

# **Extraction Oil & Gas**

**Adams County (NAD 83)**

**Sec 12-T01S-R66W**

**Duck Club 12W-20-2N**

**Wellbore #1**

**Design: Wellbore #1**

## **Standard Survey Report**

**31 December, 2018**

## Survey Report

<b>Company:</b>	Extraction Oil & Gas	<b>Local Co-ordinate Reference:</b>	Well Duck Club 12W-20-2N
<b>Project:</b>	Adams County (NAD 83)	<b>TVD Reference:</b>	KB=25 @ 5062.00usft (Patt 901)
<b>Site:</b>	Sec 12-T01S-R66W	<b>MD Reference:</b>	KB=25 @ 5062.00usft (Patt 901)
<b>Well:</b>	Duck Club 12W-20-2N	<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>	EDM 5000.1

<b>Project</b>	Adams County (NAD 83)		
<b>Map System:</b>	US State Plane 1983	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		
<b>Map Zone:</b>	Colorado Northern Zone		

Site		Sec 12-T01S-R66W						
Site Position:		Northing:	1,239,018.46	usft	Latitude:	39.98694		
From:	Map	Easting:	3,214,796.41	usft	Longitude:	-104.73343		
Position Uncertainty:	0.00	usft	Slot Radius:	13-3/16	"	Grid Convergence:	0.50	°

Well	Duck Club 12W-20-2N					
Well Position	+N/-S	0.00 usft	Northing:	1,236,266.46 usft	Latitude:	39.97937
	+E/-W	0.00 usft	Easting:	3,215,520.20 usft	Longitude:	-104.73093
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	5,037.00 usft

<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>
	HDGM	11/6/2018	8.20	66.32	51,945

<b>Design</b>	Wellbore #1				
<b>Audit Notes:</b>					
<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL	<b>Tie On Depth:</b>	0.00
<b>Vertical Section:</b>	<b>Depth From (TVD) (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Direction (°)</b>	
	0.00	0.00	0.00	282.99	

<b>Survey Program</b>	<b>Date</b>	12/31/2018			
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
129.00	1,581.00	Surface Surveys (Wellbore #1)	MWD	MWD - Standard	
1,581.00	17,807.00	Atlas MWD Surveys (Wellbore #1)	MWD	MWD - Standard	

<b>Survey</b>										
<b>Measured Depth (usft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Vertical Section (usft)</b>	<b>Dogleg Rate (°/100usft)</b>	<b>Build Rate (°/100usft)</b>	<b>Turn Rate (°/100usft)</b>	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
129.00	0.75	345.42	129.00	0.82	-0.21	0.39	0.58	0.58	0.00	
225.00	0.66	30.86	224.99	1.90	-0.09	0.51	0.57	-0.09	47.33	
320.00	1.14	57.23	319.98	2.88	0.99	-0.32	0.65	0.51	27.76	
415.00	1.93	53.01	414.94	4.36	3.06	-2.00	0.84	0.83	-4.44	
510.00	3.65	43.43	509.83	7.51	6.42	-4.56	1.87	1.81	-10.08	
604.00	5.23	43.43	603.54	12.80	11.42	-8.25	1.68	1.68	0.00	
699.00	7.25	41.58	697.97	20.43	18.38	-13.31	2.14	2.13	-1.95	
795.00	9.00	45.36	793.01	30.24	27.74	-20.23	1.91	1.82	3.94	
890.00	10.85	48.09	886.58	41.43	39.68	-29.35	2.01	1.95	2.87	

# Survey Report

<b>Company:</b>	Extraction Oil & Gas	<b>Local Co-ordinate Reference:</b>	Well Duck Club 12W-20-2N
<b>Project:</b>	Adams County (NAD 83)	<b>TVD Reference:</b>	KB=25 @ 5062.00usft (Patt 901)
<b>Site:</b>	Sec 12-T01S-R66W	<b>MD Reference:</b>	KB=25 @ 5062.00usft (Patt 901)
<b>Well:</b>	Duck Club 12W-20-2N	<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>	EDM 5000.1

