

PETROLEUM DEVELOPMENT CORP Weld County CO

Well Name: **Harvesters Resources 15R-323**

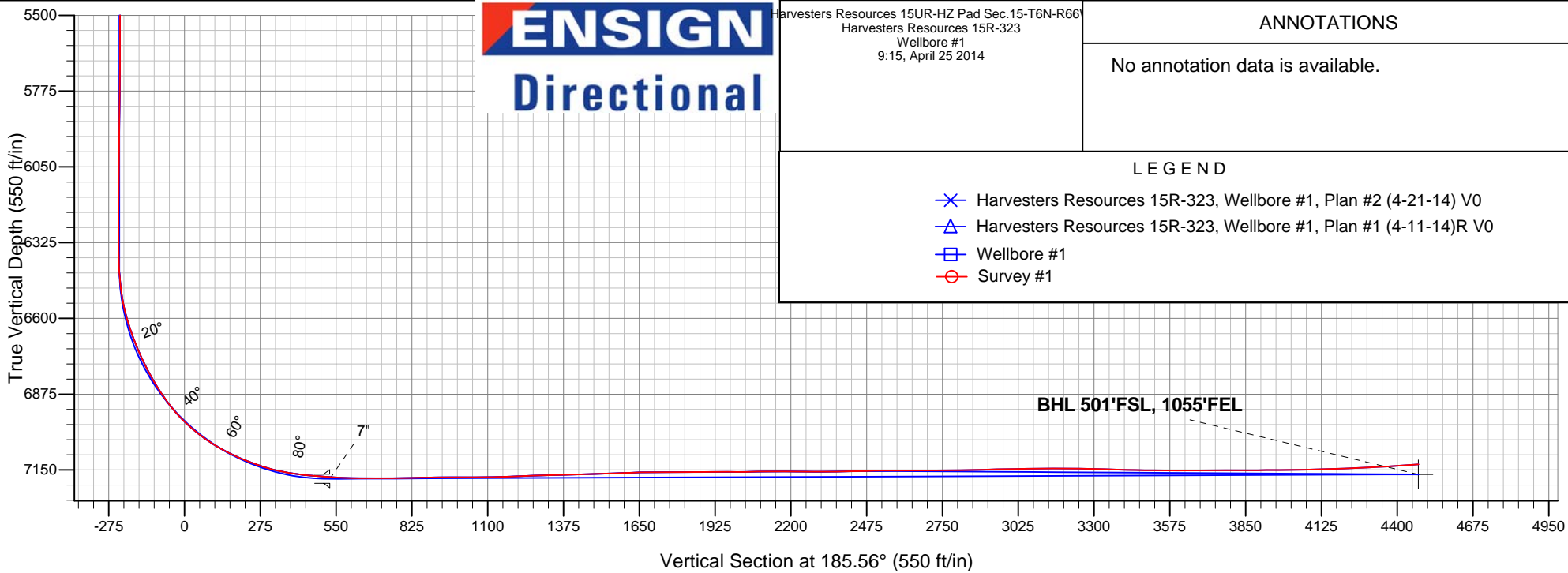
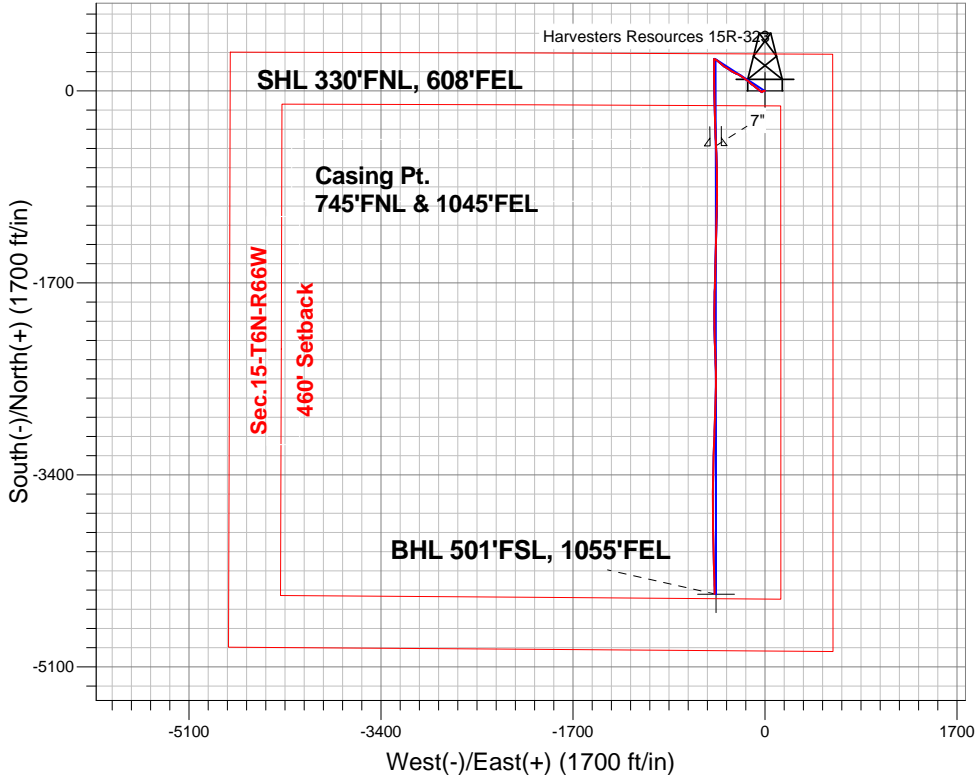
Surface Location: Harvesters Resources 15UR-HZ Pad Sec.15-T6N-R66W
North American Datum 1983 , US State Plane 1983 , Colorado Northern Zone

