





# **HRM Resources, LLC Weld County, CO**

**SEC.22-T4N-R67W**

**Dutton 11-22 Pad Sec.22-T4N-R67W**

**Dutton 11-22**

**Wellbore #1**

**Design: Wellbore #1**

## **Standard Survey Report**

**10 December, 2010**

<b>Company:</b>	HRM Resources, LLC Weld County, CO	<b>Local Co-ordinate Reference:</b>	Site Dutton 11-22 Pad Sec.22-T4N-R67W
<b>Project:</b>	SEC.22-T4N-R67W	<b>TVD Reference:</b>	WELL @ 4884.0ft (Original Well Elev)
<b>Site:</b>	Dutton 11-22 Pad Sec.22-T4N-R67W	<b>MD Reference:</b>	WELL @ 4884.0ft (Original Well Elev)
<b>Well:</b>	Dutton 11-22	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Wellbore #1	<b>Database:</b>	Landmark

<b>Project</b>	SEC.22-T4N-R67W, Weld County, CO		
<b>Map System:</b>	US State Plane 1983	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		Using Well Reference Point
<b>Map Zone:</b>	Colorado Northern Zone		Using geodetic scale factor

<b>Site</b>	Dutton 11-22 Pad Sec.22-T4N-R67W		
<b>Site Position:</b>		<b>Northing:</b>	1,353,525.58 ft
<b>From:</b>	Lat/Long	<b>Easting:</b>	3,172,324.52 ft
<b>Position Uncertainty:</b>	0.0 ft	<b>Slot Radius:</b>	"
		<b>Latitude:</b>	40° 18' 7.848 N
		<b>Longitude:</b>	104° 52' 55.740 W
		<b>Grid Convergence:</b>	0.40 °

<b>Well</b>	Dutton 11-22		
<b>Well Position</b>	<b>+N/-S</b>	0.0 ft	<b>Northing:</b>
	<b>+E/-W</b>	0.0 ft	<b>Easting:</b>
<b>Position Uncertainty</b>	0.0 ft	<b>Wellhead Elevation:</b>	ft
		<b>Latitude:</b>	40° 18' 7.848 N
		<b>Longitude:</b>	104° 52' 55.740 W
		<b>Ground Level:</b>	4,871.0 ft

<b>Wellbore</b>	Wellbore #1				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2010	10/8/2010	9.01	66.98	53,139

<b>Design</b>	Wellbore #1				
<b>Audit Notes:</b>					
<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL	<b>Tie On Depth:</b>	0.0
<b>Vertical Section:</b>	<b>Depth From (TVD) (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Direction (°)</b>	
	0.0	0.0	0.0	314.59	

<b>Survey Program</b>	<b>Date</b>	12/10/2010			
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
679.0	7,480.0	Survey #1 (Wellbore #1)	MWD	MWD - Standard	

<b>Survey</b>										
<b>Measured Depth (ft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Vertical Section (ft)</b>	<b>Dogleg Rate (°/100ft)</b>	<b>Build Rate (°/100ft)</b>	<b>Turn Rate (°/100ft)</b>	
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00	
679.0	1.00	265.80	679.0	-0.5	-5.9	3.9	0.15	0.15	0.00	
772.0	0.90	276.50	772.0	-0.4	-7.4	5.0	0.22	-0.11	11.51	
865.0	0.40	2.60	864.9	0.0	-8.2	5.8	1.03	-0.54	92.58	
958.0	0.40	357.90	957.9	0.6	-8.2	6.3	0.04	0.00	-5.05	
1,051.0	0.40	342.70	1,050.9	1.3	-8.3	6.8	0.11	0.00	-16.34	
1,144.0	0.40	321.60	1,143.9	1.8	-8.6	7.4	0.16	0.00	-22.69	
1,237.0	0.40	305.50	1,236.9	2.3	-9.0	8.0	0.12	0.00	-17.31	
1,330.0	0.60	324.10	1,329.9	2.9	-9.6	8.8	0.27	0.22	20.00	
1,422.0	2.50	333.80	1,421.9	5.0	-10.7	11.2	2.08	2.07	10.54	
1,516.0	4.20	326.20	1,515.7	9.7	-13.6	16.5	1.87	1.81	-8.09	
1,608.0	5.20	318.80	1,607.4	15.7	-18.2	24.0	1.27	1.09	-8.04	
1,701.0	6.20	314.70	1,700.0	22.4	-24.5	33.2	1.16	1.08	-4.41	

