

Results of Directional Survey

30-025-36117

CHESAPEAKE OPERATING INC
JEFFRY 4 # 1

	MD	N/S	E/W	VD
	10899	-15.60	-47.10	10896.1
TOP PERFS/OH	11084	-20.97	-54.44	11080.89
	11350	-28.70	-65.00	11346.60
	10899	-15.60	-47.10	10896.1
BOT PERFS/OH	11154	-23.01	-57.22	11150.82
	11350	-28.70	-65.00	11346.60

NEXT TO LAST	10899	-15.60	-47.10	10896.1
LAST READING	11350	-28.70	-65.00	11346.60
TD	11350	-28.70	-65.00	11346.60

Surface Location	2130	FN	610	FW
Projected BHL	2159	FN	545	FW
Location of				
Top Perfs/OH	2151	FN	556	FW
Bottom Perfs/OH	2153	FN	553	FW

SUMMARY of Subsurface Locations

Surface Location	E-4-17S-37E	2130	FN	610	FW	Vert. Depth
Top Perfs/OH	E-4-17S-37E	2151	FN	556	FW	11080.89
Bottom Perfs/OH	E-4-17S-37E	2153	FN	553	FW	11150.82
Projected TD	E-4-17S-37E	2159	FN	545	FW	11346.60

Directional Survey Report

Chesapeake Operating

Well ID: 819445

Well Bore: Original Well Bore

Well Name: Jeffry #24

Plane of Vertical Section: 0.0 degrees

#1-E, 4-17s - 37e
30-025-36117

Survey Type	Meas. Depth	Inc.	Azimuth	TVD	Coordinates		Closure	Vertical Section	Dog Leg Severity
					N-S	E-W			
**	200.0	0.75	0.0	0.0					
** Tieln	4180.0	0.75	275.0	4179.9	S 13.5	W 2.3		-13.5	
Tieln	4481.0	0.75	294.0	4480.9	S 12.5	W 6.0	13.9	-12.5	0.082
	4763.0	1.00	291.0	4762.9	S 10.9	W 10.0	14.8	-10.9	0.090
	5236.0	1.75	320.0	5235.7	S 3.9	W 18.5	18.9	-3.9	0.212
	5428.0	1.25	304.0	5427.7	S 0.5	W 22.1	22.1	-0.5	0.337
	5732.0	1.00	316.0	5731.6	N 3.3	W 26.7	26.9	3.3	0.113
	6220.0	1.25	299.0	6219.5	N 9.0	W 34.3	35.5	9.0	0.085
	6720.0	1.00	299.0	6719.4	N 13.7	W 42.9	45.1	13.7	0.050
	7225.0	1.50	304.0	7224.3	N 19.5	W 52.3	55.8	19.5	0.101
GSS	7414.0	1.75	324.0	7413.2	N 23.3	W 56.0	60.7	23.3	0.326
	7638.0	1.25	314.0	7637.1	N 27.7	W 59.8	65.9	27.7	0.251
	7758.0	2.00	314.0	7757.1	N 30.1	W 62.2	69.1	30.1	0.625
	7893.0	2.00	319.0	7892.0	N 33.5	W 65.5	73.5	33.5	0.129
	7921.0	1.90	320.8	7920.0	N 34.2	W 66.1	74.4	34.2	0.419
	7953.0	1.50	305.0	7952.0	N 34.9	W 66.8	75.3	34.9	1.914
	8016.0	1.10	264.2	8015.0	N 35.3	W 68.0	76.6	35.3	1.557
	8079.0	1.00	194.5	8077.9	N 34.7	W 68.8	77.0	34.7	1.909
	8142.0	1.70	184.1	8140.9	N 33.2	W 69.0	76.6	33.2	1.173
	8174.0	1.80	176.2	8172.9	N 32.3	W 69.0	76.2	32.3	0.815
	8206.0	1.50	155.5	8204.9	N 31.4	W 68.8	75.6	31.4	2.069
	8237.0	1.80	150.7	8235.9	N 30.6	W 68.4	74.9	30.6	1.065
	8300.0	1.93	128.4	8298.9	N 29.1	W 67.1	73.1	29.1	1.160
	8332.0	1.90	126.9	8330.8	N 28.4	W 66.2	72.0	28.4	0.187
	8427.0	1.80	122.6	8425.8	N 26.7	W 63.7	69.0	26.7	0.180
	8522.0	1.20	129.6	8520.8	N 25.2	W 61.7	66.6	25.2	0.659
	8617.0	1.50	125.0	8615.7	N 23.9	W 59.9	64.5	23.9	0.336
	8648.0	1.90	114.8	8646.7	N 23.4	W 59.1	63.6	23.4	1.613
	8680.0	2.00	109.0	8678.7	N 23.0	W 58.1	62.5	23.0	0.691
	8743.0	1.80	97.8	8741.7	N 22.5	W 56.1	60.4	22.5	0.668