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
985.00	12.48	46.33	979.62	54.49	53.76	-40.13	1.76	1.72	-1.85
1,080.00	16.08	48.53	1,071.67	70.30	71.05	-53.43	3.83	3.79	2.32
1,175.00	17.80	50.46	1,162.54	88.26	92.11	-69.91	1.90	1.81	2.03
1,270.00	21.05	48.26	1,252.13	108.86	116.04	-88.59	3.51	3.42	-2.32
1,364.00	21.67	49.14	1,339.67	131.46	141.77	-108.58	0.74	0.66	0.94
1,459.00	22.15	49.85	1,427.81	154.48	168.72	-129.67	0.58	0.51	0.75
1,555.00	23.12	48.62	1,516.41	178.61	196.70	-151.50	1.12	1.01	-1.28
1,581.00	23.55	48.26	1,540.28	185.44	204.40	-157.47	1.74	1.65	-1.38
Tie into Surface Surveys									
1,663.00	24.79	47.64	1,615.09	207.93	229.33	-176.71	1.54	1.51	-0.76
First MWD Survey @ 1663.00' MD									
1,759.00	26.03	44.25	1,701.81	236.58	258.90	-199.08	1.99	1.29	-3.53
1,855.00	28.77	48.39	1,787.04	267.02	290.88	-223.40	3.47	2.85	4.31
1,950.00	31.11	47.68	1,869.36	298.73	326.13	-250.61	2.49	2.46	-0.75
2,046.00	32.39	47.68	1,950.99	332.74	363.48	-279.36	1.33	1.33	0.00
2,142.00	31.68	47.16	2,032.37	367.19	400.98	-308.15	0.79	-0.74	-0.54
2,237.00	30.71	44.42	2,113.64	401.48	436.25	-334.81	1.81	-1.02	-2.88
2,333.00	32.52	47.02	2,195.39	436.59	472.29	-362.03	2.36	1.89	2.71
2,429.00	31.46	45.61	2,276.81	471.71	509.07	-389.98	1.35	-1.10	-1.47
2,524.00	32.26	44.95	2,357.50	506.99	544.70	-416.76	0.92	0.84	-0.69
2,620.00	32.04	47.55	2,438.78	542.31	581.59	-444.76	1.46	-0.23	2.71
2,715.00	30.53	45.39	2,519.97	576.27	617.37	-471.99	1.98	-1.59	-2.27
2,811.00	30.18	48.65	2,602.81	609.34	652.84	-499.12	1.75	-0.36	3.40
2,906.00	28.37	48.30	2,685.68	640.13	687.62	-526.08	1.91	-1.91	-0.37
3,002.00	29.52	46.27	2,769.69	671.66	721.74	-552.24	1.58	1.20	-2.11
3,097.00	31.82	49.05	2,851.40	704.25	757.58	-579.83	2.84	2.42	2.93
3,193.00	32.74	48.39	2,932.56	738.08	796.10	-609.76	1.03	0.96	-0.69
3,288.00	30.71	47.99	3,013.36	771.38	833.34	-638.56	2.15	-2.14	-0.42
3,384.00	32.61	46.94	3,095.07	805.45	870.46	-667.07	2.06	1.98	-1.09
3,479.00	30.23	45.00	3,176.14	839.84	906.08	-694.04	2.72	-2.51	-2.04
3,575.00	33.19	46.58	3,257.80	875.00	942.26	-721.39	3.20	3.08	1.65
3,670.00	30.89	45.48	3,338.32	909.98	978.54	-748.88	2.50	-2.42	-1.16
3,765.00	32.97	48.61	3,418.95	944.17	1,015.32	-777.03	2.80	2.19	3.29
3,861.00	30.80	47.02	3,500.46	978.20	1,052.91	-806.00	2.42	-2.26	-1.66
3,956.00	32.83	49.31	3,581.19	1,011.58	1,090.23	-834.87	2.49	2.14	2.41
4,051.00	30.14	48.61	3,662.19	1,044.14	1,127.66	-864.02	2.86	-2.83	-0.74
4,147.00	32.17	51.03	3,744.35	1,076.16	1,165.62	-893.80	2.48	2.11	2.52
4,242.00	29.47	50.33	3,825.92	1,106.99	1,203.27	-923.56	2.87	-2.84	-0.74
4,337.00	30.62	49.98	3,908.16	1,137.46	1,239.79	-952.29	1.22	1.21	-0.37
4,433.00	32.79	49.71	3,989.82	1,170.00	1,278.35	-982.55	2.27	2.26	-0.28
4,528.00	30.09	51.03	4,070.87	1,201.62	1,316.49	-1,012.61	2.93	-2.84	1.39
4,624.00	32.61	49.09	4,152.85	1,233.70	1,354.76	-1,042.68	2.83	2.63	-2.02
4,719.00	29.87	48.48	4,234.07	1,266.15	1,391.82	-1,071.50	2.90	-2.88	-0.64