Ground Elevation: 4815.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1423919.71	3206833.67	40.494680	-104.756310	
RKB - 15' WELL @ 4830.0ft (RKB - 15')						

FINAL SURVEY

Projected Bottom Hole Location
11619'MD 7130'TVD 4455'S & 445'W of SHL
94.0 degree Incl @ 178.8 degree AZM



Harvesters Resources 15UR-HZ Pad Sec.15-T6N-R66W Harvesters Resources 15R-323 Wellbore #1 9:15, April 25 2014	ANNOTATIONS
	No annotation data is available.
LEGEND	
✕ Harvesters Resources 15R-323, Wellbore #1, Plan #2 (4-21-14) V0	
△ Harvesters Resources 15R-323, Wellbore #1, Plan #1 (4-11-14)R V0	
□ Wellbore #1	
○ Survey #1	



PETROLEUM DEVELOPMENT CORP Weld County CO

SEC.15-T6N-R66W

Harvesters Resources 15UR-HZ Pad Sec.15-T6N-R66W

Harvesters Resources 15R-323

Wellbore #1

Survey: Survey #1

Standard Survey Report

25 April, 2014

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Harvesters Resources 15R-323
Project:	SEC.15-T6N-R66W	TVD Reference:	WELL @ 4830.0ft (RKB - 15')
Site:	Harvesters Resources 15UR-HZ Pad Sec.15-T6N-R66W	MD Reference:	WELL @ 4830.0ft (RKB - 15')
Well:	Harvesters Resources 15R-323	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Landmark

Project	SEC.15-T6N-R66W, Weld County, CO		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Northern Zone		Using geodetic scale factor

Site	Harvesters Resources 15UR-HZ Pad Sec.15-T6N-R66W				
Site Position:		Northing:	1,423,919.73 ft	Latitude:	40.494680
From:	Lat/Long	Easting:	3,206,833.67 ft	Longitude:	-104.756310
Position Uncertainty:	0.0 ft	Slot Radius:	"	Grid Convergence:	0.48 °

Well	Harvesters Resources 15R-323					
Well Position	+N-S	0.0 ft	Northing:	1,423,919.71 ft	Latitude:	40.494680
	+E-W	0.0 ft	Easting:	3,206,833.67 ft	Longitude:	-104.756310
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,815.0 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	4/21/2014	8.48	67.03	52,882

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	185.56	

Survey Program	Date 4/25/2014				
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
146.0	11,619.0	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	0.02	267.20	1.0	0.0	0.0	0.0	1.78	1.78	0.00
SHL 330°FNL, 608°FEL									
146.0	2.60	267.20	145.9	-0.2	-3.3	0.5	1.78	1.78	0.00
238.0	2.20	279.50	237.9	0.0	-7.1	0.7	0.71	-0.43	13.37
328.0	1.30	267.30	327.8	0.3	-9.9	0.7	1.08	-1.00	-13.56
420.0	1.20	254.10	419.8	0.0	-11.8	1.2	0.33	-0.11	-14.35
511.0	0.50	245.10	510.8	-0.5	-13.1	1.7	0.78	-0.77	-9.89
602.0	0.90	219.50	601.8	-1.2	-13.9	2.5	0.55	0.44	-28.13
695.0	1.50	250.80	694.8	-2.2	-15.5	3.7	0.93	0.65	33.66
787.0	2.00	223.10	786.7	-3.7	-17.8	5.4	1.05	0.54	-30.11

