

PETROLEUM DEVELOPMENT CORP Weld County CO

Well Name: **Sunmarke 28V-434**

Surface Location: Sunmarke 28V-HZ Pad Sec.28-T4N-R67W
North American Datum 1983 , US State Plane 1983 , Colorado Northern Zone

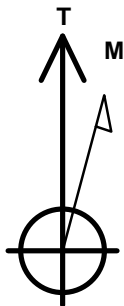
Ground Elevation: 4906.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1347928.18	3171018.83	40.286840	-104.886970	

RKB - 15' WELL @ 4921.0ft (RKB - 15')

WELLBORE TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Shape
SHL 1500'FNL, 211'FEL		0.0	0.0	Point
BHL 1645'FNL, 500'FWL	7272.0	-65.1	-4614.5	Point



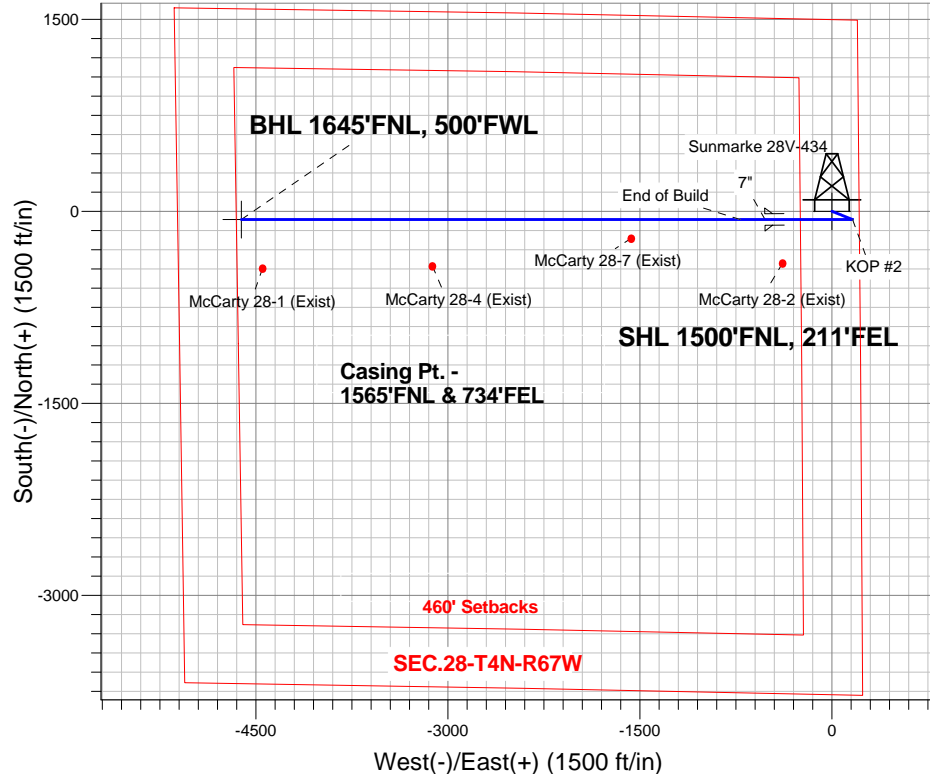
Azimuths to True North
Magnetic North: 8.59°

Magnetic Field
Strength: 52801.7snT
Dip Angle: 66.86°
Date: 11/21/2013
Model: IGRF2010

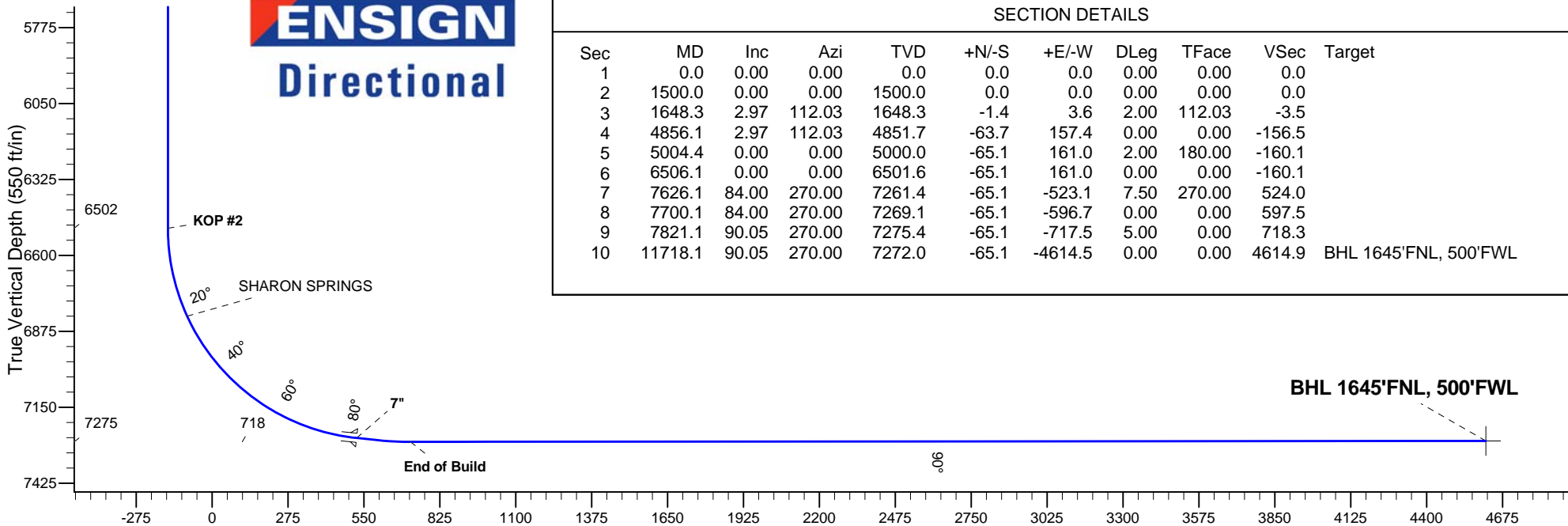
ANNOTATIONS

TVD	MD	Annotation
1500.0	1500.0	KOP #1
6501.7	6506.1	KOP #2
7275.4	7821.1	End of Build

Sunmarke 28V-HZ Pad Sec.28-T4N-R67W
Sunmarke 28V-434
Plan #1 (11-18-13)
10:21, November 21 2013



ENSIGN
Directional



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	1500.0	0.00	0.00	1500.0	0.0	0.0	0.00	0.00	0.0	
3	1648.3	2.97	112.03	1648.3	-1.4	3.6	2.00	112.03	-3.5	
4	4856.1	2.97	112.03	4851.7	-63.7	157.4	0.00	0.00	-156.5	
5	5004.4	0.00	0.00	5000.0	-65.1	161.0	2.00	180.00	-160.1	
6	6506.1	0.00	0.00	6501.6	-65.1	161.0	0.00	0.00	-160.1	
7	7626.1	84.00	270.00	7261.4	-65.1	-523.1	7.50	270.00	524.0	
8	7700.1	84.00	270.00	7269.1	-65.1	-596.7	0.00	0.00	597.5	
9	7821.1	90.05	270.00	7275.4	-65.1	-717.5	5.00	0.00	718.3	
10	11718.1	90.05	270.00	7272.0	-65.1	-4614.5	0.00	0.00	4614.9	BHL 1645'FNL, 500'FWL

Vertical Section at 269.19° (550 ft/in)



Directional

PETROLEUM DEVELOPMENT CORP Weld County CO

SEC.28-T4N-R67W

Sunmarke 28V-HZ Pad Sec.28-T4N-R67W

Sunmarke 28V-434

Wellbore #1

Plan: Plan #1 (11-18-13)

Standard Planning Report

21 November, 2013

Database:	Landmark	Local Co-ordinate Reference:	Well Sunmarke 28V-434
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	TVD Reference:	WELL @ 4921.0ft (RKB - 15')
Project:	SEC.28-T4N-R67W	MD Reference:	WELL @ 4921.0ft (RKB - 15')
Site:	Sunmarke 28V-HZ Pad Sec.28-T4N-R67W	North Reference:	True
Well:	Sunmarke 28V-434	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (11-18-13)		

Project	SEC.28-T4N-R67W, Weld County, Colorado		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		Using Well Reference Point
Map Zone:	Colorado Northern Zone		Using geodetic scale factor

Site						Sunmarke 28V-HZ Pad Sec.28-T4N-R67W											
Site Position:						Northing:			1,347,957.33ft			Latitude:			40.286920		
From:			Lat/Long			Easting:			3,171,018.63ft			Longitude:			-104.886970		
Position Uncertainty:			0.0 ft			Slot Radius:			"			Grid Convergence:			0.40 °		

Well	Sunmarke 28V-434					
Well Position	+N-S	-29.2 ft	Northing:	1,347,928.18 ft	Latitude:	40.286840
	+E-W	0.0 ft	Easting:	3,171,018.83 ft	Longitude:	-104.886970
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,906.0 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	11/21/2013	8.59	66.86	52,802

Design	Plan #1 (11-18-13)			
Audit Notes:				
Version:	Phase:	PROTOTYPE	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.0	0.0	0.0	269.19

Plan Sections										
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	
1,500.0	0.00	0.00	1,500.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,648.3	2.97	112.03	1,648.3	-1.4	3.6	2.00	2.00	0.00	112.03	
4,856.1	2.97	112.03	4,851.7	-63.7	157.4	0.00	0.00	0.00	0.00	
5,004.4	0.00	0.00	5,000.0	-65.1	161.0	2.00	-2.00	0.00	180.00	
6,506.1	0.00	0.00	6,501.6	-65.1	161.0	0.00	0.00	0.00	0.00	
7,626.1	84.00	270.00	7,261.4	-65.1	-523.1	7.50	7.50	0.00	270.00	
7,700.1	84.00	270.00	7,269.1	-65.1	-596.7	0.00	0.00	0.00	0.00	
7,821.1	90.05	270.00	7,275.4	-65.1	-717.5	5.00	5.00	0.00	0.00	
11,718.1	90.05	270.00	7,272.0	-65.1	-4,614.5	0.00	0.00	0.00	0.00	BHL 1645'FNL, 500

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Site:	Sunmarke 28V-HZ Pad Sec.28-T4N-R67W	North Reference:	True
Well:	Sunmarke 28V-434	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (11-18-13)		

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
1.0	0.00	0.00	1.0	0.0	0.0	0.0	0.00	0.00	0.00
SHL 1500'FNL, 211'FEL									
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	0.00
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	0.00
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	0.00
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	0.00
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	0.00
700.0	0.00	0.00	700.0	0.0	0.0	0.0	0.00	0.00	0.00
800.0	0.00	0.00	800.0	0.0	0.0	0.0	0.00	0.00	0.00
900.0	0.00	0.00	900.0	0.0	0.0	0.0	0.00	0.00	0.00
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.0	0.00	0.00	0.00
1,100.0	0.00	0.00	1,100.0	0.0	0.0	0.0	0.00	0.00	0.00
1,200.0	0.00	0.00	1,200.0	0.0	0.0	0.0	0.00	0.00	0.00
1,300.0	0.00	0.00	1,300.0	0.0	0.0	0.0	0.00	0.00	0.00
1,400.0	0.00	0.00	1,400.0	0.0	0.0	0.0	0.00	0.00	0.00
1,500.0	0.00	0.00	1,500.0	0.0	0.0	0.0	0.00	0.00	0.00
KOP #1									
1,600.0	2.00	112.03	1,600.0	-0.7	1.6	-1.6	2.00	2.00	0.00
1,648.3	2.97	112.03	1,648.3	-1.4	3.6	-3.5	2.00	2.00	0.00
1,700.0	2.97	112.03	1,699.9	-2.4	6.0	-6.0	0.00	0.00	0.00
1,800.0	2.97	112.03	1,799.7	-4.4	10.8	-10.8	0.00	0.00	0.00
1,900.0	2.97	112.03	1,899.6	-6.3	15.6	-15.5	0.00	0.00	0.00
2,000.0	2.97	112.03	1,999.5	-8.3	20.4	-20.3	0.00	0.00	0.00
2,100.0	2.97	112.03	2,099.3	-10.2	25.2	-25.1	0.00	0.00	0.00
2,200.0	2.97	112.03	2,199.2	-12.1	30.0	-29.8	0.00	0.00	0.00
2,300.0	2.97	112.03	2,299.1	-14.1	34.8	-34.6	0.00	0.00	0.00
2,400.0	2.97	112.03	2,398.9	-16.0	39.6	-39.4	0.00	0.00	0.00
2,500.0	2.97	112.03	2,498.8	-18.0	44.4	-44.2	0.00	0.00	0.00
2,600.0	2.97	112.03	2,598.7	-19.9	49.2	-48.9	0.00	0.00	0.00
2,700.0	2.97	112.03	2,698.5	-21.9	54.0	-53.7	0.00	0.00	0.00
2,800.0	2.97	112.03	2,798.4	-23.8	58.8	-58.5	0.00	0.00	0.00
2,900.0	2.97	112.03	2,898.3	-25.7	63.6	-63.2	0.00	0.00	0.00
3,000.0	2.97	112.03	2,998.1	-27.7	68.4	-68.0	0.00	0.00	0.00
3,100.0	2.97	112.03	3,098.0	-29.6	73.2	-72.8	0.00	0.00	0.00
3,200.0	2.97	112.03	3,197.9	-31.6	78.0	-77.5	0.00	0.00	0.00
3,300.0	2.97	112.03	3,297.7	-33.5	82.8	-82.3	0.00	0.00	0.00
3,400.0	2.97	112.03	3,397.6	-35.4	87.6	-87.1	0.00	0.00	0.00
3,500.0	2.97	112.03	3,497.5	-37.4	92.4	-91.8	0.00	0.00	0.00
3,600.0	2.97	112.03	3,597.3	-39.3	97.2	-96.6	0.00	0.00	0.00
3,642.7	2.97	112.03	3,640.0	-40.1	99.2	-98.7	0.00	0.00	0.00
PARKMAN									
3,700.0	2.97	112.03	3,697.2	-41.3	102.0	-101.4	0.00	0.00	0.00
3,800.0	2.97	112.03	3,797.1	-43.2	106.8	-106.2	0.00	0.00	0.00
3,900.0	2.97	112.03	3,896.9	-45.1	111.6	-110.9	0.00	0.00	0.00
4,000.0	2.97	112.03	3,996.8	-47.1	116.4	-115.7	0.00	0.00	0.00
4,100.0	2.97	112.03	4,096.6	-49.0	121.2	-120.5	0.00	0.00	0.00
4,153.4	2.97	112.03	4,150.0	-50.1	123.7	-123.0	0.00	0.00	0.00
SUSSEX									
4,200.0	2.97	112.03	4,196.5	-51.0	126.0	-125.2	0.00	0.00	0.00
4,300.0	2.97	112.03	4,296.4	-52.9	130.8	-130.0	0.00	0.00	0.00
4,400.0	2.97	112.03	4,396.2	-54.8	135.6	-134.8	0.00	0.00	0.00

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Site:	Sunmarke 28V-HZ Pad Sec.28-T4N-R67W	North Reference:	True
Well:	Sunmarke 28V-434	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (11-18-13)		

