

PETROLEUM DEVELOPMENT CORP Weld County CO

Well Name: Chesnut 28U-243

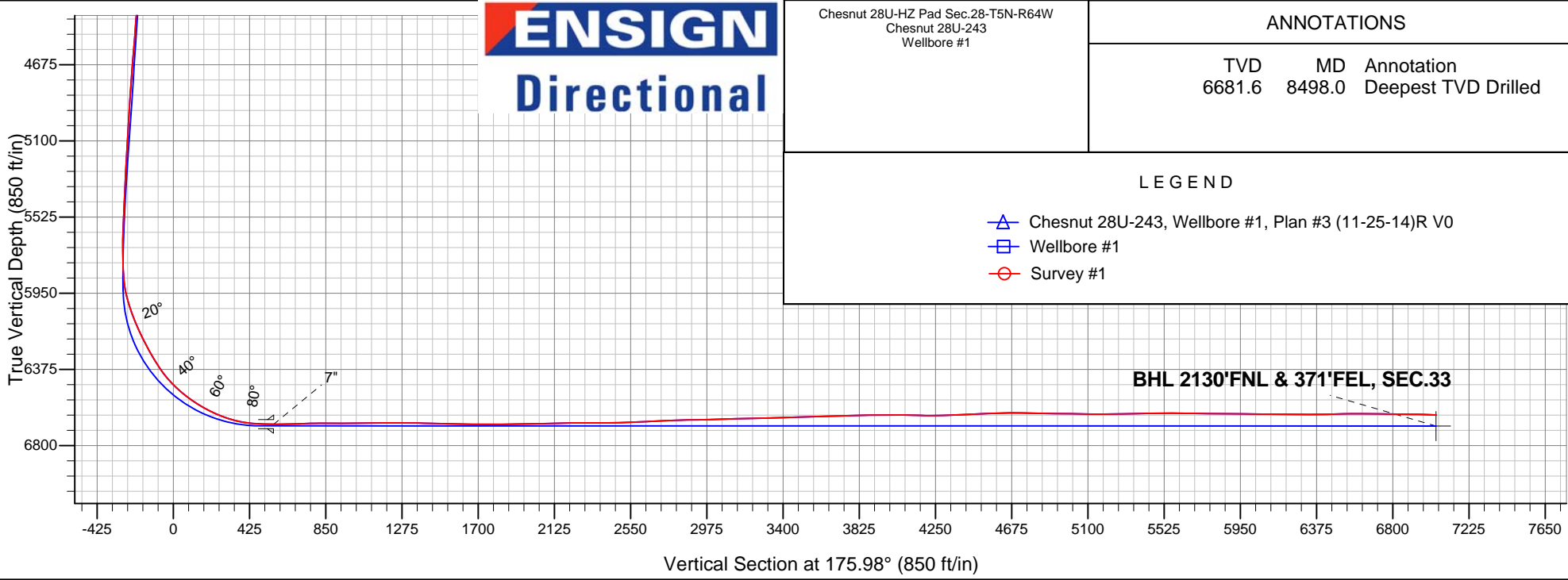
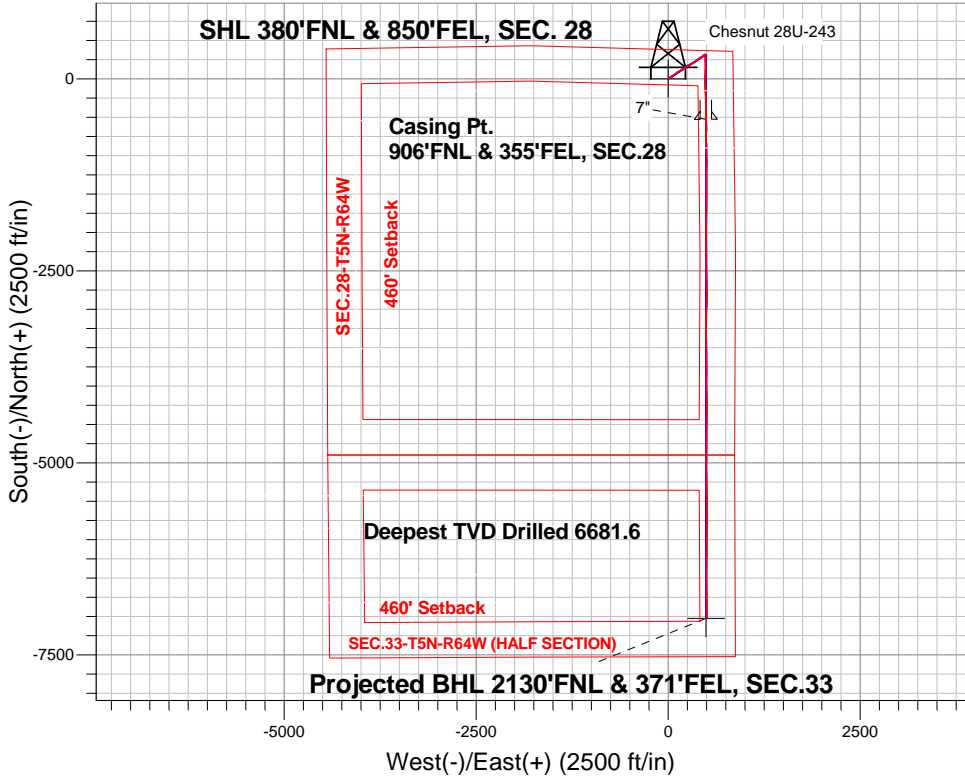
Surface Location: Chesnut 28U-HZ Pad Sec.28-T5N-R64W
North American Datum 1983 , US State Plane 1983 , Colorado Northern Zone

