,111.1	3,073.7	18.1	12.0	-179.11	175.8	-294.1	332.1	313.3	18.77	17.689		
3,200.0	3,096.3	3,210.5	3,170.8	18.9	12.6	-178.93	186.2	-313.2	342.7	323.3	19.48	17.590		
3,300.0	3,191.0	3,309.9	3,267.8	19.7	13.1	-178.77	196.5	-332.2	353.4	333.2	20.20	17.496		
3,400.0	3,285.8	3,409.3	3,364.9	20.6	13.7	-178.61	206.8	-351.3	364.0	343.1	20.91	17.407		
3,500.0	3,380.5	3,508.8	3,461.9	21.4	14.3	-178.47	217.2	-370.3	374.7	353.0	21.63	17.323		
3,600.0	3,475.2	3,608.2	3,558.9	22.2	14.8	-178.33	227.5	-389.4	385.3	363.0	22.35	17.243		
3,700.0	3,570.0	3,707.6	3,656.0	23.0	15.4	-178.20	237.9	-408.4	396.0	372.9	23.07	17.167		
3,800.0	3,664.7	3,807.0	3,753.0	23.8	16.0	-178.07	248.2	-427.4	406.6	382.8	23.79	17.095		
3,900.0	3,759.5	3,906.5	3,850.0	24.7	16.5	-177.95	258.6	-446.5	417.3	392.8	24.51	17.026		
4,000.0	3,854.2	4,005.9	3,947.1	25.5	17.1	-177.84	268.9	-465.5	427.9	402.7	25.23	16.960		
4,100.0	3,949.0	4,105.3	4,044.1	26.3	17.7	-177.73	279.3	-484.6	438.6	412.6	25.96	16.898		
4,200.0	4,043.7	4,204.8	4,141.2	27.1	18.2	-177.63	289.6	-503.6	449.3	422.6	26.68	16.838		
4,300.0	4,138.4	4,304.2	4,238.2	28.0	18.8	-177.53	300.0	-522.6	459.9	432.5	27.41	16.781		
4,400.0	4,233.2	4,403.6	4,335.2	28.8	19.4	-177.44	310.3	-541.7	470.6	442.4	28.13	16.727		
4,500.0	4,327.9	4,503.0	4,432.3	29.6	20.0	-177.35	320.6	-560.7	481.2	452.4	28.86	16.674		
4,600.0	4,422.7	4,602.5	4,529.3	30.4	20.5	-177.27	331.0	-579.8	491.9	462.3	29.59	16.624		
7,400.0	6,815.2	6,959.0	6,721.1	35.8	26.2	-78.48	65.6	-786.9	490.1	449.6	40.51	12.098		
7,500.0	6,815.9	7,039.3	6,755.0	35.5	26.1	-82.75	-7.2	-787.0	482.8	440.6	42.22	11.434		
7,600.0	6,815.6	7,128.1	6,782.7	35.3	26.1	-86.07	-91.5	-787.0	479.5	435.7	43.86	10.934		
7,700.0	6,815.3	7,223.1	6,800.6	35.2	26.2	-88.24	-184.7	-787.1	478.6	433.0	45.62	10.491		