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)
4,500.0	2.97	112.03	4,496.1	-56.8	140.4	-139.5	0.00	0.00	0.00
4,600.0	2.97	112.03	4,596.0	-58.7	145.2	-144.3	0.00	0.00	0.00
4,667.1	2.97	112.03	4,663.0	-60.0	148.4	-147.5	0.00	0.00	0.00
SHANNON									
4,700.0	2.97	112.03	4,695.8	-60.7	150.0	-149.1	0.00	0.00	0.00
4,800.0	2.97	112.03	4,795.7	-62.6	154.7	-153.9	0.00	0.00	0.00
4,856.1	2.97	112.03	4,851.7	-63.7	157.4	-156.5	0.00	0.00	0.00
4,900.0	2.09	112.03	4,895.6	-64.4	159.2	-158.3	2.00	-2.00	0.00
5,000.0	0.09	112.03	4,995.6	-65.1	161.0	-160.1	2.00	-2.00	0.00
5,004.4	0.00	0.00	5,000.0	-65.1	161.0	-160.1	2.00	-2.00	0.00
5,100.0	0.00	0.00	5,095.6	-65.1	161.0	-160.1	0.00	0.00	0.00
5,200.0	0.00	0.00	5,195.6	-65.1	161.0	-160.1	0.00	0.00	0.00
5,300.0	0.00	0.00	5,295.6	-65.1	161.0	-160.1	0.00	0.00	0.00
5,400.0	0.00	0.00	5,395.6	-65.1	161.0	-160.1	0.00	0.00	0.00
5,500.0	0.00	0.00	5,495.6	-65.1	161.0	-160.1	0.00	0.00	0.00
5,600.0	0.00	0.00	5,595.6	-65.1	161.0	-160.1	0.00	0.00	0.00
5,700.0	0.00	0.00	5,695.6	-65.1	161.0	-160.1	0.00	0.00	0.00
5,800.0	0.00	0.00	5,795.6	-65.1	161.0	-160.1	0.00	0.00	0.00
5,900.0	0.00	0.00	5,895.6	-65.1	161.0	-160.1	0.00	0.00	0.00
6,000.0	0.00	0.00	5,995.6	-65.1	161.0	-160.1	0.00	0.00	0.00
6,100.0	0.00	0.00	6,095.6	-65.1	161.0	-160.1	0.00	0.00	0.00
6,200.0	0.00	0.00	6,195.6	-65.1	161.0	-160.1	0.00	0.00	0.00
6,300.0	0.00	0.00	6,295.6	-65.1	161.0	-160.1	0.00	0.00	0.00
6,400.0	0.00	0.00	6,395.6	-65.1	161.0	-160.1	0.00	0.00	0.00
6,500.0	0.00	0.00	6,495.6	-65.1	161.0	-160.1	0.00	0.00	0.00
6,506.1	0.00	0.00	6,501.7	-65.1	161.0	-160.1	0.00	0.00	0.00
KOP #2									
6,600.0	7.05	270.00	6,595.3	-65.1	155.2	-154.3	7.50	7.50	0.00
6,700.0	14.55	270.00	6,693.5	-65.1	136.5	-135.6	7.50	7.50	0.00
6,800.0	22.05	270.00	6,788.4	-65.1	105.1	-104.2	7.50	7.50	0.00
6,834.5	24.63	270.00	6,820.0	-65.1	91.5	-90.6	7.50	7.50	0.00
SHARON SPRINGS									
6,900.0	29.55	270.00	6,878.3	-65.1	61.7	-60.7	7.50	7.50	0.00
7,000.0	37.05	270.00	6,961.9	-65.1	6.8	-5.9	7.50	7.50	0.00
7,100.0	44.55	270.00	7,037.5	-65.1	-58.5	59.4	7.50	7.50	0.00
7,200.0	52.05	270.00	7,104.0	-65.1	-133.1	134.0	7.50	7.50	0.00
7,300.0	59.55	270.00	7,160.2	-65.1	-215.7	216.6	7.50	7.50	0.00
7,400.0	67.05	270.00	7,205.1	-65.1	-305.0	305.9	7.50	7.50	0.00
7,500.0	74.55	270.00	7,238.0	-65.1	-399.4	400.3	7.50	7.50	0.00
7,600.0	82.05	270.00	7,258.2	-65.1	-497.2	498.1	7.50	7.50	0.00
7,626.1	84.00	270.00	7,261.4	-65.1	-523.1	524.0	7.49	7.49	0.00
7"									
7,700.0	84.00	270.00	7,269.1	-65.1	-596.6	597.5	0.00	0.00	0.00
7,700.1	84.00	270.00	7,269.1	-65.1	-596.7	597.5	0.00	0.00	0.00
7,800.0	89.00	270.00	7,275.2	-65.1	-696.4	697.3	5.00	5.00	0.00
7,821.1	90.05	270.00	7,275.4	-65.1	-717.5	718.4	4.99	4.99	0.00
End of Build									
7,900.0	90.05	270.00	7,275.3	-65.1	-796.4	797.2	0.00	0.00	0.00
8,000.0	90.05	270.00	7,275.2	-65.1	-896.4	897.2	0.00	0.00	0.00
8,100.0	90.05	270.00	7,275.2	-65.1	-996.4	997.2	0.00	0.00	0.00
8,200.0	90.05	270.00	7,275.1	-65.1	-1,096.4	1,097.2	0.00	0.00	0.00
8,300.0	90.05	270.00	7,275.0	-65.1	-1,196.4	1,197.2	0.00	0.00	0.00

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Wellbore:	Wellbore #1		
Design:	Plan #1 (11-18-13)		

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)
8,400.0	90.05	270.00	7,274.9	-65.1	-1,296.4	1,297.2	0.00	0.00	0.00
8,500.0	90.05	270.00	7,274.8	-65.1	-1,396.4	1,397.2	0.00	0.00	0.00
8,600.0	90.05	270.00	7,274.7	-65.1	-1,496.4	1,497.2	0.00	0.00	0.00
8,700.0	90.05	270.00	7,274.6	-65.1	-1,596.4	1,597.2	0.00	0.00	0.00
8,800.0	90.05	270.00	7,274.5	-65.1	-1,696.4	1,697.2	0.00	0.00	0.00
8,900.0	90.05	270.00	7,274.5	-65.1	-1,796.4	1,797.1	0.00	0.00	0.00
9,000.0	90.05	270.00	7,274.4	-65.1	-1,896.4	1,897.1	0.00	0.00	0.00
9,100.0	90.05	270.00	7,274.3	-65.1	-1,996.4	1,997.1	0.00	0.00	0.00
9,200.0	90.05	270.00	7,274.2	-65.1	-2,096.4	2,097.1	0.00	0.00	0.00
9,300.0	90.05	270.00	7,274.1	-65.1	-2,196.4	2,197.1	0.00	0.00	0.00
9,400.0	90.05	270.00	7,274.0	-65.1	-2,296.4	2,297.1	0.00	0.00	0.00
9,500.0	90.05	270.00	7,273.9	-65.1	-2,396.4	2,397.1	0.00	0.00	0.00
9,600.0	90.05	270.00	7,273.8	-65.1	-2,496.4	2,497.1	0.00	0.00	0.00
9,700.0	90.05	270.00	7,273.8	-65.1	-2,596.4	2,597.1	0.00	0.00	0.00
9,800.0	90.05	270.00	7,273.7	-65.1	-2,696.4	2,697.1	0.00	0.00	0.00
9,900.0	90.05	270.00	7,273.6	-65.1	-2,796.4	2,797.0	0.00	0.00	0.00
10,000.0	90.05	270.00	7,273.5	-65.1	-2,896.4	2,897.0	0.00	0.00	0.00
10,100.0	90.05	270.00	7,273.4	-65.1	-2,996.4	2,997.0	0.00	0.00	0.00
10,200.0	90.05	270.00	7,273.3	-65.1	-3,096.4	3,097.0	0.00	0.00	0.00
10,300.0	90.05	270.00	7,273.2	-65.1	-3,196.4	3,197.0	0.00	0.00	0.00
10,400.0	90.05	270.00	7,273.2	-65.1	-3,296.4	3,297.0	0.00	0.00	0.00
10,500.0	90.05	270.00	7,273.1	-65.1	-3,396.4	3,397.0	0.00	0.00	0.00
10,600.0	90.05	270.00	7,273.0	-65.1	-3,496.4	3,497.0	0.00	0.00	0.00
10,700.0	90.05	270.00	7,272.9	-65.1	-3,596.4	3,597.0	0.00	0.00	0.00
10,800.0	90.05	270.00	7,272.8	-65.1	-3,696.4	3,697.0	0.00	0.00	0.00
10,900.0	90.05	270.00	7,272.7	-65.1	-3,796.4	3,796.9	0.00	0.00	0.00
11,000.0	90.05	270.00	7,272.6	-65.1	-3,896.4	3,896.9	0.00	0.00	0.00
11,100.0	90.05	270.00	7,272.5	-65.1	-3,996.4	3,996.9	0.00	0.00	0.00
11,200.0	90.05	270.00	7,272.5	-65.1	-4,096.4	4,096.9	0.00	0.00	0.00
11,300.0	90.05	270.00	7,272.4	-65.1	-4,196.4	4,196.9	0.00	0.00	0.00
11,400.0	90.05	270.00	7,272.3	-65.1	-4,296.4	4,296.9	0.00	0.00	0.00
11,500.0	90.05	270.00	7,272.2	-65.1	-4,396.4	4,396.9	0.00	0.00	0.00
11,600.0	90.05	270.00	7,272.1	-65.1	-4,496.4	4,496.9	0.00	0.00	0.00
11,700.0	90.05	270.00	7,272.0	-65.1	-4,596.4	4,596.9	0.00	0.00	0.00
11,718.1	90.05	270.00	7,272.0	-65.1	-4,614.5	4,614.9	0.00	0.00	0.00
BHL 1645'FNL, 500'FWL									

Targets

Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
- hit/miss target									
- Shape									
SHL 1500'FNL, 211'FI	0.00	0.00	1.0	0.0	0.0	1,347,928.19	3,171,018.83	40.286840	-104.886970
- plan hits target center									
- Point									
BHL 1645'FNL, 500'FI	0.00	0.00	7,272.0	-65.1	-4,614.5	1,347,831.15	3,166,405.13	40.286660	-104.903510
- plan hits target center									
- Point									

Database:	Landmark	Local Co-ordinate Reference:	Well Sunmarke 28V-434
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	TVD Reference:	WELL @ 4921.0ft (RKB - 15')
Project:	SEC.28-T4N-R67W	MD Reference:	WELL @ 4921.0ft (RKB - 15')
Site:	Sunmarke 28V-HZ Pad Sec.28-T4N-R67W	North Reference:	True
Well:	Sunmarke 28V-434	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (11-18-13)		

Casing Points

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
7,626.1	7,261.4	7"	7	7-1/2

Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
3,642.7	3,640.0	PARKMAN			
4,153.4	4,150.0	SUSSEX			
4,667.1	4,663.0	SHANNON			
6,834.5	6,820.0	SHARON SPRINGS			

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
1,500.0	1,500.0	0.0	0.0	KOP #1
6,506.1	6,501.7	-65.1	161.0	KOP #2
7,821.1	7,275.4	-65.1	-717.5	End of Build



Directional

PETROLEUM DEVELOPMENT CORP Weld County CO

SEC.28-T4N-R67W

Sunmarke 28V-HZ Pad Sec.28-T4N-R67W

Sunmarke 28V-434

Wellbore #1

Plan #1 (11-18-13)

Anticollision Report

21 November, 2013



Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Sunmarke 28V-434
Project:	SEC.28-T4N-R67W	TVD Reference:	WELL @ 4921.0ft (RKB - 15')
Reference Site:	Sunmarke 28V-HZ Pad Sec.28-T4N-R67W	MD Reference:	WELL @ 4921.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Sunmarke 28V-434	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (11-18-13)	Offset TVD Reference:	Offset Datum

Reference	Plan #1 (11-18-13)		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	Stations	Error Model:	ISCWSA
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 1,000.0ft	Error Surface:	Elliptical Conic
Warning Levels Evaluated at:	2.00 Sigma		

Survey Tool Program	Date	11/21/2013		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
0.0	11,717.5	Plan #1 (11-18-13) (Wellbore #1)	MWD	MWD - Standard

Summary						
Site Name	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
Existing wells - Sec.28-T4N-R67W						
McCarty 28-1 (Exist) - Wellbore #1 - Wellbore #1	11,550.7	7,339.1	378.9	106.3	1.390	Level 3, CC, ES, SF
McCarty 28-2 (Exist) - Wellbore #1 - Wellbore #1	7,485.1	7,229.8	339.2	175.3	2.070	CC
McCarty 28-2 (Exist) - Wellbore #1 - Wellbore #1	7,500.0	7,234.0	339.5	175.3	2.068	ES, SF
McCarty 28-4 (Exist) - Wellbore #1 - Wellbore #1	10,225.5	7,322.3	360.9	125.3	1.532	CC, ES, SF
McCarty 28-7 (Exist) - Wellbore #1 - Wellbore #1	8,671.5	7,279.7	146.1	-46.4	0.759	Level 1, CC, ES, SF
Sunmarke 28V-HZ Pad Sec.28-T4N-R67W						
Sunmarke 28V-234 - Wellbore #1 - Plan #1 (11-18-13)	966.3	967.3	32.8	28.7	7.955	CC
Sunmarke 28V-234 - Wellbore #1 - Plan #1 (11-18-13)	1,000.0	1,001.0	32.8	28.5	7.674	ES
Sunmarke 28V-234 - Wellbore #1 - Plan #1 (11-18-13)	11,718.1	11,513.7	339.8	133.7	1.649	SF
Sunmarke 28V-304 - Wellbore #1 - Plan #1 (11-18-13)	1,500.0	1,500.0	29.1	22.6	4.471	CC, ES
Sunmarke 28V-304 - Wellbore #1 - Plan #1 (11-18-13)	11,718.1	11,615.7	303.4	71.9	1.310	Level 3, SF
Sunmarke 28W-414 - Wellbore #1 - Plan #1 (11-18-13)	566.0	568.0	61.9	59.6	26.649	CC
Sunmarke 28W-414 - Wellbore #1 - Plan #1 (11-18-13)	600.0	602.0	61.9	59.5	25.010	ES
Sunmarke 28W-414 - Wellbore #1 - Plan #1 (11-18-13)	11,718.1	11,741.3	546.6	286.0	2.097	SF

Offset Design											
Existing wells - Sec.28-T4N-R67W - McCarty 28-1 (Exist) - Wellbore #1 - Wellbore #1											
Survey Program: 7600-UNKNOWN											
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)
10,700.0	7,272.9	7,339.9	7,339.9	102.2	146.8	-90.11	-444.1	-4,447.1	931.3	682.3	249.03
10,800.0	7,272.8	7,339.8	7,339.8	105.0	146.8	-90.10	-444.1	-4,447.1	840.9	589.1	251.81
10,900.0	7,272.7	7,339.7	7,339.7	107.8	146.8	-90.09	-444.1	-4,447.1	753.0	498.4	254.58
11,000.0	7,272.6	7,339.6	7,339.6	110.6	146.8	-90.07	-444.1	-4,447.1	668.5	411.1	257.35
11,100.0	7,272.5	7,339.5	7,339.5	113.3	146.8	-90.06	-444.1	-4,447.1	588.9	328.7	260.13
11,200.0	7,272.5	7,339.5	7,339.5	116.1	146.8	-90.05	-444.1	-4,447.1	516.3	253.4	262.90
11,300.0	7,272.4	7,339.4	7,339.4	118.9	146.8	-90.03	-444.1	-4,447.1	454.4	188.7	265.68
11,400.0	7,272.3	7,339.3	7,339.3	121.7	146.8	-90.02	-444.1	-4,447.1	407.8	139.3	268.46
11,500.0	7,272.2	7,339.2	7,339.2	124.5	146.8	-90.01	-444.1	-4,447.1	382.3	111.1	271.24
11,550.7	7,272.1	7,339.1	7,339.1	125.9	146.8	-90.00	-444.1	-4,447.1	378.9	106.3	272.65
11,600.0	7,272.1	7,339.1	7,339.1	127.2	146.8	-89.99	-444.1	-4,447.1	382.1	108.1	274.02
11,700.0	7,272.0	7,339.0	7,339.0	130.0	146.8	-89.98	-444.1	-4,447.1	407.3	130.4	276.80