Ground Elevation: 4620.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1381411.34	3265145.21	40.376470	-104.548300	
Ensign Rig #121 - RKB - 13.5' WELL @ 4633ft (Ensign Rig #121 - RKB - 13')						

FINAL SURVEY

Projected Bottom Hole Location
13689'MD 6629'TVD 7023'S & 504'E of SHL
88.0 degree Incl @ 179.5 degree AZM





PETROLEUM DEVELOPMENT CORP Weld County CO

SEC.28-T5N-R64W

Chesnut 28U-HZ Pad Sec.28-T5N-R64W

Chesnut 28U-243

Wellbore #1

Survey: Survey #1

Standard Survey Report

29 December, 2014

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Chesnut 28U-243
Project:	SEC.28-T5N-R64W	TVD Reference:	WELL @ 4633ft (Ensign Rig #121 - RKB -13')
Site:	Chesnut 28U-HZ Pad Sec.28-T5N-R64W	MD Reference:	WELL @ 4633ft (Ensign Rig #121 - RKB -13')
Well:	Chesnut 28U-243	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Landmark

Project	SEC.28-T5N-R64W, 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		Chesnut 28U-HZ Pad Sec.28-T5N-R64W			
Site Position:		Northing:	1,381,414.04ft	Latitude:	40.376480
From:	Lat/Long	Easting:	3,265,056.03ft	Longitude:	-104.548620
Position Uncertainty:	0.0 ft	Slot Radius:	"	Grid Convergence:	0.61 °

Well	Chesnut 28U-243					
Well Position	+N-S	0.0 ft	Northing:	1,381,411.34 ft	Latitude:	40.376470
	+E-W	0.0 ft	Easting:	3,265,145.21 ft	Longitude:	-104.548300
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,620.0 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	11/25/2014	8.28	66.95	52,780