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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)
886.0	1.40	230.90	885.7	-5.8	-19.9	7.7	0.65	-0.61	7.88
978.0	1.50	231.40	977.7	-7.2	-21.7	9.3	0.11	0.11	0.54
1,070.0	1.60	224.90	1,069.6	-8.9	-23.5	11.1	0.22	0.11	-7.07
1,162.0	2.00	270.70	1,161.6	-9.8	-26.1	12.2	1.57	0.43	49.78
1,260.0	2.20	286.50	1,259.5	-9.2	-29.6	12.0	0.62	0.20	16.12
1,355.0	3.30	303.60	1,354.4	-7.2	-33.6	10.4	1.43	1.16	18.00
1,450.0	4.80	308.50	1,449.2	-3.2	-39.0	7.0	1.62	1.58	5.16
1,545.0	6.60	316.00	1,543.7	3.2	-45.9	1.3	2.05	1.89	7.89
1,640.0	7.10	305.10	1,638.0	10.5	-54.5	-5.2	1.46	0.53	-11.47
1,735.0	7.70	306.50	1,732.2	17.7	-64.4	-11.4	0.66	0.63	1.47
1,830.0	7.60	309.70	1,826.4	25.5	-74.4	-18.1	0.46	-0.11	3.37
1,926.0	8.60	309.60	1,921.4	34.1	-84.8	-25.7	1.04	1.04	-0.10
2,020.0	7.70	307.30	2,014.5	42.4	-95.2	-33.0	1.02	-0.96	-2.45
2,116.0	8.00	310.20	2,109.6	50.6	-105.4	-40.2	0.52	0.31	3.02
2,211.0	7.00	306.30	2,203.8	58.3	-115.1	-46.9	1.18	-1.05	-4.11
2,306.0	6.90	309.40	2,298.1	65.4	-124.2	-53.0	0.41	-0.11	3.26
2,401.0	7.40	311.20	2,392.3	73.0	-133.2	-59.8	0.58	0.53	1.89
2,496.0	6.30	313.20	2,486.6	80.6	-141.6	-66.5	1.18	-1.16	2.11
2,591.0	6.50	312.10	2,581.1	87.8	-149.4	-72.9	0.25	0.21	-1.16
2,686.0	6.30	311.30	2,675.5	94.8	-157.3	-79.1	0.23	-0.21	-0.84
2,781.0	6.20	303.20	2,769.9	101.1	-165.5	-84.6	0.93	-0.11	-8.53
2,876.0	6.90	302.90	2,864.3	107.0	-174.6	-89.6	0.74	0.74	-0.32
2,971.0	6.80	300.30	2,958.6	112.9	-184.3	-94.5	0.34	-0.11	-2.74
3,065.0	6.10	304.00	3,052.0	118.5	-193.2	-99.2	0.87	-0.74	3.94
3,160.0	6.40	304.70	3,146.4	124.4	-201.7	-104.2	0.33	0.32	0.74
3,255.0	6.80	305.20	3,240.8	130.6	-210.7	-109.6	0.43	0.42	0.53
3,349.0	6.50	303.20	3,334.2	136.7	-219.7	-114.8	0.40	-0.32	-2.13
3,444.0	7.10	300.00	3,428.5	142.6	-229.3	-119.7	0.75	0.63	-3.37
3,539.0	6.20	297.60	3,522.9	147.9	-238.9	-124.1	0.99	-0.95	-2.53
3,634.0	6.10	291.20	3,617.3	152.1	-248.2	-127.4	0.73	-0.11	-6.74
3,729.0	5.80	288.80	3,711.8	155.5	-257.4	-129.8	0.41	-0.32	-2.53
3,824.0	6.90	298.90	3,806.2	159.8	-266.9	-133.2	1.65	1.16	10.63
3,918.0	7.00	296.30	3,899.5	165.1	-277.0	-137.4	0.35	0.11	-2.77
4,013.0	8.00	298.50	3,993.7	170.8	-288.0	-142.1	1.09	1.05	2.32
4,108.0	8.20	303.20	4,087.8	177.7	-299.5	-147.8	0.73	0.21	4.95
4,204.0	7.10	304.70	4,182.9	184.8	-310.1	-153.9	1.16	-1.15	1.56
4,299.0	7.00	305.80	4,277.2	191.5	-319.6	-159.6	0.18	-0.11	1.16
4,394.0	7.00	300.70	4,371.5	197.9	-329.3	-165.0	0.65	0.00	-5.37
4,489.0	7.10	302.20	4,465.8	203.9	-339.2	-170.1	0.22	0.11	1.58
4,584.0	8.30	300.40	4,559.9	210.5	-350.1	-175.6	1.29	1.26	-1.89
4,679.0	8.20	302.90	4,653.9	217.7	-361.7	-181.6	0.39	-0.11	2.63
4,774.0	8.10	312.30	4,748.0	225.9	-372.4	-188.7	1.41	-0.11	9.89
4,869.0	8.20	313.20	4,842.0	235.0	-382.3	-196.8	0.17	0.11	0.95
4,964.0	7.70	312.70	4,936.1	244.0	-391.9	-204.8	0.53	-0.53	-0.53
5,059.0	8.30	308.70	5,030.2	252.6	-401.9	-212.4	0.86	0.63	-4.21
5,154.0	7.70	307.90	5,124.3	260.8	-412.3	-219.6	0.64	-0.63	-0.84
5,249.0	5.80	304.90	5,218.6	267.4	-421.2	-225.3	2.03	-2.00	-3.16
5,344.0	4.50	302.90	5,313.2	272.2	-428.3	-229.4	1.38	-1.37	-2.11
5,439.0	3.60	301.30	5,408.0	275.8	-434.0	-232.4	0.95	-0.95	-1.68
5,533.0	2.50	284.10	5,501.8	277.8	-438.5	-234.0	1.51	-1.17	-18.30
5,628.0	1.60	266.60	5,596.8	278.2	-441.8	-234.1	1.14	-0.95	-18.42
5,723.0	1.00	304.50	5,691.8	278.6	-443.8	-234.3	1.07	-0.63	39.89
5,817.0	1.10	323.20	5,785.7	279.8	-445.0	-235.3	0.38	0.11	19.89