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<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Wellbore #1	<b>Database:</b>	EDM 5000.1

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
4,815.00	33.14	46.98	4,315.91	1,299.91	1,428.92	-1,100.05	3.50	3.41	-1.56	
4,910.00	31.15	46.36	4,396.34	1,334.59	1,465.69	-1,128.09	2.12	-2.09	-0.65	
5,005.00	33.63	45.83	4,476.56	1,369.88	1,502.35	-1,155.87	2.63	2.61	-0.56	
5,101.00	32.04	44.69	4,557.22	1,406.51	1,539.33	-1,183.66	1.78	-1.66	-1.19	
5,196.00	33.89	46.45	4,636.92	1,442.68	1,576.25	-1,211.51	2.19	1.95	1.85	
5,292.00	30.67	45.08	4,718.07	1,478.41	1,612.99	-1,239.28	3.44	-3.35	-1.43	
5,388.00	33.54	42.57	4,799.39	1,515.24	1,648.28	-1,265.38	3.30	2.99	-2.61	
5,483.00	31.95	41.69	4,879.29	1,553.35	1,682.76	-1,290.41	1.75	-1.67	-0.93	
5,578.00	34.47	41.12	4,958.77	1,592.37	1,717.16	-1,315.15	2.67	2.65	-0.60	
5,674.00	33.01	41.29	5,038.59	1,632.49	1,752.28	-1,340.36	1.52	-1.52	0.18	
5,770.00	33.14	48.35	5,119.07	1,669.59	1,789.16	-1,367.95	4.01	0.14	7.35	
5,865.00	30.31	45.92	5,199.87	1,703.53	1,825.79	-1,396.01	3.27	-2.98	-2.56	
5,983.00	27.53	45.08	5,303.14	1,743.51	1,866.50	-1,426.69	2.38	-2.36	-0.71	
6,079.00	24.26	44.56	5,389.49	1,773.24	1,896.06	-1,448.80	3.41	-3.41	-0.54	
6,174.00	22.36	51.43	5,476.75	1,798.42	1,923.89	-1,470.26	3.49	-2.00	7.23	
6,270.00	20.15	49.62	5,566.22	1,820.52	1,950.76	-1,491.48	2.40	-2.30	-1.89	
6,365.00	18.12	49.49	5,655.96	1,840.72	1,974.46	-1,510.03	2.14	-2.14	-0.14	
6,460.00	15.16	48.96	5,746.97	1,858.47	1,995.07	-1,526.12	3.12	-3.12	-0.56	
6,556.00	12.46	46.23	5,840.19	1,873.88	2,012.02	-1,539.17	2.89	-2.81	-2.84	
6,651.00	9.99	45.83	5,933.37	1,886.72	2,025.33	-1,549.25	2.60	-2.60	-0.42	
6,747.00	6.10	42.79	6,028.41	1,896.27	2,034.77	-1,556.31	4.07	-4.05	-3.17	
6,842.00	2.74	66.99	6,123.12	1,900.86	2,040.29	-1,560.65	3.97	-3.54	25.47	
6,938.00	0.49	143.13	6,219.08	1,901.43	2,042.65	-1,562.82	2.78	-2.34	79.31	
7,033.00	1.06	144.41	6,314.07	1,900.39	2,043.41	-1,563.79	0.60	0.60	1.35	
7,129.00	0.97	163.14	6,410.05	1,898.89	2,044.16	-1,564.86	0.36	-0.09	19.51	
7,224.00	0.57	190.82	6,505.04	1,897.65	2,044.30	-1,565.28	0.56	-0.42	29.14	
7,320.00	1.24	273.53	6,601.03	1,897.25	2,043.18	-1,564.27	1.35	0.70	86.16	
7,416.00	13.08	276.57	6,696.12	1,898.56	2,031.31	-1,552.41	12.34	12.33	3.17	
7,511.00	20.28	282.65	6,787.07	1,903.40	2,004.53	-1,525.23	7.79	7.58	6.40	
7,607.00	28.37	280.05	6,874.47	1,911.04	1,965.77	-1,485.75	8.50	8.43	-2.71	
7,703.00	37.03	273.09	6,955.21	1,916.59	1,914.33	-1,434.38	9.82	9.02	-7.25	
7,798.00	46.62	268.99	7,025.93	1,917.53	1,851.09	-1,372.54	10.49	10.09	-4.32	
7,894.00	52.36	266.39	7,088.27	1,914.52	1,778.20	-1,302.20	6.32	5.98	-2.71	
7,989.00	60.32	264.67	7,140.89	1,908.30	1,699.44	-1,226.86	8.51	8.38	-1.81	
8,085.00	68.23	266.83	7,182.53	1,901.95	1,613.27	-1,144.32	8.48	8.24	2.25	
8,180.00	77.15	268.24	7,210.77	1,898.08	1,522.75	-1,056.98	9.50	9.39	1.48	
8,227.65	81.72	269.87	7,219.50	1,897.32	1,475.93	-1,011.54	10.16	9.58	3.43	
LP Duck Club 12W-20-2N										
8,275.00	86.26	271.46	7,224.46	1,897.87	1,428.85	-965.54	10.16	9.60	3.35	
8,370.00	90.99	271.19	7,226.74	1,900.06	1,333.93	-872.56	4.99	4.98	-0.28	
8,466.00	91.60	270.05	7,224.57	1,901.10	1,237.97	-778.81	1.35	0.64	-1.19	
8,561.00	89.88	269.26	7,223.35	1,900.53	1,142.98	-686.39	1.99	-1.81	-0.83	
8,657.00	90.37	269.30	7,223.14	1,899.32	1,046.99	-593.13	0.51	0.51	0.04	
8,752.00	90.99	269.52	7,222.01	1,898.35	952.00	-500.79	0.69	0.65	0.23	