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

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Sunmarke 28V-434
Project:	SEC.28-T4N-R67W	TVD Reference:	WELL @ 4921.0ft (RKB - 15')
Reference Site:	Sunmarke 28V-HZ Pad Sec.28-T4N-R67W	MD Reference:	WELL @ 4921.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Sunmarke 28V-434	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (11-18-13)	Offset TVD Reference:	Offset Datum

Offset Design Existing wells - Sec.28-T4N-R67W - McCarty 28-1 (Exist) - Wellbore #1 - Wellbore #1													Offset Site Error:	0.0 ft
Survey Program: 7600-UNKNOWN													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis		Distance								
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
11,718.1	7,272.0	7,339.0	7,339.0	130.4	146.8	-89.98	-444.1	-4,447.1	414.2	137.1	277.13	1.495	Level 3	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Sunmarke 28V-434
Project:	SEC.28-T4N-R67W	TVD Reference:	WELL @ 4921.0ft (RKB - 15')
Reference Site:	Sunmarke 28V-HZ Pad Sec.28-T4N-R67W	MD Reference:	WELL @ 4921.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Sunmarke 28V-434	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (11-18-13)	Offset TVD Reference:	Offset Datum

Offset Design		Existing wells - Sec.28-T4N-R67W - McCarty 28-2 (Exist) - Wellbore #1 - Wellbore #1											Offset Site Error:	0.0 ft
Survey Program: 7600-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)			
0.0	0.0	0.0	0.0	0.0	0.0	-136.41	-404.4	-385.0	558.4					
100.0	100.0	96.0	96.0	0.1	1.9	-136.41	-404.4	-385.0	558.3	556.3	2.03	274.699		
200.0	200.0	196.0	196.0	0.3	3.9	-136.41	-404.4	-385.0	558.3	554.1	4.26	131.149		
300.0	300.0	296.0	296.0	0.6	5.9	-136.41	-404.4	-385.0	558.3	551.9	6.48	86.137		
400.0	400.0	396.0	396.0	0.8	7.9	-136.41	-404.4	-385.0	558.3	549.6	8.71	64.127		
500.0	500.0	496.0	496.0	1.0	9.9	-136.41	-404.4	-385.0	558.3	547.4	10.93	51.076		
600.0	600.0	596.0	596.0	1.2	11.9	-136.41	-404.4	-385.0	558.3	545.2	13.16	42.439		
700.0	700.0	696.0	696.0	1.5	13.9	-136.41	-404.4	-385.0	558.3	543.0	15.38	36.301		
800.0	800.0	796.0	796.0	1.7	15.9	-136.41	-404.4	-385.0	558.3	540.7	17.61	31.714		
900.0	900.0	896.0	896.0	1.9	17.9	-136.41	-404.4	-385.0	558.3	538.5	19.83	28.156		
1,000.0	1,000.0	996.0	996.0	2.1	19.9	-136.41	-404.4	-385.0	558.3	536.3	22.06	25.316		
1,100.0	1,100.0	1,096.0	1,096.0	2.4	21.9	-136.41	-404.4	-385.0	558.3	534.1	24.28	22.996		
1,200.0	1,200.0	1,196.0	1,196.0	2.6	23.9	-136.41	-404.4	-385.0	558.3	531.8	26.50	21.066		
1,300.0	1,300.0	1,296.0	1,296.0	2.8	25.9	-136.41	-404.4	-385.0	558.3	529.6	28.73	19.434		
1,400.0	1,400.0	1,396.0	1,396.0	3.0	27.9	-136.41	-404.4	-385.0	558.3	527.4	30.95	18.038		
1,500.0	1,500.0	1,496.0	1,496.0	3.3	29.9	-136.41	-404.4	-385.0	558.3	525.2	33.18	16.828		
1,600.0	1,600.0	1,596.0	1,596.0	3.5	31.9	111.72	-404.4	-385.0	559.0	523.6	35.38	15.799		
1,648.3	1,648.3	1,644.3	1,644.3	3.6	32.9	111.91	-404.4	-385.0	559.8	523.3	36.44	15.363		
1,700.0	1,699.9	1,695.9	1,695.9	3.7	33.9	112.16	-404.4	-385.0	560.8	523.2	37.57	14.927		
1,800.0	1,799.7	1,795.7	1,795.7	3.9	35.9	112.65	-404.4	-385.0	562.7	523.0	39.76	14.153		
1,900.0	1,899.6	1,895.6	1,895.6	4.1	37.9	113.13	-404.4	-385.0	564.8	522.8	41.96	13.459		
2,000.0	1,999.5	1,995.5	1,995.5	4.3	39.9	113.61	-404.4	-385.0	566.8	522.7	44.16	12.834		
2,100.0	2,099.3	2,095.3	2,095.3	4.5	41.9	114.09	-404.4	-385.0	568.9	522.5	46.37	12.269		
2,200.0	2,199.2	2,195.2	2,195.2	4.7	43.9	114.56	-404.4	-385.0	571.0	522.5	48.58	11.754		
2,300.0	2,299.1	2,295.1	2,295.1	4.9	45.9	115.03	-404.4	-385.0	573.2	522.4	50.79	11.285		
2,400.0	2,398.9	2,394.9	2,394.9	5.1	47.9	115.50	-404.4	-385.0	575.4	522.4	53.01	10.855		
2,500.0	2,498.8	2,494.8	2,494.8	5.4	49.9	115.96	-404.4	-385.0	577.7	522.5	55.23	10.460		
2,600.0	2,598.7	2,594.7	2,594.7	5.6	51.9	116.42	-404.4	-385.0	580.0	522.5	57.45	10.096		
2,700.0	2,698.5	2,694.5	2,694.5	5.8	53.9	116.88	-404.4	-385.0	582.3	522.6	59.67	9.759		
2,800.0	2,798.4	2,794.4	2,794.4	6.0	55.9	117.33	-404.4	-385.0	584.7	522.8	61.89	9.447		
2,900.0	2,898.3	2,894.3	2,894.3	6.3	57.9	117.78	-404.4	-385.0	587.0	522.9	64.11	9.157		
3,000.0	2,998.1	2,994.1	2,994.1	6.5	59.9	118.22	-404.4	-385.0	589.5	523.1	66.33	8.887		
3,100.0	3,098.0	3,094.0	3,094.0	6.7	61.9	118.66	-404.4	-385.0	591.9	523.4	68.56	8.634		
3,200.0	3,197.9	3,193.9	3,193.9	7.0	63.9	119.10	-404.4	-385.0	594.4	523.7	70.78	8.398		
3,300.0	3,297.7	3,293.7	3,293.7	7.2	65.9	119.53	-404.4	-385.0	597.0	524.0	73.01	8.177		
3,400.0	3,397.6	3,393.6	3,393.6	7.4	67.9	119.96	-404.4	-385.0	599.6	524.3	75.24	7.969		
3,500.0	3,497.5	3,493.5	3,493.5	7.7	69.9	120.39	-404.4	-385.0	602.2	524.7	77.46	7.774		
3,600.0	3,597.3	3,593.3	3,593.3	7.9	71.9	120.81	-404.4	-385.0	604.8	525.1	79.69	7.589		
3,700.0	3,697.2	3,693.2	3,693.2	8.1	73.9	121.23	-404.4	-385.0	607.5	525.5	81.92	7.416		
3,800.0	3,797.1	3,793.1	3,793.1	8.4	75.9	121.64	-404.4	-385.0	610.2	526.0	84.15	7.251		
3,900.0	3,896.9	3,892.9	3,892.9	8.6	77.9	122.06	-404.4	-385.0	612.9	526.5	86.37	7.096		
4,000.0	3,996.8	3,992.8	3,992.8	8.9	79.9	122.46	-404.4	-385.0	615.7	527.1	88.60	6.949		
4,100.0	4,096.6	4,092.6	4,092.6	9.1	81.9	122.87	-404.4	-385.0	618.5	527.6	90.83	6.809		
4,200.0	4,196.5	4,192.5	4,192.5	9.3	83.9	123.27	-404.4	-385.0	621.3	528.2	93.06	6.676		
4,300.0	4,296.4	4,292.4	4,292.4	9.6	85.8	123.67	-404.4	-385.0	624.1	528.9	95.29	6.550		
4,400.0	4,396.2	4,392.2	4,392.2	9.8	87.8	124.06	-404.4	-385.0	627.0	529.5	97.52	6.430		
4,500.0	4,496.1	4,492.1	4,492.1	10.0	89.8	124.45	-404.4	-385.0	629.9	530.2	99.75	6.315		
4,600.0	4,596.0	4,592.0	4,592.0	10.3	91.8	124.83	-404.4	-385.0	632.9	530.9	101.98	6.206		
4,700.0	4,695.8	4,691.8	4,691.8	10.5	93.8	125.22	-404.4	-385.0	635.9	531.7	104.20	6.102		
4,800.0	4,795.7	4,791.7	4,791.7	10.8	95.8	125.60	-404.4	-385.0	638.9	532.4	106.43	6.002		
4,856.1	4,851.7	4,847.7	4,847.7	10.9	97.0	125.81	-404.4	-385.0	640.6	532.9	107.68	5.948		

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

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Sunmarke 28V-434
Project:	SEC.28-T4N-R67W	TVD Reference:	WELL @ 4921.0ft (RKB - 15')
Reference Site:	Sunmarke 28V-HZ Pad Sec.28-T4N-R67W	MD Reference:	WELL @ 4921.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Sunmarke 28V-434	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (11-18-13)	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:	0.0 ft
Survey Program: 7600-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	
4,900.0	4,895.6	4,891.6	4,891.6	11.0	97.8	125.96	-404.4	-385.0	641.7	533.0	108.68	5.905		
5,004.4	5,000.0	4,996.0	4,996.0	11.2	99.9	-121.85	-404.4	-385.0	642.8	532.0	110.79	5.802		
5,100.0	5,095.6	5,091.6	5,091.6	11.4	101.8	-121.85	-404.4	-385.0	642.8	529.9	112.89	5.694		
5,200.0	5,195.6	5,191.6	5,191.6	11.6	103.8	-121.85	-404.4	-385.0	642.8	527.7	115.09	5.585		
5,300.0	5,295.6	5,291.6	5,291.6	11.8	105.8	-121.85	-404.4	-385.0	642.8	525.5	117.30	5.480		
5,400.0	5,395.6	5,391.6	5,391.6	12.0	107.8	-121.85	-404.4	-385.0	642.8	523.3	119.50	5.379		
5,500.0	5,495.6	5,491.6	5,491.6	12.2	109.8	-121.85	-404.4	-385.0	642.8	521.1	121.71	5.282		
5,600.0	5,595.6	5,591.6	5,591.6	12.4	111.8	-121.85	-404.4	-385.0	642.8	518.9	123.91	5.188		
5,700.0	5,695.6	5,691.6	5,691.6	12.6	113.8	-121.85	-404.4	-385.0	642.8	516.7	126.12	5.097		
5,800.0	5,795.6	5,791.6	5,791.6	12.8	115.8	-121.85	-404.4	-385.0	642.8	514.5	128.33	5.009		
5,900.0	5,895.6	5,891.6	5,891.6	13.0	117.8	-121.85	-404.4	-385.0	642.8	512.3	130.53	4.924		
6,000.0	5,995.6	5,991.6	5,991.6	13.2	119.8	-121.85	-404.4	-385.0	642.8	510.1	132.74	4.843		
6,100.0	6,095.6	6,091.6	6,091.6	13.4	121.8	-121.85	-404.4	-385.0	642.8	507.9	134.95	4.763		
6,200.0	6,195.6	6,191.6	6,191.6	13.6	123.8	-121.85	-404.4	-385.0	642.8	505.7	137.16	4.687		
6,300.0	6,295.6	6,291.6	6,291.6	13.8	125.8	-121.85	-404.4	-385.0	642.8	503.4	139.37	4.612		
6,400.0	6,395.6	6,391.6	6,391.6	14.0	127.8	-121.85	-404.4	-385.0	642.8	501.2	141.58	4.540		
6,506.1	6,501.6	6,497.6	6,497.6	14.2	130.0	-121.85	-404.4	-385.0	642.8	498.9	143.93	4.466		
6,550.0	6,545.5	6,541.5	6,541.5	14.3	130.8	-31.96	-404.4	-385.0	641.7	496.9	144.86	4.430		
6,600.0	6,595.3	6,591.3	6,591.3	14.4	131.8	-32.32	-404.4	-385.0	637.9	492.6	145.33	4.389		
6,650.0	6,644.7	6,640.7	6,640.7	14.5	132.8	-32.97	-404.4	-385.0	631.4	486.0	145.38	4.343		
6,700.0	6,693.5	6,689.5	6,689.5	14.5	133.8	-33.90	-404.4	-385.0	622.1	477.1	145.03	4.290		
6,750.0	6,741.4	6,737.4	6,737.4	14.6	134.7	-35.15	-404.4	-385.0	610.4	466.0	144.36	4.228		
6,800.0	6,788.4	6,784.4	6,784.4	14.7	135.7	-36.75	-404.4	-385.0	596.1	452.6	143.47	4.155		
6,850.0	6,834.1	6,830.1	6,830.1	14.7	136.6	-38.72	-404.4	-385.0	579.5	437.1	142.48	4.067		
6,900.0	6,878.3	6,874.3	6,874.3	14.8	137.5	-41.12	-404.4	-385.0	560.9	419.3	141.59	3.961		
6,950.0	6,921.0	6,917.0	6,917.0	14.9	138.3	-43.98	-404.4	-385.0	540.4	399.3	141.02	3.832		
7,000.0	6,961.9	6,957.9	6,957.9	15.0	139.2	-47.33	-404.4	-385.0	518.3	377.3	141.01	3.675		
7,050.0	7,000.8	6,996.8	6,996.8	15.2	139.9	-51.19	-404.4	-385.0	495.0	353.2	141.79	3.491		
7,100.0	7,037.5	7,033.5	7,033.5	15.4	140.7	-55.55	-404.4	-385.0	470.9	327.3	143.50	3.281		
7,150.0	7,072.0	7,068.0	7,068.0	15.6	141.4	-60.35	-404.4	-385.0	446.5	300.4	146.13	3.056		
7,200.0	7,104.0	7,100.0	7,100.0	16.0	142.0	-65.45	-404.4	-385.0	422.5	273.1	149.43	2.828		
7,250.0	7,133.4	7,129.4	7,129.4	16.4	142.6	-70.68	-404.4	-385.0	399.8	246.8	153.02	2.612		
7,300.0	7,160.2	7,156.2	7,156.2	16.9	143.1	-75.81	-404.4	-385.0	379.1	222.7	156.44	2.423		
7,350.0	7,184.1	7,180.1	7,180.1	17.4	143.6	-80.57	-404.4	-385.0	361.7	202.3	159.32	2.270		
7,400.0	7,205.1	7,201.1	7,201.1	18.1	144.0	-84.75	-404.4	-385.0	348.5	187.0	161.51	2.158		
7,450.0	7,223.1	7,219.1	7,219.1	18.8	144.4	-88.15	-404.4	-385.0	340.9	177.8	163.07	2.090		
7,485.1	7,233.8	7,229.8	7,229.8	19.3	144.6	-90.00	-404.4	-385.0	339.2	175.3	163.91	2.070 CC		
7,500.0	7,238.0	7,234.0	7,234.0	19.6	144.7	-90.65	-404.4	-385.0	339.5	175.3	164.22	2.068 ES, SF		
7,550.0	7,249.7	7,245.7	7,245.7	20.4	144.9	-92.16	-404.4	-385.0	345.0	179.8	165.20	2.089		
7,600.0	7,258.2	7,254.2	7,254.2	21.3	145.1	-92.62	-404.4	-385.0	357.3	191.1	166.23	2.150		
7,626.1	7,261.4	7,257.4	7,257.4	21.8	145.1	-92.44	-404.4	-385.0	366.3	199.5	166.80	2.196		
7,700.1	7,269.1	7,265.1	7,265.1	23.3	145.3	-93.73	-404.4	-385.0	399.9	231.6	168.23	2.377		
7,800.0	7,275.2	7,271.2	7,271.2	25.4	145.4	-90.92	-404.4	-385.0	460.5	289.7	170.78	2.696		
7,821.1	7,275.4	7,271.4	7,271.4	25.8	145.4	-89.95	-404.4	-385.0	475.0	303.7	171.27	2.773		
7,900.0	7,275.3	7,271.3	7,271.3	27.6	145.4	-89.94	-404.4	-385.0	533.2	360.2	173.03	3.082		
8,000.0	7,275.2	7,271.2	7,271.2	29.9	145.4	-89.92	-404.4	-385.0	613.7	438.3	175.35	3.500		
8,100.0	7,275.2	7,271.2	7,271.2	32.3	145.4	-89.91	-404.4	-385.0	699.2	521.5	177.74	3.934		
8,200.0	7,275.1	7,271.1	7,271.1	34.8	145.4	-89.90	-404.4	-385.0	788.1	607.9	180.20	4.374		
8,300.0	7,275.0	7,271.0	7,271.0	37.3	145.4	-89.88	-404.4	-385.0	879.5	696.8	182.70	4.814		
8,400.0	7,274.9	7,270.9	7,270.9	39.8	145.4	-89.87	-404.4	-385.0	972.5	787.2	185.25	5.250		