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

<b>Company:</b>	PDC Energy Inc. DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Ottenhoff 29M-353
<b>Project:</b>	SEC.29-T5N-R64W	<b>TVD Reference:</b>	WWWELL @ 4686.0ft (RKB - 23')
<b>Reference Site:</b>	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	<b>MD Reference:</b>	WWWELL @ 4686.0ft (RKB - 23')
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Ottenhoff 29M-353	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.45 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #5 (5-10-18)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29R-353 - Wellbore #1 - Plan #4 (3-28-18)												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	
7,786.1	6,815.1	7,307.7	6,806.0	35.2	26.4	-88.91	-269.0	-787.1	478.4	431.2	47.22	10.132	
7,800.0	6,815.0	7,321.5	6,806.0	35.2	26.5	-88.92	-282.8	-787.1	478.4	431.0	47.48	10.078	
7,900.0	6,814.7	7,421.5	6,805.5	35.4	27.0	-88.90	-382.8	-787.2	478.5	428.9	49.59	9.649	
8,000.0	6,814.5	7,521.5	6,805.1	35.8	27.8	-88.88	-482.8	-787.2	478.5	426.4	52.04	9.195	
8,100.0	6,814.2	7,621.5	6,804.6	36.5	28.9	-88.86	-582.8	-787.3	478.5	423.7	54.78	8.734	
8,200.0	6,813.9	7,721.5	6,804.2	37.3	30.2	-88.84	-682.8	-787.4	478.5	420.7	57.78	8.281	
8,300.0	6,813.6	7,821.5	6,803.8	38.4	31.6	-88.82	-782.8	-787.4	478.5	417.5	61.00	7.845	
8,400.0	6,813.3	7,921.5	6,803.3	39.7	33.2	-88.80	-882.8	-787.5	478.5	414.1	64.40	7.431	
8,500.0	6,813.1	8,021.5	6,802.9	41.1	34.8	-88.78	-982.8	-787.5	478.5	410.6	67.95	7.043	
8,600.0	6,812.8	8,121.5	6,802.4	42.6	36.6	-88.76	-1,082.8	-787.6	478.6	406.9	71.64	6.680	
8,700.0	6,812.5	8,221.5	6,802.0	44.3	38.4	-88.74	-1,182.8	-787.7	478.6	403.1	75.43	6.344	
8,800.0	6,812.2	8,321.5	6,801.6	46.0	40.3	-88.72	-1,282.8	-787.7	478.6	399.3	79.33	6.033	
8,900.0	6,811.9	8,421.5	6,801.1	47.8	42.2	-88.70	-1,382.8	-787.8	478.6	395.3	83.31	5.745	
9,000.0	6,811.7	8,521.5	6,800.7	49.7	44.1	-88.68	-1,482.8	-787.8	478.6	391.3	87.35	5.479	
9,100.0	6,811.4	8,621.5	6,800.2	51.6	46.1	-88.66	-1,582.8	-787.9	478.6	387.2	91.47	5.233	
9,200.0	6,811.1	8,721.5	6,799.8	53.5	48.2	-88.64	-1,682.8	-788.0	478.6	383.0	95.63	5.005	
9,300.0	6,810.8	8,821.5	6,799.3	55.4	50.2	-88.63	-1,782.8	-788.0	478.7	378.8	99.84	4.794	
9,400.0	6,810.5	8,921.5	6,798.9	57.4	52.3	-88.61	-1,882.8	-788.1	478.7	374.6	104.09	4.598	
9,500.0	6,810.3	9,021.5	6,798.5	59.5	54.4	-88.59	-1,982.8	-788.1	478.7	370.3	108.38	4.417	
9,600.0	6,810.0	9,121.5	6,798.0	61.5	56.5	-88.57	-2,082.8	-788.2	478.7	366.0	112.71	4.247	
9,700.0	6,809.7	9,221.5	6,797.6	63.6	58.7	-88.55	-2,182.8	-788.3	478.7	361.7	117.06	4.090	
9,800.0	6,809.4	9,321.5	6,797.1	65.7	60.8	-88.53	-2,282.8	-788.3	478.7	357.3	121.43	3.942	
9,900.0	6,809.1	9,421.5	6,796.7	67.8	63.0	-88.51	-2,382.8	-788.4	478.7	352.9	125.83	3.805	
10,000.0	6,808.9	9,521.5	6,796.3	69.9	65.2	-88.49	-2,482.8	-788.5	478.8	348.5	130.26	3.676	
10,100.0	6,808.6	9,621.5	6,795.8	72.0	67.4	-88.47	-2,582.8	-788.5	478.8	344.1	134.69	3.555	
10,200.0	6,808.3	9,721.5	6,795.4	74.2	69.6	-88.45	-2,682.8	-788.6	478.8	339.6	139.15	3.441	
10,300.0	6,808.0	9,821.5	6,794.9	76.3	71.8	-88.43	-2,782.8	-788.6	478.8	335.2	143.62	3.334	
10,400.0	6,807.7	9,921.5	6,794.5	78.5	74.0	-88.41	-2,882.8	-788.7	478.8	330.7	148.11	3.233	
10,500.0	6,807.5	10,021.5	6,794.0	80.7	76.2	-88.39	-2,982.8	-788.8	478.8	326.2	152.60	3.138	
10,600.0	6,807.2	10,121.5	6,793.6	82.8	78.5	-88.38	-3,082.8	-788.8	478.9	321.7	157.11	3.048	
10,700.0	6,806.9	10,221.5	6,793.2	85.0	80.7	-88.36	-3,182.8	-788.9	478.9	317.2	161.63	2.963	
10,800.0	6,806.6	10,321.5	6,792.7	87.2	83.0	-88.34	-3,282.8	-788.9	478.9	312.7	166.16	2.882	
10,900.0	6,806.3	10,421.5	6,792.3	89.4	85.2	-88.32	-3,382.8	-789.0	478.9	308.2	170.70	2.805	
11,000.0	6,806.1	10,521.5	6,791.8	91.7	87.5	-88.30	-3,482.8	-789.1	478.9	303.7	175.25	2.733	
11,100.0	6,805.8	10,621.5	6,791.4	93.9	89.7	-88.28	-3,582.8	-789.1	478.9	299.1	179.80	2.664	
11,200.0	6,805.5	10,721.5	6,791.0	96.1	92.0	-88.26	-3,682.8	-789.2	478.9	294.6	184.36	2.598	
11,300.0	6,805.2	10,821.5	6,790.5	98.3	94.3	-88.24	-3,782.8	-789.2	479.0	290.0	188.93	2.535	
11,400.0	6,804.9	10,921.5	6,790.1	100.6	96.5	-88.22	-3,882.8	-789.3	479.0	285.5	193.51	2.475	
11,500.0	6,804.7	11,021.5	6,789.6	102.8	98.8	-88.20	-3,982.8	-789.4	479.0	280.9	198.09	2.418	
11,600.0	6,804.4	11,121.5	6,789.2	105.1	101.1	-88.18	-4,082.8	-789.4	479.0	276.3	202.67	2.363	
11,700.0	6,804.1	11,221.5	6,788.7	107.3	103.4	-88.16	-4,182.8	-789.5	479.0	271.8	207.26	2.311	
11,800.0	6,803.8	11,321.5	6,788.3	109.6	105.7	-88.14	-4,282.8	-789.5	479.0	267.2	211.85	2.261	
11,900.0	6,803.5	11,421.5	6,787.9	111.8	108.0	-88.12	-4,382.8	-789.6	479.1	262.6	216.45	2.213	
12,000.0	6,803.3	11,521.5	6,787.4	114.1	110.3	-88.11	-4,482.8	-789.7	479.1	258.0	221.06	2.167	
12,100.0	6,803.0	11,621.5	6,787.0	116.4	112.5	-88.09	-4,582.8	-789.7	479.1	253.4	225.66	2.123	
12,200.0	6,802.7	11,721.5	6,786.5	118.6	114.8	-88.07	-4,682.8	-789.8	479.1	248.8	230.27	2.081	
12,300.0	6,802.4	11,821.5	6,786.1	120.9	117.1	-88.05	-4,782.8	-789.8	479.1	244.2	234.88	2.040	
12,400.0	6,802.1	11,921.5	6,785.7	123.2	119.4	-88.03	-4,882.8	-789.9	479.1	239.6	239.50	2.001	
12,500.0	6,801.9	12,021.5	6,785.2	125.5	121.7	-88.01	-4,982.8	-790.0	479.2	235.0	244.12	1.963	
12,600.0	6,801.6	12,121.5	6,784.8	127.7	124.0	-87.99	-5,082.8	-790.0	479.2	230.4	248.74	1.926	
12,700.0	6,801.3	12,221.5	6,784.3	130.0	126.4	-87.97	-5,182.8	-790.1	479.2	225.8	253.37	1.891	

