

# PETROLEUM DEVELOPMENT CORP Weld County CO

## Well Name: Sorin Natural Resources 2U-443

Surface Location: Sorin Natural Resources 2R-HZ Pad Sec.2-T4N-R66W  
North American Datum 1983 , US State Plane 1983 , Colorado Northern Zone

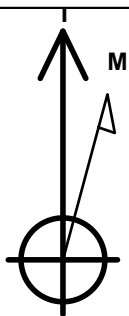
Ground Elevation: 4671.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1370685.97	3211929.38	40.348440	-104.739630	

RKB - 15' WELL @ 4686.0ft (RKB - 15')

### WELLBORE TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Shape Point
BHL 500'FSL & 450' FEL	7146.0	-4874.4	833.6	



Azimuths to True North  
Magnetic North: 8.63°

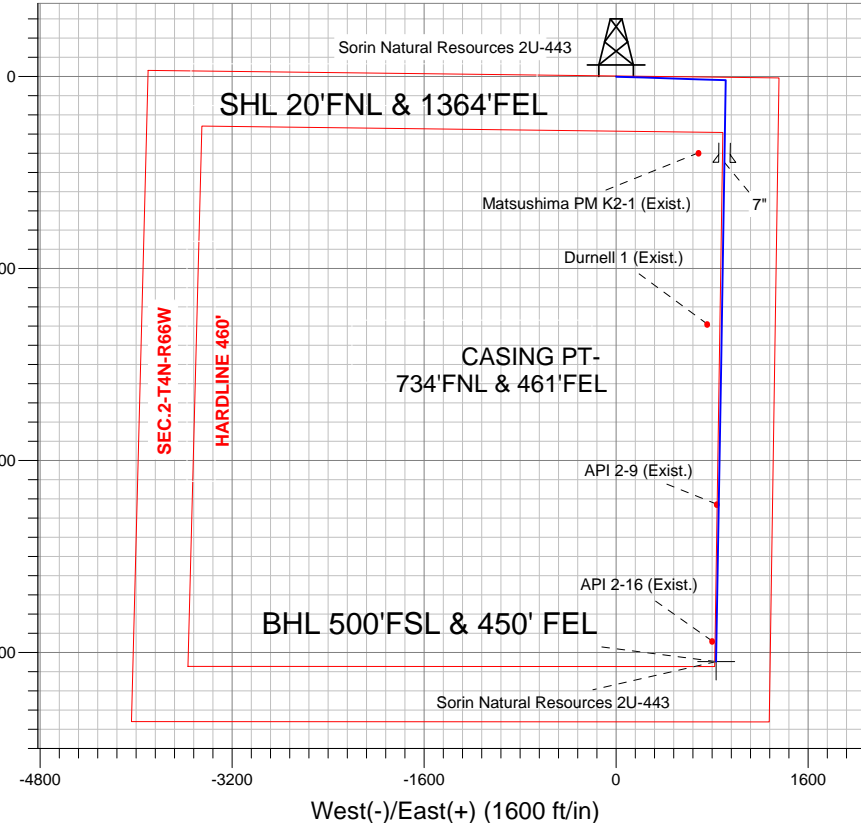
Magnetic Field  
Strength: 52937.3snT  
Dip Angle: 66.96°  
Date: 1/28/2013  
Model: IGRF2010

### ANNOTATIONS

TVD	MD	Annotation
400.0	400.0	KOP #1
6372.3	6451.1	KOP #2
7146.0	7764.1	End of Build

Sorin Natural Resources 2R-HZ Pad Sec.2-T4N-R66W  
Sorin Natural Resources 2U-443  
Plan #1 (01-28-13)  
11:00, January 29 2013

South(-)/North(+) (1600 ft/in)



### SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	DLeg	TFace	VSec	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	909.3	10.19	91.88	906.7	-1.5	45.1	2.00	91.88	9.1	
4	5569.5	10.19	91.88	5493.3	-28.5	868.9	0.00	0.00	174.6	
5	6078.8	0.00	0.00	6000.0	-30.0	914.0	2.00	180.00	183.6	
6	6451.1	0.00	0.00	6372.3	-30.0	914.0	0.00	0.00	183.6	
7	7571.1	84.00	180.95	7132.0	-714.0	902.7	7.50	180.95	855.9	
8	7644.1	84.00	180.95	7139.7	-786.6	901.5	0.00	0.00	927.3	
9	7764.1	90.00	180.95	7146.0	-906.3	899.5	5.00	0.01	1045.0	
10	11732.7	90.00	180.95	7146.0	-4874.4	833.6	0.00	0.00	4945.2	BHL 500'FSL & 450' FEL

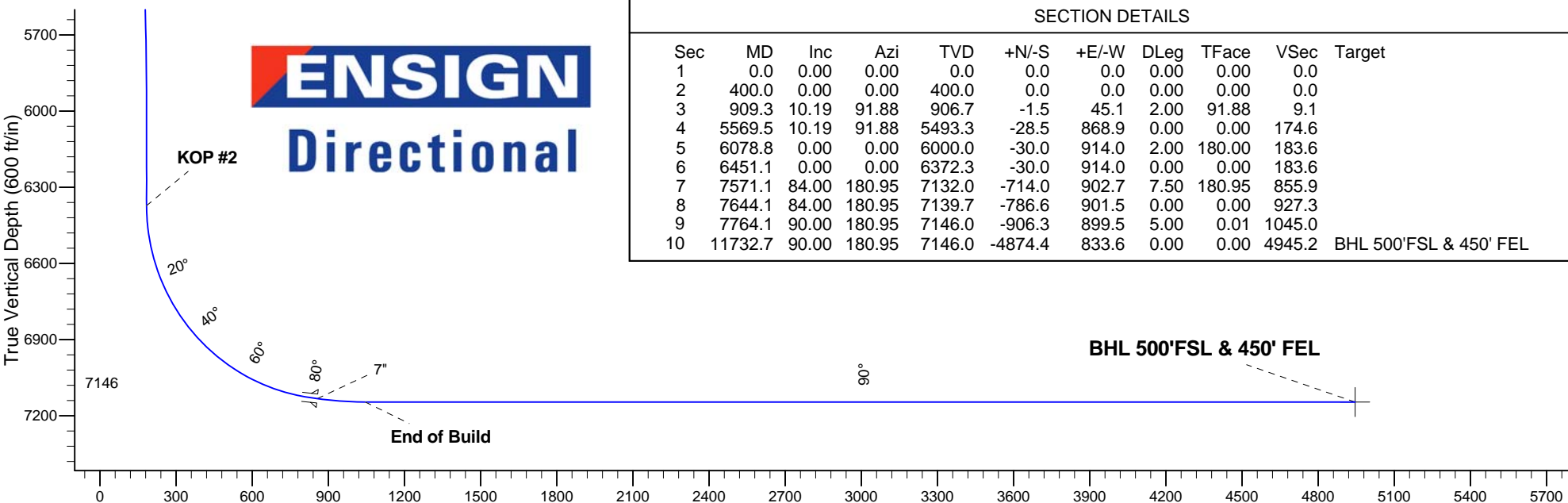
BHL 500'FSL & 450' FEL

90°

End of Build

**ENSIGN**  
Directional

KOP #2



Vertical Section at 170.30° (600 ft/in)



# **PETROLEUM DEVELOPMENT CORP Weld County CO**

**SEC.2-T4N-R66W**

**Sorin Natural Resources 2R-HZ Pad Sec.2-T4N-R66W**

**Sorin Natural Resources 2U-443**

**Wellbore #1**

**Plan: Plan #1 (01-28-13)**

## **Standard Planning Report**

**29 January, 2013**

<b>Database:</b>	Landmark	<b>Local Co-ordinate Reference:</b>	Well Sorin Natural Resources 2U-443
<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>TVD Reference:</b>	WELL @ 4686.0ft (RKB - 15')
<b>Project:</b>	SEC.2-T4N-R66W	<b>MD Reference:</b>	WELL @ 4686.0ft (RKB - 15')
<b>Site:</b>	Sorin Natural Resources 2R-HZ Pad Sec.2-T4N-R66W	<b>North Reference:</b>	True
<b>Well:</b>	Sorin Natural Resources 2U-443	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Plan #1 (01-28-13)		

<b>Project</b>	SEC.2-T4N-R66W, Weld County, Colorado		
<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						Sorin Natural Resources 2R-HZ Pad Sec.2-T4N-R66W											
Site Position:						Northing:			1,370,685.98 ft			Latitude:			40.348440		
From:			Lat/Long			Easting:			3,211,929.38 ft			Longitude:			-104.739630		
Position Uncertainty:			0.0 ft			Slot Radius:			"			Grid Convergence:			0.49 °		

Well	Sorin Natural Resources 2U-443					
Well Position	+N-S	0.0 ft	Northing:	1,370,685.97 ft	Latitude:	40.348440
	+E-W	0.0 ft	Easting:	3,211,929.38 ft	Longitude:	-104.739630
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,671.0 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	1/28/2013	8.63	66.96	52,937

<b>Design</b>	Plan #1 (01-28-13)			
<b>Audit Notes:</b>				
<b>Version:</b>	<b>Phase:</b>	PROTOTYPE	<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	170.30

<b>Plan Sections</b>										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	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	
909.3	10.19	91.88	906.7	-1.5	45.1	2.00	2.00	0.00	91.88	
5,569.5	10.19	91.88	5,493.3	-28.5	868.9	0.00	0.00	0.00	0.00	
6,078.8	0.00	0.00	6,000.0	-30.0	914.0	2.00	-2.00	0.00	180.00	
6,451.1	0.00	0.00	6,372.3	-30.0	914.0	0.00	0.00	0.00	0.00	
7,571.1	84.00	180.95	7,132.0	-714.0	902.7	7.50	7.50	0.00	180.95	
7,644.1	84.00	180.95	7,139.7	-786.6	901.5	0.00	0.00	0.00	0.00	
7,764.1	90.00	180.95	7,146.0	-906.3	899.5	5.00	5.00	0.00	0.01	
11,732.7	90.00	180.95	7,146.0	-4,874.4	833.6	0.00	0.00	0.00	0.00	BHL 500'FSL & 45C

<b>Database:</b>	Landmark	<b>Local Co-ordinate Reference:</b>	Well Sorin Natural Resources 2U-443
<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>TVD Reference:</b>	WELL @ 4686.0ft (RKB - 15')
<b>Project:</b>	SEC.2-T4N-R66W	<b>MD Reference:</b>	WELL @ 4686.0ft (RKB - 15')
<b>Site:</b>	Sorin Natural Resources 2R-HZ Pad Sec.2-T4N-R66W	<b>North Reference:</b>	True
<b>Well:</b>	Sorin Natural Resources 2U-443	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Plan #1 (01-28-13)		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
40.0	0.00	0.00	40.0	0.0	0.0	0.0	0.00	0.00	0.00
80.0	0.00	0.00	80.0	0.0	0.0	0.0	0.00	0.00	0.00
120.0	0.00	0.00	120.0	0.0	0.0	0.0	0.00	0.00	0.00
160.0	0.00	0.00	160.0	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
240.0	0.00	0.00	240.0	0.0	0.0	0.0	0.00	0.00	0.00
280.0	0.00	0.00	280.0	0.0	0.0	0.0	0.00	0.00	0.00
320.0	0.00	0.00	320.0	0.0	0.0	0.0	0.00	0.00	0.00
360.0	0.00	0.00	360.0	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
440.0	0.80	91.88	440.0	0.0	0.3	0.1	2.00	2.00	0.00
480.0	1.60	91.88	480.0	0.0	1.1	0.2	2.00	2.00	0.00
520.0	2.40	91.88	520.0	-0.1	2.5	0.5	2.00	2.00	0.00
560.0	3.20	91.88	559.9	-0.1	4.5	0.9	2.00	2.00	0.00
600.0	4.00	91.88	599.8	-0.2	7.0	1.4	2.00	2.00	0.00
640.0	4.80	91.88	639.7	-0.3	10.0	2.0	2.00	2.00	0.00
680.0	5.60	91.88	679.6	-0.4	13.7	2.7	2.00	2.00	0.00
720.0	6.40	91.88	719.3	-0.6	17.8	3.6	2.00	2.00	0.00
760.0	7.20	91.88	759.1	-0.7	22.6	4.5	2.00	2.00	0.00
800.0	8.00	91.88	798.7	-0.9	27.9	5.6	2.00	2.00	0.00
840.0	8.80	91.88	838.3	-1.1	33.7	6.8	2.00	2.00	0.00
880.0	9.60	91.88	877.8	-1.3	40.1	8.1	2.00	2.00	0.00
909.3	10.19	91.88	906.7	-1.5	45.1	9.1	2.00	2.00	0.00
920.0	10.19	91.88	917.2	-1.5	47.0	9.4	0.00	0.00	0.00
960.0	10.19	91.88	956.5	-1.8	54.1	10.9	0.00	0.00	0.00
1,000.0	10.19	91.88	995.9	-2.0	61.2	12.3	0.00	0.00	0.00
1,040.0	10.19	91.88	1,035.3	-2.2	68.2	13.7	0.00	0.00	0.00
1,080.0	10.19	91.88	1,074.6	-2.5	75.3	15.1	0.00	0.00	0.00
1,120.0	10.19	91.88	1,114.0	-2.7	82.4	16.5	0.00	0.00	0.00
1,160.0	10.19	91.88	1,153.4	-2.9	89.4	18.0	0.00	0.00	0.00
1,200.0	10.19	91.88	1,192.7	-3.2	96.5	19.4	0.00	0.00	0.00
1,240.0	10.19	91.88	1,232.1	-3.4	103.6	20.8	0.00	0.00	0.00
1,280.0	10.19	91.88	1,271.5	-3.6	110.7	22.2	0.00	0.00	0.00
1,320.0	10.19	91.88	1,310.8	-3.9	117.7	23.7	0.00	0.00	0.00
1,360.0	10.19	91.88	1,350.2	-4.1	124.8	25.1	0.00	0.00	0.00
1,400.0	10.19	91.88	1,389.6	-4.3	131.9	26.5	0.00	0.00	0.00
1,440.0	10.19	91.88	1,429.0	-4.6	138.9	27.9	0.00	0.00	0.00
1,480.0	10.19	91.88	1,468.3	-4.8	146.0	29.3	0.00	0.00	0.00
1,520.0	10.19	91.88	1,507.7	-5.0	153.1	30.8	0.00	0.00	0.00
1,560.0	10.19	91.88	1,547.1	-5.3	160.1	32.2	0.00	0.00	0.00
1,600.0	10.19	91.88	1,586.4	-5.5	167.2	33.6	0.00	0.00	0.00
1,640.0	10.19	91.88	1,625.8	-5.7	174.3	35.0	0.00	0.00	0.00
1,680.0	10.19	91.88	1,665.2	-6.0	181.4	36.4	0.00	0.00	0.00
1,720.0	10.19	91.88	1,704.5	-6.2	188.4	37.9	0.00	0.00	0.00
1,760.0	10.19	91.88	1,743.9	-6.4	195.5	39.3	0.00	0.00	0.00
1,800.0	10.19	91.88	1,783.3	-6.6	202.6	40.7	0.00	0.00	0.00
1,840.0	10.19	91.88	1,822.7	-6.9	209.6	42.1	0.00	0.00	0.00
1,880.0	10.19	91.88	1,862.0	-7.1	216.7	43.5	0.00	0.00	0.00
1,920.0	10.19	91.88	1,901.4	-7.3	223.8	45.0	0.00	0.00	0.00
1,960.0	10.19	91.88	1,940.8	-7.6	230.9	46.4	0.00	0.00	0.00
2,000.0	10.19	91.88	1,980.1	-7.8	237.9	47.8	0.00	0.00	0.00