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	175.98	

Survey Program	Date	12/29/2014			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
165.0	13,689.0	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	
1.0	0.00	50.10	1.0	0.0	0.0	0.0	0.24	0.24	0.00	
SHL 380'FNL & 850'FEL, SEC. 28										
165.0	0.40	50.10	165.0	0.4	0.4	-0.3	0.24	0.24	0.00	
260.0	0.40	70.00	260.0	0.7	1.0	-0.6	0.15	0.00	20.95	
355.0	0.40	67.90	355.0	0.9	1.6	-0.8	0.02	0.00	-2.21	
450.0	0.40	94.80	450.0	1.0	2.3	-0.9	0.20	0.00	28.32	
545.0	0.40	110.80	545.0	0.9	2.9	-0.7	0.12	0.00	16.84	
640.0	0.60	105.50	640.0	0.6	3.7	-0.4	0.22	0.21	-5.58	
735.0	0.90	126.10	735.0	0.1	4.8	0.3	0.42	0.32	21.68	

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Well:	Chesnut 28U-243	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)
830.0	1.00	128.50	830.0	-0.9	6.0	1.3	0.11	0.11	2.53
885.0	0.80	125.40	885.0	-1.4	6.7	1.9	0.37	-0.36	-5.64
1,020.0	0.20	191.80	1,020.0	-2.2	7.4	2.7	0.55	-0.44	49.19
1,115.0	3.30	30.60	1,114.9	0.0	8.8	0.6	3.67	3.26	-169.68
1,210.0	4.10	50.50	1,209.7	4.5	12.8	-3.6	1.58	0.84	20.95
1,305.0	6.10	47.30	1,304.3	10.1	19.1	-8.7	2.13	2.11	-3.37
1,400.0	7.20	64.90	1,398.7	16.0	28.2	-14.0	2.42	1.16	18.53
1,495.0	8.20	61.90	1,492.8	21.8	39.6	-18.9	1.13	1.05	-3.16
1,590.0	8.50	51.20	1,586.8	29.4	51.1	-25.7	1.66	0.32	-11.26
1,685.0	7.90	50.30	1,680.9	37.9	61.6	-33.5	0.65	-0.63	-0.95
1,780.0	7.30	63.70	1,775.0	44.8	72.0	-39.6	1.96	-0.63	14.11
1,875.0	6.90	55.00	1,869.3	50.7	82.1	-44.8	1.21	-0.42	-9.16
1,970.0	6.70	53.10	1,963.6	57.3	91.2	-50.8	0.32	-0.21	-2.00
2,066.0	7.00	44.80	2,059.0	64.8	99.8	-57.7	1.08	0.31	-8.65
2,161.0	6.90	46.40	2,153.3	72.9	108.0	-65.1	0.23	-0.11	1.68
2,256.0	7.30	57.50	2,247.5	80.1	117.2	-71.6	1.50	0.42	11.68
2,351.0	6.20	49.40	2,341.9	86.6	126.2	-77.6	1.53	-1.16	-8.53
2,446.0	7.30	61.00	2,436.2	92.9	135.4	-83.2	1.84	1.16	12.21
2,541.0	7.00	62.40	2,530.5	98.5	145.8	-88.1	0.37	-0.32	1.47
2,636.0	7.00	61.00	2,624.8	104.0	156.0	-92.8	0.18	0.00	-1.47
