

# **Extraction Oil & Gas**

**Adams County (NAD 83)**

**Sec 12-T01S-R66W**

**Duck Club 12W-20-12C**

**Wellbore #1**

**Design: Wellbore #1**

## **Standard Survey Report**

**03 January, 2019**

## Survey Report

<b>Company:</b>	Extraction Oil & Gas	<b>Local Co-ordinate Reference:</b>	Well Duck Club 12W-20-12C
<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-20-12C	<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-20-12C				
Well Position	+N/-S	0.00 usft	Northing:	1,235,985.86 usft	Latitude:	39.97860
	+E/-W	0.00 usft	Easting:	3,215,508.62 usft	Longitude:	-104.73098
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	257.51	

<b>Survey Program</b>	<b>Date</b>	1/3/2019			
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
129.00	1,593.00	Surface Surveys (Wellbore #1)	MWD	MWD - Standard	
1,593.00	18,064.00	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	0.79	89.22	129.00	0.01	0.89	-0.87	0.61	0.61	0.00	
<b>First Surface Survey</b>										
225.00	2.24	122.18	224.96	-0.98	3.14	-2.85	1.70	1.51	34.33	
320.00	3.96	126.49	319.82	-3.92	7.35	-6.33	1.83	1.81	4.54	
415.00	5.45	127.37	414.50	-8.61	13.57	-11.39	1.57	1.57	0.93	
510.00	7.60	129.30	508.88	-15.33	22.02	-18.18	2.27	2.26	2.03	
604.00	10.15	130.62	601.74	-24.66	33.12	-27.00	2.72	2.71	1.40	
699.00	11.91	131.50	694.98	-36.60	46.81	-37.79	1.86	1.85	0.93	
795.00	13.27	131.23	788.67	-50.43	62.52	-50.14	1.42	1.42	-0.28	