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Survey									
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5,912.0	0.80	335.10	5,880.7	281.1	-445.9	-236.6	0.38	-0.32	12.53
6,007.0	0.60	330.90	5,975.7	282.2	-446.4	-237.6	0.22	-0.21	-4.42
6,102.0	0.60	321.60	6,070.7	283.0	-446.9	-238.3	0.10	0.00	-9.79
6,197.0	0.70	299.00	6,165.7	283.7	-447.8	-238.9	0.29	0.11	-23.79
6,292.0	0.40	295.80	6,260.7	284.1	-448.6	-239.3	0.32	-0.32	-3.37
6,323.0	0.70	302.60	6,291.7	284.2	-448.8	-239.4	0.99	0.97	21.94
6,355.0	0.40	278.80	6,323.7	284.4	-449.1	-239.5	1.16	-0.94	-74.38
6,387.0	0.60	208.60	6,355.7	284.2	-449.3	-239.3	1.87	0.63	-219.38
6,419.0	2.10	203.90	6,387.7	283.6	-449.6	-238.6	4.70	4.69	-14.69
6,450.0	3.30	188.40	6,418.7	282.1	-450.0	-237.2	4.50	3.87	-50.00
6,482.0	4.80	186.20	6,450.6	279.9	-450.2	-234.9	4.71	4.69	-6.88
6,514.0	6.20	186.50	6,482.4	276.9	-450.6	-231.9	4.38	4.38	0.94
6,545.0	8.50	182.40	6,513.2	272.9	-450.9	-227.9	7.61	7.42	-13.23
6,577.0	11.20	179.20	6,544.7	267.4	-450.9	-222.5	8.61	8.44	-10.00
6,608.0	14.00	178.20	6,574.9	260.7	-450.8	-215.8	9.06	9.03	-3.23
6,640.0	16.50	179.80	6,605.8	252.3	-450.6	-207.4	7.92	7.81	5.00
6,672.0	18.60	180.60	6,636.3	242.6	-450.7	-197.8	6.61	6.56	2.50
6,703.0	20.30	182.00	6,665.6	232.3	-450.9	-187.5	5.69	5.48	4.52
6,735.0	21.80	180.80	6,695.4	220.8	-451.2	-176.0	4.88	4.69	-3.75
6,766.0	23.60	179.80	6,724.0	208.8	-451.2	-164.1	5.94	5.81	-3.23
6,798.0	25.50	179.30	6,753.1	195.5	-451.1	-150.9	5.97	5.94	-1.56
6,830.0	27.30	179.60	6,781.8	181.3	-451.0	-136.7	5.64	5.63	0.94
6,861.0	29.10	179.50	6,809.1	166.7	-450.9	-122.2	5.81	5.81	-0.32
6,893.0	31.00	179.40	6,836.8	150.7	-450.7	-106.2	5.94	5.94	-0.31
6,924.0	33.10	179.30	6,863.1	134.2	-450.5	-89.9	6.78	6.77	-0.32
6,956.0	35.30	178.80	6,889.5	116.2	-450.2	-72.0	6.93	6.88	-1.56
6,988.0	38.10	178.70	6,915.2	97.1	-449.8	-53.0	8.75	8.75	-0.31
7,019.0	41.20	178.60	6,939.1	77.3	-449.4	-33.4	10.00	10.00	-0.32
7,051.0	44.50	178.60	6,962.5	55.6	-448.8	-11.8	10.31	10.31	0.00
7,083.0	47.30	178.40	6,984.8	32.6	-448.2	11.0	8.76	8.75	-0.63
7,115.0	50.20	179.00	7,005.9	8.6	-447.7	34.9	9.17	9.06	1.88
7,147.0	53.10	179.20	7,025.7	-16.5	-447.3	59.8	9.08	9.06	0.63
7,178.0	56.30	179.80	7,043.6	-41.8	-447.1	85.0	10.44	10.32	1.94
7,210.0	59.00	179.10	7,060.8	-68.9	-446.8	111.8	8.64	8.44	-2.19
7,242.0	61.50	178.40	7,076.6	-96.6	-446.2	139.4	8.04	7.81	-2.19
7,273.0	64.00	178.00	7,090.8	-124.2	-445.3	166.8	8.15	8.06	-1.29
7,305.0	66.60	178.40	7,104.2	-153.2	-444.4	195.6	8.20	8.13	1.25
7,337.0	68.50	178.80	7,116.4	-182.8	-443.7	224.9	6.05	5.94	1.25
7,368.0	70.20	178.80	7,127.4	-211.8	-443.1	253.8	5.48	5.48	0.00
7,400.0	72.40	179.00	7,137.6	-242.1	-442.5	283.9	6.90	6.88	0.63
7,431.0	75.20	179.00	7,146.3	-271.9	-442.0	313.4	9.03	9.03	0.00
7,463.0	77.80	178.50	7,153.7	-303.0	-441.3	344.3	8.27	8.13	-1.56
7,495.0	80.30	177.80	7,159.8	-334.4	-440.3	375.5	8.10	7.81	-2.19
7,576.0	85.20	177.40	7,170.0	-414.6	-436.9	455.0	6.07	6.05	-0.49
7,606.0	85.30	177.30	7,172.5	-444.5	-435.6	484.6	0.47	0.33	-0.33
7,636.0	85.90	177.30	7,174.8	-474.4	-434.1	514.2	2.00	2.00	0.00
7,667.0	86.60	177.40	7,176.8	-505.3	-432.7	544.8	2.28	2.26	0.32
7,697.0	87.60	177.70	7,178.4	-535.2	-431.4	574.5	3.48	3.33	1.00
7,727.0	88.50	177.70	7,179.4	-565.2	-430.2	604.2	3.00	3.00	0.00
7,758.0	89.40	177.70	7,180.0	-596.1	-429.0	634.9	2.90	2.90	0.00
7,789.0	90.00	177.80	7,180.1	-627.1	-427.8	665.6	1.96	1.94	0.32
7,819.0	90.20	177.90	7,180.1	-657.1	-426.6	695.3	0.75	0.67	0.33