# Survey Report

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<b>Well:</b>	Duck Club 12W-20-2N	<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>	EDM 5000.1

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
8,848.00	89.13	270.00	7,221.91	1,897.94	856.01	-407.34	2.00	-1.94	0.50
8,943.00	89.48	269.52	7,223.06	1,897.55	761.01	-314.87	0.63	0.37	-0.51
9,039.00	89.13	269.08	7,224.22	1,896.37	665.03	-221.61	0.59	-0.36	-0.46
9,134.00	89.84	270.05	7,225.08	1,895.65	570.04	-129.21	1.27	0.75	1.02
9,229.00	90.06	270.40	7,225.16	1,896.03	475.04	-36.56	0.44	0.23	0.37
9,325.00	89.84	270.45	7,225.25	1,896.74	379.04	57.14	0.24	-0.23	0.05
9,420.00	89.93	270.40	7,225.44	1,897.44	284.04	149.86	0.11	0.09	-0.05
9,516.00	90.54	270.97	7,225.04	1,898.59	188.05	243.65	0.87	0.64	0.59
9,611.00	90.72	271.19	7,224.00	1,900.38	93.07	336.60	0.30	0.19	0.23
9,707.00	91.16	271.15	7,222.42	1,902.34	-2.89	430.55	0.46	0.46	-0.04
9,802.00	89.93	268.99	7,221.52	1,902.46	-97.88	523.13	2.62	-1.29	-2.27
9,898.00	90.19	268.11	7,221.42	1,900.03	-193.85	616.10	0.96	0.27	-0.92
9,993.00	90.06	267.18	7,221.21	1,896.12	-288.77	707.71	0.99	-0.14	-0.98
10,089.00	89.40	269.03	7,221.66	1,892.95	-384.71	800.48	2.05	-0.69	1.93
10,184.00	88.95	268.29	7,223.03	1,890.73	-479.67	892.51	0.91	-0.47	-0.78
10,280.00	89.26	268.51	7,224.53	1,888.05	-575.62	985.40	0.40	0.32	0.23
10,376.00	88.91	267.58	7,226.06	1,884.77	-671.55	1,078.14	1.03	-0.36	-0.97
10,471.00	89.40	269.96	7,227.47	1,882.73	-766.51	1,170.21	2.56	0.52	2.51
10,566.00	89.13	268.99	7,228.68	1,881.86	-861.50	1,262.57	1.06	-0.28	-1.02
10,662.00	90.06	270.45	7,229.36	1,881.39	-957.49	1,356.00	1.80	0.97	1.52
10,757.00	90.37	269.83	7,229.01	1,881.63	-1,052.49	1,448.62	0.73	0.33	-0.65
10,852.00	90.32	269.08	7,228.43	1,880.72	-1,147.49	1,540.97	0.79	-0.05	-0.79
10,948.00	90.50	268.07	7,227.75	1,878.34	-1,243.45	1,633.95	1.07	0.19	-1.05