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Sunmarke 28V-434
Project:	SEC.28-T4N-R67W	TVD Reference:	WELL @ 4921.0ft (RKB - 15')
Reference Site:	Sunmarke 28V-HZ Pad Sec.28-T4N-R67W	MD Reference:	WELL @ 4921.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Sunmarke 28V-434	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (11-18-13)	Offset TVD Reference:	Offset Datum

Offset Design Existing wells - Sec.28-T4N-R67W - McCarty 28-4 (Exist) - Wellbore #1 - Wellbore #1													Offset Site Error:	0.0 ft
Survey Program: 7600-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		
9,300.0	7,274.1	7,323.1	7,323.1	63.7	146.5	-90.13	-426.0	-3,121.9	993.4	783.2	210.21	4.726		
9,400.0	7,274.0	7,323.0	7,323.0	66.5	146.5	-90.11	-426.0	-3,121.9	901.0	688.0	212.92	4.231		
9,500.0	7,273.9	7,322.9	7,322.9	69.2	146.5	-90.10	-426.0	-3,121.9	810.3	594.7	215.65	3.758		
9,600.0	7,273.8	7,322.8	7,322.8	71.9	146.5	-90.09	-426.0	-3,121.9	722.2	503.8	218.38	3.307		
9,700.0	7,273.8	7,322.8	7,322.8	74.7	146.5	-90.07	-426.0	-3,121.9	637.5	416.4	221.11	2.883		
9,800.0	7,273.7	7,322.7	7,322.7	77.4	146.5	-90.06	-426.0	-3,121.9	558.0	334.1	223.85	2.493		
9,900.0	7,273.6	7,322.6	7,322.6	80.1	146.5	-90.05	-426.0	-3,121.9	486.0	259.4	226.60	2.145		
10,000.0	7,273.5	7,322.5	7,322.5	82.9	146.4	-90.03	-426.0	-3,121.9	425.6	196.2	229.35	1.856		
10,100.0	7,273.4	7,322.4	7,322.4	85.7	146.4	-90.02	-426.0	-3,121.9	382.1	150.0	232.10	1.646		
10,200.0	7,273.3	7,322.3	7,322.3	88.4	146.4	-90.00	-426.0	-3,121.9	361.8	126.9	234.86	1.541		
10,225.5	7,273.3	7,322.3	7,322.3	89.1	146.4	-90.00	-426.0	-3,121.9	360.9	125.3	235.56	1.532 CC, ES, SF		
10,300.0	7,273.2	7,322.2	7,322.2	91.2	146.4	-89.99	-426.0	-3,121.9	368.5	130.9	237.61	1.551		
10,400.0	7,273.2	7,322.2	7,322.2	93.9	146.4	-89.98	-426.0	-3,121.9	400.9	160.5	240.38	1.668		
10,500.0	7,273.1	7,322.1	7,322.1	96.7	146.4	-89.96	-426.0	-3,121.9	453.4	210.3	243.14	1.865		
10,600.0	7,273.0	7,322.0	7,322.0	99.5	146.4	-89.95	-426.0	-3,121.9	520.1	274.2	245.91	2.115		
10,700.0	7,272.9	7,321.9	7,321.9	102.2	146.4	-89.93	-426.0	-3,121.9	596.1	347.5	248.67	2.397		
10,800.0	7,272.8	7,321.8	7,321.8	105.0	146.4	-89.92	-426.0	-3,121.9	678.4	427.0	251.45	2.698		
10,900.0	7,272.7	7,321.7	7,321.7	107.8	146.4	-89.91	-426.0	-3,121.9	765.0	510.7	254.22	3.009		
11,000.0	7,272.6	7,321.6	7,321.6	110.6	146.4	-89.89	-426.0	-3,121.9	854.4	597.4	256.99	3.325		
11,100.0	7,272.5	7,321.5	7,321.5	113.3	146.4	-89.88	-426.0	-3,121.9	946.0	686.3	259.77	3.642		

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Sunmarke 28V-434
Project:	SEC.28-T4N-R67W	TVD Reference:	WELL @ 4921.0ft (RKB - 15')
Reference Site:	Sunmarke 28V-HZ Pad Sec.28-T4N-R67W	MD Reference:	WELL @ 4921.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Sunmarke 28V-434	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (11-18-13)	Offset TVD Reference:	Offset Datum

Offset Design Existing wells - Sec.28-T4N-R67W - McCarty 28-7 (Exist) - Wellbore #1 - Wellbore #1													Offset Site Error:	0.0 ft
Survey Program: 7600-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)			
7,700.1	7,269.1	7,274.1	7,274.1	23.3	145.5	-55.21	-211.2	-1,567.9	982.2	842.5	139.62	7.034		
7,800.0	7,275.2	7,280.2	7,280.2	25.4	145.6	-84.04	-211.2	-1,567.9	883.7	713.6	170.09	5.195		
7,821.1	7,275.4	7,280.4	7,280.4	25.8	145.6	-90.29	-211.2	-1,567.9	862.9	691.5	171.45	5.033		
7,900.0	7,275.3	7,280.3	7,280.3	27.6	145.6	-90.26	-211.2	-1,567.9	785.2	612.0	173.21	4.533		
8,000.0	7,275.2	7,280.2	7,280.2	29.9	145.6	-90.23	-211.2	-1,567.9	687.2	511.7	175.53	3.915		
8,100.0	7,275.2	7,280.2	7,280.2	32.3	145.6	-90.20	-211.2	-1,567.9	589.9	412.0	177.92	3.316		
8,200.0	7,275.1	7,280.1	7,280.1	34.8	145.6	-90.16	-211.2	-1,567.9	493.6	313.3	180.38	2.737		
8,300.0	7,275.0	7,280.0	7,280.0	37.3	145.6	-90.13	-211.2	-1,567.9	399.2	216.3	182.88	2.183		
8,400.0	7,274.9	7,279.9	7,279.9	39.8	145.6	-90.09	-211.2	-1,567.9	308.3	122.9	185.43	1.663		
8,500.0	7,274.8	7,279.8	7,279.8	42.4	145.6	-90.06	-211.2	-1,567.9	225.3	37.3	188.01	1.198 Level 2		
8,600.0	7,274.7	7,279.7	7,279.7	45.0	145.6	-90.02	-211.2	-1,567.9	162.7	-27.9	190.61	0.853 Level 1		
8,671.5	7,274.7	7,279.7	7,279.7	46.9	145.6	-90.00	-211.2	-1,567.9	146.1	-46.4	192.49	0.759 Level 1, CC, ES, SF		
8,700.0	7,274.6	7,279.6	7,279.6	47.7	145.6	-89.99	-211.2	-1,567.9	148.9	-44.4	193.24	0.770 Level 1		
8,800.0	7,274.5	7,279.5	7,279.5	50.3	145.6	-89.96	-211.2	-1,567.9	194.6	-1.3	195.89	0.993 Level 1		
8,900.0	7,274.5	7,279.5	7,279.5	53.0	145.6	-89.92	-211.2	-1,567.9	271.2	72.7	198.55	1.366 Level 3		
9,000.0	7,274.4	7,279.4	7,279.4	55.6	145.6	-89.89	-211.2	-1,567.9	359.5	158.3	201.23	1.787		
9,100.0	7,274.3	7,279.3	7,279.3	58.3	145.6	-89.85	-211.2	-1,567.9	452.7	248.8	203.92	2.220		
9,200.0	7,274.2	7,279.2	7,279.2	61.0	145.6	-89.82	-211.2	-1,567.9	548.3	341.7	206.62	2.654		
9,300.0	7,274.1	7,279.1	7,279.1	63.7	145.6	-89.78	-211.2	-1,567.9	645.2	435.9	209.33	3.082		
9,400.0	7,274.0	7,279.0	7,279.0	66.5	145.6	-89.75	-211.2	-1,567.9	743.0	530.9	212.04	3.504		
9,500.0	7,273.9	7,278.9	7,278.9	69.2	145.6	-89.72	-211.2	-1,567.9	841.3	626.5	214.77	3.917		
9,600.0	7,273.8	7,278.8	7,278.8	71.9	145.6	-89.68	-211.2	-1,567.9	939.9	722.4	217.49	4.322		

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Sunmarke 28V-434
Project:	SEC.28-T4N-R67W	TVD Reference:	WELL @ 4921.0ft (RKB - 15')
Reference Site:	Sunmarke 28V-HZ Pad Sec.28-T4N-R67W	MD Reference:	WELL @ 4921.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Sunmarke 28V-434	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (11-18-13)	Offset TVD Reference:	Offset Datum

Offset Design Sunmarke 28V-HZ Pad Sec.28-T4N-R67W - Sunmarke 28V-234 - Wellbore #1 - Plan #1 (11-18-13)													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	1.0	1.0	0.0	0.0	180.00	-32.8	0.0	32.8	32.8	0.00	N/A		
100.0	100.0	101.0	101.0	0.1	0.1	180.00	-32.8	0.0	32.8	32.6	0.23	144.429		
200.0	200.0	201.0	201.0	0.3	0.3	180.00	-32.8	0.0	32.8	32.1	0.68	48.463		
300.0	300.0	301.0	301.0	0.6	0.6	180.00	-32.8	0.0	32.8	31.7	1.13	29.117		
400.0	400.0	401.0	401.0	0.8	0.8	180.00	-32.8	0.0	32.8	31.2	1.58	20.809		
500.0	500.0	501.0	501.0	1.0	1.0	180.00	-32.8	0.0	32.8	30.8	2.03	16.190		
600.0	600.0	601.0	601.0	1.2	1.2	180.00	-32.8	0.0	32.8	30.3	2.47	13.249		
700.0	700.0	701.0	701.0	1.5	1.5	180.00	-32.8	0.0	32.8	29.9	2.92	11.212		
800.0	800.0	801.0	801.0	1.7	1.7	180.00	-32.8	0.0	32.8	29.4	3.37	9.718		
900.0	900.0	901.0	901.0	1.9	1.9	180.00	-32.8	0.0	32.8	29.0	3.82	8.576		
966.3	966.3	967.3	967.3	2.1	2.1	180.00	-32.8	0.0	32.8	28.7	4.12	7.955 CC		
1,000.0	1,000.0	1,001.0	1,001.0	2.1	2.1	180.00	-32.8	0.0	32.8	28.5	4.27	7.674 ES		
1,100.0	1,100.0	1,100.0	1,100.0	2.4	2.3	178.60	-34.3	0.8	34.3	29.7	4.69	7.318		
1,200.0	1,200.0	1,198.7	1,198.5	2.6	2.5	175.14	-38.8	3.3	39.0	34.0	5.10	7.664		
1,300.0	1,300.0	1,297.6	1,297.1	2.8	2.7	171.04	-46.1	7.3	46.8	41.3	5.51	8.489		
1,400.0	1,400.0	1,397.2	1,396.3	3.0	2.9	167.92	-53.9	11.5	55.3	49.4	5.95	9.297		
1,500.0	1,500.0	1,496.8	1,495.5	3.3	3.1	165.64	-61.7	15.8	63.9	57.5	6.40	9.995		
1,600.0	1,600.0	1,596.5	1,594.8	3.5	3.4	52.85	-69.5	20.1	71.6	64.8	6.76	10.585		
1,648.3	1,648.3	1,644.7	1,642.8	3.6	3.5	53.31	-73.3	22.1	74.5	67.5	6.95	10.717		
1,700.0	1,699.9	1,696.3	1,694.2	3.7	3.6	54.07	-77.3	24.3	77.4	70.2	7.16	10.809		
1,800.0	1,799.7	1,796.1	1,793.6	3.9	3.9	55.38	-85.2	28.6	83.0	75.4	7.57	10.966		
1,900.0	1,899.6	1,895.9	1,893.0	4.1	4.1	56.53	-93.0	32.9	88.7	80.7	7.99	11.100		
2,000.0	1,999.5	1,995.8	1,992.5	4.3	4.4	57.54	-100.8	37.2	94.4	86.0	8.42	11.215		
2,100.0	2,099.3	2,095.6	2,091.9	4.5	4.6	58.44	-108.6	41.4	100.1	91.3	8.85	11.314		
2,200.0	2,199.2	2,195.4	2,191.3	4.7	4.9	59.23	-116.5	45.7	105.9	96.6	9.29	11.400		
2,300.0	2,299.1	2,295.2	2,290.7	4.9	5.1	59.95	-124.3	50.0	111.6	101.9	9.73	11.474		
2,400.0	2,398.9	2,395.1	2,390.2	5.1	5.4	60.60	-132.1	54.3	117.4	107.2	10.18	11.538		
2,500.0	2,498.8	2,494.9	2,489.6	5.4	5.7	61.18	-139.9	58.5	123.2	112.6	10.63	11.594		
2,600.0	2,598.7	2,594.7	2,589.0	5.6	5.9	61.71	-147.8	62.8	129.0	117.9	11.08	11.644		
2,700.0	2,698.5	2,694.5	2,688.4	5.8	6.2	62.20	-155.6	67.1	134.8	123.3	11.54	11.687		
2,800.0	2,798.4	2,794.4	2,787.9	6.0	6.5	62.64	-163.4	71.4	140.7	128.7	12.00	11.725		
2,900.0	2,898.3	2,894.2	2,887.3	6.3	6.8	63.05	-171.2	75.7	146.5	134.0	12.46	11.759		
3,000.0	2,998.1	2,994.0	2,986.7	6.5	7.0	63.43	-179.1	79.9	152.3	139.4	12.92	11.789		
3,100.0	3,098.0	3,093.8	3,086.1	6.7	7.3	63.78	-186.9	84.2	158.2	144.8	13.39	11.815		
3,200.0	3,197.9	3,193.6	3,185.6	7.0	7.6	64.11	-194.7	88.5	164.0	150.2	13.86	11.839		
3,300.0	3,297.7	3,293.5	3,285.0	7.2	7.9	64.41	-202.5	92.8	169.9	155.6	14.32	11.861		
3,400.0	3,397.6	3,393.3	3,384.4	7.4	8.1	64.70	-210.4	97.0	175.8	161.0	14.79	11.880		
3,500.0	3,497.5	3,493.1	3,483.8	7.7	8.4	64.96	-218.2	101.3	181.6	166.4	15.27	11.897		
3,600.0	3,597.3	3,592.9	3,583.3	7.9	8.7	65.21	-226.0	105.6	187.5	171.8	15.74	11.912		
3,700.0	3,697.2	3,692.8	3,682.7	8.1	9.0	65.44	-233.8	109.9	193.4	177.2	16.21	11.927		
3,800.0	3,797.1	3,792.6	3,782.1	8.4	9.3	65.66	-241.7	114.1	199.2	182.6	16.69	11.939		
3,900.0	3,896.9	3,892.4	3,881.5	8.6	9.5	65.87	-249.5	118.4	205.1	188.0	17.16	11.951		
4,000.0	3,996.8	3,992.2	3,981.0	8.9	9.8	66.06	-257.3	122.7	211.0	193.4	17.64	11.961		
4,100.0	4,096.6	4,092.1	4,080.4	9.1	10.1	66.25	-265.1	127.0	216.9	198.8	18.12	11.971		
4,200.0	4,196.5	4,191.9	4,179.8	9.3	10.4	66.42	-273.0	131.2	222.8	204.2	18.60	11.979		
4,300.0	4,296.4	4,291.7	4,279.2	9.6	10.7	66.59	-280.8	135.5	228.7	209.6	19.08	11.987		
4,400.0	4,396.2	4,391.5	4,378.7	9.8	10.9	66.75	-288.6	139.8	234.6	215.0	19.56	11.995		
4,500.0	4,496.1	4,491.4	4,478.1	10.0	11.2	66.90	-296.4	144.1	240.4	220.4	20.04	12.001		
4,600.0	4,596.0	4,591.2	4,577.5	10.3	11.5	67.04	-304.3	148.3	246.3	225.8	20.52	12.007		
4,700.0	4,695.8	4,691.0	4,676.9	10.5	11.8	67.18	-312.1	152.6	252.2	231.2	21.00	12.013		
4,800.0	4,795.7	4,793.6	4,779.2	10.8	12.0	67.33	-320.0	156.9	258.0	236.5	21.48	12.010		