2,731.0	8.30	60.80	2,718.9	110.1	167.0	-98.2	1.37	1.37	-0.21
2,826.0	7.50	55.60	2,813.0	117.0	178.1	-104.2	1.13	-0.84	-5.47
2,921.0	8.40	58.00	2,907.1	124.2	189.1	-110.6	1.01	0.95	2.53
3,019.0	6.40	51.70	3,004.3	131.4	199.5	-117.1	2.20	-2.04	-6.43
3,114.0	7.20	49.10	3,098.6	138.5	208.1	-123.6	0.90	0.84	-2.74
3,209.0	8.00	49.40	3,192.8	146.7	217.7	-131.1	0.84	0.84	0.32
3,304.0	8.60	52.40	3,286.8	155.4	228.3	-139.0	0.78	0.63	3.16
3,400.0	7.50	62.10	3,381.9	162.7	239.5	-145.5	1.82	-1.15	10.10
3,494.0	7.00	60.30	3,475.1	168.4	249.9	-150.5	0.58	-0.53	-1.91
3,590.0	8.70	57.90	3,570.2	175.1	261.2	-156.4	1.80	1.77	-2.50
3,685.0	8.00	65.90	3,664.2	181.7	273.3	-162.1	1.43	-0.74	8.42
3,780.0	7.60	64.70	3,758.3	187.1	285.0	-166.6	0.45	-0.42	-1.26
3,875.0	8.50	65.40	3,852.4	192.7	297.1	-171.4	0.95	0.95	0.74
3,971.0	8.10	64.90	3,947.4	198.5	309.6	-176.3	0.42	-0.42	-0.52
4,066.0	7.80	61.20	4,041.5	204.4	321.3	-181.4	0.62	-0.32	-3.89
4,161.0	7.30	49.10	4,135.6	211.5	331.6	-187.7	1.75	-0.53	-12.74
4,256.0	7.70	54.00	4,229.8	219.2	341.3	-194.7	0.79	0.42	5.16
4,352.0	7.40	56.60	4,325.0	226.4	351.6	-201.2	0.47	-0.31	2.71
4,447.0	8.20	56.40	4,419.1	233.5	362.4	-207.5	0.84	0.84	-0.21
4,542.0	8.60	52.60	4,513.1	241.5	373.7	-214.8	0.72	0.42	-4.00
4,637.0	8.80	53.50	4,607.0	250.2	385.2	-222.6	0.25	0.21	0.95
4,732.0	7.70	53.80	4,701.0	258.3	396.1	-229.9	1.16	-1.16	0.32
4,827.0	8.70	57.00	4,795.1	265.9	407.3	-236.7	1.16	1.05	3.37
4,923.0	8.10	55.60	4,890.0	273.7	419.0	-243.7	0.66	-0.63	-1.46
5,018.0	7.40	59.60	4,984.2	280.6	429.8	-249.8	0.93	-0.74	4.21
5,113.0	6.20	55.70	5,078.5	286.6	439.3	-255.1	1.35	-1.26	-4.11
5,209.0	6.30	60.80	5,173.9	292.1	448.2	-259.9	0.59	0.10	5.31
5,304.0	5.50	52.40	5,268.4	297.4	456.3	-264.7	1.24	-0.84	-8.84
5,399.0	4.80	46.80	5,363.0	302.9	462.8	-269.7	0.91	-0.74	-5.89
5,494.0	3.60	42.40	5,457.8	307.8	467.7	-274.3	1.31	-1.26	-4.63
5,590.0	3.20	33.10	5,553.6	312.3	471.2	-278.5	0.71	-0.42	-9.69