11,043.00	89.88	270.31	7,227.43	1,876.99	-1,338.44	1,726.20	2.45	-0.65	2.36
11,139.00	89.75	269.96	7,227.74	1,877.22	-1,434.43	1,819.79	0.39	-0.14	-0.36
11,234.00	89.79	269.78	7,228.12	1,877.00	-1,529.43	1,912.31	0.19	0.04	-0.19
11,330.00	89.84	269.52	7,228.43	1,876.42	-1,625.43	2,005.71	0.28	0.05	-0.27
11,425.00	89.97	269.52	7,228.59	1,875.62	-1,720.43	2,098.10	0.14	0.14	0.00
11,520.00	90.15	268.95	7,228.49	1,874.35	-1,815.42	2,190.37	0.63	0.19	-0.60
11,616.00	89.70	271.94	7,228.62	1,875.10	-1,911.40	2,284.07	3.15	-0.47	3.11
11,712.00	89.84	271.11	7,229.00	1,877.65	-2,007.37	2,378.15	0.88	0.15	-0.86
11,807.00	90.01	270.71	7,229.13	1,879.16	-2,102.36	2,471.05	0.46	0.18	-0.42
11,903.00	89.66	269.30	7,229.40	1,879.17	-2,198.35	2,564.59	1.51	-0.36	-1.47
11,998.00	90.77	271.41	7,229.05	1,879.76	-2,293.34	2,657.28	2.51	1.17	2.22
12,094.00	91.34	270.31	7,227.28	1,881.20	-2,389.32	2,751.11	1.29	0.59	-1.15
12,190.00	89.48	270.22	7,226.59	1,881.64	-2,485.31	2,844.75	1.94	-1.94	-0.09
12,285.00	90.01	269.61	7,227.02	1,881.50	-2,580.31	2,937.28	0.85	0.56	-0.64
12,380.00	90.15	268.81	7,226.88	1,880.19	-2,675.30	3,029.55	0.85	0.15	-0.84
12,476.00	90.32	272.03	7,226.49	1,880.90	-2,771.28	3,123.23	3.36	0.18	3.35
12,571.00	90.28	271.63	7,225.99	1,883.93	-2,866.23	3,216.43	0.42	-0.04	-0.42
12,667.00	90.85	271.41	7,225.04	1,886.48	-2,962.19	3,310.51	0.64	0.59	-0.23
12,762.00	90.54	269.65	7,223.89	1,887.36	-3,057.18	3,403.26	1.88	-0.33	-1.85
12,857.00	90.99	268.95	7,222.62	1,886.19	-3,152.16	3,495.55	0.88	0.47	-0.74

# Survey Report

<b>Company:</b>	Extraction Oil & Gas	<b>Local Co-ordinate Reference:</b>	Well Duck Club 12W-20-2N
<b>Project:</b>	Adams County (NAD 83)	<b>TVD Reference:</b>	KB=25 @ 5062.00usft (Patt 901)
<b>Site:</b>	Sec 12-T01S-R66W	<b>MD Reference:</b>	KB=25 @ 5062.00usft (Patt 901)
<b>Well:</b>	Duck Club 12W-20-2N	<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>	EDM 5000.1