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7,849.0	90.40	178.40	7,179.9	-687.1	-425.7	725.1	1.80	0.67	1.67
7,880.0	90.20	178.70	7,179.7	-718.1	-424.9	755.9	1.16	-0.65	0.97
7,910.0	90.80	179.90	7,179.5	-748.1	-424.5	785.7	4.47	2.00	4.00
7,941.0	91.10	180.40	7,179.0	-779.0	-424.6	816.5	1.88	0.97	1.61
7,971.0	91.40	180.40	7,178.3	-809.0	-424.8	846.4	1.00	1.00	0.00
8,002.0	91.30	180.20	7,177.6	-840.0	-425.0	877.3	0.72	-0.32	-0.65
8,033.0	91.00	180.60	7,177.0	-871.0	-425.2	908.1	1.61	-0.97	1.29
8,063.0	91.20	180.30	7,176.4	-901.0	-425.4	938.0	1.20	0.67	-1.00
8,093.0	90.40	179.90	7,176.0	-931.0	-425.5	967.9	2.98	-2.67	-1.33
8,123.0	89.10	179.70	7,176.1	-961.0	-425.4	997.7	4.38	-4.33	-0.67
8,153.0	89.70	180.00	7,176.4	-991.0	-425.3	1,027.6	2.24	2.00	1.00
8,184.0	90.30	180.40	7,176.4	-1,022.0	-425.4	1,058.4	2.33	1.94	1.29
8,215.0	91.10	180.90	7,176.0	-1,053.0	-425.8	1,089.3	3.04	2.58	1.61
8,245.0	91.10	180.90	7,175.5	-1,083.0	-426.2	1,119.2	0.00	0.00	0.00
8,275.0	91.50	180.80	7,174.8	-1,113.0	-426.7	1,149.1	1.37	1.33	-0.33
8,307.0	92.00	181.60	7,173.8	-1,145.0	-427.3	1,181.0	2.95	1.56	2.50
8,338.0	92.30	181.20	7,172.6	-1,175.9	-428.1	1,211.9	1.61	0.97	-1.29
8,370.0	92.20	181.50	7,171.4	-1,207.9	-428.9	1,243.8	0.99	-0.31	0.94
8,402.0	92.00	181.70	7,170.2	-1,239.9	-429.7	1,275.7	0.88	-0.63	0.63
8,434.0	92.20	181.80	7,169.0	-1,271.8	-430.7	1,307.6	0.70	0.63	0.31
8,465.0	91.80	181.70	7,168.0	-1,302.8	-431.7	1,338.5	1.33	-1.29	-0.32
8,497.0	90.90	181.90	7,167.2	-1,334.8	-432.7	1,370.4	2.88	-2.81	0.63
8,529.0	91.50	181.80	7,166.5	-1,366.7	-433.7	1,402.4	1.90	1.88	-0.31
8,560.0	91.20	182.00	7,165.8	-1,397.7	-434.7	1,433.3	1.16	-0.97	0.65
8,592.0	91.60	181.80	7,165.0	-1,429.7	-435.8	1,465.2	1.40	1.25	-0.63
8,624.0	92.00	181.80	7,164.0	-1,461.7	-436.8	1,497.1	1.25	1.25	0.00
8,655.0	92.20	181.70	7,162.9	-1,492.6	-437.7	1,528.0	0.72	0.65	-0.32
8,687.0	92.00	181.50	7,161.7	-1,524.6	-438.6	1,559.9	0.88	-0.63	-0.63
8,719.0	92.00	181.30	7,160.6	-1,556.6	-439.4	1,591.8	0.62	0.00	-0.63
8,751.0	91.80	181.30	7,159.5	-1,588.5	-440.1	1,623.7	0.63	-0.63	0.00
8,782.0	91.30	181.60	7,158.7	-1,619.5	-440.9	1,654.6	1.88	-1.61	0.97
8,814.0	90.20	181.20	7,158.3	-1,651.5	-441.7	1,686.5	3.66	-3.44	-1.25
8,846.0	89.90	181.10	7,158.2	-1,683.5	-442.4	1,718.4	0.99	-0.94	-0.31
8,877.0	90.60	181.60	7,158.1	-1,714.5	-443.1	1,749.4	2.77	2.26	1.61
8,909.0	90.90	181.20	7,157.7	-1,746.5	-443.9	1,781.3	1.56	0.94	-1.25
8,941.0	90.50	180.80	7,157.3	-1,778.5	-444.4	1,813.2	1.77	-1.25	-1.25
8,972.0	90.00	180.70	7,157.2	-1,809.5	-444.8	1,844.1	1.64	-1.61	-0.32
9,004.0	89.90	180.70	7,157.2	-1,841.5	-445.2	1,875.9	0.31	-0.31	0.00
9,036.0	90.50	181.10	7,157.1	-1,873.5	-445.7	1,907.8	2.25	1.88	1.25
9,067.0	90.80	181.30	7,156.7	-1,904.4	-446.4	1,938.7	1.16	0.97	0.65
9,099.0	89.90	180.60	7,156.5	-1,936.4	-446.9	1,970.6	3.56	-2.81	-2.19
9,131.0	89.60	180.10	7,156.7	-1,968.4	-447.1	2,002.5	1.82	-0.94	-1.56
9,162.0	90.10	180.30	7,156.8	-1,999.4	-447.2	2,033.4	1.74	1.61	0.65
9,194.0	90.80	180.20	7,156.5	-2,031.4	-447.3	2,065.2	2.21	2.19	-0.31
9,225.0	91.40	180.60	7,155.9	-2,062.4	-447.6	2,096.1	2.33	1.94	1.29
9,257.0	90.70	180.00	7,155.3	-2,094.4	-447.7	2,128.0	2.88	-2.19	-1.88
9,288.0	90.00	178.70	7,155.1	-2,125.4	-447.4	2,158.8	4.76	-2.26	-4.19
9,320.0	89.50	178.00	7,155.3	-2,157.4	-446.5	2,190.5	2.69	-1.56	-2.19
9,351.0	89.30	177.50	7,155.6	-2,188.4	-445.2	2,221.2	1.74	-0.65	-1.61
9,383.0	89.40	177.40	7,156.0	-2,220.4	-443.8	2,252.9	0.44	0.31	-0.31
9,415.0	89.90	177.20	7,156.2	-2,252.3	-442.3	2,284.6	1.68	1.56	-0.63
9,447.0	90.20	177.10	7,156.1	-2,284.3	-440.7	2,316.2	0.99	0.94	-0.31
9,478.0	90.40	177.40	7,156.0	-2,315.2	-439.2	2,346.9	1.16	0.65	0.97