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

<b>Company:</b>	PDC Energy Inc. DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Ottenhoff 29M-353
<b>Project:</b>	SEC.29-T5N-R64W	<b>TVD Reference:</b>	WWWELL @ 4686.0ft (RKB - 23')
<b>Reference Site:</b>	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	<b>MD Reference:</b>	WWWELL @ 4686.0ft (RKB - 23')
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Ottenhoff 29M-353	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.45 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #5 (5-10-18)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design													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)				
12,800.0	6,801.0	12,321.5	6,783.9	132.3	128.7	-87.95	-5,282.8	-790.1	479.2	221.2	257.99	1.857			
12,900.0	6,800.7	12,421.5	6,783.4	134.6	131.0	-87.93	-5,382.8	-790.2	479.2	216.6	262.62	1.825			
13,000.0	6,800.5	12,521.5	6,783.0	136.9	133.3	-87.91	-5,482.8	-790.3	479.2	212.0	267.25	1.793			
13,100.0	6,800.2	12,621.5	6,782.6	139.2	135.6	-87.89	-5,582.8	-790.3	479.2	207.4	271.89	1.763			
13,200.0	6,799.9	12,721.5	6,782.1	141.5	137.9	-87.87	-5,682.8	-790.4	479.3	202.7	276.52	1.733			
13,300.0	6,799.6	12,821.5	6,781.7	143.8	140.2	-87.86	-5,782.8	-790.5	479.3	198.1	281.16	1.705			
13,400.0	6,799.3	12,921.5	6,781.2	146.1	142.5	-87.84	-5,882.8	-790.5	479.3	193.5	285.80	1.677			
13,500.0	6,799.1	13,021.5	6,780.8	148.4	144.9	-87.82	-5,982.8	-790.6	479.3	188.9	290.44	1.650			
13,600.0	6,798.8	13,121.5	6,780.4	150.7	147.2	-87.80	-6,082.8	-790.6	479.3	184.3	295.08	1.624			
13,700.0	6,798.5	13,221.5	6,779.9	153.0	149.5	-87.78	-6,182.8	-790.7	479.3	179.6	299.72	1.599			
13,800.0	6,798.2	13,321.5	6,779.5	155.3	151.8	-87.76	-6,282.8	-790.8	479.4	175.0	304.37	1.575			
13,900.0	6,797.9	13,421.5	6,779.0	157.6	154.1	-87.74	-6,382.8	-790.8	479.4	170.4	309.01	1.551			
14,000.0	6,797.7	13,521.5	6,778.6	159.9	156.5	-87.72	-6,482.8	-790.9	479.4	165.7	313.66	1.528			
14,100.0	6,797.4	13,621.5	6,778.2	162.2	158.8	-87.70	-6,582.8	-790.9	479.4	161.1	318.31	1.506			
14,200.0	6,797.1	13,721.5	6,777.7	164.5	161.1	-87.68	-6,682.8	-791.0	479.4	156.5	322.96	1.485 Level 3			
14,300.0	6,796.8	13,821.5	6,777.3	166.8	163.4	-87.66	-6,782.8	-791.1	479.5	151.8	327.61	1.463 Level 3			
14,400.0	6,796.5	13,921.5	6,776.8	169.1	165.7	-87.64	-6,882.8	-791.1	479.5	147.2	332.26	1.443 Level 3			
14,500.0	6,796.3	14,021.5	6,776.4	171.4	168.1	-87.62	-6,982.8	-791.2	479.5	142.6	336.92	1.423 Level 3			
14,553.3	6,796.1	14,074.8	6,776.1	172.6	169.3	-87.61	-7,036.1	-791.2	479.5	140.1	339.40	1.413 Level 3			
14,592.3	6,796.0	14,108.5	6,776.0	173.5	170.1	-87.61	-7,069.8	-791.2	479.5	138.4	341.09	1.406 Level 3, SF			