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

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Sunmarke 28V-434
Project:	SEC.28-T4N-R67W	TVD Reference:	WELL @ 4921.0ft (RKB - 15')
Reference Site:	Sunmarke 28V-HZ Pad Sec.28-T4N-R67W	MD Reference:	WELL @ 4921.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Sunmarke 28V-434	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (11-18-13)	Offset TVD Reference:	Offset Datum

Offset Design Sunmarke 28V-HZ Pad Sec.28-T4N-R67W - Sunmarke 28V-234 - Wellbore #1 - Plan #1 (11-18-13)													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	Offset	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
4,856.1	4,851.7	4,854.6	4,840.0	10.9	12.2	67.55		-323.5	158.9	260.1	238.4	21.74	11.967	
4,900.0	4,895.6	4,902.2	4,887.6	11.0	12.3	67.76		-325.5	159.9	261.2	239.3	21.93	11.914	
5,004.4	5,000.0	5,015.7	5,001.0	11.2	12.5	180.00		-327.4	161.0	262.3	239.4	22.94	11.432	
5,100.0	5,095.6	5,111.3	5,096.6	11.4	12.6	180.00		-327.4	161.0	262.3	239.0	23.31	11.255	
5,200.0	5,195.6	5,211.3	5,196.6	11.6	12.8	180.00		-327.4	161.0	262.3	238.6	23.68	11.079	
5,300.0	5,295.6	5,311.3	5,296.6	11.8	13.0	180.00		-327.4	161.0	262.3	238.3	24.05	10.908	
5,400.0	5,395.6	5,411.3	5,396.6	12.0	13.1	180.00		-327.4	161.0	262.3	237.9	24.42	10.741	
5,500.0	5,495.6	5,511.3	5,496.6	12.2	13.3	180.00		-327.4	161.0	262.3	237.5	24.80	10.577	
5,600.0	5,595.6	5,611.3	5,596.6	12.4	13.5	180.00		-327.4	161.0	262.3	237.1	25.18	10.418	
5,700.0	5,695.6	5,711.3	5,696.6	12.6	13.6	180.00		-327.4	161.0	262.3	236.7	25.56	10.262	
5,800.0	5,795.6	5,811.3	5,796.6	12.8	13.8	180.00		-327.4	161.0	262.3	236.4	25.94	10.111	
5,900.0	5,895.6	5,911.3	5,896.6	13.0	14.0	180.00		-327.4	161.0	262.3	236.0	26.33	9.963	
6,000.0	5,995.6	6,011.3	5,996.6	13.2	14.2	180.00		-327.4	161.0	262.3	235.6	26.72	9.818	
6,100.0	6,095.6	6,111.3	6,096.6	13.4	14.3	180.00		-327.4	161.0	262.3	235.2	27.11	9.677	
6,200.0	6,195.6	6,211.3	6,196.6	13.6	14.5	180.00		-327.4	161.0	262.3	234.8	27.50	9.539	
6,266.1	6,261.6	6,277.3	6,262.6	13.7	14.6	180.00		-327.4	161.0	262.3	234.5	27.76	9.450	
6,300.0	6,295.6	6,311.3	6,296.6	13.8	14.7	-180.00		-327.4	161.0	262.3	234.4	27.89	9.405	
6,325.0	6,320.6	6,336.2	6,321.6	13.9	14.7	-179.88		-327.4	160.5	262.3	234.3	27.98	9.373	
6,400.0	6,395.6	6,410.6	6,395.6	14.0	14.9	-178.49		-327.4	154.1	262.4	234.2	28.24	9.291	
6,506.1	6,501.6	6,512.3	6,495.2	14.2	15.0	-174.08		-327.4	133.8	263.8	235.3	28.55	9.242	
6,550.0	6,545.5	6,552.9	6,534.0	14.3	15.0	-81.67		-327.4	122.0	265.3	236.8	28.49	9.313	
6,600.0	6,595.3	6,600.0	6,578.2	14.4	15.1	-78.93		-327.4	105.8	267.5	238.9	28.67	9.331	
6,650.0	6,644.7	6,643.4	6,618.0	14.5	15.1	-76.46		-327.4	88.5	270.3	241.5	28.82	9.377	
6,700.0	6,693.5	6,687.7	6,657.5	14.5	15.1	-74.01		-327.4	68.4	273.5	244.5	28.95	9.446	
6,750.0	6,741.4	6,731.5	6,695.4	14.6	15.2	-71.68		-327.4	46.5	277.1	248.0	29.06	9.536	
6,800.0	6,788.4	6,774.8	6,731.5	14.7	15.2	-69.48		-327.4	22.6	281.0	251.9	29.14	9.644	
6,850.0	6,834.1	6,817.6	6,765.9	14.7	15.3	-67.41		-327.4	-2.9	285.1	255.9	29.19	9.767	
6,900.0	6,878.3	6,860.0	6,798.4	14.8	15.3	-65.47		-327.4	-30.1	289.4	260.2	29.23	9.901	
6,950.0	6,921.0	6,900.0	6,827.7	14.9	15.3	-63.74		-327.4	-57.3	293.8	264.5	29.26	10.042	
7,000.0	6,961.9	6,943.6	6,858.0	15.0	15.4	-62.01		-327.4	-88.7	298.2	268.9	29.30	10.176	
7,050.0	7,000.8	6,984.9	6,884.9	15.2	15.5	-60.48		-327.4	-119.9	302.6	273.2	29.36	10.305	
7,100.0	7,037.5	7,025.8	6,910.0	15.4	15.7	-59.08		-327.4	-152.4	306.8	277.4	29.45	10.419	
7,150.0	7,072.0	7,066.5	6,933.1	15.6	16.1	-57.82		-327.4	-185.9	310.9	281.3	29.59	10.509	
7,200.0	7,104.0	7,107.0	6,954.3	16.0	16.5	-56.67		-327.4	-220.3	314.8	285.1	29.79	10.569	
7,250.0	7,133.4	7,150.0	6,974.8	16.4	17.0	-55.59		-327.4	-258.1	318.5	288.4	30.09	10.587	
7,300.0	7,160.2	7,187.2	6,990.7	16.9	17.4	-54.74		-327.4	-291.8	321.9	291.4	30.47	10.566	
7,350.0	7,184.1	7,227.1	7,006.0	17.4	18.0	-53.95		-327.4	-328.6	325.0	294.0	30.97	10.494	
7,400.0	7,205.1	7,266.8	7,019.3	18.1	18.6	-53.27		-327.4	-366.0	327.7	296.1	31.59	10.373	
7,450.0	7,223.1	7,306.3	7,030.6	18.8	19.3	-52.69		-327.4	-403.9	330.1	297.7	32.35	10.204	
7,500.0	7,238.0	7,350.0	7,040.8	19.6	20.0	-52.19		-327.4	-446.3	332.1	298.8	33.29	9.977	
7,550.0	7,249.7	7,385.2	7,047.2	20.4	20.7	-51.86		-327.4	-480.9	333.6	299.3	34.28	9.733	
7,600.0	7,258.2	7,424.5	7,052.5	21.3	21.4	-51.60		-327.4	-519.8	334.8	299.3	35.44	9.445	
7,626.1	7,261.4	7,450.0	7,054.8	21.8	21.9	-51.49		-327.4	-545.3	335.2	299.1	36.17	9.269	
7,626.4	7,261.4	7,450.0	7,054.8	21.8	21.9	-51.49		-327.4	-545.3	335.2	299.1	36.17	9.267	
7,700.1	7,269.1	7,502.8	7,057.0	23.3	23.0	-51.04		-327.4	-598.1	338.0	300.0	37.96	8.904	
7,800.0	7,275.2	7,601.2	7,057.0	25.4	25.1	-50.12		-327.4	-696.4	341.9	301.0	40.86	8.367	
7,821.1	7,275.4	7,622.3	7,057.0	25.8	25.6	-50.09		-327.4	-717.5	342.0	300.4	41.58	8.224	
7,900.0	7,275.3	7,701.2	7,057.0	27.6	27.3	-50.10		-327.4	-796.4	341.9	297.6	44.31	7.716	
8,000.0	7,275.2	7,801.2	7,057.0	29.9	29.7	-50.11		-327.4	-896.4	341.9	293.9	47.92	7.134	
8,100.0	7,275.2	7,901.2	7,057.0	32.3	32.1	-50.12		-327.4	-996.4	341.8	290.2	51.65	6.617	
8,200.0	7,275.1	8,001.2	7,057.0	34.8	34.6	-50.13		-327.4	-1,096.4	341.8	286.3	55.49	6.159	

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

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Sunmarke 28V-434
Project:	SEC.28-T4N-R67W	TVD Reference:	WELL @ 4921.0ft (RKB - 15')
Reference Site:	Sunmarke 28V-HZ Pad Sec.28-T4N-R67W	MD Reference:	WELL @ 4921.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Sunmarke 28V-434	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (11-18-13)	Offset TVD Reference:	Offset Datum

Offset Design		Sunmarke 28V-HZ Pad Sec.28-T4N-R67W - Sunmarke 28V-234 - Wellbore #1 - Plan #1 (11-18-13)										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	Measured	Vertical	Reference	Offset	Highside	Offset Wellbore Centre		Between	Between	Minimum	Separation	Warning			
Depth	Depth	Depth	Depth			Toolface	+N/-S	+E/-W	Centres	Ellipses	Separation	Factor				
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	(ft)	(ft)	(ft)	(ft)	(ft)					
8,300.0	7,275.0	8,101.2	7,057.0	37.3	37.1	-50.14	-327.4	-1,196.4	341.7	282.3	59.40	5.752				
8,400.0	7,274.9	8,201.2	7,057.0	39.8	39.7	-50.15	-327.4	-1,296.4	341.6	278.3	63.38	5.390				
8,500.0	7,274.8	8,301.2	7,057.0	42.4	42.2	-50.17	-327.4	-1,396.4	341.6	274.2	67.42	5.067				
8,600.0	7,274.7	8,401.2	7,057.0	45.0	44.9	-50.18	-327.4	-1,496.4	341.5	270.0	71.50	4.777				
8,700.0	7,274.6	8,501.2	7,057.0	47.7	47.5	-50.19	-327.4	-1,596.4	341.5	265.9	75.62	4.516				
8,800.0	7,274.5	8,601.2	7,057.0	50.3	50.2	-50.20	-327.4	-1,696.4	341.4	261.6	79.77	4.280				
8,900.0	7,274.5	8,701.2	7,057.0	53.0	52.8	-50.21	-327.4	-1,796.4	341.4	257.4	83.95	4.066				
9,000.0	7,274.4	8,801.2	7,057.0	55.6	55.5	-50.22	-327.4	-1,896.4	341.3	253.1	88.16	3.872				
9,100.0	7,274.3	8,901.2	7,057.0	58.3	58.2	-50.23	-327.4	-1,996.4	341.2	248.9	92.38	3.694				
9,200.0	7,274.2	9,001.2	7,057.0	61.0	60.9	-50.24	-327.4	-2,096.4	341.2	244.6	96.63	3.531				
9,300.0	7,274.1	9,101.2	7,057.0	63.7	63.6	-50.26	-327.4	-2,196.4	341.1	240.2	100.89	3.381				
9,400.0	7,274.0	9,201.2	7,057.0	66.5	66.4	-50.27	-327.4	-2,296.4	341.1	235.9	105.16	3.243				
9,500.0	7,273.9	9,301.2	7,057.0	69.2	69.1	-50.28	-327.4	-2,396.4	341.0	231.6	109.45	3.116				
9,600.0	7,273.8	9,401.2	7,057.0	71.9	71.8	-50.29	-327.4	-2,496.4	341.0	227.2	113.75	2.997				
9,700.0	7,273.8	9,501.2	7,057.0	74.7	74.6	-50.30	-327.4	-2,596.4	340.9	222.8	118.07	2.887				
9,800.0	7,273.7	9,601.2	7,057.0	77.4	77.3	-50.31	-327.4	-2,696.4	340.9	218.5	122.39	2.785				
9,900.0	7,273.6	9,701.2	7,057.0	80.1	80.1	-50.32	-327.4	-2,796.4	340.8	214.1	126.72	2.689				
10,000.0	7,273.5	9,801.2	7,057.0	82.9	82.8	-50.33	-327.4	-2,896.4	340.7	209.7	131.05	2.600				
10,100.0	7,273.4	9,901.2	7,057.0	85.7	85.6	-50.35	-327.4	-2,996.4	340.7	205.3	135.40	2.516				
10,200.0	7,273.3	10,001.2	7,057.0	88.4	88.3	-50.36	-327.4	-3,096.4	340.6	200.9	139.75	2.437				
10,300.0	7,273.2	10,101.2	7,057.0	91.2	91.1	-50.37	-327.4	-3,196.4	340.6	196.5	144.11	2.363				
10,400.0	7,273.2	10,201.2	7,057.0	93.9	93.9	-50.38	-327.4	-3,296.4	340.5	192.0	148.47	2.293				
10,500.0	7,273.1	10,301.2	7,057.0	96.7	96.6	-50.39	-327.4	-3,396.4	340.5	187.6	152.84	2.228				
10,600.0	7,273.0	10,401.2	7,057.0	99.5	99.4	-50.40	-327.4	-3,496.4	340.4	183.2	157.22	2.165				
10,700.0	7,272.9	10,501.2	7,057.0	102.2	102.2	-50.41	-327.4	-3,596.4	340.4	178.8	161.60	2.106				
10,800.0	7,272.8	10,601.2	7,057.0	105.0	104.9	-50.43	-327.4	-3,696.4	340.3	174.3	165.98	2.050				
10,900.0	7,272.7	10,701.2	7,057.0	107.8	107.7	-50.44	-327.4	-3,796.4	340.2	169.9	170.37	1.997				
11,000.0	7,272.6	10,801.2	7,057.0	110.6	110.5	-50.45	-327.4	-3,896.4	340.2	165.4	174.76	1.947				
11,100.0	7,272.5	10,901.2	7,057.0	113.3	113.3	-50.46	-327.4	-3,996.4	340.1	161.0	179.16	1.899				
11,200.0	7,272.5	11,001.2	7,057.0	116.1	116.1	-50.47	-327.4	-4,096.4	340.1	156.5	183.56	1.853				
11,300.0	7,272.4	11,101.2	7,057.0	118.9	118.8	-50.48	-327.4	-4,196.4	340.0	152.1	187.96	1.809				
11,400.0	7,272.3	11,201.2	7,057.0	121.7	121.6	-50.49	-327.4	-4,296.4	340.0	147.6	192.37	1.767				
11,500.0	7,272.2	11,301.2	7,057.0	124.5	124.4	-50.50	-327.4	-4,396.4	339.9	143.1	196.78	1.727				
11,600.0	7,272.1	11,401.2	7,057.0	127.2	127.2	-50.52	-327.4	-4,496.4	339.9	138.7	201.19	1.689				
11,700.0	7,272.0	11,501.2	7,057.0	130.0	130.0	-50.53	-327.4	-4,596.4	339.8	134.2	205.61	1.653				
11,712.7	7,272.0	11,513.7	7,057.0	130.3	130.3	-50.53	-327.4	-4,608.9	339.8	133.7	206.07	1.649				
11,718.1	7,272.0	11,513.7	7,057.0	130.4	130.3	-50.53	-327.4	-4,608.9	339.8	133.7	206.14	1.649 SF				