Directional Survey Report

Chesapeake Operating

Well ID: 819445

Well Name: Jeffry 1-4

Well Bore: Original Well Bore

Plane of Vertical Section: 0.0 degrees

Survey Type	Meas. Depth	Inc.	Azimuth	TVD	Coordinates		Closure	Vertical Section	Dog Leg Severity
					N-S	E-W			
	8806.0	2.20	94.6	8804.6	N 22.3	W 53.9	58.3	22.3	0.659
	8869.0	2.10	93.0	8867.6	N 22.1	W 51.5	56.1	22.1	0.185
	8963.0	2.29	121.7	8961.5	N 21.1	W 48.2	52.6	21.1	1.173
	9025.0	2.00	134.0	9023.5	N 19.7	W 46.4	50.4	19.7	0.876
	9056.0	3.10	141.2	9054.4	N 18.6	W 45.4	49.1	18.6	3.689
	9087.0	3.40	148.4	9085.4	N 17.2	W 44.4	47.7	17.2	1.632
	9119.0	3.00	156.4	9117.3	N 15.6	W 43.6	46.3	15.6	1.871
	9214.0	2.60	150.9	9212.2	N 11.5	W 41.6	43.1	11.5	0.507
	9336.0	2.20	178.0	9334.1	N 6.7	W 40.1	40.7	6.7	0.975
	9431.0	2.60	175.7	9429.0	N 2.0	W 39.4	39.4	2.0	0.842
	9525.0	2.70	170.0	9522.9	S 2.3	W 38.8	38.9	-2.3	0.300
	9610.0	3.10	170.7	9607.8	S 6.5	W 38.1	38.7	-6.5	0.472
	9649.0	2.90	177.8	9646.7	S 8.5	W 37.9	38.9	-8.5	1.081
	9681.0	2.99	173.0	9678.7	S 10.2	W 37.8	39.1	-10.2	0.820
	9744.0	3.17	166.5	9741.6	S 13.5	W 37.2	39.5	-13.5	0.622
	9807.0	2.60	152.0	9804.5	S 16.5	W 36.1	39.7	-16.5	1.464
	9901.0	1.60	104.4	9898.5	S 18.7	W 33.8	38.6	-18.7	2.049
	9964.0	1.40	97.0	9961.4	S 19.0	W 32.2	37.4	-19.0	0.441
	10026.0	1.30	85.3	10023.4	S 19.0	W 30.7	36.2	-19.0	0.472
	10207.0	0.25	240.0	10204.4	S 19.0	W 29.0	34.7	-19.0	0.845
	10618.0	2.25	284.0	10615.3	S 17.5	W 37.6	41.5	-17.5	0.505
	10773.0	2.00	294.0	10770.2	S 15.7	W 43.1	45.8	-15.7	0.288
	10899.0	2.00	250.0	10896.1	S 15.6	W 47.1	49.6	-15.6	1.189
	11350.0	3.75	225.0	11346.6	S 28.7	W 65.0	71.0	-28.7	0.469

Calculations using Minimum Curvature Method