

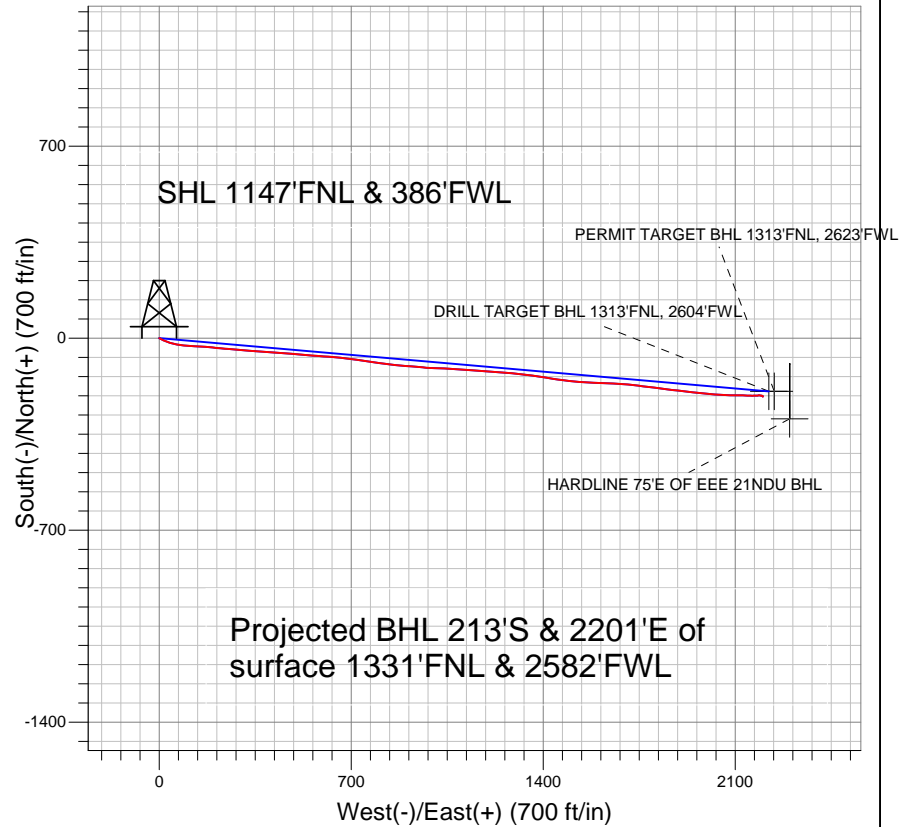
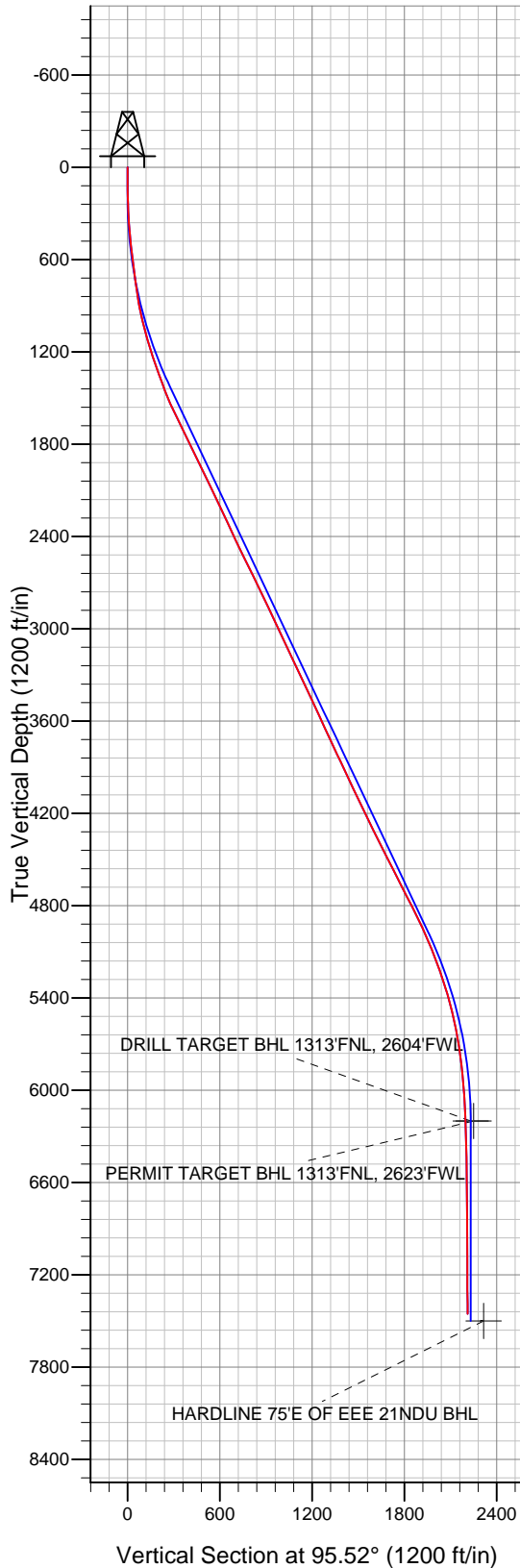
Well Name: **EEE 21NDU**