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Survey									
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5,685.0	3.30	58.60	5,648.5	315.9	475.0	-281.9	1.51	0.11	26.84
5,780.0	3.90	110.80	5,743.3	316.2	480.4	-281.8	3.38	0.63	54.95
5,827.0	3.30	120.60	5,790.2	314.9	483.0	-280.3	1.82	-1.28	20.85
5,875.0	3.40	154.40	5,838.1	313.0	484.8	-278.2	4.06	0.21	70.42
5,922.0	5.50	164.90	5,885.0	309.5	486.0	-274.7	4.77	4.47	22.34
5,970.0	10.50	180.20	5,932.5	302.9	486.6	-268.1	11.23	10.42	31.88
6,017.0	15.30	182.10	5,978.3	292.4	486.4	-257.6	10.25	10.21	4.04
6,066.0	18.00	180.00	6,025.2	278.4	486.1	-243.7	5.64	5.51	-4.29
6,113.0	19.80	181.10	6,069.7	263.2	486.0	-228.5	3.90	3.83	2.34
6,161.0	22.80	178.60	6,114.4	245.8	486.0	-211.1	6.53	6.25	-5.21
6,208.0	25.90	177.40	6,157.2	226.4	486.7	-191.7	6.68	6.60	-2.55
6,256.0	26.30	178.40	6,200.3	205.3	487.5	-170.6	1.24	0.83	2.08
6,303.0	26.60	179.10	6,242.4	184.4	488.0	-149.7	0.92	0.64	1.49
6,351.0	29.50	178.80	6,284.8	161.8	488.4	-127.2	6.05	6.04	-0.63
6,398.0	32.50	181.60	6,325.1	137.6	488.3	-103.0	7.08	6.38	5.96
6,446.0	34.40	183.20	6,365.1	111.2	487.1	-76.8	4.36	3.96	3.33
6,493.0	36.80	182.70	6,403.3	83.8	485.7	-49.6	5.14	5.11	-1.06
6,541.0	41.60	182.00	6,440.5	53.5	484.5	-19.5	10.04	10.00	-1.46
6,588.0	47.10	181.80	6,474.1	20.7	483.4	13.2	11.71	11.70	-0.43
6,637.0	50.80	181.10	6,506.3	-16.2	482.5	50.0	7.63	7.55	-1.43
6,684.0	54.00	179.80	6,535.0	-53.5	482.2	87.1	7.15	6.81	-2.77
6,732.0	57.20	176.20	6,562.1	-93.0	483.6	126.7	9.09	6.67	-7.50
6,779.0	60.80	176.00	6,586.3	-133.2	486.4	166.9	7.67	7.66	-0.43
6,827.0	63.40	177.20	6,608.7	-175.5	488.9	209.4	5.85	5.42	2.50
6,874.0	66.30	177.40	6,628.7	-218.0	490.9	251.9	6.18	6.17	0.43
6,922.0	70.40	177.90	6,646.4	-262.6	492.7	296.5	8.60	8.54	1.04
7,018.0	81.20	180.00	6,669.9	-355.5	494.4	389.3	11.45	11.25	2.19
7,113.0	87.50	180.00	6,679.3	-450.0	494.4	483.5	6.63	6.63	0.00
7,158.0	89.50	179.50	6,680.5	-495.0	494.6	528.4	4.58	4.44	-1.11
7,189.0	89.93	179.50	6,680.6	-526.0	494.8	559.4	1.39	1.39	0.00
7"									
7,280.0	91.20	179.50	6,679.7	-617.0	495.6	650.2	1.39	1.39	0.00
7,374.0	92.20	181.40	6,676.9	-710.9	494.9	743.8	2.28	1.06	2.02
7,469.0	89.80	179.50	6,675.3	-805.9	494.1	838.5	3.22	-2.53	-2.00
7,563.0	89.80	177.70	6,675.6	-899.9	496.4	932.4	1.91	0.00	-1.91
7,655.0	91.40	179.00	6,674.6	-991.8	499.1	1,024.3	2.24	1.74	1.41
7,747.0	89.80	179.80	6,673.7	-1,083.8	500.0	1,116.2	1.94	-1.74	0.87
7,838.0	89.40	181.20	6,674.3	-1,174.8	499.2	1,206.9	1.60	-0.44	1.54
7,932.0	90.70	180.50	6,674.2	-1,268.8	497.9	1,300.5	1.57	1.38	-0.74
8,026.0	88.30	180.00	6,675.0	-1,362.8	497.4	1,394.3	2.61	-2.55	-0.53
8,120.0	88.50	179.00	6,677.7	-1,456.7	498.3	1,488.1	1.08	0.21	-1.06
8,215.0	89.40	179.70	6,679.4	-1,551.7	499.3	1,582.9	1.20	0.95	0.74
8,309.0	89.50	181.40	6,680.3	-1,645.7	498.4	1,676.6	1.81	0.11	1.81
8,404.0	89.40	180.50	6,681.2	-1,740.7	496.9	1,771.2	0.95	-0.11	-0.95
8,498.0	90.10	181.40	6,681.6	-1,834.7	495.3	1,864.8	1.21	0.74	0.96
8,592.0	91.50	180.50	6,680.3	-1,928.6	493.7	1,958.5	1.77	1.49	-0.96
8,686.0	91.80	179.10	6,677.6	-2,022.6	494.1	2,052.2	1.52	0.32	-1.49
8,780.0	91.50	178.30	6,674.9	-2,116.5	496.2	2,146.1	0.91	-0.32	-0.85
8,874.0	90.30	180.90	6,673.4	-2,210.5	496.9	2,239.9	3.05	-1.28	2.77
8,968.0	89.90	180.20	6,673.3	-2,304.5	496.0	2,333.6	0.86	-0.43	-0.74
9,063.0	89.80	179.30	6,673.5	-2,399.5	496.4	2,428.4	0.95	-0.11	-0.95