<b>Company:</b>	PDC Energy Inc. DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Ottenhoff 29M-353
<b>Project:</b>	SEC.29-T5N-R64W	<b>TVD Reference:</b>	WWWELL @ 4686.0ft (RKB - 23')
<b>Reference Site:</b>	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	<b>MD Reference:</b>	WWWELL @ 4686.0ft (RKB - 23')
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Ottenhoff 29M-353	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.45 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #5 (5-10-18)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design													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	90.46	-0.7	90.0	90.0						
100.0	100.0	99.0	99.0	0.1	0.1	90.46	-0.7	90.0	90.0	89.7	0.27	328.501			
200.0	200.0	199.0	199.0	0.4	0.4	90.46	-0.7	90.0	90.0	89.2	0.82	109.318			
300.0	300.0	299.0	299.0	0.7	0.7	90.46	-0.7	90.0	90.0	88.6	1.37	65.503			
400.0	400.0	399.0	399.0	1.0	1.0	90.46	-0.7	90.0	90.0	88.1	1.92	46.761 CC, ES			
500.0	500.0	499.0	499.0	1.2	1.2	149.16	-0.7	90.0	91.1	88.6	2.47	36.863			
600.0	599.9	598.9	598.9	1.5	1.5	150.35	-0.7	90.0	94.5	91.5	3.02	31.295			
700.0	699.7	698.7	698.7	1.8	1.8	152.16	-0.7	90.0	100.2	96.7	3.57	28.046			
800.0	799.3	798.3	798.3	2.1	2.1	154.37	-0.7	90.0	108.4	104.3	4.13	26.230			
900.0	898.6	897.6	897.6	2.4	2.3	156.74	-0.7	90.0	119.1	114.4	4.70	25.368			
1,000.0	997.5	996.5	996.5	2.8	2.6	159.12	-0.7	90.0	132.5	127.2	5.26	25.177 SF			
1,100.0	1,096.1	1,095.1	1,095.1	3.2	2.9	161.37	-0.7	90.0	148.4	142.6	5.83	25.473			
1,200.0	1,194.2	1,193.2	1,193.2	3.7	3.1	163.42	-0.7	90.0	167.1	160.7	6.39	26.134			
1,300.0	1,291.7	1,290.7	1,290.7	4.2	3.4	165.25	-0.7	90.0	188.4	181.4	6.96	27.072			
1,400.0	1,388.6	1,387.6	1,387.6	4.8	3.7	166.86	-0.7	90.0	212.3	204.8	7.52	28.223			
1,500.0	1,484.9	1,483.9	1,483.9	5.4	3.9	168.25	-0.7	90.0	238.8	230.8	8.09	29.540			
1,600.0	1,580.4	1,579.4	1,579.4	6.1	4.2	169.46	-0.7	90.0	268.0	259.3	8.65	30.988			
1,700.0	1,675.2	1,674.2	1,674.2	6.8	4.5	170.53	-0.7	90.0	299.3	290.1	9.23	32.444			
1,800.0	1,769.9	1,768.9	1,768.9	7.6	4.7	171.44	-0.7	90.0	331.0	321.1	9.82	33.705			
1,900.0	1,864.7	1,865.9	1,865.9	8.4	5.0	172.12	-0.2	90.0	362.5	352.1	10.42	34.775			
2,000.0	1,959.4	1,964.5	1,964.4	9.2	5.3	172.36	2.8	90.2	393.2	382.2	11.04	35.620			
2,100.0	2,054.1	2,063.7	2,063.5	10.0	5.5	172.22	8.4	90.6	423.0	411.4	11.67	36.263			
2,200.0	2,148.9	2,163.4	2,162.8	10.8	5.8	171.78	16.5	91.1	452.0	439.7	12.31	36.719			
2,300.0	2,243.6	2,263.4	2,262.2	11.6	6.1	171.09	27.3	91.7	480.2	467.2	12.98	37.002			