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<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>TVD Reference:</b>	WELL @ 4686.0ft (RKB - 15')
<b>Project:</b>	SEC.2-T4N-R66W	<b>MD Reference:</b>	WELL @ 4686.0ft (RKB - 15')
<b>Site:</b>	Sorin Natural Resources 2R-HZ Pad Sec.2-T4N-R66W	<b>North Reference:</b>	True
<b>Well:</b>	Sorin Natural Resources 2U-443	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Plan #1 (01-28-13)		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
2,040.0	10.19	91.88	2,019.5	-8.0	245.0	49.2	0.00	0.00	0.00
2,080.0	10.19	91.88	2,058.9	-8.3	252.1	50.6	0.00	0.00	0.00
2,120.0	10.19	91.88	2,098.2	-8.5	259.1	52.1	0.00	0.00	0.00
2,160.0	10.19	91.88	2,137.6	-8.7	266.2	53.5	0.00	0.00	0.00
2,200.0	10.19	91.88	2,177.0	-9.0	273.3	54.9	0.00	0.00	0.00
2,240.0	10.19	91.88	2,216.3	-9.2	280.3	56.3	0.00	0.00	0.00
2,280.0	10.19	91.88	2,255.7	-9.4	287.4	57.7	0.00	0.00	0.00
2,320.0	10.19	91.88	2,295.1	-9.7	294.5	59.2	0.00	0.00	0.00
2,360.0	10.19	91.88	2,334.5	-9.9	301.6	60.6	0.00	0.00	0.00
2,400.0	10.19	91.88	2,373.8	-10.1	308.6	62.0	0.00	0.00	0.00
2,440.0	10.19	91.88	2,413.2	-10.4	315.7	63.4	0.00	0.00	0.00
2,480.0	10.19	91.88	2,452.6	-10.6	322.8	64.8	0.00	0.00	0.00
2,520.0	10.19	91.88	2,491.9	-10.8	329.8	66.3	0.00	0.00	0.00
2,560.0	10.19	91.88	2,531.3	-11.1	336.9	67.7	0.00	0.00	0.00
2,600.0	10.19	91.88	2,570.7	-11.3	344.0	69.1	0.00	0.00	0.00
2,640.0	10.19	91.88	2,610.0	-11.5	351.0	70.5	0.00	0.00	0.00
2,680.0	10.19	91.88	2,649.4	-11.8	358.1	72.0	0.00	0.00	0.00
2,720.0	10.19	91.88	2,688.8	-12.0	365.2	73.4	0.00	0.00	0.00
2,760.0	10.19	91.88	2,728.1	-12.2	372.3	74.8	0.00	0.00	0.00
2,800.0	10.19	91.88	2,767.5	-12.5	379.3	76.2	0.00	0.00	0.00
2,840.0	10.19	91.88	2,806.9	-12.7	386.4	77.6	0.00	0.00	0.00
2,880.0	10.19	91.88	2,846.3	-12.9	393.5	79.1	0.00	0.00	0.00
2,920.0	10.19	91.88	2,885.6	-13.1	400.5	80.5	0.00	0.00	0.00
2,960.0	10.19	91.88	2,925.0	-13.4	407.6	81.9	0.00	0.00	0.00
3,000.0	10.19	91.88	2,964.4	-13.6	414.7	83.3	0.00	0.00	0.00
3,040.0	10.19	91.88	3,003.7	-13.8	421.8	84.7	0.00	0.00	0.00
3,080.0	10.19	91.88	3,043.1	-14.1	428.8	86.2	0.00	0.00	0.00
3,120.0	10.19	91.88	3,082.5	-14.3	435.9	87.6	0.00	0.00	0.00
3,160.0	10.19	91.88	3,121.8	-14.5	443.0	89.0	0.00	0.00	0.00
3,200.0	10.19	91.88	3,161.2	-14.8	450.0	90.4	0.00	0.00	0.00
3,240.0	10.19	91.88	3,200.6	-15.0	457.1	91.8	0.00	0.00	0.00
3,280.0	10.19	91.88	3,240.0	-15.2	464.2	93.3	0.00	0.00	0.00
3,320.0	10.19	91.88	3,279.3	-15.5	471.2	94.7	0.00	0.00	0.00
3,360.0	10.19	91.88	3,318.7	-15.7	478.3	96.1	0.00	0.00	0.00
3,400.0	10.19	91.88	3,358.1	-15.9	485.4	97.5	0.00	0.00	0.00
3,440.0	10.19	91.88	3,397.4	-16.2	492.5	98.9	0.00	0.00	0.00
3,480.0	10.19	91.88	3,436.8	-16.4	499.5	100.4	0.00	0.00	0.00
3,520.0	10.19	91.88	3,476.2	-16.6	506.6	101.8	0.00	0.00	0.00
3,560.0	10.19	91.88	3,515.5	-16.9	513.7	103.2	0.00	0.00	0.00
3,600.0	10.19	91.88	3,554.9	-17.1	520.7	104.6	0.00	0.00	0.00
3,640.0	10.19	91.88	3,594.3	-17.3	527.8	106.0	0.00	0.00	0.00
3,680.0	10.19	91.88	3,633.6	-17.6	534.9	107.5	0.00	0.00	0.00
3,720.0	10.19	91.88	3,673.0	-17.8	541.9	108.9	0.00	0.00	0.00
3,760.0	10.19	91.88	3,712.4	-18.0	549.0	110.3	0.00	0.00	0.00
3,800.0	10.19	91.88	3,751.8	-18.3	556.1	111.7	0.00	0.00	0.00
3,840.0	10.19	91.88	3,791.1	-18.5	563.2	113.1	0.00	0.00	0.00
3,880.0	10.19	91.88	3,830.5	-18.7	570.2	114.6	0.00	0.00	0.00
3,920.0	10.19	91.88	3,869.9	-18.9	577.3	116.0	0.00	0.00	0.00
3,960.0	10.19	91.88	3,909.2	-19.2	584.4	117.4	0.00	0.00	0.00
4,000.0	10.19	91.88	3,948.6	-19.4	591.4	118.8	0.00	0.00	0.00
4,040.0	10.19	91.88	3,988.0	-19.6	598.5	120.3	0.00	0.00	0.00
4,080.0	10.19	91.88	4,027.3	-19.9	605.6	121.7	0.00	0.00	0.00

<b>Database:</b>	Landmark	<b>Local Co-ordinate Reference:</b>	Well Sorin Natural Resources 2U-443
<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>TVD Reference:</b>	WELL @ 4686.0ft (RKB - 15')
<b>Project:</b>	SEC.2-T4N-R66W	<b>MD Reference:</b>	WELL @ 4686.0ft (RKB - 15')
<b>Site:</b>	Sorin Natural Resources 2R-HZ Pad Sec.2-T4N-R66W	<b>North Reference:</b>	True
<b>Well:</b>	Sorin Natural Resources 2U-443	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Plan #1 (01-28-13)		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
4,120.0	10.19	91.88	4,066.7	-20.1	612.7	123.1	0.00	0.00	0.00
4,160.0	10.19	91.88	4,106.1	-20.3	619.7	124.5	0.00	0.00	0.00
4,200.0	10.19	91.88	4,145.4	-20.6	626.8	125.9	0.00	0.00	0.00
4,240.0	10.19	91.88	4,184.8	-20.8	633.9	127.4	0.00	0.00	0.00
4,280.0	10.19	91.88	4,224.2	-21.0	640.9	128.8	0.00	0.00	0.00
4,320.0	10.19	91.88	4,263.6	-21.3	648.0	130.2	0.00	0.00	0.00
4,360.0	10.19	91.88	4,302.9	-21.5	655.1	131.6	0.00	0.00	0.00
4,400.0	10.19	91.88	4,342.3	-21.7	662.1	133.0	0.00	0.00	0.00
4,440.0	10.19	91.88	4,381.7	-22.0	669.2	134.5	0.00	0.00	0.00
4,480.0	10.19	91.88	4,421.0	-22.2	676.3	135.9	0.00	0.00	0.00
4,520.0	10.19	91.88	4,460.4	-22.4	683.4	137.3	0.00	0.00	0.00
4,560.0	10.19	91.88	4,499.8	-22.7	690.4	138.7	0.00	0.00	0.00
4,600.0	10.19	91.88	4,539.1	-22.9	697.5	140.1	0.00	0.00	0.00
4,640.0	10.19	91.88	4,578.5	-23.1	704.6	141.6	0.00	0.00	0.00
4,680.0	10.19	91.88	4,617.9	-23.4	711.6	143.0	0.00	0.00	0.00
4,720.0	10.19	91.88	4,657.3	-23.6	718.7	144.4	0.00	0.00	0.00
4,760.0	10.19	91.88	4,696.6	-23.8	725.8	145.8	0.00	0.00	0.00
4,800.0	10.19	91.88	4,736.0	-24.1	732.9	147.2	0.00	0.00	0.00
4,840.0	10.19	91.88	4,775.4	-24.3	739.9	148.7	0.00	0.00	0.00
4,880.0	10.19	91.88	4,814.7	-24.5	747.0	150.1	0.00	0.00	0.00
4,920.0	10.19	91.88	4,854.1	-24.8	754.1	151.5	0.00	0.00	0.00
4,960.0	10.19	91.88	4,893.5	-25.0	761.1	152.9	0.00	0.00	0.00
5,000.0	10.19	91.88	4,932.8	-25.2	768.2	154.3	0.00	0.00	0.00
5,040.0	10.19	91.88	4,972.2	-25.4	775.3	155.8	0.00	0.00	0.00
5,080.0	10.19	91.88	5,011.6	-25.7	782.3	157.2	0.00	0.00	0.00
5,120.0	10.19	91.88	5,050.9	-25.9	789.4	158.6	0.00	0.00	0.00
5,160.0	10.19	91.88	5,090.3	-26.1	796.5	160.0	0.00	0.00	0.00
5,200.0	10.19	91.88	5,129.7	-26.4	803.6	161.4	0.00	0.00	0.00
5,240.0	10.19	91.88	5,169.1	-26.6	810.6	162.9	0.00	0.00	0.00
5,280.0	10.19	91.88	5,208.4	-26.8	817.7	164.3	0.00	0.00	0.00
5,320.0	10.19	91.88	5,247.8	-27.1	824.8	165.7	0.00	0.00	0.00
5,360.0	10.19	91.88	5,287.2	-27.3	831.8	167.1	0.00	0.00	0.00
5,400.0	10.19	91.88	5,326.5	-27.5	838.9	168.6	0.00	0.00	0.00
5,440.0	10.19	91.88	5,365.9	-27.8	846.0	170.0	0.00	0.00	0.00
5,480.0	10.19	91.88	5,405.3	-28.0	853.0	171.4	0.00	0.00	0.00
5,520.0	10.19	91.88	5,444.6	-28.2	860.1	172.8	0.00	0.00	0.00
5,560.0	10.19	91.88	5,484.0	-28.5	867.2	174.2	0.00	0.00	0.00
5,569.5	10.19	91.88	5,493.3	-28.5	868.9	174.6	0.00	0.00	0.00
5,600.0	9.58	91.88	5,523.4	-28.7	874.1	175.6	2.00	-2.00	0.00
5,640.0	8.78	91.88	5,562.9	-28.9	880.5	176.9	2.00	-2.00	0.00
5,680.0	7.98	91.88	5,602.5	-29.1	886.3	178.1	2.00	-2.00	0.00
5,720.0	7.18	91.88	5,642.1	-29.3	891.6	179.1	2.00	-2.00	0.00
5,760.0	6.38	91.88	5,681.8	-29.4	896.3	180.1	2.00	-2.00	0.00
5,800.0	5.58	91.88	5,721.6	-29.6	900.4	180.9	2.00	-2.00	0.00
5,840.0	4.78	91.88	5,761.5	-29.7	904.1	181.6	2.00	-2.00	0.00
5,880.0	3.98	91.88	5,801.3	-29.8	907.1	182.3	2.00	-2.00	0.00
5,920.0	3.18	91.88	5,841.3	-29.9	909.6	182.8	2.00	-2.00	0.00
5,960.0	2.38	91.88	5,881.2	-29.9	911.5	183.1	2.00	-2.00	0.00
6,000.0	1.58	91.88	5,921.2	-30.0	912.9	183.4	2.00	-2.00	0.00
6,040.0	0.78	91.88	5,961.2	-30.0	913.7	183.6	2.00	-2.00	0.00
6,078.8	0.00	0.00	6,000.0	-30.0	914.0	183.6	2.00	-2.00	0.00
6,080.0	0.00	0.00	6,001.2	-30.0	914.0	183.6	0.00	0.00	0.00

<b>Database:</b>	Landmark	<b>Local Co-ordinate Reference:</b>	Well Sorin Natural Resources 2U-443
<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>TVD Reference:</b>	WELL @ 4686.0ft (RKB - 15')
<b>Project:</b>	SEC.2-T4N-R66W	<b>MD Reference:</b>	WELL @ 4686.0ft (RKB - 15')
<b>Site:</b>	Sorin Natural Resources 2R-HZ Pad Sec.2-T4N-R66W	<b>North Reference:</b>	True
<b>Well:</b>	Sorin Natural Resources 2U-443	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Plan #1 (01-28-13)		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
6,120.0	0.00	0.00	6,041.2	-30.0	914.0	183.6	0.00	0.00	0.00
6,160.0	0.00	0.00	6,081.2	-30.0	914.0	183.6	0.00	0.00	0.00
6,200.0	0.00	0.00	6,121.2	-30.0	914.0	183.6	0.00	0.00	0.00
6,240.0	0.00	0.00	6,161.2	-30.0	914.0	183.6	0.00	0.00	0.00
6,280.0	0.00	0.00	6,201.2	-30.0	914.0	183.6	0.00	0.00	0.00
6,320.0	0.00	0.00	6,241.2	-30.0	914.0	183.6	0.00	0.00	0.00
6,360.0	0.00	0.00	6,281.2	-30.0	914.0	183.6	0.00	0.00	0.00
6,400.0	0.00	0.00	6,321.2	-30.0	914.0	183.6	0.00	0.00	0.00
6,440.0	0.00	0.00	6,361.2	-30.0	914.0	183.6	0.00	0.00	0.00
6,451.1	0.00	0.00	6,372.3	-30.0	914.0	183.6	0.00	0.00	0.00
6,480.0	2.17	180.95	6,401.2	-30.5	914.0	184.2	7.50	7.50	0.00
6,520.0	5.17	180.95	6,441.1	-33.1	913.9	186.7	7.50	7.50	0.00
6,560.0	8.17	180.95	6,480.8	-37.7	913.9	191.3	7.50	7.50	0.00
6,600.0	11.17	180.95	6,520.2	-44.5	913.8	197.9	7.50	7.50	0.00
6,640.0	14.17	180.95	6,559.3	-53.2	913.6	206.5	7.50	7.50	0.00
6,680.0	17.17	180.95	6,597.8	-64.0	913.4	217.1	7.50	7.50	0.00
6,720.0	20.17	180.95	6,635.7	-76.8	913.2	229.7	7.50	7.50	0.00
6,760.0	23.17	180.95	6,672.8	-91.6	913.0	244.2	7.50	7.50	0.00
6,800.0	26.17	180.95	6,709.2	-108.3	912.7	260.6	7.50	7.50	0.00
6,840.0	29.17	180.95	6,744.6	-126.9	912.4	278.8	7.50	7.50	0.00
6,880.0	32.17	180.95	6,779.0	-147.3	912.1	298.9	7.50	7.50	0.00
6,920.0	35.17	180.95	6,812.3	-169.4	911.7	320.7	7.50	7.50	0.00
6,960.0	38.17	180.95	6,844.4	-193.3	911.3	344.1	7.50	7.50	0.00
7,000.0	41.17	180.95	6,875.2	-218.8	910.9	369.2	7.50	7.50	0.00
7,040.0	44.17	180.95	6,904.6	-245.9	910.4	395.9	7.50	7.50	0.00
7,080.0	47.17	180.95	6,932.5	-274.5	909.9	424.0	7.50	7.50	0.00
7,120.0	50.17	180.95	6,958.9	-304.6	909.4	453.5	7.50	7.50	0.00
7,160.0	53.17	180.95	6,983.7	-335.9	908.9	484.3	7.50	7.50	0.00
7,200.0	56.17	180.95	7,006.9	-368.6	908.4	516.4	7.50	7.50	0.00
7,240.0	59.17	180.95	7,028.3	-402.3	907.8	549.6	7.50	7.50	0.00
7,280.0	62.17	180.95	7,047.9	-437.2	907.2	583.9	7.50	7.50	0.00
7,320.0	65.17	180.95	7,065.6	-473.1	906.7	619.1	7.50	7.50	0.00
7,360.0	68.17	180.95	7,081.4	-509.8	906.0	655.2	7.50	7.50	0.00
7,400.0	71.17	180.95	7,095.3	-547.3	905.4	692.1	7.50	7.50	0.00
7,440.0	74.17	180.95	7,107.2	-585.4	904.8	729.6	7.50	7.50	0.00
7,480.0	77.17	180.95	7,117.1	-624.2	904.1	767.7	7.50	7.50	0.00
7,520.0	80.17	180.95	7,125.0	-663.4	903.5	806.2	7.50	7.50	0.00
7,560.0	83.17	180.95	7,130.8	-703.0	902.8	845.1	7.50	7.50	0.00
7,571.1	84.00	180.95	7,132.0	-714.0	902.7	855.9	7.50	7.50	0.00
7,600.0	84.00	180.95	7,135.1	-742.7	902.2	884.2	0.00	0.00	0.00
7,640.0	84.00	180.95	7,139.2	-782.5	901.5	923.3	0.00	0.00	0.00
7,644.1	84.00	180.95	7,139.7	-786.6	901.5	927.3	0.00	0.00	0.00
7,680.0	85.79	180.95	7,142.9	-822.3	900.9	962.4	5.00	5.00	0.00
7,720.0	87.79	180.95	7,145.1	-862.3	900.2	1,001.7	5.00	5.00	0.00
7,760.0	89.79	180.95	7,145.9	-902.2	899.5	1,041.0	5.00	5.00	0.00
7,764.1	90.00	180.95	7,146.0	-906.3	899.5	1,045.0	5.00	5.00	0.00
7,800.0	90.00	180.95	7,146.0	-942.2	898.9	1,080.3	0.00	0.00	0.00
7,840.0	90.00	180.95	7,146.0	-982.2	898.2	1,119.6	0.00	0.00	0.00
7,880.0	90.00	180.95	7,146.0	-1,022.2	897.5	1,158.9	0.00	0.00	0.00
7,920.0	90.00	180.95	7,146.0	-1,062.2	896.9	1,198.2	0.00	0.00	0.00
7,960.0	90.00	180.95	7,146.0	-1,102.2	896.2	1,237.5	0.00	0.00	0.00
8,000.0	90.00	180.95	7,146.0	-1,142.2	895.6	1,276.8	0.00	0.00	0.00