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

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Sunmarke 28V-434
Project:	SEC.28-T4N-R67W	TVD Reference:	WELL @ 4921.0ft (RKB - 15')
Reference Site:	Sunmarke 28V-HZ Pad Sec.28-T4N-R67W	MD Reference:	WELL @ 4921.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Sunmarke 28V-434	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (11-18-13)	Offset TVD Reference:	Offset Datum

Offset Design Sunmarke 28V-HZ Pad Sec.28-T4N-R67W - Sunmarke 28V-304 - Wellbore #1 - Plan #1 (11-18-13)													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	Offset	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	
4,900.0	4,895.6	4,891.3	4,884.3	11.0	11.3	-117.51	174.1	135.9	239.9	217.8	22.05	10.877		
5,004.4	5,000.0	4,995.5	4,988.2	11.2	11.6	-4.68	179.5	141.0	245.7	223.6	22.12	11.106		
5,100.0	5,095.6	5,090.8	5,083.3	11.4	11.9	-3.52	184.4	145.6	250.3	227.8	22.54	11.104		
5,200.0	5,195.6	5,190.6	5,182.8	11.6	12.1	-2.36	189.6	150.5	255.3	232.3	22.99	11.105		
5,300.0	5,295.6	5,290.3	5,282.3	11.8	12.4	-1.24	194.8	155.4	260.3	236.9	23.43	11.109		
5,400.0	5,395.6	5,396.3	5,388.1	12.0	12.6	-0.32	199.2	159.5	264.5	240.6	23.87	11.080		
5,500.0	5,495.6	5,503.5	5,495.2	12.2	12.8	0.00	200.8	161.0	265.9	241.7	24.26	10.961		
5,600.0	5,595.6	5,603.8	5,595.6	12.4	13.0	0.00	200.8	161.0	265.9	241.3	24.66	10.784		
5,700.0	5,695.6	5,703.8	5,695.6	12.6	13.2	0.00	200.8	161.0	265.9	240.9	25.08	10.603		
5,800.0	5,795.6	5,803.8	5,795.6	12.8	13.4	0.00	200.8	161.0	265.9	240.4	25.50	10.428		
5,900.0	5,895.6	5,903.8	5,895.6	13.0	13.6	0.00	200.8	161.0	265.9	240.0	25.92	10.259		
6,000.0	5,995.6	6,003.8	5,995.6	13.2	13.8	0.00	200.8	161.0	265.9	239.6	26.35	10.094		
6,100.0	6,095.6	6,103.8	6,095.6	13.4	14.0	0.00	200.8	161.0	265.9	239.2	26.77	9.934		
6,200.0	6,195.6	6,203.8	6,195.6	13.6	14.2	0.00	200.8	161.0	265.9	238.7	27.19	9.779		
6,300.0	6,295.6	6,303.8	6,295.6	13.8	14.4	0.00	200.8	161.0	265.9	238.3	27.62	9.629		
6,400.0	6,395.6	6,403.8	6,395.6	14.0	14.7	0.00	200.8	161.0	265.9	237.9	28.05	9.483		
6,430.5	6,426.0	6,434.2	6,426.0	14.1	14.7	-0.12	200.8	160.5	265.9	237.8	28.17	9.441		
6,506.1	6,501.6	6,509.2	6,500.7	14.2	14.8	-1.52	200.8	153.9	266.0	237.6	28.46	9.347		
6,550.0	6,545.5	6,552.2	6,543.1	14.3	14.9	87.21	200.8	146.9	266.3	237.3	28.95	9.199		
6,600.0	6,595.3	6,600.7	6,590.3	14.4	15.0	85.79	200.8	136.1	266.7	237.6	29.10	9.166		
6,650.0	6,644.7	6,648.8	6,636.5	14.5	15.0	84.40	200.8	122.5	267.2	238.0	29.23	9.143		
6,700.0	6,693.5	6,696.5	6,681.3	14.5	15.1	83.04	200.8	106.1	267.9	238.6	29.35	9.128		
6,750.0	6,741.4	6,743.9	6,724.7	14.6	15.1	81.72	200.8	87.2	268.8	239.3	29.47	9.120		
6,800.0	6,788.4	6,791.0	6,766.6	14.7	15.1	80.45	200.8	65.7	269.7	240.1	29.59	9.116		
6,850.0	6,834.1	6,837.7	6,806.7	14.7	15.2	79.22	200.8	41.9	270.8	241.1	29.72	9.112		
6,900.0	6,878.3	6,884.1	6,845.1	14.8	15.3	78.05	200.8	15.8	271.9	242.0	29.86	9.105		
6,950.0	6,921.0	6,930.2	6,881.6	14.9	15.4	76.94	200.8	-12.4	273.1	243.0	30.04	9.091		
7,000.0	6,961.9	6,976.1	6,916.2	15.0	15.6	75.89	200.8	-42.5	274.3	244.0	30.27	9.063		
7,050.0	7,000.8	7,021.7	6,948.7	15.2	15.8	74.90	200.8	-74.5	275.5	245.0	30.55	9.021		
7,100.0	7,037.5	7,067.0	6,979.1	15.4	16.1	73.98	200.8	-108.1	276.8	245.9	30.90	8.957		
7,150.0	7,072.0	7,112.2	7,007.3	15.6	16.4	73.13	200.8	-143.4	278.0	246.6	31.34	8.870		
7,200.0	7,104.0	7,157.2	7,033.3	16.0	16.8	72.34	200.8	-180.1	279.2	247.3	31.89	8.755		
7,250.0	7,133.4	7,200.0	7,056.0	16.4	17.2	71.66	200.8	-216.4	280.3	247.8	32.53	8.617		
7,300.0	7,160.2	7,246.6	7,078.3	16.9	17.7	70.99	200.8	-257.3	281.3	248.0	33.33	8.441		
7,350.0	7,184.1	7,291.0	7,097.3	17.4	18.3	70.43	200.8	-297.5	282.3	248.1	34.25	8.242		
7,400.0	7,205.1	7,335.4	7,113.8	18.1	18.9	69.93	200.8	-338.7	283.2	247.9	35.31	8.020		
7,450.0	7,223.1	7,379.7	7,127.9	18.8	19.5	69.51	200.8	-380.6	283.9	247.4	36.49	7.781		
7,500.0	7,238.0	7,423.8	7,139.6	19.6	20.3	69.17	200.8	-423.2	284.6	246.8	37.81	7.527		
7,550.0	7,249.7	7,467.9	7,148.7	20.4	21.0	68.90	200.8	-466.3	285.1	245.8	39.24	7.265		
7,600.0	7,258.2	7,512.0	7,155.3	21.3	21.8	68.70	200.8	-509.9	285.4	244.7	40.79	6.998		
7,626.1	7,261.4	7,534.9	7,157.8	21.8	22.3	68.63	200.8	-532.7	285.6	243.9	41.64	6.859		
7,700.1	7,269.1	7,600.0	7,161.0	23.3	23.5	67.96	200.8	-597.7	287.1	243.1	44.03	6.521		
7,800.0	7,275.2	7,697.7	7,160.2	25.4	25.6	66.62	200.8	-695.4	289.7	242.3	47.49	6.101		
7,821.1	7,275.4	7,718.8	7,160.0	25.8	26.0	66.55	200.8	-716.5	289.9	241.6	48.32	5.999		
7,900.0	7,275.3	7,797.7	7,159.4	27.6	27.8	66.44	200.8	-795.4	290.1	238.6	51.51	5.633		
8,000.0	7,275.2	7,897.7	7,158.5	29.9	30.1	66.30	200.8	-895.4	290.4	234.7	55.71	5.214		
8,100.0	7,275.2	7,997.7	7,157.6	32.3	32.5	66.15	200.8	-995.4	290.8	230.7	60.04	4.842		
8,200.0	7,275.1	8,097.7	7,156.7	34.8	34.9	66.01	200.8	-1,095.4	291.1	226.6	64.49	4.514		
8,300.0	7,275.0	8,197.7	7,155.9	37.3	37.4	65.87	200.8	-1,195.4	291.4	222.4	69.01	4.222		
8,400.0	7,274.9	8,297.7	7,155.0	39.8	40.0	65.73	200.8	-1,295.4	291.7	218.1	73.61	3.963		
8,500.0	7,274.8	8,397.7	7,154.1	42.4	42.5	65.59	200.8	-1,395.4	292.1	213.8	78.25	3.732		

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

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Sunmarke 28V-434
Project:	SEC.28-T4N-R67W	TVD Reference:	WELL @ 4921.0ft (RKB - 15')
Reference Site:	Sunmarke 28V-HZ Pad Sec.28-T4N-R67W	MD Reference:	WELL @ 4921.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Sunmarke 28V-434	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (11-18-13)	Offset TVD Reference:	Offset Datum

Offset Design Sunmarke 28V-HZ Pad Sec.28-T4N-R67W - Sunmarke 28V-304 - Wellbore #1 - Plan #1 (11-18-13)												Offset Site Error:	0.0 ft
Survey Program: 0-MWD												Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre	Between Centres	Between Ellipses	Minimum Separation	Separation Factor		
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)		
8,600.0	7,274.7	8,497.7	7,153.2	45.0	45.1	65.45	200.8	-1,495.3	292.4	209.4	82.94	3.525	
8,700.0	7,274.6	8,597.7	7,152.4	47.7	47.8	65.31	200.8	-1,595.3	292.7	205.0	87.66	3.339	
8,800.0	7,274.5	8,697.7	7,151.5	50.3	50.4	65.17	200.8	-1,695.3	293.0	200.6	92.40	3.171	
8,900.0	7,274.5	8,797.7	7,150.6	53.0	53.1	65.03	200.8	-1,795.3	293.4	196.2	97.17	3.019	
9,000.0	7,274.4	8,897.7	7,149.8	55.6	55.7	64.89	200.8	-1,895.3	293.7	191.7	101.95	2.881	
9,100.0	7,274.3	8,997.7	7,148.9	58.3	58.4	64.75	200.8	-1,995.3	294.0	187.3	106.75	2.754	
9,200.0	7,274.2	9,097.7	7,148.0	61.0	61.1	64.62	200.8	-2,095.3	294.4	182.8	111.55	2.639	
9,300.0	7,274.1	9,197.7	7,147.1	63.7	63.8	64.48	200.8	-2,195.3	294.7	178.3	116.36	2.533	
9,400.0	7,274.0	9,297.7	7,146.3	66.5	66.5	64.34	200.8	-2,295.3	295.0	173.9	121.18	2.435	
9,500.0	7,273.9	9,397.7	7,145.4	69.2	69.3	64.20	200.8	-2,395.3	295.4	169.4	125.99	2.344	
9,600.0	7,273.8	9,497.7	7,144.5	71.9	72.0	64.07	200.8	-2,495.3	295.7	164.9	130.81	2.261	
9,700.0	7,273.8	9,597.7	7,143.6	74.7	74.7	63.93	200.8	-2,595.3	296.1	160.4	135.63	2.183	
9,800.0	7,273.7	9,697.7	7,142.8	77.4	77.5	63.79	200.8	-2,695.3	296.4	156.0	140.45	2.110	
9,900.0	7,273.6	9,797.7	7,141.9	80.1	80.2	63.66	200.8	-2,795.3	296.8	151.5	145.26	2.043	
10,000.0	7,273.5	9,897.7	7,141.0	82.9	83.0	63.52	200.8	-2,895.2	297.1	147.0	150.07	1.980	
10,100.0	7,273.4	9,997.7	7,140.2	85.7	85.7	63.39	200.8	-2,995.2	297.5	142.6	154.88	1.921	
10,200.0	7,273.3	10,097.7	7,139.3	88.4	88.5	63.25	200.8	-3,095.2	297.8	138.1	159.68	1.865	
10,300.0	7,273.2	10,197.7	7,138.4	91.2	91.2	63.12	200.8	-3,195.2	298.2	133.7	164.48	1.813	
10,400.0	7,273.2	10,297.7	7,137.5	93.9	94.0	62.98	200.8	-3,295.2	298.5	129.3	169.27	1.764	
10,500.0	7,273.1	10,397.7	7,136.7	96.7	96.8	62.85	200.8	-3,395.2	298.9	124.8	174.05	1.717	
10,600.0	7,273.0	10,497.7	7,135.8	99.5	99.5	62.71	200.8	-3,495.2	299.2	120.4	178.83	1.673	
10,700.0	7,272.9	10,597.6	7,134.9	102.2	102.3	62.58	200.8	-3,595.2	299.6	116.0	183.60	1.632	
10,800.0	7,272.8	10,697.6	7,134.0	105.0	105.1	62.45	200.8	-3,695.2	300.0	111.6	188.36	1.593	
10,900.0	7,272.7	10,797.6	7,133.2	107.8	107.8	62.31	200.8	-3,795.2	300.3	107.2	193.11	1.555	
11,000.0	7,272.6	10,897.6	7,132.3	110.6	110.6	62.18	200.8	-3,895.2	300.7	102.8	197.86	1.520	
11,100.0	7,272.5	10,997.6	7,131.4	113.3	113.4	62.05	200.8	-3,995.2	301.1	98.5	202.59	1.486 Level 3	
11,200.0	7,272.5	11,097.6	7,130.6	116.1	116.2	61.92	200.8	-4,095.2	301.4	94.1	207.32	1.454 Level 3	
11,300.0	7,272.4	11,197.6	7,129.7	118.9	118.9	61.79	200.8	-4,195.2	301.8	89.8	212.04	1.423 Level 3	
11,400.0	7,272.3	11,297.6	7,128.8	121.7	121.7	61.65	200.8	-4,295.2	302.2	85.4	216.75	1.394 Level 3	
11,500.0	7,272.2	11,397.6	7,127.9	124.5	124.5	61.52	200.8	-4,395.1	302.5	81.1	221.45	1.366 Level 3	
11,600.0	7,272.1	11,497.6	7,127.1	127.2	127.3	61.39	200.8	-4,495.1	302.9	76.8	226.14	1.340 Level 3	
11,700.0	7,272.0	11,597.6	7,126.2	130.0	130.1	61.26	200.8	-4,595.1	303.3	72.5	230.82	1.314 Level 3	
11,718.1	7,272.0	11,615.7	7,126.0	130.4	130.6	61.24	200.8	-4,613.2	303.4	71.9	231.51	1.310 Level 3, SF	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Sunmarke 28V-434
Project:	SEC.28-T4N-R67W	TVD Reference:	WELL @ 4921.0ft (RKB - 15')
Reference Site:	Sunmarke 28V-HZ Pad Sec.28-T4N-R67W	MD Reference:	WELL @ 4921.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Sunmarke 28V-434	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (11-18-13)	Offset TVD Reference:	Offset Datum