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Harvesters Resources 15R-323
Project:	SEC.15-T6N-R66W	TVD Reference:	WELL @ 4830.0ft (RKB - 15')
Site:	Harvesters Resources 15UR-HZ Pad Sec.15-T6N-R66W	MD Reference:	WELL @ 4830.0ft (RKB - 15')
Well:	Harvesters Resources 15R-323	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)
9,510.0	91.00	177.70	7,155.6	-2,347.2	-437.9	2,378.6	2.10	1.88	0.94
9,542.0	91.40	178.20	7,154.9	-2,379.2	-436.7	2,410.3	2.00	1.25	1.56
9,574.0	91.50	178.30	7,154.1	-2,411.2	-435.7	2,442.0	0.44	0.31	0.31
9,605.0	91.40	178.50	7,153.3	-2,442.1	-434.9	2,472.8	0.72	-0.32	0.65
9,637.0	91.00	179.20	7,152.6	-2,474.1	-434.2	2,504.6	2.52	-1.25	2.19
9,669.0	90.80	179.80	7,152.1	-2,506.1	-434.0	2,536.4	1.98	-0.63	1.88
9,700.0	90.20	180.00	7,151.9	-2,537.1	-433.9	2,567.2	2.04	-1.94	0.65
9,732.0	90.10	180.30	7,151.8	-2,569.1	-434.0	2,599.1	0.99	-0.31	0.94
9,763.0	90.20	180.30	7,151.7	-2,600.1	-434.1	2,630.0	0.32	0.32	0.00
9,795.0	90.40	180.90	7,151.5	-2,632.1	-434.5	2,661.8	1.98	0.63	1.88
9,827.0	90.20	181.40	7,151.4	-2,664.1	-435.1	2,693.7	1.68	-0.63	1.56
9,859.0	90.20	181.30	7,151.3	-2,696.1	-435.9	2,725.6	0.31	0.00	-0.31
9,890.0	90.10	181.50	7,151.2	-2,727.1	-436.6	2,756.6	0.72	-0.32	0.65
9,922.0	90.40	181.40	7,151.0	-2,759.1	-437.4	2,788.5	0.99	0.94	-0.31
9,954.0	90.80	181.60	7,150.7	-2,791.1	-438.3	2,820.4	1.40	1.25	0.63
9,985.0	91.40	182.00	7,150.1	-2,822.0	-439.3	2,851.3	2.33	1.94	1.29
10,017.0	91.90	181.70	7,149.2	-2,854.0	-440.3	2,883.2	1.82	1.56	-0.94
10,049.0	91.60	181.80	7,148.2	-2,886.0	-441.3	2,915.2	0.99	-0.94	0.31
10,080.0	91.40	182.30	7,147.4	-2,916.9	-442.4	2,946.1	1.74	-0.65	1.61
10,112.0	90.80	182.40	7,146.8	-2,948.9	-443.7	2,978.0	1.90	-1.88	0.31
10,143.0	90.70	181.90	7,146.4	-2,979.9	-444.8	3,009.0	1.64	-0.32	-1.61
10,175.0	90.70	181.90	7,146.0	-3,011.9	-445.9	3,040.9	0.00	0.00	0.00
10,206.0	91.00	182.00	7,145.5	-3,042.8	-447.0	3,071.8	1.02	0.97	0.32
10,238.0	91.00	182.30	7,145.0	-3,074.8	-448.2	3,103.8	0.94	0.00	0.94