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<b>Site:</b>	Dutton 11-22 Pad Sec.22-T4N-R67W	<b>MD Reference:</b>	WELL @ 4884.0ft (Original Well Elev)
<b>Well:</b>	Dutton 11-22	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Wellbore #1	<b>Database:</b>	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)	
1,794.0	8.00	315.30	1,792.2	30.5	-32.7	44.7	1.94	1.94	0.65	
1,887.0	9.50	311.40	1,884.2	40.2	-43.0	58.8	1.73	1.61	-4.19	
1,980.0	12.30	317.30	1,975.5	52.6	-55.4	76.4	3.24	3.01	6.34	
2,073.0	12.20	315.10	2,066.4	66.8	-69.1	96.1	0.51	-0.11	-2.37	
2,165.0	13.10	311.70	2,156.1	80.6	-83.7	116.2	1.27	0.98	-3.70	
2,258.0	14.30	311.30	2,246.5	95.2	-100.2	138.2	1.29	1.29	-0.43	
2,351.0	14.40	312.30	2,336.6	110.6	-117.4	161.3	0.29	0.11	1.08	
2,444.0	14.90	312.00	2,426.6	126.4	-134.9	184.8	0.54	0.54	-0.32	
2,537.0	16.00	314.10	2,516.2	143.3	-152.9	209.5	1.33	1.18	2.26	
2,629.0	16.40	313.80	2,604.5	161.1	-171.4	235.2	0.44	0.43	-0.33	
2,722.0	16.00	315.50	2,693.8	179.3	-189.9	261.1	0.67	-0.43	1.83	
2,815.0	15.10	312.80	2,783.4	196.7	-207.8	286.0	1.24	-0.97	-2.90	
2,908.0	15.20	316.00	2,873.2	213.7	-225.1	310.3	0.91	0.11	3.44	
3,001.0	15.50	316.20	2,962.9	231.4	-242.2	335.0	0.33	0.32	0.22	
3,094.0	15.30	312.70	3,052.6	248.7	-259.8	359.6	1.02	-0.22	-3.76	
3,187.0	15.80	311.30	3,142.2	265.4	-278.3	384.5	0.67	0.54	-1.51	
3,280.0	15.00	315.50	3,231.8	282.3	-296.3	409.2	1.48	-0.86	4.52	
3,373.0	14.60	313.20	3,321.7	298.9	-313.3	433.0	0.76	-0.43	-2.47	
3,466.0	14.60	315.50	3,411.7	315.3	-330.0	456.4	0.62	0.00	2.47	
3,559.0	14.90	316.50	3,501.7	332.4	-346.5	480.1	0.42	0.32	1.08	
3,652.0	15.30	317.40	3,591.5	350.1	-363.0	504.3	0.50	0.43	0.97	
3,745.0	15.60	315.40	3,681.1	368.0	-380.1	529.0	0.66	0.32	-2.15	
3,838.0	16.00	314.90	3,770.6	386.0	-398.0	554.4	0.45	0.43	-0.54	
3,931.0	16.20	315.40	3,859.9	404.2	-416.1	580.2	0.26	0.22	0.54	
4,024.0	15.50	314.40	3,949.4	422.2	-434.1	605.6	0.81	-0.75	-1.08	
4,117.0	14.20	309.90	4,039.3	438.2	-451.8	629.3	1.87	-1.40	-4.84	
4,209.0	13.40	311.90	4,128.6	452.5	-468.4	651.2	1.01	-0.87	2.17	
4,301.0	12.40	313.00	4,218.3	466.4	-483.5	671.8	1.12	-1.09	1.20	
4,394.0	10.40	313.00	4,309.5	478.9	-497.0	690.1	2.15	-2.15	0.00	
4,487.0	9.00	311.50	4,401.1	489.5	-508.5	705.8	1.53	-1.51	-1.61	
4,580.0	7.00	308.80	4,493.2	497.9	-518.4	718.7	2.19	-2.15	-2.90	
4,673.0	5.40	321.40	4,585.7	504.8	-525.6	728.7	2.25	-1.72	13.55	
4,766.0	3.00	337.60	4,678.4	510.5	-529.2	735.3	2.85	-2.58	17.42	
4,859.0	1.50	346.80	4,771.4	513.9	-530.4	738.5	1.65	-1.61	9.89	
4,952.0	0.30	184.40	4,864.4	514.9	-530.7	739.4	1.92	-1.29	-174.62	
5,045.0	0.20	200.80	4,957.4	514.5	-530.8	739.2	0.13	-0.11	17.63	
5,087.7	0.07	187.85	5,000.0	514.4	-530.8	739.1	0.32	-0.31	-30.37	
TARGET BHL 637°FNL, 654°FWL										
5,138.0	0.10	39.80	5,050.4	514.4	-530.8	739.1	0.32	0.07	-294.04	
5,231.0	0.04	302.40	5,143.4	514.5	-530.8	739.2	0.12	-0.06	-104.73	
5,324.0	0.10	300.50	5,236.4	514.5	-530.9	739.3	0.06	0.06	-2.04	
5,417.0	0.30	336.70	5,329.4	514.8	-531.0	739.6	0.24	0.22	38.92	
5,510.0	0.30	35.70	5,422.4	515.2	-531.0	739.8	0.32	0.00	63.44	
5,602.0	0.40	292.10	5,514.4	515.5	-531.1	740.2	0.60	0.11	-112.61	
5,695.0	1.40	334.10	5,607.3	516.7	-531.9	741.6	1.22	1.08	45.16	
5,788.0	0.50	352.20	5,700.3	518.1	-532.5	742.9	1.01	-0.97	19.46	
5,881.0	0.30	341.80	5,793.3	518.7	-532.6	743.5	0.23	-0.22	-11.18	
5,973.0	0.30	278.30	5,885.3	519.0	-532.9	743.9	0.34	0.00	-69.02	
6,065.0	0.20	285.10	5,977.3	519.1	-533.3	744.2	0.11	-0.11	7.39	
6,158.0	0.30	225.60	6,070.3	518.9	-533.7	744.4	0.28	0.11	-63.98	
6,251.0	0.30	217.30	6,163.3	518.6	-534.0	744.3	0.05	0.00	-8.92	
6,344.0	0.10	223.20	6,256.3	518.3	-534.2	744.3	0.22	-0.22	6.34	
6,437.0	0.10	194.50	6,349.3	518.2	-534.3	744.3	0.05	0.00	-30.86	
6,530.0	0.20	102.90	6,442.3	518.1	-534.1	744.1	0.24	0.11	-98.49	