<b>Database:</b>	Landmark	<b>Local Co-ordinate Reference:</b>	Well Sorin Natural Resources 2U-443
<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>TVD Reference:</b>	WELL @ 4686.0ft (RKB - 15')
<b>Project:</b>	SEC.2-T4N-R66W	<b>MD Reference:</b>	WELL @ 4686.0ft (RKB - 15')
<b>Site:</b>	Sorin Natural Resources 2R-HZ Pad Sec.2-T4N-R66W	<b>North Reference:</b>	True
<b>Well:</b>	Sorin Natural Resources 2U-443	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Plan #1 (01-28-13)		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
8,040.0	90.00	180.95	7,146.0	-1,182.2	894.9	1,316.1	0.00	0.00	0.00
8,080.0	90.00	180.95	7,146.0	-1,222.2	894.2	1,355.5	0.00	0.00	0.00
8,120.0	90.00	180.95	7,146.0	-1,262.2	893.6	1,394.8	0.00	0.00	0.00
8,160.0	90.00	180.95	7,146.0	-1,302.2	892.9	1,434.1	0.00	0.00	0.00
8,200.0	90.00	180.95	7,146.0	-1,342.2	892.2	1,473.4	0.00	0.00	0.00
8,240.0	90.00	180.95	7,146.0	-1,382.2	891.6	1,512.7	0.00	0.00	0.00
8,280.0	90.00	180.95	7,146.0	-1,422.2	890.9	1,552.0	0.00	0.00	0.00
8,320.0	90.00	180.95	7,146.0	-1,462.2	890.2	1,591.3	0.00	0.00	0.00
8,360.0	90.00	180.95	7,146.0	-1,502.2	889.6	1,630.6	0.00	0.00	0.00
8,400.0	90.00	180.95	7,146.0	-1,542.2	888.9	1,669.9	0.00	0.00	0.00
8,440.0	90.00	180.95	7,146.0	-1,582.2	888.2	1,709.2	0.00	0.00	0.00
8,480.0	90.00	180.95	7,146.0	-1,622.2	887.6	1,748.6	0.00	0.00	0.00
8,520.0	90.00	180.95	7,146.0	-1,662.1	886.9	1,787.9	0.00	0.00	0.00
8,560.0	90.00	180.95	7,146.0	-1,702.1	886.3	1,827.2	0.00	0.00	0.00
8,600.0	90.00	180.95	7,146.0	-1,742.1	885.6	1,866.5	0.00	0.00	0.00
8,640.0	90.00	180.95	7,146.0	-1,782.1	884.9	1,905.8	0.00	0.00	0.00
8,680.0	90.00	180.95	7,146.0	-1,822.1	884.3	1,945.1	0.00	0.00	0.00
8,720.0	90.00	180.95	7,146.0	-1,862.1	883.6	1,984.4	0.00	0.00	0.00
8,760.0	90.00	180.95	7,146.0	-1,902.1	882.9	2,023.7	0.00	0.00	0.00
8,800.0	90.00	180.95	7,146.0	-1,942.1	882.3	2,063.0	0.00	0.00	0.00
8,840.0	90.00	180.95	7,146.0	-1,982.1	881.6	2,102.3	0.00	0.00	0.00
8,880.0	90.00	180.95	7,146.0	-2,022.1	880.9	2,141.7	0.00	0.00	0.00
8,920.0	90.00	180.95	7,146.0	-2,062.1	880.3	2,181.0	0.00	0.00	0.00
8,960.0	90.00	180.95	7,146.0	-2,102.1	879.6	2,220.3	0.00	0.00	0.00
9,000.0	90.00	180.95	7,146.0	-2,142.1	878.9	2,259.6	0.00	0.00	0.00
9,040.0	90.00	180.95	7,146.0	-2,182.1	878.3	2,298.9	0.00	0.00	0.00
9,080.0	90.00	180.95	7,146.0	-2,222.1	877.6	2,338.2	0.00	0.00	0.00
9,120.0	90.00	180.95	7,146.0	-2,262.1	877.0	2,377.5	0.00	0.00	0.00
9,160.0	90.00	180.95	7,146.0	-2,302.1	876.3	2,416.8	0.00	0.00	0.00
9,200.0	90.00	180.95	7,146.0	-2,342.1	875.6	2,456.1	0.00	0.00	0.00
9,240.0	90.00	180.95	7,146.0	-2,382.0	875.0	2,495.4	0.00	0.00	0.00
9,280.0	90.00	180.95	7,146.0	-2,422.0	874.3	2,534.8	0.00	0.00	0.00
9,320.0	90.00	180.95	7,146.0	-2,462.0	873.6	2,574.1	0.00	0.00	0.00
9,360.0	90.00	180.95	7,146.0	-2,502.0	873.0	2,613.4	0.00	0.00	0.00
9,400.0	90.00	180.95	7,146.0	-2,542.0	872.3	2,652.7	0.00	0.00	0.00
9,440.0	90.00	180.95	7,146.0	-2,582.0	871.6	2,692.0	0.00	0.00	0.00
9,480.0	90.00	180.95	7,146.0	-2,622.0	871.0	2,731.3	0.00	0.00	0.00
9,520.0	90.00	180.95	7,146.0	-2,662.0	870.3	2,770.6	0.00	0.00	0.00
9,560.0	90.00	180.95	7,146.0	-2,702.0	869.7	2,809.9	0.00	0.00	0.00
9,600.0	90.00	180.95	7,146.0	-2,742.0	869.0	2,849.2	0.00	0.00	0.00
9,640.0	90.00	180.95	7,146.0	-2,782.0	868.3	2,888.6	0.00	0.00	0.00
9,680.0	90.00	180.95	7,146.0	-2,822.0	867.7	2,927.9	0.00	0.00	0.00
9,720.0	90.00	180.95	7,146.0	-2,862.0	867.0	2,967.2	0.00	0.00	0.00
9,760.0	90.00	180.95	7,146.0	-2,902.0	866.3	3,006.5	0.00	0.00	0.00
9,800.0	90.00	180.95	7,146.0	-2,942.0	865.7	3,045.8	0.00	0.00	0.00
9,840.0	90.00	180.95	7,146.0	-2,982.0	865.0	3,085.1	0.00	0.00	0.00
9,880.0	90.00	180.95	7,146.0	-3,022.0	864.3	3,124.4	0.00	0.00	0.00
9,920.0	90.00	180.95	7,146.0	-3,062.0	863.7	3,163.7	0.00	0.00	0.00
9,960.0	90.00	180.95	7,146.0	-3,101.9	863.0	3,203.0	0.00	0.00	0.00
10,000.0	90.00	180.95	7,146.0	-3,141.9	862.3	3,242.3	0.00	0.00	0.00
10,040.0	90.00	180.95	7,146.0	-3,181.9	861.7	3,281.7	0.00	0.00	0.00
10,080.0	90.00	180.95	7,146.0	-3,221.9	861.0	3,321.0	0.00	0.00	0.00



<b>Database:</b>	Landmark	<b>Local Co-ordinate Reference:</b>	Well Sorin Natural Resources 2U-443
<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>TVD Reference:</b>	WELL @ 4686.0ft (RKB - 15')
<b>Project:</b>	SEC.2-T4N-R66W	<b>MD Reference:</b>	WELL @ 4686.0ft (RKB - 15')
<b>Site:</b>	Sorin Natural Resources 2R-HZ Pad Sec.2-T4N-R66W	<b>North Reference:</b>	True
<b>Well:</b>	Sorin Natural Resources 2U-443	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Plan #1 (01-28-13)		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
10,120.0	90.00	180.95	7,146.0	-3,261.9	860.4	3,360.3	0.00	0.00	0.00
10,160.0	90.00	180.95	7,146.0	-3,301.9	859.7	3,399.6	0.00	0.00	0.00
10,200.0	90.00	180.95	7,146.0	-3,341.9	859.0	3,438.9	0.00	0.00	0.00
10,240.0	90.00	180.95	7,146.0	-3,381.9	858.4	3,478.2	0.00	0.00	0.00
10,280.0	90.00	180.95	7,146.0	-3,421.9	857.7	3,517.5	0.00	0.00	0.00
10,320.0	90.00	180.95	7,146.0	-3,461.9	857.0	3,556.8	0.00	0.00	0.00
10,360.0	90.00	180.95	7,146.0	-3,501.9	856.4	3,596.1	0.00	0.00	0.00
10,400.0	90.00	180.95	7,146.0	-3,541.9	855.7	3,635.4	0.00	0.00	0.00
10,440.0	90.00	180.95	7,146.0	-3,581.9	855.0	3,674.8	0.00	0.00	0.00
10,480.0	90.00	180.95	7,146.0	-3,621.9	854.4	3,714.1	0.00	0.00	0.00
10,520.0	90.00	180.95	7,146.0	-3,661.9	853.7	3,753.4	0.00	0.00	0.00
10,560.0	90.00	180.95	7,146.0	-3,701.9	853.0	3,792.7	0.00	0.00	0.00
10,600.0	90.00	180.95	7,146.0	-3,741.9	852.4	3,832.0	0.00	0.00	0.00
10,640.0	90.00	180.95	7,146.0	-3,781.9	851.7	3,871.3	0.00	0.00	0.00
10,680.0	90.00	180.95	7,146.0	-3,821.8	851.1	3,910.6	0.00	0.00	0.00
10,720.0	90.00	180.95	7,146.0	-3,861.8	850.4	3,949.9	0.00	0.00	0.00
10,760.0	90.00	180.95	7,146.0	-3,901.8	849.7	3,989.2	0.00	0.00	0.00
10,800.0	90.00	180.95	7,146.0	-3,941.8	849.1	4,028.5	0.00	0.00	0.00
10,840.0	90.00	180.95	7,146.0	-3,981.8	848.4	4,067.9	0.00	0.00	0.00
10,880.0	90.00	180.95	7,146.0	-4,021.8	847.7	4,107.2	0.00	0.00	0.00
10,920.0	90.00	180.95	7,146.0	-4,061.8	847.1	4,146.5	0.00	0.00	0.00
10,960.0	90.00	180.95	7,146.0	-4,101.8	846.4	4,185.8	0.00	0.00	0.00
11,000.0	90.00	180.95	7,146.0	-4,141.8	845.7	4,225.1	0.00	0.00	0.00
11,040.0	90.00	180.95	7,146.0	-4,181.8	845.1	4,264.4	0.00	0.00	0.00
11,080.0	90.00	180.95	7,146.0	-4,221.8	844.4	4,303.7	0.00	0.00	0.00
11,120.0	90.00	180.95	7,146.0	-4,261.8	843.8	4,343.0	0.00	0.00	0.00
11,160.0	90.00	180.95	7,146.0	-4,301.8	843.1	4,382.3	0.00	0.00	0.00
11,200.0	90.00	180.95	7,146.0	-4,341.8	842.4	4,421.7	0.00	0.00	0.00
11,240.0	90.00	180.95	7,146.0	-4,381.8	841.8	4,461.0	0.00	0.00	0.00
11,280.0	90.00	180.95	7,146.0	-4,421.8	841.1	4,500.3	0.00	0.00	0.00
11,320.0	90.00	180.95	7,146.0	-4,461.8	840.4	4,539.6	0.00	0.00	0.00
11,360.0	90.00	180.95	7,146.0	-4,501.8	839.8	4,578.9	0.00	0.00	0.00
11,400.0	90.00	180.95	7,146.0	-4,541.7	839.1	4,618.2	0.00	0.00	0.00
11,440.0	90.00	180.95	7,146.0	-4,581.7	838.4	4,657.5	0.00	0.00	0.00
11,480.0	90.00	180.95	7,146.0	-4,621.7	837.8	4,696.8	0.00	0.00	0.00
11,520.0	90.00	180.95	7,146.0	-4,661.7	837.1	4,736.1	0.00	0.00	0.00
11,560.0	90.00	180.95	7,146.0	-4,701.7	836.4	4,775.4	0.00	0.00	0.00
11,600.0	90.00	180.95	7,146.0	-4,741.7	835.8	4,814.8	0.00	0.00	0.00
11,640.0	90.00	180.95	7,146.0	-4,781.7	835.1	4,854.1	0.00	0.00	0.00
11,680.0	90.00	180.95	7,146.0	-4,821.7	834.5	4,893.4	0.00	0.00	0.00
11,720.0	90.00	180.95	7,146.0	-4,861.7	833.8	4,932.7	0.00	0.00	0.00
11,732.7	90.00	180.95	7,146.0	-4,874.4	833.6	4,945.2	0.00	0.00	0.00

Casing Points				
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
7,571.1	7,132.0	7"	7	8-3/4

<b>Database:</b>	Landmark	<b>Local Co-ordinate Reference:</b>	Well Sorin Natural Resources 2U-443
<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>TVD Reference:</b>	WELL @ 4686.0ft (RKB - 15')
<b>Project:</b>	SEC.2-T4N-R66W	<b>MD Reference:</b>	WELL @ 4686.0ft (RKB - 15')
<b>Site:</b>	Sorin Natural Resources 2R-HZ Pad Sec.2-T4N-R66W	<b>North Reference:</b>	True
<b>Well:</b>	Sorin Natural Resources 2U-443	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Plan #1 (01-28-13)		

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 #1
6,451.1	6,372.3	-30.0	914.0	KOP #2
7,764.1	7,146.0	-906.3	899.5	End of Build



# **PETROLEUM DEVELOPMENT CORP Weld County CO**

**SEC.2-T4N-R66W**

**Sorin Natural Resources 2R-HZ Pad Sec.2-T4N-R66W**

**Sorin Natural Resources 2U-443**

**Wellbore #1**

**Plan #1 (01-28-13)**

## **Anticollision Report**

**29 January, 2013**



<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Sorin Natural Resources 2U-443
<b>Project:</b>	SEC.2-T4N-R66W	<b>TVD Reference:</b>	WELL @ 4686.0ft (RKB - 15')
<b>Reference Site:</b>	Sorin Natural Resources 2R-HZ Pad Sec.2-T4N-R66W	<b>MD Reference:</b>	WELL @ 4686.0ft (RKB - 15')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Sorin Natural Resources 2U-443	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #1 (01-28-13)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design												Sorin Natural Existing wells Sec.2-T4N-R66W - API 2-16 (Exist.) - Wellbore #1 - Wellbore #1		Offset Site Error:		0.0 ft	
Survey Program: 7300-UNKNOWN														Offset Well Error:		0.0 ft	
Reference		Offset		Semi Major Axis			Distance										
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning				
11,732.7	7,146.0	7,180.0	7,180.0	95.7	143.6	90.00	-4,703.2	800.1	174.5	-63.6	238.06	0.733	Level 1				