# Survey Report

<b>Company:</b>	Extraction Oil & Gas	<b>Local Co-ordinate Reference:</b>	Well Duck Club 12W-20-12C
<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-20-12C	<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)	
890.00	15.12	130.71	880.77	-65.70	80.11	-64.01	1.95	1.95	-0.55	
985.00	17.93	133.08	971.84	-83.77	100.19	-79.71	3.04	2.96	2.49	
1,080.00	20.31	132.90	1,061.59	-104.98	122.95	-97.34	2.51	2.51	-0.19	
1,175.00	21.88	130.53	1,150.22	-127.71	148.49	-117.36	1.88	1.65	-2.49	
1,270.00	23.12	131.23	1,237.99	-151.51	175.97	-139.04	1.34	1.31	0.74	
1,364.00	24.39	131.32	1,324.02	-176.49	204.43	-161.43	1.35	1.35	0.10	
1,459.00	24.96	131.58	1,410.35	-202.74	234.15	-184.77	0.61	0.60	0.27	
1,555.00	26.59	131.41	1,496.79	-230.40	265.42	-209.32	1.70	1.70	-0.18	
1,593.00	27.03	131.32	1,530.71	-241.72	278.28	-219.43	1.16	1.16	-0.24	
Last Surface Survey - Tie into Surface Surveys										
1,663.00	26.96	130.93	1,593.08	-262.62	302.22	-238.28	0.27	-0.10	-0.56	
First MWD Survey @ 1663' MD										
1,758.00	25.85	128.72	1,678.17	-289.69	334.65	-264.09	1.56	-1.17	-2.33	
1,854.00	29.08	130.58	1,763.34	-317.96	368.70	-291.23	3.48	3.36	1.94	
1,950.00	29.21	129.65	1,847.19	-348.09	404.46	-319.62	0.49	0.14	-0.97	
2,046.00	29.56	128.20	1,930.84	-377.68	441.10	-349.00	0.83	0.36	-1.51	
2,142.00	29.65	128.50	2,014.31	-407.10	478.30	-378.95	0.18	0.09	0.31	
2,237.00	29.30	131.06	2,097.01	-437.00	514.22	-407.56	1.38	-0.37	2.69	
2,333.00	29.30	134.06	2,180.74	-468.77	548.81	-434.46	1.53	0.00	3.13	
2,429.00	28.90	132.82	2,264.62	-500.87	582.71	-460.62	0.75	-0.42	-1.29	
2,524.00	27.75	132.87	2,348.24	-531.52	615.76	-486.26	1.21	-1.21	0.05	
2,619.00	26.82	132.73	2,432.67	-561.11	647.71	-511.05	0.98	-0.98	-0.15	
2,715.00	25.23	131.72	2,518.94	-589.43	678.89	-535.38	1.72	-1.66	-1.05	
2,810.00	27.40	133.57	2,604.09	-617.97	709.84	-559.43	2.44	2.28	1.95	
2,906.00	26.03	134.72	2,689.84	-648.02	740.82	-583.17	1.53	-1.43	1.20	
3,001.00	27.57	132.29	2,774.63	-677.48	771.90	-607.14	1.99	1.62	-2.56	
3,097.00	26.34	132.43	2,860.20	-706.80	804.05	-632.20	1.28	-1.28	0.15	
3,192.00	28.33	130.49	2,944.59	-735.66	836.75	-657.88	2.29	2.09	-2.04	
3,288.00	25.59	129.87	3,030.15	-763.75	870.00	-684.27	2.87	-2.85	-0.65	
3,384.00	28.33	134.28	3,115.72	-792.95	902.23	-709.42	3.53	2.85	4.59	
3,479.00	26.12	133.00	3,200.19	-822.95	933.66	-733.62	2.41	-2.33	-1.35	
3,574.00	28.24	132.73	3,284.70	-852.47	965.47	-758.30	2.24	2.23	-0.28	
3,669.00	26.29	131.24	3,369.14	-881.59	997.80	-783.57	2.17	-2.05	-1.57	
3,765.00	28.19	128.37	3,454.49	-909.68	1,031.57	-810.46	2.41	1.98	-2.99	
3,860.00	26.38	127.31	3,538.92	-936.41	1,065.95	-838.25	1.97	-1.91	-1.12	
3,956.00	28.02	133.22	3,624.31	-964.78	1,099.36	-864.73	3.29	1.71	6.16	
4,051.00	27.31	132.51	3,708.45	-994.79	1,131.68	-889.80	0.82	-0.75	-0.75	
4,146.00	27.53	132.07	3,792.78	-1,024.23	1,164.05	-915.04	0.31	0.23	-0.46	
4,242.00	30.14	129.87	3,876.87	-1,054.55	1,199.02	-942.63	2.93	2.72	-2.29	
4,337.00	28.10	127.14	3,959.86	-1,083.35	1,235.17	-971.69	2.56	-2.15	-2.87	
4,432.00	26.96	130.49	4,044.11	-1,110.85	1,269.38	-999.15	2.02	-1.20	3.53	
4,528.00	22.89	130.88	4,131.15	-1,137.21	1,300.06	-1,023.40	4.24	-4.24	0.41	
4,623.00	24.66	129.12	4,218.09	-1,161.80	1,329.41	-1,046.74	2.01	1.86	-1.85	