10,270.0	90.40	182.40	7,144.6	-3,106.8	-449.5	3,135.7	1.90	-1.88	0.31
10,301.0	89.70	182.50	7,144.5	-3,137.8	-450.8	3,166.7	2.28	-2.26	0.32
10,333.0	89.50	182.50	7,144.8	-3,169.7	-452.2	3,198.6	0.63	-0.63	0.00
10,365.0	89.50	182.30	7,145.0	-3,201.7	-453.5	3,230.6	0.62	0.00	-0.63
10,397.0	89.10	182.20	7,145.4	-3,233.7	-454.8	3,262.5	1.29	-1.25	-0.31
10,428.0	88.70	182.00	7,146.0	-3,264.6	-455.9	3,293.5	1.44	-1.29	-0.65
10,460.0	88.40	181.70	7,146.8	-3,296.6	-457.0	3,325.4	1.33	-0.94	-0.94
10,491.0	88.30	181.60	7,147.7	-3,327.6	-457.9	3,356.3	0.46	-0.32	-0.32
10,523.0	88.40	180.90	7,148.7	-3,359.6	-458.6	3,388.2	2.21	0.31	-2.19
10,555.0	88.70	180.60	7,149.5	-3,391.6	-459.0	3,420.1	1.33	0.94	-0.94
10,587.0	88.80	180.60	7,150.2	-3,423.6	-459.3	3,452.0	0.31	0.31	0.00
10,618.0	89.20	180.40	7,150.7	-3,454.5	-459.6	3,482.8	1.44	1.29	-0.65
10,650.0	89.40	180.40	7,151.1	-3,486.5	-459.8	3,514.7	0.63	0.63	0.00
10,682.0	89.70	180.50	7,151.3	-3,518.5	-460.1	3,546.6	0.99	0.94	0.31
10,714.0	89.80	180.50	7,151.5	-3,550.5	-460.3	3,578.4	0.31	0.31	0.00
10,745.0	89.80	180.50	7,151.6	-3,581.5	-460.6	3,609.3	0.00	0.00	0.00
10,777.0	90.00	180.20	7,151.6	-3,613.5	-460.8	3,641.2	1.13	0.63	-0.94
10,809.0	90.20	180.30	7,151.6	-3,645.5	-460.9	3,673.1	0.70	0.63	0.31
10,840.0	90.40	180.20	7,151.4	-3,676.5	-461.1	3,703.9	0.72	0.65	-0.32
10,872.0	90.60	180.30	7,151.2	-3,708.5	-461.2	3,735.8	0.70	0.63	0.31
10,904.0	90.60	180.10	7,150.8	-3,740.5	-461.3	3,767.6	0.62	0.00	-0.63
10,935.0	90.20	179.60	7,150.6	-3,771.5	-461.2	3,798.5	2.07	-1.29	-1.61
10,967.0	90.00	179.20	7,150.5	-3,803.5	-460.9	3,830.3	1.40	-0.63	-1.25
10,999.0	89.90	178.90	7,150.6	-3,835.5	-460.4	3,862.1	0.99	-0.31	-0.94
11,031.0	90.00	178.90	7,150.6	-3,867.5	-459.8	3,893.9	0.31	0.31	0.00
11,062.0	90.30	178.90	7,150.5	-3,898.5	-459.2	3,924.7	0.97	0.97	0.00
11,094.0	90.40	178.90	7,150.3	-3,930.5	-458.6	3,956.4	0.31	0.31	0.00
11,126.0	90.70	178.70	7,150.0	-3,962.5	-457.9	3,988.2	1.13	0.94	-0.63