<b>Company:</b>	PDC Energy Inc. DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Ottenhoff 29M-353
<b>Project:</b>	SEC.29-T5N-R64W	<b>TVD Reference:</b>	WWWELL @ 4686.0ft (RKB - 23')
<b>Reference Site:</b>	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	<b>MD Reference:</b>	WWWELL @ 4686.0ft (RKB - 23')
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Ottenhoff 29M-353	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.45 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #5 (5-10-18)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design													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)				
0.0	0.0	0.0	0.0	0.0	0.0	90.52	-1.1	120.1	120.1						
100.0	100.0	100.0	100.0	0.1	0.1	90.52	-1.1	120.1	120.1	119.8	0.28	436.156			
200.0	200.0	200.0	200.0	0.4	0.4	90.52	-1.1	120.1	120.1	119.3	0.83	145.385			
300.0	300.0	300.0	300.0	0.7	0.7	90.52	-1.1	120.1	120.1	118.7	1.38	87.231			
400.0	400.0	400.0	400.0	1.0	1.0	90.52	-1.1	120.1	120.1	118.2	1.93	62.308	CC, ES		
500.0	500.0	498.6	498.6	1.2	1.2	148.56	0.0	120.7	121.8	119.3	2.47	49.325			
600.0	599.9	597.0	596.9	1.5	1.5	147.90	3.4	122.4	126.9	123.9	3.01	42.093			
700.0	699.7	695.0	694.7	1.8	1.8	146.90	9.0	125.3	135.4	131.9	3.57	37.889			
800.0	799.3	792.5	791.8	2.1	2.1	145.69	16.8	129.3	147.4	143.3	4.15	35.492			
900.0	898.6	889.2	887.9	2.4	2.4	144.39	26.7	134.4	162.9	158.1	4.76	34.225			
1,000.0	997.5	985.1	982.8	2.8	2.7	143.08	38.7	140.6	181.7	176.3	5.40	33.681			
1,100.0	1,096.1	1,080.0	1,076.4	3.2	3.1	141.83	52.6	147.8	204.0	197.9	6.07	33.600	SF		
1,200.0	1,194.2	1,173.6	1,168.3	3.7	3.5	140.65	68.3	155.9	229.7	222.9	6.79	33.813			
1,300.0	1,291.7	1,267.2	1,259.8	4.2	4.0	139.59	85.9	165.0	258.5	251.0	7.56	34.186			
1,400.0	1,388.6	1,362.3	1,352.6	4.8	4.4	138.91	104.2	174.4	289.6	281.2	8.37	34.580			
1,500.0	1,484.9	1,456.7	1,444.8	5.4	4.9	138.61	122.3	183.8	322.5	313.3	9.22	34.969			
1,600.0	1,580.4	1,550.4	1,536.3	6.1	5.4	138.56	140.3	193.0	357.3	347.2	10.10	35.377			
1,700.0	1,675.2	1,643.5	1,627.2	6.8	5.9	138.89	158.2	202.3	393.6	382.6	11.02	35.730			
1,800.0	1,769.9	1,736.6	1,718.1	7.6	6.4	139.32	176.1	211.5	430.2	418.2	11.96	35.966			
1,900.0	1,864.7	1,829.6	1,808.9	8.4	6.9	139.69	194.0	220.7	466.8	453.9	12.92	36.135			



<b>Company:</b>	PDC Energy Inc. DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Ottenhoff 29M-353
<b>Project:</b>	SEC.29-T5N-R64W	<b>TVD Reference:</b>	WWWELL @ 4686.0ft (RKB - 23')
<b>Reference Site:</b>	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	<b>MD Reference:</b>	WWWELL @ 4686.0ft (RKB - 23')
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Ottenhoff 29M-353	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.45 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #5 (5-10-18)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29U-343 - Wellbore #1 - Plan #3 (6-27-17)													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	90.61	-1.4	135.1	135.1					
100.0	100.0	99.0	99.0	0.1	0.1	90.61	-1.4	135.1	135.1	134.9	0.27	493.272		
200.0	200.0	199.0	199.0	0.4	0.4	90.61	-1.4	135.1	135.1	134.3	0.82	164.151	CC, ES	
300.0	300.0	296.8	296.8	0.7	0.7	90.21	-0.5	135.9	135.9	134.6	1.37	99.558		
400.0	400.0	394.5	394.4	1.0	1.0	89.02	2.4	138.3	138.4	136.5	1.91	72.395		
500.0	500.0	491.9	491.6	1.2	1.2	145.65	7.1	142.2	143.7	141.2	2.47	58.263		
600.0	599.9	588.8	588.1	1.5	1.5	143.97	13.8	147.7	153.0	149.9	3.03	50.424		
700.0	699.7	685.0	683.7	1.8	1.9	142.38	22.2	154.7	166.2	162.6	3.62	45.919		
800.0	799.3	780.3	778.1	2.1	2.2	140.94	32.5	163.2	183.4	179.1	4.23	43.385		
900.0	898.6	874.5	871.0	2.4	2.6	139.70	44.3	173.0	204.3	199.5	4.86	42.069		
1,000.0	997.5	967.4	962.3	2.8	3.0	138.64	57.8	184.1	229.1	223.6	5.52	41.525		
1,100.0	1,096.1	1,058.9	1,051.6	3.2	3.5	137.75	72.6	196.4	257.5	251.3	6.21	41.473	SF	
1,200.0	1,194.2	1,148.7	1,139.0	3.7	4.0	136.98	88.9	209.8	289.5	282.6	6.94	41.734		
1,300.0	1,291.7	1,237.9	1,225.2	4.2	4.5	136.33	106.5	224.4	325.0	317.3	7.71	42.158		
1,400.0	1,388.6	1,330.5	1,314.5	4.8	5.1	135.91	125.3	240.0	362.7	354.2	8.53	42.546		
1,500.0	1,484.9	1,422.4	1,403.1	5.4	5.7	135.75	144.0	255.4	402.2	392.8	9.37	42.916		
1,600.0	1,580.4	1,513.4	1,491.0	6.1	6.3	135.77	162.5	270.7	443.4	433.2	10.25	43.251		
1,700.0	1,675.2	1,603.7	1,578.1	6.8	6.9	136.17	180.8	285.9	486.1	474.9	11.18	43.482		