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Survey									
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4,719.00	31.82	131.90	4,302.61	-1,191.38	1,363.83	-1,073.95	7.58	7.46	2.90
4,814.00	30.89	132.03	4,383.73	-1,224.44	1,400.59	-1,102.69	0.98	-0.98	0.14
4,910.00	28.02	131.50	4,467.32	-1,255.88	1,435.79	-1,130.26	3.00	-2.99	-0.55
5,005.00	30.40	133.26	4,550.23	-1,287.15	1,470.01	-1,156.91	2.66	2.51	1.85
5,100.00	27.97	133.53	4,633.17	-1,318.97	1,503.67	-1,182.89	2.56	-2.56	0.28
5,196.00	23.55	131.76	4,719.61	-1,347.26	1,534.31	-1,206.69	4.67	-4.60	-1.84
5,292.00	25.85	131.15	4,806.82	-1,373.81	1,564.38	-1,230.31	2.41	2.40	-0.64
5,387.00	31.51	131.94	4,890.13	-1,404.05	1,598.47	-1,257.05	5.97	5.96	0.83
5,482.00	30.45	129.34	4,971.58	-1,435.91	1,635.56	-1,286.38	1.80	-1.12	-2.74
5,578.00	28.68	128.77	5,055.08	-1,465.76	1,672.34	-1,315.83	1.87	-1.84	-0.59
5,697.00	27.00	134.98	5,160.32	-1,502.74	1,713.72	-1,348.23	2.81	-1.41	5.22
5,793.00	23.73	135.20	5,247.05	-1,531.86	1,742.75	-1,370.28	3.41	-3.41	0.23
5,888.00	27.31	130.71	5,332.78	-1,559.65	1,772.75	-1,393.57	4.28	3.77	-4.73
5,984.00	30.49	134.54	5,416.82	-1,591.11	1,806.82	-1,420.02	3.83	3.31	3.99
6,079.00	26.73	133.75	5,500.21	-1,622.80	1,839.44	-1,445.02	3.98	-3.96	-0.83
6,175.00	27.26	136.79	5,585.75	-1,653.75	1,870.09	-1,468.25	1.54	0.55	3.17
6,271.00	25.10	137.01	5,671.90	-1,684.67	1,899.03	-1,489.82	2.25	-2.25	0.23
6,366.00	21.87	137.98	5,759.02	-1,712.56	1,924.62	-1,508.78	3.42	-3.40	1.02
6,461.00	21.43	138.95	5,847.32	-1,738.80	1,947.86	-1,525.80	0.60	-0.46	1.02
6,557.00	18.21	137.45	5,937.62	-1,763.08	1,969.53	-1,541.70	3.40	-3.35	-1.56
6,652.00	14.14	136.17	6,028.84	-1,782.39	1,987.61	-1,555.18	4.30	-4.28	-1.35