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Sorin Natural Resources 2U-443
<b>Project:</b>	SEC.2-T4N-R66W	<b>TVD Reference:</b>	WELL @ 4686.0ft (RKB - 15')
<b>Reference Site:</b>	Sorin Natural Resources 2R-HZ Pad Sec.2-T4N-R66W	<b>MD Reference:</b>	WELL @ 4686.0ft (RKB - 15')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Sorin Natural Resources 2U-443	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #1 (01-28-13)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design														Offset Site Error:	0.0 ft
Survey Program: 7300-UNKNOWN														Offset Well Error:	0.0 ft
Reference															
		Offset		Semi Major Axis			Distance								
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning		
9,500.0	7,146.0	7,180.0	7,180.0	55.1	143.6	89.96	-3,562.9	839.1	921.5	724.9	196.50	4.689			
9,600.0	7,146.0	7,180.0	7,180.0	56.8	143.6	89.96	-3,562.9	839.1	821.5	623.1	198.32	4.142			
9,700.0	7,146.0	7,180.0	7,180.0	58.6	143.6	89.97	-3,562.9	839.1	721.5	521.3	200.15	3.605			
9,800.0	7,146.0	7,180.0	7,180.0	60.4	143.6	89.97	-3,562.9	839.1	621.5	419.5	201.99	3.077			
9,900.0	7,146.0	7,180.0	7,180.0	62.1	143.6	89.98	-3,562.9	839.1	521.6	317.7	203.82	2.559			
10,000.0	7,146.0	7,180.0	7,180.0	63.9	143.6	89.98	-3,562.9	839.1	421.6	216.0	205.67	2.050			
10,100.0	7,146.0	7,180.0	7,180.0	65.7	143.6	89.99	-3,562.9	839.1	321.7	114.2	207.52	1.550			
10,200.0	7,146.0	7,180.0	7,180.0	67.5	143.6	89.99	-3,562.9	839.1	221.9	12.5	209.37	1.060	Level 2		
10,300.0	7,146.0	7,180.0	7,180.0	69.3	143.6	89.99	-3,562.9	839.1	122.4	-88.8	211.22	0.579	Level 1		
10,400.0	7,146.0	7,180.0	7,180.0	71.1	143.6	90.00	-3,562.9	839.1	26.8	-186.3	213.08	0.126	Level 1		
10,421.3	7,146.0	7,180.0	7,180.0	71.5	143.6	90.00	-3,562.9	839.1	16.2	-197.2	213.48	0.076	Level 1, CC, ES, SF		
10,500.0	7,146.0	7,180.0	7,180.0	73.0	143.6	90.00	-3,562.9	839.1	80.3	-134.6	214.94	0.374	Level 1		
10,600.0	7,146.0	7,180.0	7,180.0	74.8	143.6	90.01	-3,562.9	839.1	179.4	-37.4	216.81	0.828	Level 1		
10,700.0	7,146.0	7,180.0	7,180.0	76.6	143.6	90.01	-3,562.9	839.1	279.2	60.5	218.67	1.277	Level 3		
10,800.0	7,146.0	7,180.0	7,180.0	78.4	143.6	90.02	-3,562.9	839.1	379.0	158.5	220.54	1.719			
10,900.0	7,146.0	7,180.0	7,180.0	80.3	143.6	90.02	-3,562.9	839.1	479.0	256.6	222.41	2.154			
11,000.0	7,146.0	7,180.0	7,180.0	82.1	143.6	90.03	-3,562.9	839.1	578.9	354.6	224.29	2.581			
11,100.0	7,146.0	7,180.0	7,180.0	84.0	143.6	90.03	-3,562.9	839.1	678.9	452.7	226.16	3.002			
11,200.0	7,146.0	7,180.0	7,180.0	85.8	143.6	90.03	-3,562.9	839.1	778.9	550.8	228.04	3.415			
11,300.0	7,146.0	7,180.0	7,180.0	87.7	143.6	90.04	-3,562.9	839.1	878.8	648.9	229.92	3.822			
11,400.0	7,146.0	7,180.0	7,180.0	89.5	143.6	90.04	-3,562.9	839.1	978.8	747.0	231.80	4.223			

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Sorin Natural Resources 2U-443
<b>Project:</b>	SEC.2-T4N-R66W	<b>TVD Reference:</b>	WELL @ 4686.0ft (RKB - 15')
<b>Reference Site:</b>	Sorin Natural Resources 2R-HZ Pad Sec.2-T4N-R66W	<b>MD Reference:</b>	WELL @ 4686.0ft (RKB - 15')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Sorin Natural Resources 2U-443	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #1 (01-28-13)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design														Offset Site Error:	0.0 ft
Survey Program: 7300-UNKNOWN														Offset Well Error:	0.0 ft
Reference															
Offset															
Semi Major Axis															
Distance															
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning		
8,000.0	7,146.0	7,142.0	7,142.0	31.2	142.8	89.99	-2,062.0	758.2	930.0	759.9	170.02	5.470			
8,100.0	7,146.0	7,142.0	7,142.0	32.6	142.8	90.00	-2,062.0	758.2	830.9	659.4	171.56	4.843			
8,200.0	7,146.0	7,142.0	7,142.0	34.0	142.8	90.00	-2,062.0	758.2	732.2	559.0	173.14	4.229			
8,300.0	7,146.0	7,142.0	7,142.0	35.4	142.8	90.00	-2,062.0	758.2	633.8	459.0	174.76	3.627			
8,400.0	7,146.0	7,142.0	7,142.0	36.9	142.8	90.00	-2,062.0	758.2	536.0	359.6	176.41	3.038			
8,500.0	7,146.0	7,142.0	7,142.0	38.4	142.8	90.00	-2,062.0	758.2	439.2	261.1	178.08	2.466			
8,600.0	7,146.0	7,142.0	7,142.0	40.0	142.8	90.00	-2,062.0	758.2	344.3	164.5	179.78	1.915			
8,700.0	7,146.0	7,142.0	7,142.0	41.6	142.8	90.00	-2,062.0	758.2	253.3	71.7	181.50	1.395	Level 3		
8,800.0	7,146.0	7,142.0	7,142.0	43.2	142.8	90.00	-2,062.0	758.2	172.5	-10.7	183.24	0.941	Level 1		
8,900.0	7,146.0	7,142.0	7,142.0	44.8	142.8	90.00	-2,062.0	758.2	124.0	-61.0	184.99	0.670	Level 1		
8,921.9	7,146.0	7,142.0	7,142.0	45.2	142.8	90.00	-2,062.0	758.2	122.0	-63.3	185.38	0.658	Level 1, CC, ES, SF		
9,000.0	7,146.0	7,142.0	7,142.0	46.5	142.8	90.00	-2,062.0	758.2	144.9	-41.9	186.76	0.776	Level 1		
9,100.0	7,146.0	7,142.0	7,142.0	48.2	142.8	90.00	-2,062.0	758.2	215.9	27.4	188.54	1.145	Level 2		
9,200.0	7,146.0	7,142.0	7,142.0	49.9	142.8	90.00	-2,062.0	758.2	303.7	113.4	190.33	1.596			
9,300.0	7,146.0	7,142.0	7,142.0	51.6	142.8	90.00	-2,062.0	758.2	397.3	205.2	192.12	2.068			
9,400.0	7,146.0	7,142.0	7,142.0	53.3	142.8	90.00	-2,062.0	758.2	493.4	299.5	193.93	2.544			
9,500.0	7,146.0	7,142.0	7,142.0	55.1	142.8	90.00	-2,062.0	758.2	590.8	395.1	195.75	3.018			
9,600.0	7,146.0	7,142.0	7,142.0	56.8	142.8	90.00	-2,062.0	758.2	689.0	491.4	197.57	3.487			
9,700.0	7,146.0	7,142.0	7,142.0	58.6	142.8	90.00	-2,062.0	758.2	787.6	588.2	199.39	3.950			
9,800.0	7,146.0	7,142.0	7,142.0	60.4	142.8	90.01	-2,062.0	758.2	886.5	685.3	201.23	4.406			
9,900.0	7,146.0	7,142.0	7,142.0	62.1	142.8	90.01	-2,062.0	758.2	985.7	782.6	203.07	4.854			



<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Sorin Natural Resources 2U-443
<b>Project:</b>	SEC.2-T4N-R66W	<b>TVD Reference:</b>	WELL @ 4686.0ft (RKB - 15')
<b>Reference Site:</b>	Sorin Natural Resources 2R-HZ Pad Sec.2-T4N-R66W	<b>MD Reference:</b>	WELL @ 4686.0ft (RKB - 15')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Sorin Natural Resources 2U-443	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #1 (01-28-13)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design				Sorin Natural Existing wells Sec.2-T4N-R66W - Matsushima PM K2-1 (Exist.) - Wellbore #1 - Wellbore #										Offset Site Error:		0.0 ft
Survey Program: 7300-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				
0.0	0.0	0.0	0.0	0.0	0.0	132.75	-633.9	685.7	933.8							
100.0	100.0	98.0	98.0	0.1	2.0	132.75	-633.9	685.7	933.8	931.7	2.07	450.554				
200.0	200.0	198.0	198.0	0.3	4.0	132.75	-633.9	685.7	933.8	929.5	4.30	217.299				
300.0	300.0	298.0	298.0	0.6	6.0	132.75	-633.9	685.7	933.8	927.3	6.52	143.176				
400.0	400.0	398.0	398.0	0.8	8.0	132.75	-633.9	685.7	933.8	925.1	8.75	106.759				
500.0	500.0	498.0	498.0	1.0	10.0	40.96	-633.9	685.7	932.5	921.5	10.96	85.118				
600.0	599.8	597.8	597.8	1.2	12.0	41.22	-633.9	685.7	928.5	915.4	13.15	70.623				
700.0	699.5	697.5	697.5	1.4	13.9	41.67	-633.9	685.7	922.0	906.7	15.34	60.121				
800.0	798.7	796.7	796.7	1.7	15.9	42.30	-633.9	685.7	912.9	895.4	17.52	52.113				
900.0	897.5	895.5	895.5	2.0	17.9	43.12	-633.9	685.7	901.3	881.6	19.70	45.757				
1,000.0	995.9	993.9	993.9	2.4	19.9	43.91	-633.9	685.7	888.4	866.5	21.94	40.496				
1,100.0	1,094.3	1,092.3	1,092.3	2.7	21.8	44.71	-633.9	685.7	875.7	851.5	24.20	36.183				
1,200.0	1,192.7	1,190.7	1,190.7	3.1	23.8	45.52	-633.9	685.7	863.1	836.6	26.48	32.598				
1,300.0	1,291.2	1,289.2	1,289.2	3.5	25.8	46.37	-633.9	685.7	850.7	821.9	28.76	29.577				
1,400.0	1,389.6	1,387.6	1,387.6	3.9	27.8	47.24	-633.9	685.7	838.5	807.4	31.06	26.998				
1,500.0	1,488.0	1,486.0	1,486.0	4.3	29.7	48.13	-633.9	685.7	826.5	793.1	33.36	24.773				
1,600.0	1,586.4	1,584.4	1,584.4	4.7	31.7	49.05	-633.9	685.7	814.7	779.0	35.67	22.837				
1,700.0	1,684.9	1,682.9	1,682.9	5.1	33.7	49.99	-633.9	685.7	803.1	765.1	37.99	21.137				
1,800.0	1,783.3	1,781.3	1,781.3	5.5	35.6	50.96	-633.9	685.7	791.7	751.4	40.32	19.635				
1,900.0	1,881.7	1,879.7	1,879.7	5.9	37.6	51.96	-633.9	685.7	780.6	738.0	42.66	18.300				
2,000.0	1,980.1	1,978.1	1,978.1	6.3	39.6	52.99	-633.9	685.7	769.7	724.7	45.00	17.105				
2,100.0	2,078.6	2,076.6	2,076.6	6.7	41.5	54.04	-633.9	685.7	759.1	711.8	47.35	16.032				
2,200.0	2,177.0	2,175.0	2,175.0	7.1	43.5	55.12	-633.9	685.7	748.7	699.0	49.71	15.063				
2,300.0	2,275.4	2,273.4	2,273.4	7.5	45.5	56.24	-633.9	685.7	738.7	686.6	52.07	14.185				
2,400.0	2,373.8	2,371.8	2,371.8	7.9	47.4	57.38	-633.9	685.7	728.9	674.4	54.44	13.387				
2,500.0	2,472.2	2,470.2	2,470.2	8.3	49.4	58.55	-633.9	685.7	719.4	662.6	56.82	12.660				
2,600.0	2,570.7	2,568.7	2,568.7	8.7	51.4	59.76	-633.9	685.7	710.2	651.0	59.21	11.995				
2,700.0	2,669.1	2,667.1	2,667.1	9.1	53.3	60.99	-633.9	685.7	701.4	639.8	61.60	11.386				
2,800.0	2,767.5	2,765.5	2,765.5	9.5	55.3	62.25	-633.9	685.7	692.9	628.9	64.00	10.826				
2,900.0	2,865.9	2,863.9	2,863.9	9.9	57.3	63.55	-633.9	685.7	684.7	618.3	66.40	10.311				
3,000.0	2,964.4	2,962.4	2,962.4	10.3	59.2	64.87	-633.9	685.7	676.9	608.1	68.81	9.837				
3,100.0	3,062.8	3,060.8	3,060.8	10.7	61.2	66.22	-633.9	685.7	669.5	598.3	71.23	9.399				
3,200.0	3,161.2	3,159.2	3,159.2	11.1	63.2	67.60	-633.9	685.7	662.5	588.8	73.65	8.995				
3,300.0	3,259.6	3,257.6	3,257.6	11.5	65.2	69.01	-633.9	685.7	655.8	579.8	76.07	8.621				
3,400.0	3,358.1	3,356.1	3,356.1	11.9	67.1	70.45	-633.9	685.7	649.6	571.1	78.50	8.276				
3,500.0	3,456.5	3,454.5	3,454.5	12.3	69.1	71.91	-633.9	685.7	643.8	562.9	80.92	7.956				
3,600.0	3,554.9	3,552.9	3,552.9	12.7	71.1	73.40	-633.9	685.7	638.5	555.1	83.35	7.660				
3,700.0	3,653.3	3,651.3	3,651.3	13.1	73.0	74.91	-633.9	685.7	633.6	547.8	85.78	7.386				
3,800.0	3,751.8	3,749.8	3,749.8	13.5	75.0	76.44	-633.9	685.7	629.1	540.9	88.21	7.132				
3,900.0	3,850.2	3,848.2	3,848.2	13.9	77.0	77.99	-633.9	685.7	625.2	534.5	90.64	6.897				
4,000.0	3,948.6	3,946.6	3,946.6	14.4	78.9	79.56	-633.9	685.7	621.7	528.6	93.07	6.679				
4,100.0	4,047.0	4,045.0	4,045.0	14.8	80.9	81.15	-633.9	685.7	618.6	523.2	95.49	6.478				
4,200.0	4,145.4	4,143.4	4,143.4	15.2	82.9	82.75	-633.9	685.7	616.1	518.2	97.91	6.293				
4,300.0	4,243.9	4,241.9	4,241.9	15.6	84.8	84.36	-633.9	685.7	614.1	513.8	100.33	6.121				
4,400.0	4,342.3	4,340.3	4,340.3	16.0	86.8	85.98	-633.9	685.7	612.6	509.9	102.73	5.963				
4,500.0	4,440.7	4,438.7	4,438.7	16.4	88.8	87.61	-633.9	685.7	611.6	506.5	105.13	5.817				
4,600.0	4,539.1	4,537.1	4,537.1	16.8	90.7	89.24	-633.9	685.7	611.1	503.6	107.53	5.683				
4,646.7	4,585.1	4,583.1	4,583.1	17.0	91.7	90.00	-633.9	685.7	611.0	502.4	108.64	5.625				
4,700.0	4,637.6	4,635.6	4,635.6	17.2	92.7	90.87	-633.9	685.7	611.1	501.2	109.91	5.560				
4,800.0	4,736.0	4,734.0	4,734.0	17.6	94.7	92.50	-633.9	685.7	611.6	499.4	112.28	5.447				
4,900.0	4,834.4	4,832.4	4,832.4	18.0	96.6	94.13	-633.9	685.7	612.7	498.0	114.64	5.344				