<b>Company:</b>	PDC Energy Inc. DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Ottenhoff 29M-353
<b>Project:</b>	SEC.29-T5N-R64W	<b>TVD Reference:</b>	WWWELL @ 4686.0ft (RKB - 23')
<b>Reference Site:</b>	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	<b>MD Reference:</b>	WWWELL @ 4686.0ft (RKB - 23')
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Ottenhoff 29M-353	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.45 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #5 (5-10-18)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design Schneider 19Q-HZ Pad Sec.19-T5N-R64W - Schneider 19Q-202 - Wellbore #1 - Wellbore #1													Offset Site Error:	0.0 ft
Survey Program: 151-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		
6,500.0	6,273.4	11,394.3	6,703.2	38.9	161.1	-25.67	626.8	-1,253.2	459.9	293.6	166.30	2.765		
6,600.0	6,368.5	11,391.8	6,703.3	38.8	161.0	-164.47	626.7	-1,255.7	360.0	179.0	180.99	1.989		
6,700.0	6,458.3	11,388.7	6,703.3	38.5	160.9	-175.40	626.5	-1,258.8	261.9	89.9	172.00	1.523		
6,800.0	6,541.2	11,384.9	6,703.3	38.2	160.8	-178.73	626.4	-1,262.5	172.2	15.0	157.15	1.096	Level 2	
6,900.0	6,615.6	11,380.8	6,703.4	37.8	160.7	179.07	626.2	-1,266.7	116.1	-23.6	139.66	0.831	Level 1, ES, SF	
6,920.0	6,629.3	11,380.0	6,703.4	37.7	160.6	178.65	626.1	-1,267.5	114.0	-21.8	135.89	0.839	Level 1, CC	
7,000.0	6,679.9	11,376.5	6,703.4	37.4	160.5	176.76	626.0	-1,271.0	142.8	22.8	120.00	1.190	Level 2	
7,100.0	6,732.9	11,372.1	6,703.5	36.9	160.4	173.14	625.8	-1,275.4	224.3	125.8	98.51	2.277		
7,200.0	6,773.6	11,367.7	6,703.5	36.5	160.2	163.73	625.6	-1,279.8	320.3	245.9	74.39	4.305		
7,300.0	6,801.2	11,363.3	6,703.6	36.1	160.1	89.59	625.4	-1,284.1	419.7	376.8	42.96	9.770		

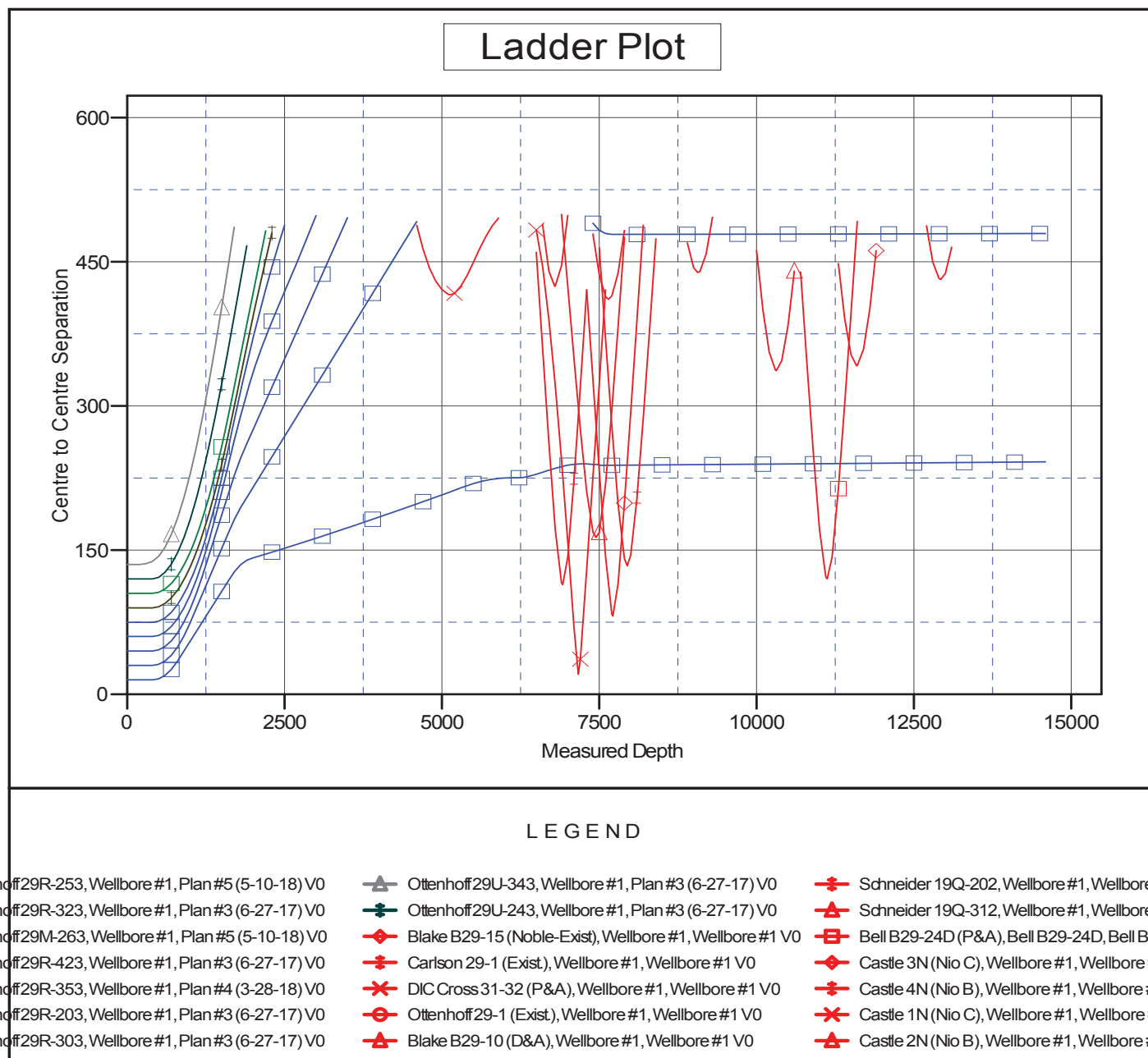
<b>Company:</b>	PDC Energy Inc. DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Ottenhoff 29M-353
<b>Project:</b>	SEC.29-T5N-R64W	<b>TVD Reference:</b>	WWWELL @ 4686.0ft (RKB - 23')
<b>Reference Site:</b>	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	<b>MD Reference:</b>	WWWELL @ 4686.0ft (RKB - 23')
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Ottenhoff 29M-353	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.45 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #5 (5-10-18)	<b>Offset TVD Reference:</b>	Offset Datum