6,748.00	14.41	128.37	6,121.88	-1,798.27	2,005.10	-1,568.82	2.02	0.28	-8.13
6,843.00	10.83	128.06	6,214.57	-1,811.11	2,021.40	-1,581.96	3.77	-3.77	-0.33
6,938.00	7.78	121.41	6,308.31	-1,819.97	2,033.92	-1,592.26	3.40	-3.21	-7.00
7,034.00	5.66	115.02	6,403.65	-1,825.36	2,043.75	-1,600.70	2.34	-2.21	-6.66
7,129.00	4.33	109.86	6,498.29	-1,828.56	2,051.37	-1,607.45	1.48	-1.40	-5.43
7,225.00	0.49	26.80	6,594.19	-1,829.42	2,054.97	-1,610.77	4.48	-4.00	-86.52
7,320.00	1.02	351.66	6,689.19	-1,828.22	2,055.03	-1,611.09	0.72	0.56	-36.99
7,416.00	1.59	346.11	6,785.16	-1,826.09	2,054.59	-1,611.12	0.61	0.59	-5.78
7,512.00	2.12	341.75	6,881.11	-1,823.11	2,053.71	-1,610.91	0.57	0.55	-4.54
7,607.00	2.39	330.24	6,976.04	-1,819.72	2,052.18	-1,610.14	0.55	0.28	-12.12
7,703.00	13.79	281.11	7,070.98	-1,815.76	2,039.91	-1,599.02	12.87	11.88	-51.18
7,799.00	23.11	278.07	7,161.95	-1,810.90	2,009.96	-1,570.83	9.76	9.71	-3.17
7,894.00	27.35	264.01	7,247.94	-1,810.56	1,969.74	-1,531.64	7.70	4.46	-14.80
7,922.19	30.00	263.59	7,272.67	-1,812.02	1,956.30	-1,518.20	9.42	9.39	-1.48
30° Inclination @ 7922.2' MD									
7,990.00	36.37	262.82	7,329.40	-1,816.43	1,919.47	-1,481.28	9.42	9.40	-1.14
8,085.00	47.06	269.21	7,400.24	-1,820.44	1,856.54	-1,418.98	12.10	11.25	6.73
8,180.00	58.77	270.22	7,457.43	-1,820.77	1,780.89	-1,345.05	12.36	12.33	1.06
8,276.00	67.17	269.61	7,501.01	-1,820.91	1,695.45	-1,261.60	8.77	8.75	-0.64
8,325.88	70.00	269.73	7,519.22	-1,821.18	1,649.02	-1,216.21	5.68	5.67	0.24
70° Inclination @ 8325.88' MD									
8,371.00	72.56	269.83	7,533.70	-1,821.35	1,606.29	-1,174.46	5.68	5.67	0.23
8,466.00	81.62	269.83	7,554.91	-1,821.62	1,513.79	-1,084.08	9.54	9.54	0.00