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

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Sorin Natural Resources 2U-443
<b>Project:</b>	SEC.2-T4N-R66W	<b>TVD Reference:</b>	WELL @ 4686.0ft (RKB - 15')
<b>Reference Site:</b>	Sorin Natural Resources 2R-HZ Pad Sec.2-T4N-R66W	<b>MD Reference:</b>	WELL @ 4686.0ft (RKB - 15')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Sorin Natural Resources 2U-443	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #1 (01-28-13)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design													Offset Site Error:	0.0 ft
Survey Program: 7300-UNKNOWN													Offset Well Error:	0.0 ft
Reference														
Offset														
Semi Major Axis														
Distance														
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
5,000.0	4,932.8	4,930.8	4,930.8	18.4	98.6	95.75	-633.9	685.7	614.2	497.2	116.99	5.250		
5,100.0	5,031.3	5,029.3	5,029.3	18.8	100.6	97.36	-633.9	685.7	616.3	497.0	119.33	5.164		
5,200.0	5,129.7	5,127.7	5,127.7	19.2	102.6	98.96	-633.9	685.7	618.8	497.2	121.66	5.087		
5,300.0	5,228.1	5,226.1	5,226.1	19.6	104.5	100.54	-633.9	685.7	621.9	497.9	123.98	5.016		
5,400.0	5,326.5	5,324.5	5,324.5	20.0	106.5	102.11	-633.9	685.7	625.4	499.1	126.28	4.953		
5,500.0	5,425.0	5,423.0	5,423.0	20.4	108.5	103.66	-633.9	685.7	629.4	500.8	128.57	4.895		
5,600.0	5,523.4	5,521.4	5,521.4	20.8	110.4	105.21	-633.9	685.7	633.8	503.0	130.84	4.844		
5,700.0	5,622.3	5,620.3	5,620.3	21.1	112.4	106.56	-633.9	685.7	638.0	504.9	133.04	4.795		
5,800.0	5,721.6	5,719.6	5,719.6	21.3	114.4	107.60	-633.9	685.7	641.3	506.1	135.23	4.743		
5,900.0	5,821.3	5,819.3	5,819.3	21.5	116.4	108.33	-633.9	685.7	643.8	506.4	137.40	4.686		
6,000.0	5,921.2	5,919.2	5,919.2	21.7	118.4	108.73	-633.9	685.7	645.2	505.7	139.54	4.624		
6,100.0	6,021.2	6,019.2	6,019.2	21.8	120.4	-159.29	-633.9	685.7	645.6	503.9	141.71	4.556		
6,200.0	6,121.2	6,119.2	6,119.2	21.9	122.4	-159.29	-633.9	685.7	645.6	501.8	143.84	4.488		
6,300.0	6,221.2	6,219.2	6,219.2	22.1	124.4	-159.29	-633.9	685.7	645.6	499.6	145.97	4.423		
6,400.0	6,321.2	6,319.2	6,319.2	22.2	126.4	-159.29	-633.9	685.7	645.6	497.5	148.11	4.359		
6,500.0	6,421.1	6,419.1	6,419.1	22.3	128.4	19.84	-633.9	685.7	644.1	494.2	149.88	4.298		
6,600.0	6,520.2	6,518.2	6,518.2	22.5	130.4	20.56	-633.9	685.7	632.0	482.3	149.68	4.222		
6,700.0	6,616.8	6,614.8	6,614.8	22.6	132.3	22.10	-633.9	685.7	607.9	460.7	147.27	4.128		
6,800.0	6,709.2	6,707.2	6,707.2	22.8	134.1	24.68	-633.9	685.7	572.5	429.5	143.02	4.003		
6,900.0	6,795.8	6,793.8	6,793.8	23.0	135.9	28.68	-633.9	685.7	526.8	388.9	137.85	3.821		
7,000.0	6,875.2	6,873.2	6,873.2	23.2	137.5	34.70	-633.9	685.7	472.2	338.5	133.71	3.532		
7,100.0	6,945.9	6,943.9	6,943.9	23.5	138.9	43.51	-633.9	685.7	410.9	277.1	133.85	3.070		
7,200.0	7,006.9	7,004.9	7,004.9	23.9	140.1	55.54	-633.9	685.7	346.4	205.4	141.00	2.457		
7,300.0	7,057.0	7,055.0	7,055.0	24.4	141.1	69.65	-633.9	685.7	284.5	132.3	152.20	1.869		
7,400.0	7,095.3	7,093.3	7,093.3	25.0	141.9	82.40	-633.9	685.7	236.2	76.1	160.03	1.476	Level 3	
7,493.6	7,120.1	7,118.1	7,118.1	25.7	142.4	90.00	-633.9	685.7	218.3	55.5	162.75	1.341	Level 3, CC	
7,500.0	7,121.3	7,119.3	7,119.3	25.8	142.4	90.32	-633.9	685.7	218.3	55.5	162.84	1.341	Level 3, ES, SF	
7,600.0	7,135.1	7,133.1	7,133.1	26.7	142.7	92.89	-633.9	685.7	242.3	78.1	164.19	1.476	Level 3	
7,700.0	7,144.2	7,142.2	7,142.2	27.7	142.8	93.00	-633.9	685.7	299.3	133.7	165.65	1.807		
7,800.0	7,146.0	7,144.0	7,144.0	28.8	142.9	90.00	-633.9	685.7	374.9	207.7	167.15	2.243		
7,900.0	7,146.0	7,144.0	7,144.0	30.0	142.9	90.00	-633.9	685.7	459.9	291.3	168.58	2.728		
8,000.0	7,146.0	7,144.0	7,144.0	31.2	142.9	90.00	-633.9	685.7	549.9	379.9	170.06	3.234		
8,100.0	7,146.0	7,144.0	7,144.0	32.6	142.9	90.00	-633.9	685.7	643.0	471.4	171.60	3.747		
8,200.0	7,146.0	7,144.0	7,144.0	34.0	142.9	90.00	-633.9	685.7	737.8	564.6	173.18	4.260		
8,300.0	7,146.0	7,144.0	7,144.0	35.4	142.9	90.00	-633.9	685.7	833.8	659.0	174.80	4.770		
8,400.0	7,146.0	7,144.0	7,144.0	36.9	142.9	90.00	-633.9	685.7	930.7	754.3	176.45	5.275		

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Sorin Natural Resources 2U-443
<b>Project:</b>	SEC.2-T4N-R66W	<b>TVD Reference:</b>	WELL @ 4686.0ft (RKB - 15')
<b>Reference Site:</b>	Sorin Natural Resources 2R-HZ Pad Sec.2-T4N-R66W	<b>MD Reference:</b>	WELL @ 4686.0ft (RKB - 15')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Sorin Natural Resources 2U-443	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #1 (01-28-13)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design		Sorin Natural Resources 2R-HZ Pad Sec.2-T4N-R66W - Sorin Natural Resources 2R-223 - Wellbore #1										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	-90.00	0.0	-30.7	30.7					
100.0	100.0	100.0	100.0	0.1	0.1	-90.00	0.0	-30.7	30.7	30.4	0.22	136.412		
200.0	200.0	200.0	200.0	0.3	0.3	-90.00	0.0	-30.7	30.7	30.0	0.67	45.471		
300.0	300.0	300.0	300.0	0.6	0.6	-90.00	0.0	-30.7	30.7	29.5	1.12	27.282		
400.0	400.0	400.0	400.0	0.8	0.8	-90.00	0.0	-30.7	30.7	29.1	1.57	19.487 CC, ES		
500.0	500.0	500.0	500.0	1.0	1.0	178.22	0.0	-30.7	32.4	30.4	2.01	16.099		
600.0	599.8	599.8	599.8	1.2	1.2	178.46	0.0	-30.7	37.6	35.2	2.45	15.372		
700.0	699.5	699.5	699.5	1.4	1.5	178.75	0.0	-30.7	46.3	43.5	2.89	16.042		
800.0	798.7	798.7	798.7	1.7	1.7	179.01	0.0	-30.7	58.5	55.2	3.33	17.561		
900.0	897.5	897.5	897.5	2.0	1.9	179.21	0.0	-30.7	74.2	70.4	3.78	19.626		
1,000.0	995.9	995.9	995.9	2.4	2.1	179.36	0.0	-30.7	91.8	87.6	4.23	21.721		
1,100.0	1,094.3	1,098.0	1,098.0	2.7	2.3	179.44	-0.1	-29.0	107.9	103.2	4.67	23.099		
1,200.0	1,192.7	1,201.4	1,201.2	3.1	2.6	179.45	-0.4	-23.6	120.4	115.3	5.11	23.576		
1,300.0	1,291.2	1,305.5	1,304.9	3.5	2.8	179.40	-0.9	-14.4	129.4	123.8	5.56	23.270		
1,400.0	1,389.6	1,407.8	1,406.5	3.9	3.0	179.32	-1.5	-2.1	135.1	129.1	6.02	22.448		
1,500.0	1,488.0	1,507.7	1,505.6	4.3	3.3	179.24	-2.2	10.4	140.3	133.8	6.48	21.647		
1,600.0	1,586.4	1,607.6	1,604.7	4.7	3.6	179.17	-2.9	22.9	145.5	138.6	6.95	20.939		
1,700.0	1,684.9	1,707.4	1,703.7	5.1	3.8	179.10	-3.5	35.4	150.7	143.3	7.42	20.309		
1,800.0	1,783.3	1,807.3	1,802.8	5.5	4.1	179.03	-4.2	47.9	155.9	148.0	7.90	19.746		
1,900.0	1,881.7	1,907.1	1,901.9	5.9	4.4	178.97	-4.9	60.4	161.2	152.8	8.38	19.241		
2,000.0	1,980.1	2,007.0	2,001.0	6.3	4.7	178.91	-5.5	72.9	166.4	157.5	8.86	18.785		
2,100.0	2,078.6	2,106.9	2,100.0	6.7	5.0	178.86	-6.2	85.4	171.6	162.3	9.34	18.372		
2,200.0	2,177.0	2,206.7	2,199.1	7.1	5.3	178.81	-6.9	97.9	176.8	167.0	9.82	17.997		
2,300.0	2,275.4	2,306.6	2,298.2	7.5	5.6	178.76	-7.6	110.4	182.0	171.7	10.31	17.654		
2,400.0	2,373.8	2,406.5	2,397.3	7.9	5.9	178.72	-8.2	122.9	187.3	176.5	10.80	17.340		
2,500.0	2,472.2	2,506.3	2,496.3	8.3	6.2	178.67	-8.9	135.4	192.5	181.2	11.29	17.052		
2,600.0	2,570.7	2,606.2	2,595.4	8.7	6.5	178.63	-9.6	147.9	197.7	185.9	11.78	16.786		
2,700.0	2,669.1	2,706.1	2,694.5	9.1	6.9	178.60	-10.2	160.3	202.9	190.6	12.27	16.540		
2,800.0	2,767.5	2,805.9	2,793.6	9.5	7.2	178.56	-10.9	172.8	208.1	195.4	12.76	16.312		
2,900.0	2,865.9	2,905.8	2,892.7	9.9	7.5	178.52	-11.6	185.3	213.3	200.1	13.25	16.100		
3,000.0	2,964.4	3,005.6	2,991.7	10.3	7.8	178.49	-12.2	197.8	218.6	204.8	13.74	15.903		
3,100.0	3,062.8	3,105.5	3,090.8	10.7	8.1	178.46	-12.9	210.3	223.8	209.5	14.24	15.719		
3,200.0	3,161.2	3,205.4	3,189.9	11.1	8.4	178.43	-13.6	222.8	229.0	214.3	14.73	15.546		
3,300.0	3,259.6	3,305.2	3,289.0	11.5	8.7	178.40	-14.2	235.3	234.2	219.0	15.22	15.384		
3,400.0	3,358.1	3,405.1	3,388.0	11.9	9.1	178.37	-14.9	247.8	239.4	223.7	15.72	15.232		
3,500.0	3,456.5	3,505.0	3,487.1	12.3	9.4	178.35	-15.6	260.3	244.7	228.4	16.21	15.089		
3,600.0	3,554.9	3,604.8	3,586.2	12.7	9.7	178.32	-16.3	272.8	249.9	233.2	16.71	14.954		
3,700.0	3,653.3	3,704.7	3,685.3	13.1	10.0	178.30	-16.9	285.3	255.1	237.9	17.21	14.827		
3,800.0	3,751.8	3,804.6	3,784.3	13.5	10.3	178.28	-17.6	297.8	260.3	242.6	17.70	14.706		
3,900.0	3,850.2	3,904.4	3,883.4	13.9	10.7	178.25	-18.3	310.3	265.5	247.3	18.20	14.592		
4,000.0	3,948.6	4,004.3	3,982.5	14.4	11.0	178.23	-18.9	322.8	270.8	252.1	18.69	14.484		
4,100.0	4,047.0	4,104.1	4,081.6	14.8	11.3	178.21	-19.6	335.3	276.0	256.8	19.19	14.381		
4,200.0	4,145.4	4,204.0	4,180.6	15.2	11.6	178.19	-20.3	347.8	281.2	261.5	19.69	14.283		
4,300.0	4,243.9	4,303.9	4,279.7	15.6	12.0	178.17	-20.9	360.3	286.4	266.2	20.18	14.190		
4,400.0	4,342.3	4,403.7	4,378.8	16.0	12.3	178.16	-21.6	372.8	291.6	271.0	20.68	14.101		
4,500.0	4,440.7	4,503.6	4,477.9	16.4	12.6	178.14	-22.3	385.3	296.9	275.7	21.18	14.016		
4,600.0	4,539.1	4,603.5	4,576.9	16.8	12.9	178.12	-23.0	397.8	302.1	280.4	21.68	13.935		
4,700.0	4,637.6	4,703.3	4,676.0	17.2	13.2	178.10	-23.6	410.3	307.3	285.1	22.17	13.858		
4,800.0	4,736.0	4,803.2	4,775.1	17.6	13.6	178.09	-24.3	422.8	312.5	289.8	22.67	13.784		
4,900.0	4,834.4	4,903.1	4,874.2	18.0	13.9	178.07	-25.0	435.3	317.7	294.6	23.17	13.713		
5,000.0	4,932.8	5,002.9	4,973.3	18.4	14.2	178.06	-25.6	447.8	323.0	299.3	23.67	13.645		

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

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Sorin Natural Resources 2U-443
<b>Project:</b>	SEC.2-T4N-R66W	<b>TVD Reference:</b>	WELL @ 4686.0ft (RKB - 15')
<b>Reference Site:</b>	Sorin Natural Resources 2R-HZ Pad Sec.2-T4N-R66W	<b>MD Reference:</b>	WELL @ 4686.0ft (RKB - 15')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Sorin Natural Resources 2U-443	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #1 (01-28-13)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design		Sorin Natural Resources 2R-HZ Pad Sec.2-T4N-R66W - Sorin Natural Resources 2R-223 - Wellbore #1										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				
5,100.0	5,031.3	5,102.8	5,072.3	18.8	14.5	178.04	-26.3	460.3	328.2	304.0	24.17	13.579				
5,200.0	5,129.7	5,202.6	5,171.4	19.2	14.9	178.03	-27.0	472.8	333.4	308.7	24.67	13.517				
5,300.0	5,228.1	5,302.5	5,270.5	19.6	15.2	178.02	-27.6	485.3	338.6	313.5	25.16	13.456				
5,400.0	5,326.5	5,402.4	5,369.6	20.0	15.5	178.00	-28.3	497.8	343.8	318.2	25.66	13.398				
5,500.0	5,425.0	5,500.0	5,466.4	20.4	15.8	177.99	-29.0	509.9	349.2	323.0	26.15	13.353				
5,600.0	5,523.4	5,588.0	5,554.0	20.8	16.0	178.00	-29.4	518.8	356.6	330.1	26.57	13.420				
5,700.0	5,622.3	5,676.6	5,642.3	21.1	16.2	178.02	-29.8	525.0	364.6	337.6	26.95	13.527				
5,800.0	5,721.6	5,764.9	5,730.6	21.3	16.3	178.05	-30.0	528.5	372.1	344.8	27.28	13.638				
5,900.0	5,821.3	5,855.6	5,821.3	21.5	16.5	178.09	-30.0	529.3	379.1	351.5	27.58	13.744				
6,000.0	5,921.2	5,955.5	5,921.2	21.7	16.6	178.11	-30.0	529.3	383.6	355.7	27.87	13.761				
6,100.0	6,021.2	6,055.5	6,021.2	21.8	16.8	-90.00	-30.0	529.3	384.7	356.5	28.20	13.642				
6,200.0	6,121.2	6,155.5	6,121.2	21.9	17.0	-90.00	-30.0	529.3	384.7	356.1	28.57	13.463				
6,261.5	6,182.7	6,217.0	6,182.7	22.0	17.1	-90.00	-30.0	529.3	384.7	355.9	28.80	13.354				
6,300.0	6,221.2	6,255.4	6,221.1	22.1	17.1	-90.02	-30.1	529.3	384.7	355.7	28.95	13.287				
6,400.0	6,321.2	6,353.8	6,319.0	22.2	17.3	-91.21	-38.2	529.2	384.9	355.5	29.37	13.105				
6,500.0	6,421.1	6,448.9	6,412.1	22.3	17.5	85.07	-57.8	528.9	386.1	356.3	29.84	12.939				
6,600.0	6,520.2	6,541.6	6,499.6	22.5	17.6	82.16	-88.0	528.4	388.4	358.0	30.42	12.767				
6,700.0	6,616.8	6,632.2	6,581.1	22.6	17.8	79.43	-127.5	527.7	391.5	360.4	31.08	12.595				
6,800.0	6,709.2	6,721.1	6,656.0	22.8	18.1	76.92	-175.3	526.9	395.2	363.4	31.80	12.428				
6,900.0	6,795.8	6,808.5	6,723.6	23.0	18.4	74.65	-230.5	526.0	399.2	366.6	32.54	12.269				
7,000.0	6,875.2	6,894.5	6,783.7	23.2	18.7	72.65	-292.1	525.0	403.3	370.0	33.28	12.118				
7,100.0	6,945.9	6,979.5	6,835.9	23.5	19.2	70.93	-359.1	523.9	407.2	373.2	34.02	11.972				
7,200.0	7,006.9	7,063.6	6,879.8	23.9	19.7	69.51	-430.8	522.7	410.8	376.1	34.75	11.822				
7,300.0	7,057.0	7,150.0	6,916.5	24.4	20.3	68.36	-508.9	521.4	413.9	378.3	35.53	11.647				
7,400.0	7,095.3	7,229.9	6,942.4	25.0	21.1	67.56	-584.5	520.1	416.2	379.9	36.34	11.454				
7,500.0	7,121.3	7,312.4	6,960.7	25.8	21.9	67.04	-664.9	518.8	417.7	380.5	37.28	11.207				
7,600.0	7,135.1	7,394.7	6,970.2	26.7	22.8	66.78	-746.6	517.4	418.6	380.0	38.62	10.838				
7,700.0	7,144.2	7,483.2	6,971.4	27.7	23.9	65.86	-835.0	516.0	421.6	381.4	40.26	10.472				
7,800.0	7,146.0	7,583.2	6,970.9	28.8	25.2	65.53	-935.0	514.3	422.6	380.3	42.25	10.002				
7,900.0	7,146.0	7,683.2	6,970.4	30.0	26.6	65.47	-1,035.0	512.6	422.8	377.9	44.87	9.423				
8,000.0	7,146.0	7,783.2	6,969.9	31.2	28.0	65.41	-1,134.9	511.0	423.0	375.4	47.60	8.886				
8,100.0	7,146.0	7,883.2	6,969.4	32.6	29.5	65.35	-1,234.9	509.3	423.2	372.8	50.43	8.391				
8,200.0	7,146.0	7,983.2	6,968.9	34.0	31.0	65.28	-1,334.9	507.7	423.4	370.1	53.34	7.938				
8,300.0	7,146.0	8,083.2	6,968.4	35.4	32.6	65.22	-1,434.9	506.0	423.6	367.3	56.32	7.522				
8,400.0	7,146.0	8,183.2	6,967.9	36.9	34.2	65.16	-1,534.9	504.3	423.9	364.5	59.35	7.142				
8,500.0	7,146.0	8,283.2	6,967.4	38.4	35.8	65.10	-1,634.9	502.7	424.1	361.6	62.43	6.793				
8,600.0	7,146.0	8,383.2	6,966.9	40.0	37.5	65.04	-1,734.8	501.0	424.3	358.7	65.54	6.473				
8,700.0	7,146.0	8,483.2	6,966.4	41.6	39.2	64.97	-1,834.8	499.4	424.5	355.8	68.69	6.180				
8,800.0	7,146.0	8,583.2	6,965.9	43.2	40.9	64.91	-1,934.8	497.7	424.7	352.8	71.87	5.909				
8,900.0	7,146.0	8,683.2	6,965.4	44.8	42.6	64.85	-2,034.8	496.0	424.9	349.8	75.08	5.660				
9,000.0	7,146.0	8,783.2	6,964.9	46.5	44.4	64.79	-2,134.8	494.4	425.1	346.8	78.31	5.429				
9,100.0	7,146.0	8,883.2	6,964.4	48.2	46.1	64.73	-2,234.8	492.7	425.4	343.8	81.55	5.216				
9,200.0	7,146.0	8,983.2	6,963.9	49.9	47.9	64.66	-2,334.7	491.0	425.6	340.8	84.81	5.018				
9,300.0	7,146.0	9,083.2	6,963.4	51.6	49.7	64.60	-2,434.7	489.4	425.8	337.7	88.09	4.834				
9,400.0	7,146.0	9,183.2	6,962.8	53.3	51.5	64.54	-2,534.7	487.7	426.0	334.6	91.38	4.662				
9,500.0	7,146.0	9,283.2	6,962.3	55.1	53.3	64.48	-2,634.7	486.1	426.2	331.6	94.68	4.502				
9,600.0	7,146.0	9,383.2	6,961.8	56.8	55.1	64.42	-2,734.7	484.4	426.5	328.5	97.98	4.352				
9,700.0	7,146.0	9,483.2	6,961.3	58.6	56.9	64.36	-2,834.7	482.7	426.7	325.4	101.30	4.212				
9,800.0	7,146.0	9,583.2	6,960.8	60.4	58.7	64.30	-2,934.6	481.1	426.9	322.3	104.62	4.080				
9,900.0	7,146.0	9,683.2	6,960.3	62.1	60.5	64.23	-3,034.6	479.4	427.1	319.2	107.95	3.957				