Surface Location: EEE/Ryland 20SD Pad Sec.21-T4N-R67W
 North American Datum 1983 , US State Plane 1983 , Colorado Northern Zone

Ground Elevation: 4922.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1353603.57	3166154.32	40° 18' 9.036 N	104° 54' 15.372 W	
Original Well Elev WELL @ 4935.0ft (Original Well Elev)						

PETROLEUM DEVELOPMENT CORP Weld County CO



LEGEND

- EEE 21NDU, Wellbore #1, Plan #1 (3-8-10) V0
- Wellbore #1
- Survey #1

Final Survey Plot

Projected Final Survey -
 7907'MD & 7455'TVD @ 2211' VS
 0.5 deg Inc 113.1 deg AZ

Project: SEC.21-T4N-R67W
 Site: EEE/Ryland 20SD Pad Sec.21-T4N-R67W
 Well: EEE 21NDU
 Plan: Wellbore #1



Directional

PETROLEUM DEVELOPMENT CORP Weld County CO

SEC.21-T4N-R67W

EEE/Ryland 20SD Pad Sec.21-T4N-R67W

EEE 21NDU

Wellbore #1

Survey: Survey #1

Standard Survey Report

01 November, 2010





Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well EEE 21NDU
Project:	SEC.21-T4N-R67W	TVD Reference:	WELL @ 4935.0ft (Original Well Elev)
Site:	EEE/Ryland 20SD Pad Sec.21-T4N-R67W	MD Reference:	WELL @ 4935.0ft (Original Well Elev)
Well:	EEE 21NDU	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Landmark

Project	SEC.21-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	EEE/Ryland 20SD Pad Sec.21-T4N-R67W				
Site Position:		Northing:	1,353,584.71 ft	Latitude:	40° 18' 8.856 N
From:	Lat/Long	Easting:	3,166,056.83 ft	Longitude:	104° 54' 16.632 W
Position Uncertainty:	0.0 ft	Slot Radius:	"	Grid Convergence:	0.38 °

Well	EEE 21NDU					
Well Position	+N-S	0.0 ft	Northing:	1,353,603.57 ft	Latitude:	40° 18' 9.036 N
	+E-W	0.0 ft	Easting:	3,166,154.32 ft	Longitude:	104° 54' 15.372 W
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,922.0 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	10/26/2010	9.02	66.97	53,131

Design	Wellbore #1				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)	
	0.0	0.0	0.0	95.52	

Survey Program	Date	11/1/2010			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
147.0	7,907.0	Survey #1 (Wellbore #1)	MWD	MWD - Standard	

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	
147.0	0.60	124.30	147.0	-0.4	0.6	0.7	0.41	0.41	0.00	
237.0	1.90	118.40	237.0	-1.4	2.3	2.5	1.45	1.44	-6.56	
329.0	3.50	114.40	328.9	-3.3	6.2	6.5	1.75	1.74	-4.35	
420.0	5.20	113.80	419.6	-6.1	12.5	13.1	1.87	1.87	-0.66	
510.0	6.40	114.90	509.1	-9.9	20.8	21.7	1.34	1.33	1.22	
605.0	7.90	109.20	603.4	-14.2	31.8	33.0	1.74	1.58	-6.00	
663.0	8.00	108.70	660.8	-16.8	39.4	40.8	0.21	0.17	-0.86	
731.0	7.60	108.80	728.2	-19.8	48.1	49.8	0.59	-0.59	0.15	
824.0	8.50	99.80	820.3	-23.0	60.7	62.6	1.66	0.97	-9.68	
918.0	10.80	97.50	913.0	-25.3	76.3	78.4	2.48	2.45	-2.45	
1,012.0	13.80	94.50	1,004.8	-27.3	96.2	98.4	3.26	3.19	-3.19	



Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well EEE 21NDU
Project:	SEC.21-T4N-R67W	TVD Reference:	WELL @ 4935.0ft (Original Well Elev)
Site:	EEE/Ryland 20SD Pad Sec.21-T4N-R67W	MD Reference:	WELL @ 4935.0ft (Original Well Elev)
Well:	EEE 21NDU	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Landmark