Offset Design Sunmarke 28V-HZ Pad Sec.28-T4N-R67W - Sunmarke 28W-414 - Wellbore #1 - Plan #1 (11-18-13)													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	Offset	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	2.0	2.0	0.0	0.0	180.00	180.00	-61.9	0.0	61.9	61.9	0.00	N/A	
100.0	100.0	102.0	102.0	0.1	0.1	180.00	180.00	-61.9	0.0	61.9	61.7	0.23	270.136	
200.0	200.0	202.0	202.0	0.3	0.3	180.00	180.00	-61.9	0.0	61.9	61.3	0.68	91.238	
300.0	300.0	302.0	302.0	0.6	0.6	180.00	180.00	-61.9	0.0	61.9	60.8	1.13	54.888	
400.0	400.0	402.0	402.0	0.8	0.8	180.00	180.00	-61.9	0.0	61.9	60.4	1.58	39.251	
500.0	500.0	502.0	502.0	1.0	1.0	180.00	180.00	-61.9	0.0	61.9	59.9	2.03	30.548	
566.0	566.0	568.0	568.0	1.2	1.2	180.00	180.00	-61.9	0.0	61.9	59.6	2.32	26.649 CC	
600.0	600.0	602.0	602.0	1.2	1.2	180.00	180.00	-61.9	0.0	61.9	59.5	2.48	25.010 ES	
700.0	700.0	700.0	700.0	1.5	1.4	179.56	179.56	-63.6	0.5	63.6	60.7	2.89	21.986	
800.0	800.0	797.6	797.4	1.7	1.6	178.40	178.40	-68.5	1.9	68.6	65.3	3.30	20.807	
900.0	900.0	894.8	894.3	1.9	1.8	176.81	176.81	-76.5	4.3	77.0	73.3	3.73	20.662	
1,000.0	1,000.0	992.3	991.1	2.1	2.0	175.11	175.11	-87.5	7.5	88.5	84.3	4.18	21.161	
1,100.0	1,100.0	1,091.6	1,089.6	2.4	2.3	173.70	173.70	-99.4	11.0	100.8	96.1	4.66	21.608	
1,200.0	1,200.0	1,190.8	1,188.0	2.6	2.6	172.60	172.60	-111.3	14.5	113.1	108.0	5.16	21.920	
1,300.0	1,300.0	1,290.0	1,286.4	2.8	2.9	171.71	171.71	-123.2	18.0	125.5	119.8	5.67	22.144	
1,400.0	1,400.0	1,389.2	1,384.9	3.0	3.2	170.98	170.98	-135.2	21.5	137.9	131.7	6.18	22.310	
1,500.0	1,500.0	1,488.4	1,483.3	3.3	3.5	170.38	170.38	-147.1	24.9	150.3	143.6	6.70	22.435	
1,600.0	1,600.0	1,587.7	1,581.9	3.5	3.8	58.16	58.16	-159.0	28.4	161.9	155.1	6.79	23.857	
1,648.3	1,648.3	1,635.8	1,629.5	3.6	3.9	58.45	58.45	-164.8	30.1	166.8	159.8	6.99	23.869	
1,700.0	1,699.9	1,687.2	1,680.5	3.7	4.1	58.95	58.95	-171.0	31.9	171.8	164.6	7.21	23.841	
1,800.0	1,799.7	1,786.7	1,779.2	3.9	4.4	59.84	59.84	-182.9	35.4	181.6	174.0	7.64	23.777	
1,900.0	1,899.6	1,886.2	1,877.9	4.1	4.7	60.64	60.64	-194.9	38.9	191.4	183.4	8.08	23.705	
2,000.0	1,999.5	1,985.7	1,976.6	4.3	5.0	61.36	61.36	-206.8	42.4	201.3	192.8	8.52	23.629	
2,100.0	2,099.3	2,085.1	2,075.3	4.5	5.4	62.01	62.01	-218.8	45.9	211.2	202.2	8.97	23.550	
2,200.0	2,199.2	2,184.6	2,174.0	4.7	5.7	62.60	62.60	-230.7	49.4	221.1	211.7	9.42	23.471	
2,300.0	2,299.1	2,284.1	2,272.7	4.9	6.0	63.15	63.15	-242.7	52.9	231.0	221.2	9.88	23.391	
2,400.0	2,398.9	2,383.6	2,371.4	5.1	6.3	63.64	63.64	-254.6	56.4	241.0	230.6	10.34	23.313	
2,500.0	2,498.8	2,483.1	2,470.1	5.4	6.6	64.10	64.10	-266.6	59.9	251.0	240.2	10.80	23.236	
2,600.0	2,598.7	2,582.6	2,568.8	5.6	7.0	64.53	64.53	-278.5	63.4	260.9	249.7	11.27	23.161	
2,700.0	2,698.5	2,682.0	2,667.5	5.8	7.3	64.92	64.92	-290.5	66.9	270.9	259.2	11.73	23.089	
2,800.0	2,798.4	2,781.5	2,766.2	6.0	7.6	65.28	65.28	-302.4	70.4	280.9	268.7	12.20	23.019	
2,900.0	2,898.3	2,881.0	2,864.9	6.3	7.9	65.62	65.62	-314.4	73.9	291.0	278.3	12.68	22.951	
3,000.0	2,998.1	2,980.5	2,963.6	6.5	8.3	65.94	65.94	-326.3	77.4	301.0	287.8	13.15	22.886	
3,100.0	3,098.0	3,080.0	3,062.3	6.7	8.6	66.23	66.23	-338.3	80.9	311.0	297.4	13.63	22.824	
3,200.0	3,197.9	3,179.4	3,161.0	7.0	8.9	66.51	66.51	-350.2	84.4	321.1	307.0	14.10	22.764	
3,300.0	3,297.7	3,278.9	3,259.7	7.2	9.2	66.77	66.77	-362.2	87.9	331.1	316.5	14.58	22.706	
3,400.0	3,397.6	3,378.4	3,358.4	7.4	9.6	67.02	67.02	-374.1	91.4	341.2	326.1	15.06	22.650	
3,500.0	3,497.5	3,477.9	3,457.1	7.7	9.9	67.25	67.25	-386.1	94.9	351.2	335.7	15.54	22.597	
3,600.0	3,597.3	3,577.4	3,555.8	7.9	10.2	67.47	67.47	-398.0	98.4	361.3	345.3	16.03	22.546	
3,700.0	3,697.2	3,676.9	3,654.5	8.1	10.6	67.67	67.67	-410.0	101.9	371.4	354.9	16.51	22.497	
3,800.0	3,797.1	3,776.3	3,753.2	8.4	10.9	67.87	67.87	-421.9	105.4	381.5	364.5	16.99	22.449	
3,900.0	3,896.9	3,875.8	3,851.9	8.6	11.2	68.06	68.06	-433.9	108.9	391.6	374.1	17.48	22.404	
4,000.0	3,996.8	3,975.3	3,950.6	8.9	11.5	68.23	68.23	-445.8	112.4	401.6	383.7	17.96	22.360	
4,100.0	4,096.6	4,074.8	4,049.3	9.1	11.9	68.40	68.40	-457.8	115.9	411.7	393.3	18.45	22.318	
4,200.0	4,196.5	4,174.3	4,148.0	9.3	12.2	68.56	68.56	-469.7	119.4	421.8	402.9	18.93	22.278	
4,300.0	4,296.4	4,273.8	4,246.7	9.6	12.5	68.71	68.71	-481.7	122.9	431.9	412.5	19.42	22.239	
4,400.0	4,396.2	4,373.2	4,345.4	9.8	12.8	68.86	68.86	-493.6	126.4	442.0	422.1	19.91	22.202	
4,500.0	4,496.1	4,472.7	4,444.1	10.0	13.2	69.00	69.00	-505.6	129.9	452.1	431.7	20.40	22.166	
4,600.0	4,596.0	4,572.2	4,542.8	10.3	13.5	69.13	69.13	-517.5	133.4	462.2	441.3	20.89	22.131	
4,700.0	4,695.8	4,671.7	4,641.5	10.5	13.8	69.26	69.26	-529.5	136.9	472.3	451.0	21.38	22.097	
4,800.0	4,795.7	4,771.2	4,740.3	10.8	14.2	69.38	69.38	-541.4	140.4	482.4	460.6	21.86	22.065	

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

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Sunmarke 28V-434
Project:	SEC.28-T4N-R67W	TVD Reference:	WELL @ 4921.0ft (RKB - 15')
Reference Site:	Sunmarke 28V-HZ Pad Sec.28-T4N-R67W	MD Reference:	WELL @ 4921.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Sunmarke 28V-434	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (11-18-13)	Offset TVD Reference:	Offset Datum

Offset Design Sunmarke 28V-HZ Pad Sec.28-T4N-R67W - Sunmarke 28W-414 - Wellbore #1 - Plan #1 (11-18-13)												Offset Site Error: 0.0 ft		
Survey Program: 0-MWD												Offset Well Error: 0.0 ft		
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor		
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)			
4,856.1	4,851.7	4,827.0	4,795.6	10.9	14.3	69.44	-548.1	142.4	488.1	466.0	22.14	22.047		
4,900.0	4,895.6	4,870.6	4,838.9	11.0	14.5	69.54	-553.4	143.9	492.7	470.3	22.34	22.051		
5,004.4	5,000.0	4,974.4	4,941.9	11.2	14.8	-178.47	-565.8	147.6	504.5	479.1	25.37	19.885		
5,100.0	5,095.6	5,069.2	5,035.9	11.4	15.1	-178.87	-577.2	150.9	515.9	490.0	25.88	19.930		
5,200.0	5,195.6	5,168.4	5,134.4	11.6	15.5	-179.28	-589.1	154.4	527.8	501.4	26.42	19.976		
5,300.0	5,295.6	5,287.9	5,253.1	11.8	15.8	-179.68	-601.4	158.0	538.1	511.2	26.92	19.991		
5,400.0	5,395.6	5,409.7	5,374.7	12.0	16.0	-179.92	-609.0	160.2	544.3	517.0	27.35	19.900		
5,500.0	5,495.6	5,532.1	5,497.0	12.2	16.2	-180.00	-611.6	161.0	546.5	518.7	27.75	19.693		
5,600.0	5,595.6	5,632.6	5,597.6	12.4	16.3	180.00	-611.6	161.0	546.5	518.4	28.10	19.447		
5,700.0	5,695.6	5,732.6	5,697.6	12.6	16.4	180.00	-611.6	161.0	546.5	518.0	28.44	19.215		
5,800.0	5,795.6	5,832.6	5,797.6	12.8	16.6	180.00	-611.6	161.0	546.5	517.7	28.78	18.986		
5,900.0	5,895.6	5,932.6	5,897.6	13.0	16.7	180.00	-611.6	161.0	546.5	517.3	29.13	18.761		
6,000.0	5,995.6	6,032.6	5,997.6	13.2	16.9	180.00	-611.6	161.0	546.5	517.0	29.48	18.539		
6,100.0	6,095.6	6,132.6	6,097.6	13.4	17.0	180.00	-611.6	161.0	546.5	516.6	29.83	18.322		
6,200.0	6,195.6	6,232.6	6,197.6	13.6	17.1	180.00	-611.6	161.0	546.5	516.3	30.18	18.108		
6,300.0	6,295.6	6,332.6	6,297.6	13.8	17.3	180.00	-611.6	161.0	546.5	515.9	30.53	17.897		
6,400.0	6,395.6	6,432.6	6,397.6	14.0	17.4	180.00	-611.6	161.0	546.5	515.6	30.89	17.690		
6,470.5	6,466.1	6,503.1	6,468.1	14.2	17.5	180.00	-611.6	161.0	546.5	515.3	31.14	17.547		
6,506.1	6,501.6	6,538.7	6,503.6	14.2	17.6	-180.00	-611.6	161.0	546.5	515.2	31.27	17.475		
6,550.0	6,545.5	6,582.6	6,547.5	14.3	17.6	-89.99	-611.6	159.7	546.5	517.6	28.89	18.913		
6,600.0	6,595.3	6,632.6	6,597.3	14.4	17.7	-89.99	-611.6	155.1	546.5	517.4	29.05	18.810		
6,650.0	6,644.7	6,682.6	6,646.7	14.5	17.8	-89.98	-611.6	147.3	546.5	517.3	29.19	18.719		
6,700.0	6,693.5	6,732.6	6,695.4	14.5	17.8	-89.97	-611.6	136.2	546.5	517.1	29.32	18.638		
6,750.0	6,741.4	6,782.6	6,743.3	14.6	17.9	-89.96	-611.6	122.0	546.5	517.0	29.44	18.562		
6,800.0	6,788.4	6,832.5	6,790.2	14.7	17.9	-89.95	-611.6	104.7	546.5	516.9	29.56	18.488		
6,850.0	6,834.1	6,882.5	6,835.8	14.7	18.0	-89.95	-611.6	84.4	546.5	516.8	29.69	18.408		
6,900.0	6,878.3	6,932.5	6,880.1	14.8	18.0	-89.94	-611.6	61.2	546.5	516.6	29.84	18.314		
6,950.0	6,921.0	6,982.4	6,922.7	14.9	18.0	-89.93	-611.6	35.1	546.5	516.4	30.03	18.199		
7,000.0	6,961.9	7,032.4	6,963.4	15.0	18.1	-89.93	-611.6	6.2	546.5	516.2	30.27	18.054		
7,050.0	7,000.8	7,082.3	7,002.3	15.2	18.1	-89.92	-611.6	-25.2	546.5	515.9	30.58	17.868		
7,100.0	7,037.5	7,132.3	7,038.9	15.4	18.2	-89.92	-611.6	-59.1	546.5	515.5	30.99	17.633		
7,150.0	7,072.0	7,182.2	7,073.3	15.6	18.2	-89.91	-611.6	-95.3	546.5	515.0	31.51	17.344		
7,200.0	7,104.0	7,232.2	7,105.3	16.0	18.3	-89.90	-611.6	-133.7	546.5	514.3	32.15	16.996		
7,250.0	7,133.4	7,282.1	7,134.6	16.4	18.4	-89.90	-611.6	-174.0	546.5	513.5	32.94	16.591		
7,300.0	7,160.2	7,332.0	7,161.3	16.9	18.6	-89.90	-611.6	-216.2	546.5	512.6	33.88	16.132		
7,350.0	7,184.1	7,382.0	7,185.2	17.4	18.8	-89.89	-611.6	-260.1	546.5	511.5	34.97	15.626		
7,400.0	7,205.1	7,431.9	7,206.1	18.1	19.2	-89.89	-611.6	-305.4	546.5	510.2	36.23	15.085		
7,450.0	7,223.1	7,481.8	7,224.0	18.8	19.7	-89.89	-611.6	-352.0	546.5	508.8	37.64	14.520		
7,500.0	7,238.0	7,531.8	7,238.9	19.6	20.4	-89.88	-611.6	-399.7	546.5	507.3	39.19	13.943		
7,550.0	7,249.7	7,581.7	7,250.6	20.4	21.2	-89.88	-611.6	-448.2	546.5	505.6	40.88	13.367		
7,600.0	7,258.2	7,631.6	7,259.1	21.3	22.0	-89.88	-611.6	-497.4	546.5	503.8	42.69	12.801		
7,626.1	7,261.4	7,657.6	7,262.2	21.8	22.5	-89.88	-611.6	-523.2	546.5	502.8	43.67	12.514		
7,680.4	7,267.1	7,711.9	7,267.9	22.9	23.5	-89.88	-611.6	-577.2	546.5	500.7	45.81	11.929		
7,700.1	7,269.1	7,731.6	7,270.0	23.3	23.9	-89.88	-611.6	-596.8	546.5	499.9	46.59	11.728		
7,800.0	7,275.2	7,831.5	7,276.1	25.4	25.9	-89.88	-611.6	-696.4	546.5	495.7	50.80	10.756		
7,821.1	7,275.4	7,852.5	7,276.2	25.8	26.4	-89.88	-611.6	-717.5	546.5	494.7	51.72	10.566		
7,900.0	7,275.3	7,931.5	7,276.3	27.6	28.1	-89.90	-611.6	-796.4	546.5	491.2	55.25	9.891		
8,000.0	7,275.2	8,031.5	7,276.5	29.9	30.4	-89.92	-611.6	-896.4	546.5	486.6	59.88	9.126		
8,100.0	7,275.2	8,131.5	7,276.6	32.3	32.8	-89.94	-611.6	-996.4	546.5	481.8	64.67	8.450		
8,200.0	7,275.1	8,231.5	7,276.7	34.8	35.2	-89.96	-611.6	-1,096.4	546.5	476.9	69.58	7.854		
8,300.0	7,275.0	8,331.5	7,276.8	37.3	37.7	-89.98	-611.6	-1,196.4	546.5	471.9	74.59	7.326		