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

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Sorin Natural Resources 2U-443
<b>Project:</b>	SEC.2-T4N-R66W	<b>TVD Reference:</b>	WELL @ 4686.0ft (RKB - 15')
<b>Reference Site:</b>	Sorin Natural Resources 2R-HZ Pad Sec.2-T4N-R66W	<b>MD Reference:</b>	WELL @ 4686.0ft (RKB - 15')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Sorin Natural Resources 2U-443	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #1 (01-28-13)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design		Sorin Natural Resources 2R-HZ Pad Sec.2-T4N-R66W - Sorin Natural Resources 2R-223 - Wellbore #1										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	7,146.0	9,783.2	6,959.8	63.9	62.4	64.17	-3,134.6	477.8	427.3	316.1	111.28	3.840			
10,100.0	7,146.0	9,883.2	6,959.3	65.7	64.2	64.11	-3,234.6	476.1	427.6	312.9	114.62	3.730			
10,200.0	7,146.0	9,983.2	6,958.8	67.5	66.1	64.05	-3,334.6	474.4	427.8	309.8	117.96	3.626			
10,300.0	7,146.0	10,083.2	6,958.3	69.3	67.9	63.99	-3,434.6	472.8	428.0	306.7	121.31	3.528			
10,400.0	7,146.0	10,183.2	6,957.8	71.1	69.7	63.93	-3,534.5	471.1	428.2	303.6	124.65	3.435			
10,500.0	7,146.0	10,283.2	6,957.3	73.0	71.6	63.87	-3,634.5	469.5	428.5	300.5	128.00	3.347			
10,600.0	7,146.0	10,383.2	6,956.8	74.8	73.5	63.81	-3,734.5	467.8	428.7	297.3	131.35	3.264			
10,700.0	7,146.0	10,483.1	6,956.3	76.6	75.3	63.75	-3,834.5	466.1	428.9	294.2	134.71	3.184			
10,800.0	7,146.0	10,583.1	6,955.8	78.4	77.2	63.69	-3,934.5	464.5	429.1	291.1	138.06	3.108			
10,900.0	7,146.0	10,683.1	6,955.3	80.3	79.0	63.63	-4,034.5	462.8	429.4	287.9	141.42	3.036			
11,000.0	7,146.0	10,783.1	6,954.7	82.1	80.9	63.56	-4,134.4	461.2	429.6	284.8	144.77	2.967			
11,100.0	7,146.0	10,883.1	6,954.2	84.0	82.8	63.50	-4,234.4	459.5	429.8	281.7	148.13	2.902			
11,200.0	7,146.0	10,983.1	6,953.7	85.8	84.6	63.44	-4,334.4	457.8	430.0	278.6	151.48	2.839			
11,300.0	7,146.0	11,083.1	6,953.2	87.7	86.5	63.38	-4,434.4	456.2	430.3	275.4	154.84	2.779			
11,400.0	7,146.0	11,183.1	6,952.7	89.5	88.4	63.32	-4,534.4	454.5	430.5	272.3	158.19	2.721			
11,500.0	7,146.0	11,283.1	6,952.2	91.4	90.3	63.26	-4,634.4	452.8	430.7	269.2	161.54	2.666			
11,600.0	7,146.0	11,383.1	6,951.7	93.2	92.1	63.20	-4,734.3	451.2	431.0	266.1	164.90	2.613			
11,700.0	7,146.0	11,483.1	6,951.2	95.1	94.0	63.14	-4,834.3	449.5	431.2	262.9	168.25	2.563			
11,732.7	7,146.0	11,515.9	6,951.0	95.7	94.6	63.12	-4,867.0	449.0	431.3	261.9	169.35	2.547 SF			

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Sorin Natural Resources 2U-443
<b>Project:</b>	SEC.2-T4N-R66W	<b>TVD Reference:</b>	WELL @ 4686.0ft (RKB - 15')
<b>Reference Site:</b>	Sorin Natural Resources 2R-HZ Pad Sec.2-T4N-R66W	<b>MD Reference:</b>	WELL @ 4686.0ft (RKB - 15')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Sorin Natural Resources 2U-443	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #1 (01-28-13)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design		Sorin Natural Resources 2R-HZ Pad Sec.2-T4N-R66W - Sorin Natural Resources 2R-403 - Wellbore #1											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	-90.00	0.0	-61.3	61.3							
100.0	100.0	100.0	100.0	0.1	0.1	-90.00	0.0	-61.3	61.3	61.1	0.22	272.824				
200.0	200.0	200.0	200.0	0.3	0.3	-90.00	0.0	-61.3	61.3	60.6	0.67	90.941				
300.0	300.0	300.0	300.0	0.6	0.6	-90.00	0.0	-61.3	61.3	60.2	1.12	54.565				
400.0	400.0	400.0	400.0	0.8	0.8	-90.00	0.0	-61.3	61.3	59.7	1.57	38.975 CC, ES				
500.0	500.0	500.0	500.0	1.0	1.0	178.17	0.0	-61.3	63.1	61.1	2.01	31.331				
600.0	599.8	599.8	599.8	1.2	1.2	178.31	0.0	-61.3	68.3	65.8	2.45	27.895				
700.0	699.5	699.5	699.5	1.4	1.5	178.49	0.0	-61.3	77.0	74.1	2.89	26.653				
800.0	798.7	798.7	798.7	1.7	1.7	178.69	0.0	-61.3	89.2	85.9	3.33	26.759				
900.0	897.5	897.5	897.5	2.0	1.9	178.88	0.0	-61.3	104.8	101.1	3.78	27.737				
1,000.0	995.9	995.9	995.9	2.4	2.1	179.04	0.0	-61.3	122.5	118.3	4.23	28.969				
1,100.0	1,094.3	1,094.3	1,094.3	2.7	2.3	179.16	0.0	-61.3	140.2	135.5	4.68	29.930				
1,200.0	1,192.7	1,192.7	1,192.7	3.1	2.6	179.26	0.0	-61.3	157.9	152.7	5.14	30.698				
1,300.0	1,291.2	1,291.2	1,291.2	3.5	2.8	179.33	0.0	-61.3	175.6	169.9	5.60	31.324				
1,400.0	1,389.6	1,389.6	1,389.6	3.9	3.0	179.39	0.0	-61.3	193.2	187.2	6.07	31.843				
1,500.0	1,488.0	1,488.0	1,488.0	4.3	3.2	179.44	0.0	-61.3	210.9	204.4	6.53	32.279				
1,600.0	1,586.4	1,593.9	1,593.8	4.7	3.5	179.46	-0.2	-59.8	227.2	220.2	7.00	32.457				
1,700.0	1,684.9	1,701.8	1,701.7	5.1	3.7	179.38	-0.8	-54.3	239.8	232.3	7.45	32.169				
1,800.0	1,783.3	1,810.7	1,810.1	5.5	3.9	179.22	-1.9	-44.6	248.7	240.7	7.92	31.402				
1,900.0	1,881.7	1,913.9	1,912.5	5.9	4.1	179.01	-3.3	-32.4	254.5	246.1	8.38	30.371				
2,000.0	1,980.1	2,013.7	2,011.6	6.3	4.4	178.82	-4.7	-20.3	260.2	251.3	8.84	29.420				
2,100.0	2,078.6	2,113.6	2,110.7	6.7	4.6	178.63	-6.1	-8.2	265.8	256.5	9.31	28.551				
2,200.0	2,177.0	2,213.4	2,209.8	7.1	4.9	178.45	-7.5	3.9	271.4	261.6	9.78	27.755				
2,300.0	2,275.4	2,313.2	2,308.9	7.5	5.2	178.28	-8.8	15.9	277.1	266.8	10.25	27.025				
2,400.0	2,373.8	2,413.1	2,408.0	7.9	5.4	178.11	-10.2	28.0	282.7	272.0	10.73	26.352				
2,500.0	2,472.2	2,512.9	2,507.1	8.3	5.7	177.95	-11.6	40.1	288.3	277.1	11.21	25.730				
2,600.0	2,570.7	2,612.8	2,606.2	8.7	6.0	177.80	-13.0	52.2	294.0	282.3	11.69	25.155				
2,700.0	2,669.1	2,712.6	2,705.3	9.1	6.3	177.65	-14.4	64.2	299.6	287.5	12.17	24.622				
2,800.0	2,767.5	2,812.4	2,804.4	9.5	6.6	177.51	-15.8	76.3	305.3	292.6	12.65	24.126				
2,900.0	2,865.9	2,912.3	2,903.5	9.9	6.9	177.37	-17.1	88.4	310.9	297.8	13.14	23.663				
3,000.0	2,964.4	3,012.1	3,002.6	10.3	7.2	177.24	-18.5	100.5	316.6	302.9	13.63	23.232				
3,100.0	3,062.8	3,111.9	3,101.7	10.7	7.5	177.11	-19.9	112.5	322.2	308.1	14.12	22.828				
3,200.0	3,161.2	3,211.8	3,200.8	11.1	7.8	176.99	-21.3	124.6	327.9	313.3	14.61	22.449				
3,300.0	3,259.6	3,311.6	3,299.9	11.5	8.1	176.87	-22.7	136.7	333.5	318.4	15.10	22.094				
3,400.0	3,358.1	3,411.5	3,399.0	11.9	8.4	176.76	-24.1	148.8	339.2	323.6	15.59	21.759				
3,500.0	3,456.5	3,511.3	3,498.1	12.3	8.7	176.65	-25.4	160.8	344.9	328.8	16.08	21.444				
3,600.0	3,554.9	3,611.1	3,597.2	12.7	9.0	176.54	-26.8	172.9	350.5	333.9	16.58	21.146				
3,700.0	3,653.3	3,706.0	3,691.3	13.1	9.2	176.45	-28.1	184.1	356.5	339.4	17.05	20.908				
3,800.0	3,751.8	3,800.0	3,785.0	13.5	9.5	176.42	-29.1	192.6	365.1	347.6	17.49	20.871				
3,900.0	3,850.2	3,882.6	3,867.4	13.9	9.6	176.45	-29.7	197.6	376.7	358.8	17.91	21.030				
4,000.0	3,948.6	3,970.0	3,954.7	14.4	9.8	176.53	-30.0	200.3	391.3	373.0	18.33	21.343				
4,100.0	4,047.0	4,062.3	4,047.0	14.8	9.9	176.66	-30.0	200.7	408.6	389.8	18.77	21.769				
4,200.0	4,145.4	4,160.7	4,145.4	15.2	10.1	176.80	-30.0	200.7	426.2	407.0	19.22	22.174				
4,300.0	4,243.9	4,259.1	4,243.9	15.6	10.3	176.93	-30.0	200.7	443.9	424.2	19.68	22.555				
4,400.0	4,342.3	4,357.5	4,342.3	16.0	10.5	177.05	-30.0	200.7	461.5	441.4	20.14	22.918				
4,500.0	4,440.7	4,456.0	4,440.7	16.4	10.7	177.16	-30.0	200.7	479.2	458.6	20.60	23.264				
4,600.0	4,539.1	4,554.4	4,539.1	16.8	10.9	177.26	-30.0	200.7	496.9	475.8	21.06	23.594				
4,700.0	4,637.6	4,652.8	4,637.6	17.2	11.1	177.35	-30.0	200.7	514.5	493.0	21.52	23.909				
4,800.0	4,736.0	4,751.2	4,736.0	17.6	11.3	177.44	-30.0	200.7	532.2	510.2	21.98	24.210				
4,900.0	4,834.4	4,849.7	4,834.4	18.0	11.5	177.52	-30.0	200.7	549.9	527.4	22.45	24.498				
5,000.0	4,932.8	4,948.1	4,932.8	18.4	11.7	177.60	-30.0	200.7	567.5	544.6	22.91	24.774				