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)
1,105.0	15.50	92.60	1,094.8	-28.8	119.7	121.9	1.90	1.83	-2.04
1,199.0	18.00	94.50	1,184.8	-30.5	146.7	149.0	2.72	2.66	2.02
1,292.0	18.70	94.50	1,273.0	-32.8	175.9	178.2	0.75	0.75	0.00
1,386.0	19.80	95.60	1,361.8	-35.5	206.8	209.2	1.23	1.17	1.17
1,479.0	21.20	94.20	1,448.9	-38.3	239.2	241.8	1.59	1.51	-1.51
1,573.0	24.10	95.90	1,535.6	-41.5	275.3	278.0	3.16	3.09	1.81
1,666.0	25.20	93.40	1,620.2	-44.6	313.9	316.7	1.63	1.18	-2.69
1,760.0	26.20	94.70	1,704.9	-47.5	354.6	357.5	1.22	1.06	1.38
1,853.0	26.50	95.10	1,788.2	-51.0	395.7	398.8	0.37	0.32	0.43
1,947.0	26.30	93.60	1,872.4	-54.2	437.4	440.6	0.74	-0.21	-1.60
2,041.0	25.90	93.80	1,956.8	-56.9	478.6	481.9	0.44	-0.43	0.21
2,134.0	25.60	95.10	2,040.6	-60.0	518.9	522.3	0.69	-0.32	1.40
2,228.0	25.50	95.50	2,125.4	-63.7	559.3	562.8	0.21	-0.11	0.43
2,321.0	24.70	92.20	2,209.6	-66.4	598.6	602.2	1.73	-0.86	-3.55
2,415.0	24.70	95.80	2,295.0	-69.2	637.8	641.5	1.60	0.00	3.83
2,508.0	25.10	96.10	2,379.4	-73.2	676.7	680.6	0.45	0.43	0.32
2,602.0	26.20	98.30	2,464.1	-78.3	717.1	721.3	1.55	1.17	2.34
2,696.0	26.70	98.70	2,548.3	-84.5	758.5	763.1	0.56	0.53	0.43
2,789.0	26.50	98.00	2,631.4	-90.6	799.7	804.7	0.40	-0.22	-0.75
2,883.0	25.50	97.20	2,715.9	-96.0	840.6	845.9	1.13	-1.06	-0.85
2,976.0	25.00	94.20	2,800.0	-100.0	880.0	885.6	1.48	-0.54	-3.23
3,070.0	25.10	94.80	2,885.2	-103.1	919.7	925.3	0.29	0.11	0.64
3,164.0	26.20	95.20	2,969.9	-106.6	960.2	966.0	1.18	1.17	0.43
3,257.0	24.70	91.50	3,053.9	-109.0	1,000.1	1,006.0	2.35	-1.61	-3.98
3,351.0	25.60	92.90	3,139.0	-110.5	1,040.0	1,045.8	1.15	0.96	1.49
3,445.0	25.40	94.40	3,223.8	-113.1	1,080.4	1,086.3	0.72	-0.21	1.60
3,538.0	24.90	94.80	3,308.0	-116.3	1,119.8	1,125.8	0.57	-0.54	0.43
3,631.0	25.10	93.60	3,392.3	-119.2	1,159.0	1,165.1	0.59	0.22	-1.29
3,725.0	24.80	92.10	3,477.5	-121.1	1,198.6	1,204.7	0.74	-0.32	-1.60
3,819.0	24.90	94.70	3,562.8	-123.5	1,238.0	1,244.2	1.17	0.11	2.77
3,912.0	24.70	95.70	3,647.3	-127.0	1,276.9	1,283.2	0.50	-0.22	1.08
4,006.0	25.10	97.20	3,732.5	-131.5	1,316.2	1,322.7	0.80	0.43	1.60
4,099.0	25.00	97.90	3,816.8	-136.6	1,355.2	1,362.1	0.34	-0.11	0.75
4,193.0	26.20	98.20	3,901.5	-142.3	1,395.4	1,402.7	1.28	1.28	0.32
4,286.0	25.50	98.60	3,985.2	-148.3	1,435.6	1,443.2	0.78	-0.75	0.43
4,380.0	24.40	96.50	4,070.5	-153.5	1,474.9	1,482.8	1.50	-1.17	-2.23
4,473.0	24.80	95.60	4,155.0	-157.6	1,513.4	1,521.5	0.59	0.43	-0.97
4,567.0	26.30	95.10	4,239.8	-161.3	1,553.7	1,562.0	1.61	1.60	-0.53
4,660.0	27.10	90.70	4,322.9	-163.4	1,595.4	1,603.7	2.29	0.86	-4.73
4,754.0	27.60	92.10	4,406.4	-164.5	1,638.6	1,646.8	0.87	0.53	1.49
4,848.0	26.90	94.30	4,490.0	-166.9	1,681.6	1,689.8	1.30	-0.74	2.34
4,941.0	25.80	96.50	4,573.3	-170.7	1,722.6	1,731.1	1.58	-1.18	2.37
5,035.0	26.50	97.20	4,657.7	-175.7	1,763.8	1,772.5	0.81	0.74	0.74
5,128.0	27.40	97.20	4,740.6	-181.0	1,805.6	1,814.6	0.97	0.97	0.00
5,222.0	27.60	97.20	4,824.0	-186.4	1,848.7	1,858.0	0.21	0.21	0.00
5,316.0	25.80	96.20	4,907.9	-191.3	1,890.6	1,900.2	1.97	-1.91	-1.06
5,409.0	23.60	96.50	4,992.4	-195.6	1,929.2	1,939.1	2.37	-2.37	0.32
5,503.0	21.50	96.60	5,079.2	-199.8	1,965.0	1,975.1	2.23	-2.23	0.11
5,596.0	20.60	95.00	5,166.0	-203.1	1,998.3	2,008.5	1.15	-0.97	-1.72
5,690.0	18.90	93.60	5,254.5	-205.5	2,029.9	2,040.3	1.88	-1.81	-1.49
5,784.0	17.20	93.50	5,343.9	-207.3	2,059.0	2,069.4	1.81	-1.81	-0.11
5,877.0	15.10	90.70	5,433.2	-208.3	2,084.8	2,095.2	2.41	-2.26	-3.01
5,971.0	12.90	90.80	5,524.4	-208.6	2,107.6	2,117.9	2.34	-2.34	0.11