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
12,953.00	90.37	270.67	7,221.48	1,885.88	-3,248.15	3,589.01	1.90	-0.65	1.79	
13,049.00	89.04	270.31	7,221.98	1,886.70	-3,344.14	3,682.73	1.44	-1.39	-0.38	
13,145.00	88.69	269.08	7,223.88	1,886.19	-3,440.12	3,776.13	1.33	-0.36	-1.28	
13,240.00	88.73	268.90	7,226.02	1,884.51	-3,535.08	3,868.29	0.19	0.04	-0.19	
13,335.00	88.82	268.24	7,228.05	1,882.14	-3,630.03	3,960.27	0.70	0.09	-0.69	
13,430.00	89.35	270.53	7,229.57	1,881.12	-3,725.00	4,052.58	2.47	0.56	2.41	
13,526.00	89.79	269.78	7,230.29	1,881.38	-3,821.00	4,146.18	0.91	0.46	-0.78	
13,622.00	90.28	268.55	7,230.23	1,879.98	-3,916.99	4,239.40	1.38	0.51	-1.28	
13,717.00	91.12	268.20	7,229.07	1,877.29	-4,011.94	4,331.31	0.96	0.88	-0.37	
13,813.00	89.48	271.37	7,228.57	1,876.93	-4,107.92	4,424.76	3.72	-1.71	3.30	
13,908.00	89.22	270.49	7,229.64	1,878.47	-4,202.90	4,517.65	0.97	-0.27	-0.93	
14,004.00	88.95	270.36	7,231.18	1,879.18	-4,298.89	4,611.34	0.31	-0.28	-0.14	
14,100.00	89.09	270.53	7,232.82	1,879.93	-4,394.87	4,705.03	0.23	0.15	0.18	
14,195.00	88.64	269.12	7,234.70	1,879.64	-4,489.85	4,797.51	1.56	-0.47	-1.48	
14,290.00	90.10	271.72	7,235.74	1,880.34	-4,584.83	4,890.22	3.14	1.54	2.74	
14,386.00	90.37	271.37	7,235.35	1,882.92	-4,680.80	4,984.31	0.46	0.28	-0.36	
14,481.00	91.25	270.89	7,234.01	1,884.80	-4,775.77	5,077.27	1.06	0.93	-0.51	
14,577.00	90.10	270.22	7,232.88	1,885.73	-4,871.75	5,171.01	1.39	-1.20	-0.70	
14,672.00	90.94	269.34	7,232.02	1,885.36	-4,966.75	5,263.49	1.28	0.88	-0.93	
14,768.00	88.95	268.95	7,232.11	1,883.93	-5,062.73	5,356.69	2.11	-2.07	-0.41	
14,864.00	89.75	267.71	7,233.20	1,881.13	-5,158.68	5,449.55	1.54	0.83	-1.29	
14,959.00	90.19	267.14	7,233.25	1,876.86	-5,253.59	5,541.07	0.76	0.46	-0.60	
15,054.00	88.07	268.81	7,234.69	1,873.51	-5,348.51	5,632.80	2.84	-2.23	1.76	
15,149.00	88.56	268.46	7,237.48	1,871.25	-5,443.44	5,724.80	0.63	0.52	-0.37	
15,244.00	88.47	267.85	7,239.94	1,868.19	-5,538.36	5,816.60	0.65	-0.09	-0.64	
15,339.00	89.35	270.97	7,241.75	1,867.21	-5,633.32	5,908.91	3.41	0.93	3.28	
15,434.00	89.40	270.89	7,242.79	1,868.75	-5,728.30	6,001.81	0.10	0.05	-0.08	
15,530.00	89.88	272.21	7,243.39	1,871.35	-5,824.26	6,095.89	1.46	0.50	1.38	
15,625.00	90.54	271.77	7,243.04	1,874.65	-5,919.21	6,189.15	0.83	0.69	-0.46	
15,721.00	90.23	270.31	7,242.40	1,876.39	-6,015.18	6,283.06	1.55	-0.32	-1.52	
15,816.00	90.81	269.74	7,241.54	1,876.43	-6,110.18	6,375.63	0.86	0.61	-0.60	
15,912.00	91.52	269.43	7,239.58	1,875.74	-6,206.16	6,468.99	0.81	0.74	-0.32	
16,007.00	90.23	267.89	7,238.13	1,873.52	-6,301.11	6,561.02	2.11	-1.36	-1.62	
16,103.00	90.90	266.96	7,237.19	1,869.20	-6,397.01	6,653.49	1.19	0.70	-0.97	
16,198.00	89.62	270.14	7,236.76	1,866.80	-6,491.97	6,745.48	3.61	-1.35	3.35	
16,294.00	89.44	267.80	7,237.54	1,865.07	-6,587.94	6,838.61	2.44	-0.19	-2.44	
16,389.00	89.62	272.30	7,238.32	1,865.16	-6,682.91	6,931.16	4.74	0.19	4.74	
16,484.00	89.31	270.05	7,239.21	1,867.10	-6,777.88	7,024.14	2.39	-0.33	-2.37	
16,580.00	89.44	273.53	7,240.26	1,870.10	-6,873.82	7,118.29	3.63	0.14	3.63	
16,675.00	89.84	276.00	7,240.85	1,877.99	-6,968.48	7,212.30	2.63	0.42	2.60	
16,771.00	89.17	269.78	7,241.68	1,882.83	-7,064.30	7,306.76	6.52	-0.70	-6.48	
16,866.00	89.66	271.50	7,242.65	1,883.89	-7,159.29	7,399.56	1.88	0.52	1.81	
16,962.00	89.48	268.95	7,243.37	1,884.27	-7,255.28	7,493.17	2.66	-0.19	-2.66	