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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)
9,158.0	93.40	180.00	6,670.9	-2,494.4	497.0	2,523.1	3.86	3.79	0.74
9,253.0	92.20	178.80	6,666.2	-2,589.3	497.9	2,617.8	1.79	-1.26	-1.26
9,348.0	92.50	177.90	6,662.3	-2,684.2	500.7	2,712.7	1.00	0.32	-0.95
9,442.0	91.80	179.50	6,658.8	-2,778.1	502.8	2,806.5	1.86	-0.74	1.70
9,536.0	90.60	180.20	6,656.8	-2,872.1	503.1	2,900.3	1.48	-1.28	0.74
9,630.0	91.90	182.30	6,654.8	-2,966.0	501.0	2,993.8	2.63	1.38	2.23
9,765.0	91.50	182.10	6,650.8	-3,100.9	495.8	3,128.0	0.33	-0.30	-0.15
9,859.0	90.90	181.10	6,648.8	-3,194.8	493.2	3,221.5	1.24	-0.64	-1.06
9,954.0	91.90	179.70	6,646.5	-3,289.8	492.5	3,316.2	1.81	1.05	-1.47
10,048.0	91.70	178.80	6,643.5	-3,383.7	493.8	3,410.0	0.98	-0.21	-0.96
10,142.0	91.50	177.90	6,640.9	-3,477.6	496.5	3,503.9	0.98	-0.21	-0.96
10,236.0	91.70	179.30	6,638.3	-3,571.6	498.8	3,597.7	1.50	0.21	1.49
10,330.0	92.00	180.20	6,635.3	-3,665.5	499.2	3,691.5	1.01	0.32	0.96
10,424.0	92.00	181.40	6,632.0	-3,759.5	497.9	3,785.1	1.28	0.00	1.28
10,518.0	90.10	180.70	6,630.2	-3,853.4	496.1	3,878.7	2.15	-2.02	-0.74
10,613.0	89.90	179.30	6,630.2	-3,948.4	496.1	3,973.5	1.49	-0.21	-1.47
10,708.0	89.70	178.60	6,630.6	-4,043.4	497.9	4,068.3	0.77	-0.21	-0.74
10,803.0	88.90	178.10	6,631.7	-4,138.4	500.6	4,163.3	0.99	-0.84	-0.53
10,898.0	90.80	179.10	6,632.0	-4,233.3	502.9	4,258.2	2.26	2.00	1.05
10,992.0	92.20	181.20	6,629.5	-4,327.3	502.7	4,351.9	2.68	1.49	2.23
11,086.0	92.20	180.20	6,625.9	-4,421.2	501.6	4,445.5	1.06	0.00	-1.06
11,180.0	93.40	180.20	6,621.3	-4,515.1	501.2	4,539.1	1.28	1.28	0.00
11,275.0	91.00	181.20	6,617.7	-4,610.0	500.1	4,633.7	2.74	-2.53	1.05
11,370.0	89.00	181.80	6,617.7	-4,705.0	497.6	4,728.3	2.20	-2.11	0.63
11,465.0	88.70	180.40	6,619.6	-4,799.9	495.8	4,822.9	1.51	-0.32	-1.47
11,560.0	89.50	180.40	6,621.1	-4,894.9	495.1	4,917.6	0.84	0.84	0.00
11,654.0	88.80	179.00	6,622.5	-4,988.9	495.6	5,011.4	1.67	-0.74	-1.49
11,748.0	89.80	179.10	6,623.6	-5,082.9	497.1	5,105.2	1.07	1.06	0.11