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Survey										
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6,064.0	11.30	91.30	5,615.3	-209.0	2,127.1	2,137.3	1.72	-1.72	0.54	
6,158.0	9.00	91.20	5,707.9	-209.3	2,143.6	2,153.8	2.45	-2.45	-0.11	
6,252.0	7.10	91.70	5,800.9	-209.7	2,156.8	2,167.0	2.02	-2.02	0.53	
6,345.0	5.60	88.30	5,893.4	-209.7	2,167.1	2,177.2	1.66	-1.61	-3.66	
6,439.0	4.70	87.40	5,987.0	-209.4	2,175.5	2,185.6	0.96	-0.96	-0.96	
6,532.0	3.30	86.90	6,079.7	-209.1	2,182.0	2,192.0	1.51	-1.51	-0.54	
6,626.0	1.90	89.10	6,173.6	-208.9	2,186.2	2,196.2	1.49	-1.49	2.34	
6,720.0	1.80	92.10	6,267.6	-208.9	2,189.3	2,199.2	0.15	-0.11	3.19	
6,813.0	1.20	94.70	6,360.6	-209.1	2,191.7	2,201.7	0.65	-0.65	2.80	
6,907.0	1.00	90.80	6,454.5	-209.2	2,193.5	2,203.5	0.23	-0.21	-4.15	
7,000.0	1.00	102.70	6,547.5	-209.3	2,195.1	2,205.1	0.22	0.00	12.80	
7,094.0	0.80	103.70	6,641.5	-209.7	2,196.5	2,206.5	0.21	-0.21	1.06	
7,187.0	0.30	138.00	6,734.5	-210.0	2,197.3	2,207.4	0.62	-0.54	36.88	
7,281.0	0.30	129.50	6,828.5	-210.4	2,197.7	2,207.7	0.05	0.00	-9.04	
7,375.0	0.50	141.60	6,922.5	-210.8	2,198.1	2,208.2	0.23	0.21	12.87	
7,468.0	0.30	160.50	7,015.5	-211.4	2,198.5	2,208.6	0.25	-0.22	20.32	
7,562.0	0.30	88.30	7,109.5	-211.6	2,198.8	2,209.0	0.38	0.00	-76.81	
7,655.0	0.20	100.00	7,202.5	-211.6	2,199.2	2,209.4	0.12	-0.11	12.58	
7,749.0	0.40	135.70	7,296.5	-211.9	2,199.6	2,209.8	0.28	0.21	37.98	
7,843.0	0.50	113.10	7,390.5	-212.3	2,200.2	2,210.4	0.21	0.11	-24.04	
7,907.0	0.50	113.10	7,454.5	-212.5	2,200.7	2,211.0	0.00	0.00	0.00	

Checked By: _____	Approved By: _____	Date: _____
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