<b>Offset Design</b> Schneider 19Q-HZ Pad Sec.19-T5N-R64W - Schneider 19Q-312 - Wellbore #1 - Wellbore #1												<b>Offset Site Error:</b>	0.0 ft
<b>Survey Program:</b> 153-MWD												<b>Offset Well Error:</b>	0.0 ft
<b>Reference</b>		<b>Offset</b>		<b>Semi Major Axis</b>		<b>Distance</b>							<b>Warning</b>
<b>Measured Depth (ft)</b>	<b>Vertical Depth (ft)</b>	<b>Measured Depth (ft)</b>	<b>Vertical Depth (ft)</b>	<b>Reference (ft)</b>	<b>Offset (ft)</b>	<b>Highside Toolface (°)</b>	<b>Offset Wellbore Centre +N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Between Centres (ft)</b>	<b>Between Ellipses (ft)</b>	<b>Minimum Separation (ft)</b>	<b>Separation Factor</b>	
6,600.0	6,368.5	11,266.7	6,782.8	38.8	158.7	-178.70	972.6	-1,255.8	488.9	308.7	180.15	2.714	
6,700.0	6,458.3	11,265.5	6,782.9	38.5	158.6	-178.96	972.6	-1,257.0	440.4	271.5	168.82	2.608 SF	
6,792.6	6,535.4	11,264.5	6,782.9	38.2	158.6	-179.11	972.6	-1,258.0	424.6	268.9	155.75	2.726 CC, ES	
6,800.0	6,541.2	11,264.5	6,782.9	38.2	158.6	-179.12	972.6	-1,258.0	424.7	270.1	154.61	2.747	
6,900.0	6,615.6	11,263.7	6,782.9	37.8	158.6	-179.20	972.6	-1,258.8	445.7	307.8	137.90	3.232	
7,000.0	6,679.9	11,263.1	6,782.9	37.4	158.6	-179.22	972.6	-1,259.4	498.3	379.1	119.27	4.178	

<b>Company:</b>	PDC Energy Inc. DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Ottenhoff 29M-353
<b>Project:</b>	SEC.29-T5N-R64W	<b>TVD Reference:</b>	WWWELL @ 4686.0ft (RKB - 23')
<b>Reference Site:</b>	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	<b>MD Reference:</b>	WWWELL @ 4686.0ft (RKB - 23')
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Ottenhoff 29M-353	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.45 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #5 (5-10-18)	<b>Offset TVD Reference:</b>	Offset Datum

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

Coordinates are relative to: Ottenhoff 29M-353  
Coordinate System is US State Plane 1983, Colorado Northern Zone  
Grid Convergence at Surface is: 0.60°



<b>Company:</b>	PDC Energy Inc. DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Ottenhoff 29M-353
<b>Project:</b>	SEC.29-T5N-R64W	<b>TVD Reference:</b>	WWWELL @ 4686.0ft (RKB - 23')
<b>Reference Site:</b>	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	<b>MD Reference:</b>	WWWELL @ 4686.0ft (RKB - 23')
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Ottenhoff 29M-353	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.45 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #5 (5-10-18)	<b>Offset TVD Reference:</b>	Offset Datum

Reference Depths are relative to WWWELL @ 4686.0ft (RKB - 23')