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<b>Well:</b>	Duck Club 12W-20-12C	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
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Survey										
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8,493.07	82.89	269.90	7,558.56	-1,821.68	1,486.97	-1,057.88	4.71	4.70	0.27	
LP Duck Club 12W-20-12C										
8,562.00	86.13	270.09	7,565.15	-1,821.69	1,418.36	-990.90	4.71	4.70	0.27	
8,657.00	85.77	269.74	7,571.86	-1,821.83	1,323.60	-898.35	0.53	-0.38	-0.37	
8,753.00	90.15	270.22	7,575.27	-1,821.86	1,227.68	-804.69	4.59	4.56	0.50	
8,848.00	89.79	268.95	7,575.32	-1,822.55	1,132.69	-711.80	1.39	-0.38	-1.34	
8,943.00	89.88	268.51	7,575.60	-1,824.65	1,037.71	-618.61	0.47	0.09	-0.46	
9,039.00	90.99	271.19	7,574.87	-1,824.90	941.73	-524.84	3.02	1.16	2.79	
9,134.00	91.07	270.62	7,573.16	-1,823.40	846.75	-432.44	0.61	0.08	-0.60	
9,230.00	90.85	269.74	7,571.55	-1,823.10	750.77	-338.79	0.94	-0.23	-0.92	
9,325.00	91.74	269.78	7,569.41	-1,823.50	655.79	-245.98	0.94	0.94	0.04	
9,420.00	88.56	271.06	7,569.16	-1,822.80	560.81	-153.39	3.61	-3.35	1.35	
9,516.00	88.03	270.45	7,572.01	-1,821.54	464.86	-59.99	0.84	-0.55	-0.64	
9,611.00	87.67	269.48	7,575.58	-1,821.60	369.93	32.71	1.09	-0.38	-1.02	
9,707.00	89.17	270.31	7,578.22	-1,821.77	273.97	126.44	1.79	1.56	0.86	
9,802.00	89.22	268.95	7,579.56	-1,822.39	178.99	219.31	1.43	0.05	-1.43	
9,898.00	90.28	270.93	7,579.98	-1,822.49	82.99	313.05	2.34	1.10	2.06	
9,993.00	90.46	270.31	7,579.36	-1,821.46	-12.00	405.57	0.68	0.19	-0.65	
10,089.00	90.85	270.05	7,578.27	-1,821.16	-107.99	499.23	0.49	0.41	-0.27	
10,184.00	91.21	269.70	7,576.56	-1,821.37	-202.98	592.01	0.53	0.38	-0.37	
10,280.00	89.62	271.28	7,575.86	-1,820.54	-298.96	685.55	2.33	-1.66	1.65	
10,376.00	89.93	270.62	7,576.24	-1,818.95	-394.95	778.92	0.76	0.32	-0.69	
10,511.00	90.06	269.43	7,576.25	-1,818.89	-529.95	910.71	0.89	0.10	-0.88	
10,607.00	89.62	270.97	7,576.52	-1,818.56	-625.94	1,004.37	1.67	-0.46	1.60	
10,652.56	89.62	270.70	7,576.82	-1,817.90	-671.50	1,048.70	0.60	0.00	-0.60	
Cross @ 10652.56' MD										
10,702.00	89.62	270.40	7,577.15	-1,817.42	-720.93	1,096.86	0.60	0.00	-0.60	
10,797.00	88.78	268.90	7,578.48	-1,818.00	-815.92	1,189.73	1.81	-0.88	-1.58	
10,893.00	89.17	268.51	7,580.19	-1,820.17	-911.88	1,283.89	0.57	0.41	-0.41	
10,988.00	89.22	267.98	7,581.53	-1,823.08	-1,006.82	1,377.21	0.56	0.05	-0.56	
11,084.00	89.62	268.77	7,582.50	-1,825.80	-1,102.78	1,471.49	0.92	0.42	0.82	
11,179.00	91.03	269.30	7,581.96	-1,827.40	-1,197.76	1,564.57	1.59	1.48	0.56	
11,275.00	90.32	270.89	7,580.83	-1,827.24	-1,293.75	1,658.25	1.81	-0.74	1.66	
11,370.00	89.04	272.08	7,581.36	-1,824.78	-1,388.72	1,750.44	1.84	-1.35	1.25	
11,466.00	86.43	270.89	7,585.16	-1,822.30	-1,484.60	1,843.51	2.99	-2.72	-1.24	
11,561.00	88.95	270.53	7,588.98	-1,821.12	-1,579.51	1,935.92	2.68	2.65	-0.38	
11,656.00	88.95	270.53	7,590.72	-1,820.24	-1,674.49	2,028.47	0.00	0.00	0.00	
11,752.00	88.86	270.67	7,592.56	-1,819.24	-1,770.46	2,121.95	0.17	-0.09	0.15	
11,848.00	90.15	270.80	7,593.39	-1,818.00	-1,866.45	2,215.40	1.35	1.34	0.14	
11,943.00	90.90	271.06	7,592.52	-1,816.46	-1,961.43	2,307.81	0.84	0.79	0.27	
12,039.00	90.10	271.94	7,591.68	-1,813.95	-2,057.39	2,400.95	1.24	-0.83	0.92	
12,134.00	89.00	270.89	7,592.43	-1,811.60	-2,152.36	2,493.17	1.60	-1.16	-1.11	
12,230.00	89.57	270.22	7,593.62	-1,810.67	-2,248.35	2,586.68	0.92	0.59	-0.70	
12,325.00	90.59	270.22	7,593.49	-1,810.31	-2,343.34	2,679.35	1.07	1.07	0.00	