11,843.0	89.60	178.30	6,624.1	-5,177.8	499.3	5,200.1	0.87	-0.21	-0.84
11,937.0	91.50	179.80	6,623.2	-5,271.8	500.9	5,294.0	2.58	2.02	1.60
12,031.0	91.40	178.60	6,620.8	-5,365.8	502.2	5,387.8	1.28	-0.11	-1.28
12,125.0	89.80	179.50	6,619.9	-5,459.8	503.7	5,481.6	1.95	-1.70	0.96
12,220.0	90.70	179.50	6,619.4	-5,554.8	504.6	5,576.5	0.95	0.95	0.00
12,314.0	88.80	180.20	6,619.9	-5,648.7	504.8	5,670.2	2.15	-2.02	0.74
12,409.0	89.40	180.20	6,621.3	-5,743.7	504.5	5,765.0	0.63	0.63	0.00
12,504.0	89.10	180.00	6,622.6	-5,838.7	504.3	5,859.7	0.38	-0.32	-0.21
12,599.0	90.00	181.10	6,623.3	-5,933.7	503.4	5,954.4	1.50	0.95	1.16
12,693.0	89.50	180.20	6,623.7	-6,027.7	502.3	6,048.1	1.10	-0.53	-0.96
12,789.0	89.40	180.20	6,624.7	-6,123.7	502.0	6,143.8	0.10	-0.10	0.00
12,884.0	89.30	179.50	6,625.7	-6,218.7	502.2	6,238.6	0.74	-0.11	-0.74
12,979.0	90.20	182.00	6,626.2	-6,313.7	501.0	6,333.3	2.80	0.95	2.63
13,074.0	90.70	181.20	6,625.4	-6,408.6	498.3	6,427.8	0.99	0.53	-0.84
13,169.0	91.50	180.20	6,623.6	-6,503.6	497.2	6,522.5	1.35	0.84	-1.05
13,265.0	89.90	179.50	6,622.4	-6,599.6	497.4	6,618.2	1.82	-1.67	-0.73
13,360.0	89.30	178.60	6,623.1	-6,694.6	499.0	6,713.1	1.14	-0.63	-0.95
13,455.0	89.30	178.10	6,624.2	-6,789.5	501.7	6,808.0	0.53	0.00	-0.53
13,550.0	89.30	179.80	6,625.4	-6,884.5	503.5	6,902.9	1.79	0.00	1.79
13,634.0	88.00	179.50	6,627.4	-6,968.5	504.0	6,986.7	1.59	-1.55	-0.36
13,689.0	88.00	179.50	6,629.3	-7,023.4	504.5	7,041.5	0.00	0.00	0.00

BHL 2130°FNL & 382°FEL, SEC.33

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Chesnut 28U-243
Project:	SEC.28-T5N-R64W	TVD Reference:	WELL @ 4633ft (Ensign Rig #121 - RKB -13')
Site:	Chesnut 28U-HZ Pad Sec.28-T5N-R64W	MD Reference:	WELL @ 4633ft (Ensign Rig #121 - RKB -13')
Well:	Chesnut 28U-243	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Landmark

Casing Points					
	Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
	7,189.0	6,680.6	7"	7	7-1/2

Checked By: _____	Approved By: _____	Date: _____
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