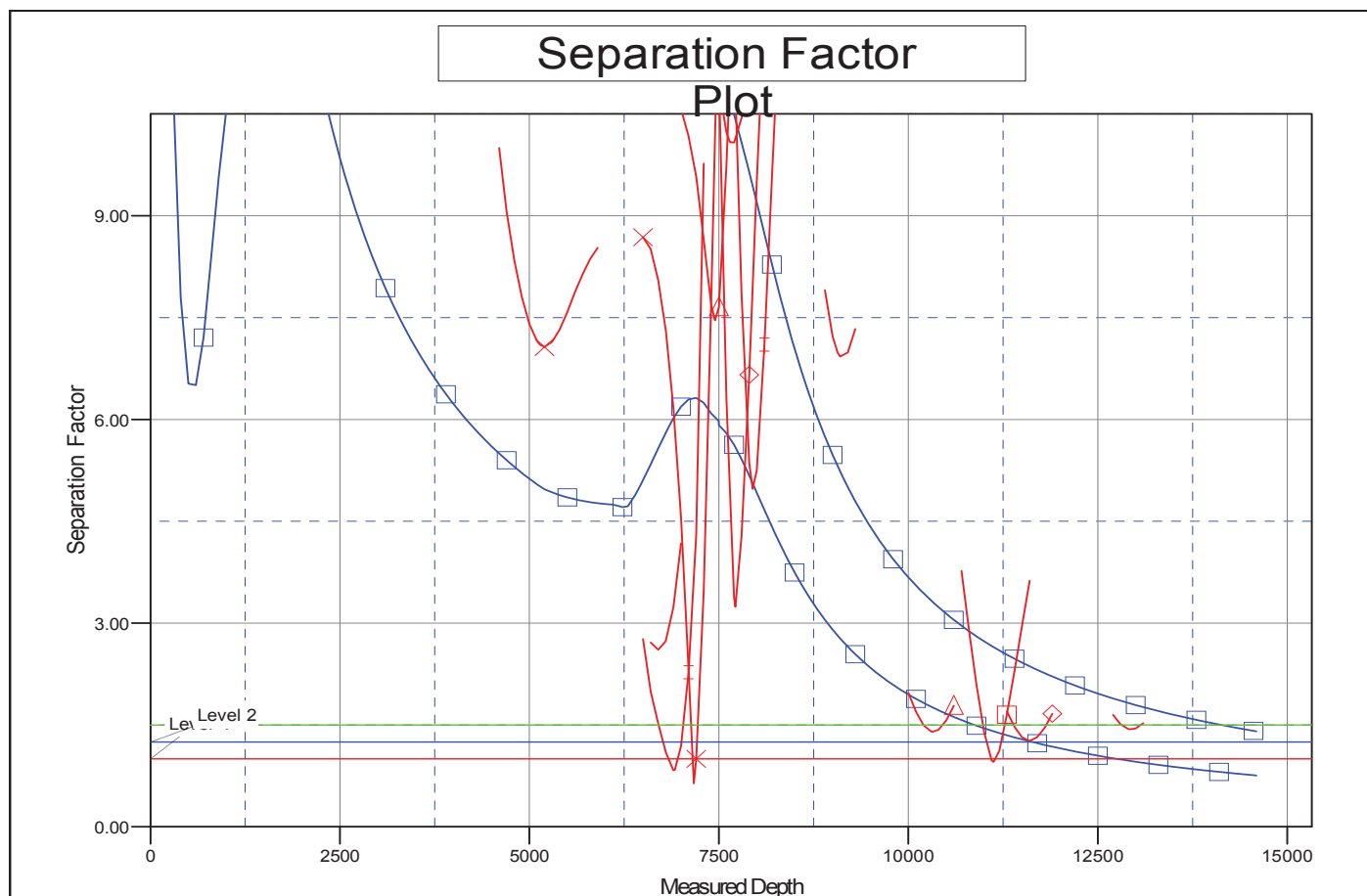
Offset Depths are relative to Offset Datum

Central Meridian is -105.500000

Coordinates are relative to: Ottenhoff 29M-353

Coordinate System is US State Plane 1983, Colorado Northern Zone

Grid Convergence at Surface is: 0.60°



### LEGEND

hoff 29R-253, Wellbore #1, Plan #5 (5-10-18) V0	▲ Ottenhoff 29U-343, Wellbore #1, Plan #3 (6-27-17) V0	✱ Schneider 19Q-202, Wellbore #1, Wellbore #1
hoff 29R-323, Wellbore #1, Plan #3 (6-27-17) V0	◆ Ottenhoff 29U-243, Wellbore #1, Plan #3 (6-27-17) V0	▲ Schneider 19Q-312, Wellbore #1, Wellbore #1
hoff 29M-263, Wellbore #1, Plan #5 (5-10-18) V0	◆ Blake B29-15 (Noble-Exist), Wellbore #1, Wellbore #1 V0	■ Bell B29-24D (P&A), Bell B29-24D, Bell B29-
hoff 29R-423, Wellbore #1, Plan #3 (6-27-17) V0	✱ Carlson 29-1 (Exist), Wellbore #1, Wellbore #1 V0	◆ Castle 3N (Nio C), Wellbore #1, Wellbore #1
hoff 29R-353, Wellbore #1, Plan #4 (3-28-18) V0	✱ DIC Cross 31-32 (P&A), Wellbore #1, Wellbore #1 V0	✱ Castle 4N (Nio B), Wellbore #1, Wellbore #1
hoff 29R-203, Wellbore #1, Plan #3 (6-27-17) V0	◆ Ottenhoff 29-1 (Exist), Wellbore #1, Wellbore #1 V0	✱ Castle 1N (Nio C), Wellbore #1, Wellbore #1
hoff 29R-303, Wellbore #1, Plan #3 (6-27-17) V0	▲ Blake B29-10 (D&A), Wellbore #1, Wellbore #1 V0	▲ Castle 2N (Nio B), Wellbore #1, Wellbore #1