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<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Wellbore #1	<b>Database:</b>	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)
6,623.0	0.10	235.00	6,535.3	518.0	-534.0	744.0	0.30	-0.11	142.04
6,715.0	0.20	247.00	6,627.3	517.9	-534.2	744.0	0.11	0.11	13.04
6,808.0	0.30	243.20	6,720.3	517.7	-534.6	744.2	0.11	0.11	-4.09
6,901.0	0.40	306.60	6,813.3	517.8	-535.1	744.6	0.41	0.11	68.17
6,987.4	0.76	4.65	6,899.7	518.5	-535.3	745.2	0.74	0.41	67.17
<b>LEGAL BOX 400' X 400' 657'FNL, 654'FWL</b>									
6,987.6	0.76	4.70	6,899.9	518.5	-535.3	745.2	0.74	0.63	29.64
<b>TARGET CIRCLE 637'FNL, 654'FWL</b>									
6,994.0	0.80	6.50	6,906.3	518.6	-535.3	745.3	0.74	0.64	28.09
7,087.0	0.80	28.40	6,999.3	519.8	-534.9	745.9	0.33	0.00	23.55
7,180.0	0.80	42.00	7,092.3	520.9	-534.2	746.1	0.20	0.00	14.62
7,273.0	0.80	40.80	7,185.3	521.9	-533.3	746.2	0.02	0.00	-1.29
7,366.0	0.80	44.60	7,278.3	522.8	-532.4	746.2	0.06	0.00	4.09
7,436.0	0.70	46.30	7,348.3	523.5	-531.8	746.2	0.15	-0.14	2.43
7,480.0	0.70	46.30	7,392.3	523.8	-531.4	746.2	0.00	0.00	0.00

Checked By: \_\_\_\_\_ Approved By: \_\_\_\_\_ Date: \_\_\_\_\_