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

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Sunmarke 28V-434
Project:	SEC.28-T4N-R67W	TVD Reference:	WELL @ 4921.0ft (RKB - 15')
Reference Site:	Sunmarke 28V-HZ Pad Sec.28-T4N-R67W	MD Reference:	WELL @ 4921.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Sunmarke 28V-434	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (11-18-13)	Offset TVD Reference:	Offset Datum

Offset Design		Sunmarke 28V-HZ Pad Sec.28-T4N-R67W - Sunmarke 28W-414 - Wellbore #1 - Plan #1 (11-18-13)										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 +N/-S	Offset Wellbore Centre +E/-W	Between Centres	Between Ellipses	Minimum Separation	Separation Factor	Warning			
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	(ft)	(ft)	(ft)	(ft)	(ft)					
8,371.0	7,274.9	8,402.5	7,276.9	39.1	39.5	-90.00	-611.6	-1,267.4	546.5	468.3	78.19	6.988				
8,400.0	7,274.9	8,431.5	7,277.0	39.8	40.2	-90.01	-611.6	-1,296.4	546.5	466.8	79.68	6.858				
8,500.0	7,274.8	8,531.5	7,277.1	42.4	42.8	-90.03	-611.6	-1,396.4	546.5	461.6	84.83	6.441				
8,600.0	7,274.7	8,631.5	7,277.2	45.0	45.3	-90.05	-611.6	-1,496.4	546.5	456.4	90.05	6.069				
8,700.0	7,274.6	8,731.5	7,277.3	47.7	48.0	-90.07	-611.6	-1,596.4	546.5	451.2	95.30	5.734				
8,800.0	7,274.5	8,831.5	7,277.4	50.3	50.6	-90.09	-611.6	-1,696.4	546.5	445.9	100.60	5.432				
8,900.0	7,274.5	8,931.5	7,277.6	53.0	53.2	-90.12	-611.6	-1,796.4	546.5	440.5	105.93	5.159				
9,000.0	7,274.4	9,031.5	7,277.7	55.6	55.9	-90.14	-611.6	-1,896.4	546.5	435.2	111.28	4.911				
9,100.0	7,274.3	9,131.5	7,277.8	58.3	58.6	-90.16	-611.6	-1,996.4	546.5	429.8	116.66	4.684				
9,200.0	7,274.2	9,231.5	7,277.9	61.0	61.3	-90.18	-611.6	-2,096.4	546.5	424.4	122.06	4.477				
9,300.0	7,274.1	9,331.5	7,278.1	63.7	64.0	-90.20	-611.6	-2,196.4	546.5	419.0	127.48	4.287				
9,400.0	7,274.0	9,431.5	7,278.2	66.5	66.7	-90.23	-611.6	-2,296.4	546.5	413.5	132.92	4.111				
9,500.0	7,273.9	9,531.5	7,278.3	69.2	69.4	-90.25	-611.6	-2,396.4	546.5	408.1	138.37	3.949				
9,600.0	7,273.8	9,631.5	7,278.4	71.9	72.1	-90.27	-611.6	-2,496.4	546.5	402.6	143.83	3.799				
9,700.0	7,273.8	9,731.5	7,278.5	74.7	74.9	-90.29	-611.6	-2,596.4	546.5	397.2	149.30	3.660				
9,800.0	7,273.7	9,831.5	7,278.7	77.4	77.6	-90.31	-611.6	-2,696.4	546.5	391.7	154.78	3.530				
9,900.0	7,273.6	9,931.5	7,278.8	80.1	80.3	-90.34	-611.6	-2,796.4	546.5	386.2	160.28	3.410				
10,000.0	7,273.5	10,031.5	7,278.9	82.9	83.1	-90.36	-611.6	-2,896.4	546.5	380.7	165.78	3.296				
10,100.0	7,273.4	10,131.5	7,279.0	85.7	85.8	-90.38	-611.6	-2,996.4	546.5	375.2	171.28	3.190				
10,200.0	7,273.3	10,231.5	7,279.2	88.4	88.6	-90.40	-611.6	-3,096.4	546.5	369.7	176.80	3.091				
10,300.0	7,273.2	10,331.5	7,279.3	91.2	91.3	-90.42	-611.6	-3,196.4	546.5	364.2	182.32	2.997				
10,400.0	7,273.2	10,431.5	7,279.4	93.9	94.1	-90.45	-611.6	-3,296.4	546.5	358.6	187.84	2.909				
10,500.0	7,273.1	10,531.5	7,279.5	96.7	96.8	-90.47	-611.6	-3,396.4	546.5	353.1	193.37	2.826				
10,600.0	7,273.0	10,631.5	7,279.6	99.5	99.6	-90.49	-611.6	-3,496.4	546.5	347.6	198.91	2.747				
10,700.0	7,272.9	10,731.5	7,279.8	102.2	102.4	-90.51	-611.6	-3,596.4	546.5	342.0	204.45	2.673				
10,800.0	7,272.8	10,831.5	7,279.9	105.0	105.1	-90.53	-611.6	-3,696.4	546.5	336.5	209.99	2.602				
10,900.0	7,272.7	10,931.5	7,280.0	107.8	107.9	-90.56	-611.6	-3,796.4	546.5	330.9	215.54	2.535				
11,000.0	7,272.6	11,031.5	7,280.1	110.6	110.7	-90.58	-611.6	-3,896.4	546.5	325.4	221.08	2.472				
11,100.0	7,272.5	11,131.5	7,280.3	113.3	113.5	-90.60	-611.6	-3,996.4	546.5	319.9	226.64	2.411				
11,200.0	7,272.5	11,231.5	7,280.4	116.1	116.2	-90.62	-611.6	-4,096.4	546.5	314.3	232.19	2.354				
11,300.0	7,272.4	11,331.5	7,280.5	118.9	119.0	-90.64	-611.6	-4,196.4	546.5	308.7	237.75	2.299				
11,400.0	7,272.3	11,431.4	7,280.6	121.7	121.8	-90.67	-611.6	-4,296.4	546.5	303.2	243.31	2.246				
11,500.0	7,272.2	11,531.4	7,280.7	124.5	124.6	-90.69	-611.6	-4,396.4	546.5	297.6	248.87	2.196				
11,600.0	7,272.1	11,631.4	7,280.9	127.2	127.3	-90.71	-611.6	-4,496.4	546.5	292.1	254.44	2.148				
11,700.0	7,272.0	11,731.4	7,281.0	130.0	130.1	-90.73	-611.6	-4,596.4	546.5	286.5	260.00	2.102				
11,701.4	7,272.0	11,732.8	7,281.0	130.1	130.2	-90.73	-611.6	-4,597.8	546.5	286.4	260.07	2.101				
11,718.1	7,272.0	11,741.3	7,281.0	130.4	130.4	-90.73	-611.6	-4,606.2	546.6	286.0	260.60	2.097 SF				

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Sunmarke 28V-434
Project:	SEC.28-T4N-R67W	TVD Reference:	WELL @ 4921.0ft (RKB - 15')
Reference Site:	Sunmarke 28V-HZ Pad Sec.28-T4N-R67W	MD Reference:	WELL @ 4921.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Sunmarke 28V-434	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (11-18-13)	Offset TVD Reference:	Offset Datum

Reference Depths are relative to WELL @ 4921.0ft (RKB - 15')
Offset Depths are relative to Offset Datum
Central Meridian is -105.500000 °

Coordinates are relative to: Sunmarke 28V-434
Coordinate System is US State Plane 1983, Colorado Northern Zone
Grid Convergence at Surface is: 0.40°



Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Sunmarke 28V-434
Project:	SEC.28-T4N-R67W	TVD Reference:	WELL @ 4921.0ft (RKB - 15')
Reference Site:	Sunmarke 28V-HZ Pad Sec.28-T4N-R67W	MD Reference:	WELL @ 4921.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Sunmarke 28V-434	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (11-18-13)	Offset TVD Reference:	Offset Datum

Reference Depths are relative to WELL @ 4921.0ft (RKB - 15')

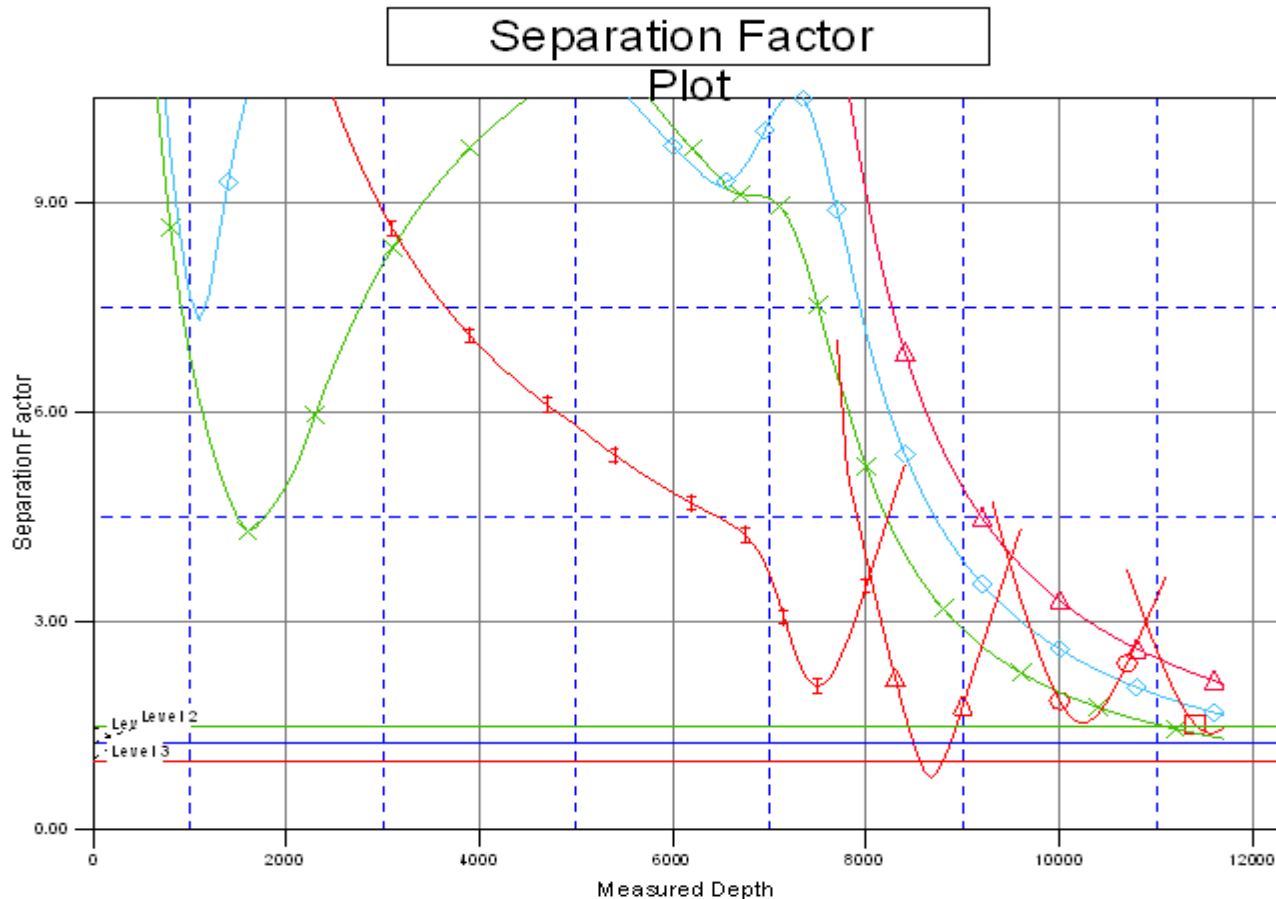
Offset Depths are relative to Offset Datum

Central Meridian is -105.500000 °

Coordinates are relative to: Sunmarke 28V-434

Coordinate System is US State Plane 1983, Colorado Northern Zone

Grid Convergence at Surface is: 0.40°



LEGEND

28V-234, Wellbore #1, Plan #1 (11-18-13) V0	McCarty 28-1 (Exist), Wellbore #1, Wellbore #1 V0	McCarty 28-7 (Exist), Wellbore #1, Wellbore #1 V0
28V-304, Wellbore #1, Plan #1 (11-18-13) V0	McCarty 28-2 (Exist), Wellbore #1, Wellbore #1 V0	
28W-414, Wellbore #1, Plan #1 (11-18-13) V0	McCarty 28-4 (Exist), Wellbore #1, Wellbore #1 V0	