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Harvesters Resources 15R-323
Project:	SEC.15-T6N-R66W	TVD Reference:	WELL @ 4830.0ft (RKB - 15')
Site:	Harvesters Resources 15UR-HZ Pad Sec.15-T6N-R66W	MD Reference:	WELL @ 4830.0ft (RKB - 15')
Well:	Harvesters Resources 15R-323	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)
11,157.0	91.00	178.70	7,149.6	-3,993.5	-457.2	4,019.0	0.97	0.97	0.00
11,189.0	90.90	178.30	7,149.0	-4,025.5	-456.3	4,050.8	1.29	-0.31	-1.25
11,221.0	91.30	178.30	7,148.4	-4,057.5	-455.4	4,082.5	1.25	1.25	0.00
11,252.0	91.30	178.20	7,147.7	-4,088.4	-454.4	4,113.2	0.32	0.00	-0.32
11,284.0	91.70	178.10	7,146.9	-4,120.4	-453.4	4,144.9	1.29	1.25	-0.31
11,316.0	92.00	178.20	7,145.8	-4,152.4	-452.4	4,176.7	0.99	0.94	0.31
11,348.0	92.40	178.20	7,144.6	-4,184.3	-451.4	4,208.4	1.25	1.25	0.00
11,379.0	92.70	178.10	7,143.2	-4,215.3	-450.4	4,239.1	1.02	0.97	-0.32
11,411.0	92.60	178.20	7,141.8	-4,247.2	-449.3	4,270.8	0.44	-0.31	0.31
11,443.0	92.60	178.40	7,140.3	-4,279.2	-448.4	4,302.5	0.62	0.00	0.63
11,474.0	92.80	178.90	7,138.8	-4,310.1	-447.7	4,333.2	1.74	0.65	1.61
11,506.0	93.40	178.90	7,137.1	-4,342.1	-447.1	4,365.0	1.88	1.88	0.00
11,538.0	93.80	178.60	7,135.1	-4,374.0	-446.4	4,396.7	1.56	1.25	-0.94
11,565.0	94.00	178.80	7,133.3	-4,400.9	-445.7	4,423.4	1.05	0.74	0.74
11,617.5	94.00	178.80	7,129.6	-4,453.3	-444.7	4,475.4	0.00	0.00	0.00
BHL 500'FSL, 1044'FEL									
11,619.0	94.00	178.80	7,129.5	-4,454.8	-444.6	4,476.9	0.00	0.00	0.00

Checked By: _____	Approved By: _____	Date: _____
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