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



Sorin Natural Resources 2R-HZ Pad Sec.2-T4N-R66W - Sorin Natural Resources 2R-403 - Wellbore #1													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		
5,100.0	5,031.3	5,046.5	5,031.3	18.8	11.9	177.67	-30.0	200.7	585.2	561.8	23.37	25.038		
5,200.0	5,129.7	5,144.9	5,129.7	19.2	12.0	177.74	-30.0	200.7	602.9	579.1	23.84	25.291		
5,300.0	5,228.1	5,243.4	5,228.1	19.6	12.2	177.80	-30.0	200.7	620.6	596.3	24.30	25.535		
5,400.0	5,326.5	5,341.8	5,326.5	20.0	12.4	177.87	-30.0	200.7	638.2	613.5	24.77	25.768		
5,500.0	5,425.0	5,440.2	5,425.0	20.4	12.6	177.92	-30.0	200.7	655.9	630.7	25.23	25.993		
5,600.0	5,523.4	5,538.7	5,523.4	20.8	12.8	177.98	-30.0	200.7	673.4	647.7	25.71	26.197		
5,700.0	5,622.3	5,637.5	5,622.3	21.1	13.0	178.03	-30.0	200.7	688.3	662.2	26.14	26.327		
5,800.0	5,721.6	5,736.9	5,721.6	21.3	13.3	178.07	-30.0	200.7	699.8	673.2	26.55	26.356		
5,900.0	5,821.3	5,836.5	5,821.3	21.5	13.5	178.10	-30.0	200.7	707.7	680.8	26.92	26.289		
6,000.0	5,921.2	5,936.4	5,921.2	21.7	13.7	178.12	-30.0	200.7	712.2	685.0	27.26	26.130		
6,100.0	6,021.2	6,036.4	6,021.2	21.8	13.9	-90.00	-30.0	200.7	713.3	685.7	27.61	25.834		
6,200.0	6,121.2	6,136.4	6,121.2	21.9	14.1	-90.00	-30.0	200.7	713.3	685.3	28.01	25.469		
6,300.0	6,221.2	6,236.4	6,221.2	22.1	14.3	-90.00	-30.0	200.7	713.3	684.9	28.41	25.112		
6,400.0	6,321.2	6,336.4	6,321.2	22.2	14.5	-90.00	-30.0	200.7	713.3	684.5	28.80	24.764		
6,500.0	6,421.1	6,435.7	6,420.4	22.3	14.7	89.05	-31.5	200.7	713.3	684.2	29.16	24.459		
6,600.0	6,520.2	6,534.2	6,518.1	22.5	14.9	89.07	-44.0	200.5	713.3	683.8	29.53	24.155		
6,700.0	6,616.8	6,632.8	6,613.4	22.6	15.1	89.10	-69.0	200.1	713.3	683.4	29.93	23.832		
6,800.0	6,709.2	6,731.4	6,704.7	22.8	15.3	89.15	-106.1	199.5	713.3	682.9	30.40	23.465		
6,900.0	6,795.8	6,830.2	6,790.6	23.0	15.6	89.21	-154.7	198.7	713.2	682.2	30.98	23.021		
7,000.0	6,875.2	6,929.0	6,869.5	23.2	15.9	89.28	-214.0	197.7	713.2	681.4	31.74	22.469		
7,100.0	6,945.9	7,027.9	6,940.2	23.5	16.3	89.37	-283.0	196.6	713.1	680.4	32.73	21.788		
7,200.0	7,006.9	7,127.0	7,001.5	23.9	16.9	89.46	-360.8	195.4	713.1	679.1	34.00	20.975		
7,300.0	7,057.0	7,226.2	7,052.4	24.4	17.7	89.57	-445.9	194.0	713.0	677.5	35.57	20.048		
7,400.0	7,095.3	7,325.6	7,091.8	25.0	18.6	89.69	-537.1	192.5	713.0	675.5	37.44	19.042		
7,500.0	7,121.3	7,425.2	7,119.0	25.8	19.7	89.80	-632.8	191.0	712.9	673.3	39.60	18.001		
7,600.0	7,135.1	7,525.0	7,133.8	26.7	20.8	89.90	-731.4	189.4	712.9	670.8	42.02	16.967		
7,700.0	7,144.2	7,625.0	7,143.5	27.7	22.1	89.94	-830.9	187.8	712.8	668.2	44.62	15.973		
7,800.0	7,146.0	7,724.9	7,146.1	28.8	23.5	90.01	-930.8	186.2	712.8	665.4	47.39	15.041		
7,900.0	7,146.0	7,824.9	7,146.2	30.0	25.0	90.02	-1,030.8	184.6	712.7	662.4	50.29	14.173		
8,000.0	7,146.0	7,924.9	7,146.3	31.2	26.5	90.03	-1,130.7	183.0	712.7	659.4	53.30	13.370		
8,100.0	7,146.0	8,024.9	7,146.4	32.6	28.0	90.04	-1,230.7	181.4	712.6	656.2	56.42	12.631		
8,200.0	7,146.0	8,124.9	7,146.6	34.0	29.6	90.05	-1,330.7	179.8	712.6	652.9	59.62	11.952		
8,300.0	7,146.0	8,224.9	7,146.7	35.4	31.3	90.06	-1,430.7	178.2	712.5	649.6	62.89	11.330		
8,400.0	7,146.0	8,324.9	7,146.8	36.9	32.9	90.07	-1,530.7	176.5	712.5	646.2	66.22	10.760		
8,500.0	7,146.0	8,424.9	7,146.9	38.4	34.6	90.08	-1,630.7	174.9	712.4	642.8	69.60	10.236		
8,600.0	7,146.0	8,524.9	7,147.1	40.0	36.3	90.09	-1,730.7	173.3	712.4	639.3	73.02	9.755		
8,700.0	7,146.0	8,624.9	7,147.2	41.6	38.1	90.10	-1,830.6	171.7	712.3	635.8	76.49	9.313		
8,800.0	7,146.0	8,724.9	7,147.3	43.2	39.8	90.11	-1,930.6	170.1	712.3	632.3	79.99	8.905		
8,900.0	7,146.0	8,824.9	7,147.4	44.8	41.6	90.12	-2,030.6	168.5	712.2	628.7	83.51	8.528		
9,000.0	7,146.0	8,924.9	7,147.6	46.5	43.4	90.13	-2,130.6	166.9	712.2	625.1	87.07	8.180		
9,100.0	7,146.0	9,024.9	7,147.7	48.2	45.2	90.14	-2,230.6	165.3	712.1	621.5	90.64	7.856		
9,200.0	7,146.0	9,124.9	7,147.8	49.9	47.0	90.15	-2,330.6	163.7	712.1	617.8	94.24	7.556		
9,300.0	7,146.0	9,224.9	7,147.9	51.6	48.8	90.16	-2,430.6	162.0	712.0	614.2	97.85	7.276		
9,400.0	7,146.0	9,324.9	7,148.1	53.3	50.6	90.17	-2,530.6	160.4	712.0	610.5	101.48	7.016		
9,500.0	7,146.0	9,424.9	7,148.2	55.1	52.4	90.18	-2,630.5	158.8	711.9	606.8	105.13	6.772		
9,600.0	7,146.0	9,524.9	7,148.3	56.8	54.2	90.19	-2,730.5	157.2	711.9	603.1	108.78	6.544		
9,700.0	7,146.0	9,624.9	7,148.4	58.6	56.1	90.20	-2,830.5	155.6	711.8	599.4	112.45	6.330		
9,800.0	7,146.0	9,724.9	7,148.6	60.4	57.9	90.21	-2,930.5	154.0	711.8	595.6	116.13	6.129		
9,900.0	7,146.0	9,824.9	7,148.7	62.1	59.7	90.22	-3,030.5	152.4	711.7	591.9	119.82	5.940		
10,000.0	7,146.0	9,924.9	7,148.8	63.9	61.6	90.23	-3,130.5	150.8	711.7	588.2	123.52	5.762		



<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Sorin Natural Resources 2U-443
<b>Project:</b>	SEC.2-T4N-R66W	<b>TVD Reference:</b>	WELL @ 4686.0ft (RKB - 15')
<b>Reference Site:</b>	Sorin Natural Resources 2R-HZ Pad Sec.2-T4N-R66W	<b>MD Reference:</b>	WELL @ 4686.0ft (RKB - 15')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Sorin Natural Resources 2U-443	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #1 (01-28-13)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design		Sorin Natural Resources 2R-HZ Pad Sec.2-T4N-R66W - Sorin Natural Resources 2R-403 - Wellbore #1										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)						
10,100.0	7,146.0	10,024.9	7,148.9	65.7	63.4	90.24	-3,230.5	149.2	711.6	584.4	127.22	5.594					
10,200.0	7,146.0	10,124.9	7,149.1	67.5	65.3	90.25	-3,330.4	147.6	711.6	580.6	130.93	5.435					
10,300.0	7,146.0	10,224.9	7,149.2	69.3	67.2	90.26	-3,430.4	145.9	711.5	576.9	134.65	5.284					
10,400.0	7,146.0	10,324.9	7,149.3	71.1	69.0	90.27	-3,530.4	144.3	711.5	573.1	138.38	5.142					
10,500.0	7,146.0	10,424.9	7,149.4	73.0	70.9	90.28	-3,630.4	142.7	711.4	569.3	142.11	5.006					
10,600.0	7,146.0	10,524.9	7,149.6	74.8	72.8	90.29	-3,730.4	141.1	711.4	565.5	145.85	4.878					
10,700.0	7,146.0	10,624.9	7,149.7	76.6	74.6	90.30	-3,830.4	139.5	711.3	561.7	149.59	4.755					
10,800.0	7,146.0	10,724.9	7,149.8	78.4	76.5	90.31	-3,930.4	137.9	711.3	557.9	153.33	4.639					
10,900.0	7,146.0	10,824.9	7,149.9	80.3	78.4	90.32	-4,030.4	136.3	711.2	554.1	157.08	4.528					
11,000.0	7,146.0	10,924.9	7,150.1	82.1	80.3	90.33	-4,130.3	134.7	711.2	550.3	160.84	4.422					
11,100.0	7,146.0	11,024.9	7,150.2	84.0	82.1	90.34	-4,230.3	133.1	711.1	546.5	164.59	4.321					
11,200.0	7,146.0	11,124.9	7,150.3	85.8	84.0	90.35	-4,330.3	131.4	711.1	542.7	168.35	4.224					
11,300.0	7,146.0	11,224.9	7,150.4	87.7	85.9	90.36	-4,430.3	129.8	711.0	538.9	172.12	4.131					
11,400.0	7,146.0	11,324.9	7,150.6	89.5	87.8	90.37	-4,530.3	128.2	711.0	535.1	175.88	4.042					
11,500.0	7,146.0	11,424.9	7,150.7	91.4	89.7	90.38	-4,630.3	126.6	710.9	531.3	179.65	3.957					
11,600.0	7,146.0	11,524.9	7,150.8	93.2	91.6	90.39	-4,730.3	125.0	710.9	527.5	183.42	3.876					
11,700.0	7,146.0	11,624.9	7,150.9	95.1	93.4	90.40	-4,830.3	123.4	710.8	523.6	187.20	3.797					
11,732.7	7,146.0	11,657.6	7,151.0	95.7	94.1	90.40	-4,863.0	122.9	710.8	522.4	188.43	3.772 SF					

Sorin Natural Resources 2R-HZ Pad Sec.2-T4N-R66W - Sorin Natural Resources 2U-203 - Wellbore #1													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance							
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
0.0	0.0	0.0	0.0	0.0	0.0	90.02	0.0	27.9	27.9					
100.0	100.0	100.0	100.0	0.1	0.1	90.02	0.0	27.9	27.9	27.6	0.22	124.011		
200.0	200.0	200.0	200.0	0.3	0.3	90.02	0.0	27.9	27.9	27.2	0.67	41.337 CC, ES		
300.0	300.0	299.0	299.0	0.6	0.6	90.10	-0.1	29.6	29.6	28.5	1.11	26.637		
400.0	400.0	397.8	397.6	0.8	0.8	90.31	-0.2	34.7	34.8	33.2	1.56	22.359		
500.0	500.0	496.2	495.7	1.0	1.0	-1.38	-0.4	43.2	41.6	39.7	1.99	20.959		
600.0	599.8	594.4	593.2	1.2	1.3	-1.28	-0.7	55.0	48.5	46.0	2.42	20.050		
700.0	699.5	692.4	690.0	1.4	1.6	-1.22	-1.1	70.1	55.2	52.3	2.86	19.304		
800.0	798.7	790.2	786.0	1.7	2.0	-1.20	-1.6	88.4	61.9	58.6	3.32	18.663		
900.0	897.5	889.4	883.0	2.0	2.4	-1.21	-2.2	109.5	67.6	63.8	3.79	17.848		
1,000.0	995.9	989.4	980.6	2.4	2.9	-1.25	-2.7	130.9	71.4	67.1	4.28	16.682		
1,100.0	1,094.3	1,089.3	1,078.2	2.7	3.3	-1.30	-3.3	152.3	75.2	70.4	4.78	15.723		
1,200.0	1,192.7	1,189.2	1,175.9	3.1	3.8	-1.33	-3.9	173.6	79.0	73.7	5.29	14.930		
1,300.0	1,291.2	1,289.2	1,273.5	3.5	4.2	-1.37	-4.4	195.0	82.7	76.9	5.80	14.271		
1,400.0	1,389.6	1,389.1	1,371.1	3.9	4.7	-1.40	-5.0	216.4	86.5	80.2	6.31	13.705		
1,500.0	1,488.0	1,489.0	1,468.7	4.3	5.2	-1.42	-5.6	237.7	90.3	83.5	6.83	13.222		
1,600.0	1,586.4	1,588.9	1,566.3	4.7	5.6	-1.45	-6.1	259.1	94.1	86.7	7.35	12.803		
1,700.0	1,684.9	1,688.9	1,663.9	5.1	6.1	-1.47	-6.7	280.5	97.9	90.0	7.87	12.438		
1,800.0	1,783.3	1,788.8	1,761.5	5.5	6.5	-1.49	-7.3	301.9	101.6	93.3	8.39	12.116		
1,900.0	1,881.7	1,888.7	1,859.2	5.9	7.0	-1.52	-7.8	323.2	105.4	96.5	8.91	11.830		
2,000.0	1,980.1	1,988.7	1,956.8	6.3	7.5	-1.53	-8.4	344.6	109.2	99.8	9.43	11.575		
2,100.0	2,078.6	2,088.6	2,054.4	6.7	8.0	-1.55	-9.0	366.0	113.0	103.0	9.96	11.346		
2,200.0	2,177.0	2,188.5	2,152.0	7.1	8.4	-1.57	-9.5	387.3	116.8	106.3	10.48	11.139		
2,300.0	2,275.4	2,288.4	2,249.6	7.5	8.9	-1.58	-10.1	408.7	120.5	109.5	11.01	10.951		
2,400.0	2,373.8	2,388.4	2,347.2	7.9	9.4	-1.60	-10.6	430.1	124.3	112.8	11.53	10.780		
2,500.0	2,472.2	2,488.3	2,444.8	8.3	9.8	-1.61	-11.2	451.4	128.1	116.1	12.06	10.624		
2,600.0	2,570.7	2,588.2	2,542.5	8.7	10.3	-1.63	-11.8	472.8	131.9	119.3	12.59	10.480		
2,700.0	2,669.1	2,688.2	2,640.1	9.1	10.8	-1.64	-12.3	494.2	135.7	122.6	13.11	10.348		
2,800.0	2,767.5	2,788.1	2,737.7	9.5	11.2	-1.65	-12.9	515.6	139.5	125.8	13.64	10.225		
2,900.0	2,865.9	2,888.0	2,835.3	9.9	11.7	-1.66	-13.5	536.9	143.2	129.1	14.17	10.112		
3,000.0	2,964.4	2,987.9	2,932.9	10.3	12.2	-1.67	-14.0	558.3	147.0	132.3	14.69	10.006		
3,100.0	3,062.8	3,087.9	3,030.5	10.7	12.7	-1.68	-14.6	579.7	150.8	135.6	15.22	9.908		
3,200.0	3,161.2	3,187.8	3,128.2	11.1	13.1	-1.69	-15.2	601.0	154.6	138.8	15.75	9.816		
3,300.0	3,259.6	3,287.7	3,225.8	11.5	13.6	-1.70	-15.7	622.4	158.4	142.1	16.28	9.730		
3,400.0	3,358.1	3,387.7	3,323.4	11.9	14.1	-1.71	-16.3	643.8	162.1	145.3	16.80	9.650		
3,500.0	3,456.5	3,487.6	3,421.0	12.3	14.5	-1.71	-16.9	665.1	165.9	148.6	17.33	9.574		
3,600.0	3,554.9	3,587.5	3,518.6	12.7	15.0	-1.72	-17.4	686.5	169.7	151.8	17.86	9.502		
3,700.0	3,653.3	3,687.4	3,616.2	13.1	15.5	-1.73	-18.0	707.9	173.5	155.1	18.39	9.435		
3,800.0	3,751.8	3,787.4	3,713.8	13.5	15.9	-1.74	-18.6	729.3	177.3	158.4	18.92	9.371		
3,900.0	3,850.2	3,887.3	3,811.5	13.9	16.4	-1.74	-19.1	750.6	181.0	161.6	19.44	9.311		
4,000.0	3,948.6	3,987.2	3,909.1	14.4	16.9	-1.75	-19.7	772.0	184.8	164.9	19.97	9.254		
4,100.0	4,047.0	4,087.2	4,006.7	14.8	17.4	-1.76	-20.3	793.4	188.6	168.1	20.50	9.200		
4,200.0	4,145.4	4,187.1	4,104.3	15.2	17.8	-1.76	-20.8	814.7	192.4	171.4	21.03	9.148		
4,300.0	4,243.9	4,287.0	4,201.9	15.6	18.3	-1.77	-21.4	836.1	196.2	174.6	21.56	9.099		
4,400.0	4,342.3	4,386.9	4,299.5	16.0	18.8	-1.77	-22.0	857.5	200.0	177.9	22.09	9.053		
4,500.0	4,440.7	4,486.9	4,397.1	16.4	19.2	-1.78	-22.5	878.8	203.7	181.1	22.62	9.008		
4,600.0	4,539.1	4,586.8	4,494.8	16.8	19.7	-1.78	-23.1	900.2	207.5	184.4	23.15	8.966		
4,700.0	4,637.6	4,686.7	4,592.4	17.2	20.2	-1.79	-23.7	921.6	211.3	187.6	23.67	8.925		
4,800.0	4,736.0	4,786.7	4,690.0	17.6	20.7	-1.79	-24.2	943.0	215.1	190.9	24.20	8.886		
4,900.0	4,834.4	4,886.6	4,787.6	18.0	21.1	-1.80	-24.8	964.3	218.9	194.1	24.73	8.849		
5,000.0	4,932.8	4,986.5	4,885.2	18.4	21.6	-1.80	-25.3	985.7	222.6	197.4	25.26	8.814		