## Survey Report

<b>Company:</b>	Extraction Oil & Gas	<b>Local Co-ordinate Reference:</b>	Well Duck Club 12W-20-2N
<b>Project:</b>	Adams County (NAD 83)	<b>TVD Reference:</b>	KB=25 @ 5062.00usft (Patt 901)
<b>Site:</b>	Sec 12-T01S-R66W	<b>MD Reference:</b>	KB=25 @ 5062.00usft (Patt 901)
<b>Well:</b>	Duck Club 12W-20-2N	<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>	EDM 5000.1

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
17,057.00	89.48	266.21	7,244.24	1,880.26	-7,350.18	7,584.74	2.88	0.00	-2.88	
17,152.00	89.97	266.96	7,244.69	1,874.60	-7,445.01	7,675.87	0.94	0.52	0.79	
17,248.00	91.30	271.33	7,243.63	1,873.17	-7,540.97	7,769.05	4.76	1.39	4.55	
17,343.00	91.96	270.97	7,240.93	1,875.07	-7,635.91	7,861.99	0.79	0.69	-0.38	
17,438.00	92.62	269.48	7,237.13	1,875.45	-7,730.83	7,954.56	1.71	0.69	-1.57	
17,534.00	90.37	270.31	7,234.63	1,875.27	-7,826.79	8,048.03	2.50	-2.34	0.86	
17,629.00	89.00	268.46	7,235.15	1,874.25	-7,921.78	8,140.35	2.42	-1.44	-1.95	
17,725.00	88.51	266.66	7,237.23	1,870.17	-8,017.66	8,232.86	1.94	-0.51	-1.88	
<b>Last MWD Survey @ 17725.00' MD</b>										
17,807.00	88.51	266.66	7,239.37	1,865.39	-8,099.50	8,311.53	0.00	0.00	0.00	
<b>Projection to TD @ 17807' MD 874.8' FNL/ 2128.8' FEL - PBHL Duck Club 12W-20-2N</b>										

Design Targets										
Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude	
30° Inclination @ 7625.0 - actual wellpath misses target center by 0.03usft at 7625.05usft MD (6890.23 TVD, 1912.45 N, 1957.09 E) - Point	0.00	0.00	6,890.25	1,912.48	1,957.08	1,238,195.84	3,217,460.62	39.98462	-104.72395	
70° Inclination @ 8103.8 - actual wellpath misses target center by 0.02usft at 8103.83usft MD (7189.24 TVD, 1901.03 N, 1595.70 E) - Point	0.00	0.00	7,189.25	1,901.02	1,595.68	1,238,181.25	3,217,099.34	39.98459	-104.72524	
Cross @ 10401.47' MD - actual wellpath hits target center - Point	0.00	0.00	7,226.52	1,883.84	-697.00	1,238,144.18	3,214,806.89	39.98454	-104.73342	
Cross @ 15677.81' MD - actual wellpath hits target center - Point	0.00	0.00	7,242.62	1,875.91	-5,972.00	1,238,090.50	3,209,532.16	39.98452	-104.75224	

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
1,581.00	1,540.28	185.44	204.40	Tie into Surface Surveys	
1,663.00	1,615.09	207.93	229.33	First MWD Survey @ 1663.00' MD	
17,725.00	7,237.23	1,870.17	-8,017.66	Last MWD Survey @ 17725.00' MD	
17,807.00	7,239.37	1,865.39	-8,099.50	Projection to TD @ 17807' MD 874.8' FNL/ 2128.8' FEL	

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