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Sorin Natural Resources 2U-443
<b>Project:</b>	SEC.2-T4N-R66W	<b>TVD Reference:</b>	WELL @ 4686.0ft (RKB - 15')
<b>Reference Site:</b>	Sorin Natural Resources 2R-HZ Pad Sec.2-T4N-R66W	<b>MD Reference:</b>	WELL @ 4686.0ft (RKB - 15')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Sorin Natural Resources 2U-443	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #1 (01-28-13)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design		Sorin Natural Resources 2R-HZ Pad Sec.2-T4N-R66W - Sorin Natural Resources 2U-203 - Wellbore #1										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			
5,100.0	5,031.3	5,086.4	4,982.8	18.8	22.1	-1.81	-25.9	1,007.1	226.4	200.6	25.79	8.779			
5,200.0	5,129.7	5,186.4	5,080.5	19.2	22.5	-1.81	-26.5	1,028.4	230.2	203.9	26.32	8.746			
5,300.0	5,228.1	5,286.3	5,178.1	19.6	23.0	-1.82	-27.0	1,049.8	234.0	207.1	26.85	8.715			
5,400.0	5,326.5	5,386.2	5,275.7	20.0	23.5	-1.82	-27.6	1,071.2	237.8	210.4	27.38	8.685			
5,500.0	5,425.0	5,486.2	5,373.3	20.4	24.0	-1.82	-28.2	1,092.5	241.5	213.6	27.91	8.655			
5,600.0	5,523.4	5,594.1	5,479.0	20.8	24.4	-1.84	-28.7	1,114.1	244.1	215.7	28.42	8.589			
5,700.0	5,622.3	5,703.4	5,586.9	21.1	24.7	-1.85	-29.2	1,131.9	245.5	216.7	28.82	8.519			
5,800.0	5,721.6	5,812.8	5,695.4	21.3	25.0	-1.86	-29.6	1,145.6	246.6	217.4	29.16	8.456			
5,900.0	5,821.3	5,922.2	5,804.4	21.5	25.2	-1.87	-29.8	1,155.2	247.3	217.9	29.45	8.399			
6,000.0	5,921.2	6,031.7	5,913.7	21.7	25.3	-1.88	-30.0	1,160.6	247.8	218.1	29.68	8.348			
6,100.0	6,021.2	6,139.1	6,021.2	21.8	25.5	90.00	-30.0	1,161.9	247.9	217.9	29.95	8.276			
6,200.0	6,121.2	6,239.1	6,121.2	21.9	25.6	90.00	-30.0	1,161.9	247.9	217.6	30.30	8.181			
6,300.0	6,221.2	6,339.2	6,221.3	22.1	25.7	90.05	-30.2	1,161.9	247.9	217.2	30.64	8.089			
6,359.1	6,280.3	6,398.4	6,280.3	22.2	25.7	90.91	-34.0	1,161.8	247.8	217.0	30.81	8.043			
6,400.0	6,321.2	6,438.8	6,320.4	22.2	25.8	92.11	-39.1	1,161.7	247.9	217.0	30.92	8.018			
6,500.0	6,421.1	6,534.9	6,414.1	22.3	25.9	-84.34	-59.8	1,161.4	249.1	217.8	31.31	7.956			
6,600.0	6,520.2	6,628.3	6,502.1	22.5	26.0	-79.66	-91.1	1,160.9	252.2	220.2	31.96	7.890			
6,700.0	6,616.8	6,719.5	6,583.7	22.6	26.1	-75.30	-131.7	1,160.2	256.6	224.0	32.64	7.863			
6,800.0	6,709.2	6,808.8	6,658.3	22.8	26.3	-71.34	-180.7	1,159.5	262.2	229.0	33.17	7.904			
6,900.0	6,795.8	6,896.5	6,725.5	23.0	26.5	-67.82	-236.9	1,158.6	268.3	234.9	33.47	8.017			
7,000.0	6,875.2	6,982.8	6,785.0	23.2	26.7	-64.76	-299.4	1,157.6	274.7	241.2	33.59	8.180			
7,100.0	6,945.9	7,067.8	6,836.3	23.5	27.0	-62.17	-367.1	1,156.5	281.0	247.4	33.64	8.352			
7,200.0	7,006.9	7,150.0	6,878.5	23.9	27.4	-60.08	-437.6	1,155.4	286.8	252.9	33.85	8.473			
7,300.0	7,057.0	7,235.2	6,914.0	24.4	27.8	-58.35	-515.0	1,154.1	291.8	257.3	34.46	8.468			
7,400.0	7,095.3	7,317.9	6,939.9	25.0	28.3	-57.08	-593.5	1,152.9	295.8	260.2	35.67	8.294			
7,500.0	7,121.3	7,400.0	6,957.2	25.8	28.9	-56.22	-673.7	1,151.6	298.7	261.1	37.61	7.943			
7,600.0	7,135.1	7,482.1	6,965.7	26.7	29.6	-55.71	-755.3	1,150.3	300.7	260.7	39.95	7.527			
7,700.0	7,144.2	7,572.4	6,966.5	27.7	30.4	-54.47	-845.6	1,148.8	305.4	263.3	42.09	7.255			
7,800.0	7,146.0	7,672.4	6,966.1	28.8	31.3	-54.09	-945.5	1,147.2	306.7	261.8	44.88	6.833			
7,900.0	7,146.0	7,772.4	6,965.7	30.0	32.4	-54.04	-1,045.5	1,145.7	307.0	259.7	47.28	6.492			
8,000.0	7,146.0	7,872.4	6,965.3	31.2	33.6	-53.99	-1,145.5	1,144.1	307.2	257.5	49.77	6.173			
8,100.0	7,146.0	7,972.4	6,964.9	32.6	34.8	-53.94	-1,245.5	1,142.5	307.5	255.2	52.33	5.876			
8,200.0	7,146.0	8,072.4	6,964.6	34.0	36.1	-53.89	-1,345.5	1,140.9	307.8	252.8	54.96	5.601			
8,300.0	7,146.0	8,172.4	6,964.2	35.4	37.5	-53.84	-1,445.5	1,139.3	308.1	250.4	57.64	5.345			
8,400.0	7,146.0	8,272.4	6,963.8	36.9	38.9	-53.79	-1,545.4	1,137.7	308.3	248.0	60.37	5.108			
8,500.0	7,146.0	8,372.4	6,963.4	38.4	40.3	-53.73	-1,645.4	1,136.1	308.6	245.5	63.14	4.888			
8,600.0	7,146.0	8,472.4	6,963.0	40.0	41.8	-53.68	-1,745.4	1,134.5	308.9	243.0	65.94	4.685			
8,700.0	7,146.0	8,572.4	6,962.6	41.6	43.3	-53.63	-1,845.4	1,132.9	309.2	240.4	68.77	4.496			
8,800.0	7,146.0	8,672.4	6,962.2	43.2	44.9	-53.58	-1,945.4	1,131.3	309.5	237.8	71.64	4.320			
8,900.0	7,146.0	8,772.4	6,961.9	44.8	46.4	-53.53	-2,045.4	1,129.7	309.7	235.2	74.52	4.157			
9,000.0	7,146.0	8,872.4	6,961.5	46.5	48.0	-53.48	-2,145.4	1,128.1	310.0	232.6	77.42	4.004			
9,100.0	7,146.0	8,972.4	6,961.1	48.2	49.7	-53.43	-2,245.3	1,126.5	310.3	230.0	80.34	3.862			
9,200.0	7,146.0	9,072.4	6,960.7	49.9	51.3	-53.38	-2,345.3	1,124.9	310.6	227.3	83.28	3.729			
9,300.0	7,146.0	9,172.3	6,960.3	51.6	53.0	-53.33	-2,445.3	1,123.3	310.9	224.6	86.23	3.605			
9,400.0	7,146.0	9,272.3	6,959.9	53.3	54.7	-53.28	-2,545.3	1,121.7	311.1	222.0	89.19	3.489			
9,500.0	7,146.0	9,372.3	6,959.6	55.1	56.4	-53.23	-2,645.3	1,120.1	311.4	219.3	92.16	3.379			
9,600.0	7,146.0	9,472.3	6,959.2	56.8	58.1	-53.18	-2,745.3	1,118.5	311.7	216.6	95.14	3.276			
9,700.0	7,146.0	9,572.3	6,958.8	58.6	59.8	-53.13	-2,845.3	1,116.9	312.0	213.9	98.12	3.179			
9,800.0	7,146.0	9,672.3	6,958.4	60.4	61.6	-53.08	-2,945.2	1,115.3	312.3	211.1	101.12	3.088			
9,900.0	7,146.0	9,772.3	6,958.0	62.1	63.3	-53.03	-3,045.2	1,113.7	312.5	208.4	104.12	3.002			

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

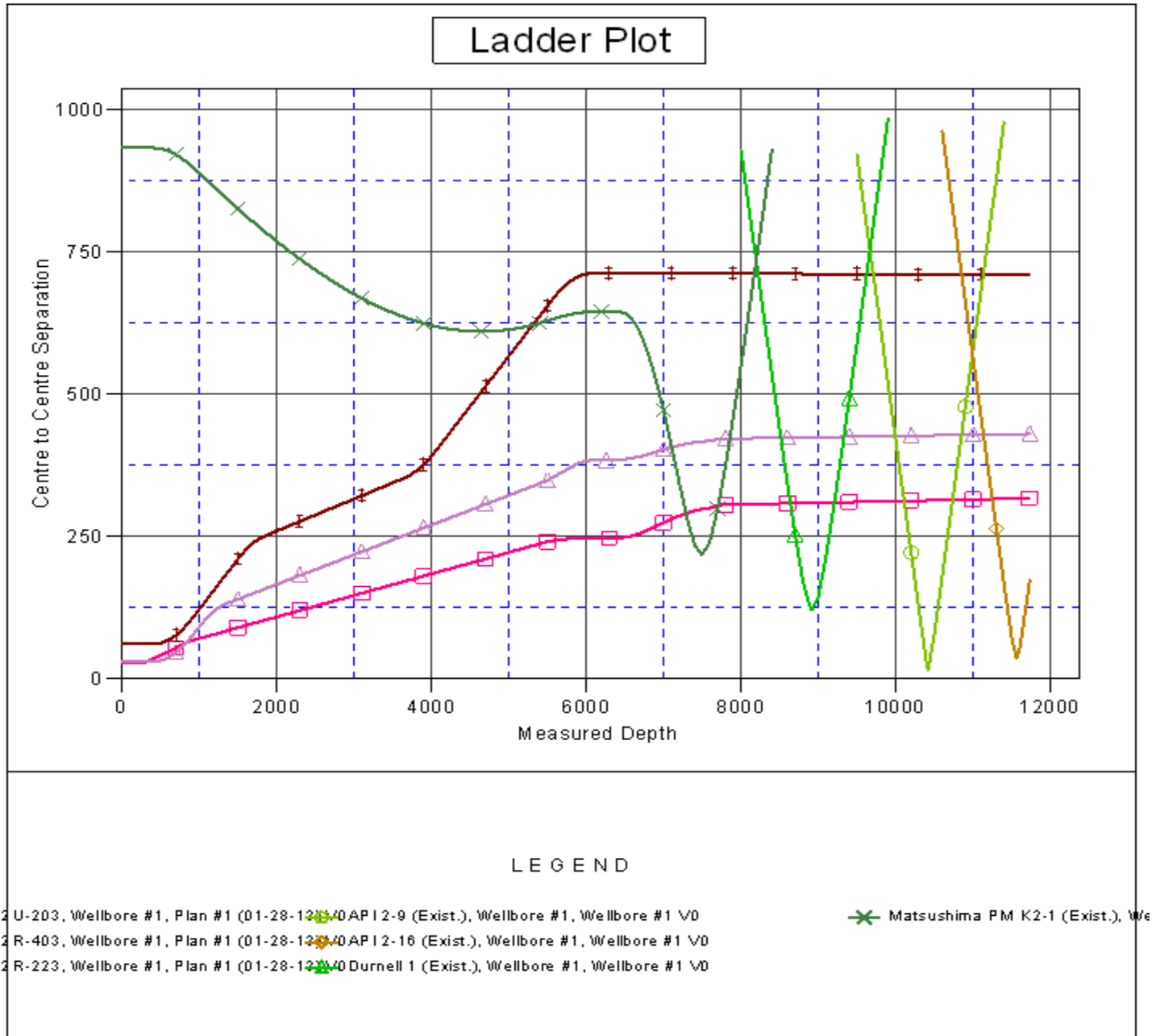
<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Sorin Natural Resources 2U-443
<b>Project:</b>	SEC.2-T4N-R66W	<b>TVD Reference:</b>	WELL @ 4686.0ft (RKB - 15')
<b>Reference Site:</b>	Sorin Natural Resources 2R-HZ Pad Sec.2-T4N-R66W	<b>MD Reference:</b>	WELL @ 4686.0ft (RKB - 15')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Sorin Natural Resources 2U-443	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #1 (01-28-13)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design Sorin Natural Resources 2R-HZ Pad Sec.2-T4N-R66W - Sorin Natural Resources 2U-203 - Wellbore #1														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	7,146.0	9,872.3	6,957.6	63.9	65.1	-52.98	-3,145.2	1,112.1	312.8	205.7	107.12	2.920		
10,100.0	7,146.0	9,972.3	6,957.3	65.7	66.8	-52.93	-3,245.2	1,110.5	313.1	203.0	110.13	2.843		
10,200.0	7,146.0	10,072.3	6,956.9	67.5	68.6	-52.88	-3,345.2	1,108.9	313.4	200.3	113.15	2.770		
10,300.0	7,146.0	10,172.3	6,956.5	69.3	70.4	-52.84	-3,445.2	1,107.3	313.7	197.5	116.16	2.700		
10,400.0	7,146.0	10,272.3	6,956.1	71.1	72.2	-52.79	-3,545.2	1,105.7	314.0	194.8	119.18	2.634		
10,500.0	7,146.0	10,372.3	6,955.7	73.0	74.0	-52.74	-3,645.1	1,104.1	314.2	192.0	122.20	2.572		
10,600.0	7,146.0	10,472.3	6,955.3	74.8	75.8	-52.69	-3,745.1	1,102.5	314.5	189.3	125.22	2.512		
10,700.0	7,146.0	10,572.3	6,955.0	76.6	77.6	-52.64	-3,845.1	1,100.9	314.8	186.6	128.25	2.455		
10,800.0	7,146.0	10,672.3	6,954.6	78.4	79.4	-52.59	-3,945.1	1,099.3	315.1	183.8	131.28	2.400		
10,900.0	7,146.0	10,772.3	6,954.2	80.3	81.2	-52.54	-4,045.1	1,097.7	315.4	181.1	134.30	2.348		
11,000.0	7,146.0	10,872.3	6,953.8	82.1	83.0	-52.49	-4,145.1	1,096.1	315.7	178.3	137.33	2.299		
11,100.0	7,146.0	10,972.3	6,953.4	84.0	84.8	-52.45	-4,245.1	1,094.5	315.9	175.6	140.36	2.251		
11,200.0	7,146.0	11,072.3	6,953.0	85.8	86.7	-52.40	-4,345.0	1,092.9	316.2	172.8	143.39	2.205		
11,300.0	7,146.0	11,172.3	6,952.6	87.7	88.5	-52.35	-4,445.0	1,091.3	316.5	170.1	146.41	2.162		
11,400.0	7,146.0	11,272.3	6,952.3	89.5	90.3	-52.30	-4,545.0	1,089.7	316.8	167.4	149.44	2.120		
11,500.0	7,146.0	11,372.3	6,951.9	91.4	92.2	-52.25	-4,645.0	1,088.1	317.1	164.6	152.47	2.080		
11,600.0	7,146.0	11,472.3	6,951.5	93.2	94.0	-52.20	-4,745.0	1,086.6	317.4	161.9	155.50	2.041		
11,700.0	7,146.0	11,572.3	6,951.1	95.1	95.9	-52.16	-4,845.0	1,085.0	317.7	159.1	158.52	2.004		
11,732.7	7,146.0	11,601.8	6,951.0	95.7	96.4	-52.14	-4,874.4	1,084.5	317.8	158.3	159.46	1.993 SF		

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Sorin Natural Resources 2U-443
<b>Project:</b>	SEC.2-T4N-R66W	<b>TVD Reference:</b>	WELL @ 4686.0ft (RKB - 15')
<b>Reference Site:</b>	Sorin Natural Resources 2R-HZ Pad Sec.2-T4N-R66W	<b>MD Reference:</b>	WELL @ 4686.0ft (RKB - 15')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Sorin Natural Resources 2U-443	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #1 (01-28-13)	<b>Offset TVD Reference:</b>	Offset Datum

Reference Depths are relative to WELL @ 4686.0ft (RKB - 15')  
Offset Depths are relative to Offset Datum  
Central Meridian is -105.500000 °

Coordinates are relative to: Sorin Natural Resources 2U-443  
Coordinate System is US State Plane 1983, Colorado Northern Zone  
Grid Convergence at Surface is: 0.49°



Reference Depths are relative to WELL @ 4686.0ft (RKB - 15')  
Offset Depths are relative to Offset Datum  
Central Meridian is -105.500000 °

Coordinates are relative to: Sorin Natural Resources 2U-443  
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