# Survey Report

<b>Company:</b>	Extraction Oil & Gas	<b>Local Co-ordinate Reference:</b>	Well Duck Club 12W-20-12C
<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-20-12C	<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)
12,421.00	89.17	270.40	7,593.69	-1,809.79	-2,439.34	2,772.97	1.49	-1.48	0.19
12,516.00	89.88	270.71	7,594.48	-1,808.87	-2,534.33	2,865.51	0.82	0.75	0.33
12,612.00	88.33	269.61	7,595.98	-1,808.60	-2,630.32	2,959.17	1.98	-1.61	-1.15
12,707.00	89.22	269.92	7,598.01	-1,808.99	-2,725.29	3,051.98	0.99	0.94	0.33
12,802.00	91.30	270.14	7,597.58	-1,808.94	-2,820.29	3,144.71	2.20	2.19	0.23
12,898.00	87.72	270.27	7,598.40	-1,808.60	-2,916.27	3,238.35	3.73	-3.73	0.14
12,994.00	88.47	270.62	7,601.59	-1,807.85	-3,012.21	3,331.86	0.86	0.78	0.36
13,090.00	89.17	270.53	7,603.57	-1,806.89	-3,108.18	3,425.36	0.74	0.73	-0.09
13,185.00	90.90	270.36	7,603.51	-1,806.15	-3,203.18	3,517.94	1.83	1.82	-0.18
13,280.00	89.13	272.03	7,603.49	-1,804.17	-3,298.15	3,610.24	2.56	-1.86	1.76
13,375.00	91.12	272.03	7,603.28	-1,800.81	-3,393.08	3,702.20	2.09	2.09	0.00
13,471.00	89.75	272.25	7,602.55	-1,797.22	-3,489.01	3,795.09	1.45	-1.43	0.23
13,566.00	87.72	270.45	7,604.65	-1,794.98	-3,583.95	3,887.30	2.86	-2.14	-1.89
13,662.00	87.41	269.39	7,608.73	-1,795.12	-3,679.87	3,980.97	1.15	-0.32	-1.10
13,758.00	90.81	270.00	7,610.22	-1,795.63	-3,775.84	4,074.78	3.60	3.54	0.64
13,853.00	90.68	270.58	7,608.98	-1,795.15	-3,870.83	4,167.42	0.63	-0.14	0.61
13,949.00	88.69	269.92	7,609.51	-1,794.73	-3,966.82	4,261.05	2.18	-2.07	-0.69
14,044.00	88.82	270.27	7,611.57	-1,794.57	-4,061.80	4,353.75	0.39	0.14	0.37
14,140.00	92.09	270.45	7,610.81	-1,793.97	-4,157.78	4,447.33	3.41	3.41	0.19
14,235.00	90.59	270.80	7,608.59	-1,792.93	-4,252.75	4,539.82	1.62	-1.58	0.37
14,330.00	90.59	270.67	7,607.61	-1,791.71	-4,347.73	4,632.30	0.14	0.00	-0.14
14,426.00	90.23	268.99	7,606.92	-1,792.00	-4,443.73	4,726.08	1.79	-0.38	-1.75
14,522.00	91.03	269.12	7,605.87	-1,793.58	-4,539.71	4,820.14	0.84	0.83	0.14
14,618.00	90.72	267.89	7,604.40	-1,796.09	-4,635.66	4,914.36	1.32	-0.32	-1.28
14,713.00	89.17	269.30	7,604.49	-1,798.41	-4,730.63	5,007.58	2.21	-1.63	1.48
14,809.00	88.29	268.46	7,606.62	-1,800.29	-4,826.58	5,101.68	1.27	-0.92	-0.88
14,905.00	86.61	267.23	7,610.89	-1,803.90	-4,922.41	5,196.02	2.17	-1.75	-1.28
15,000.00	87.58	267.18	7,615.71	-1,808.52	-5,017.18	5,289.54	1.02	1.02	-0.05
15,096.00	89.40	267.71	7,618.24	-1,812.80	-5,113.05	5,384.07	1.97	1.90	0.55
15,191.00	91.52	268.07	7,617.47	-1,816.30	-5,207.97	5,477.50	2.26	2.23	0.38
15,287.00	91.43	267.10	7,615.00	-1,820.34	-5,303.85	5,571.99	1.01	-0.09	-1.01
15,382.00	89.88	266.92	7,613.92	-1,825.30	-5,398.72	5,665.68	1.64	-1.63	-0.19
15,478.00	89.75	268.15	7,614.23	-1,829.42	-5,494.62	5,760.21	1.29	-0.14	1.28
15,573.00	88.86	269.96	7,615.38	-1,830.99	-5,589.60	5,853.28	2.12	-0.94	1.91
15,669.00	89.40	271.11	7,616.84	-1,830.10	-5,685.58	5,946.80	1.32	0.56	1.20
15,765.00	89.17	269.83	7,618.04	-1,829.31	-5,781.57	6,040.34	1.35	-0.24	-1.33
15,860.00	91.38	271.02	7,617.58	-1,828.60	-5,876.56	6,132.93	2.64	2.33	1.25
15,925.97	90.35	271.35	7,616.58	-1,827.24	-5,942.50	6,197.02	1.64	-1.56	0.50
Cross @ 15925.96' MD									
15,956.00	89.88	271.50	7,616.52	-1,826.49	-5,972.53	6,226.17	1.64	-1.56	0.50
16,052.00	90.06	271.06	7,616.57	-1,824.35	-6,068.50	6,319.42	0.50	0.19	-0.46
16,147.00	89.13	272.03	7,617.25	-1,821.79	-6,163.46	6,411.58	1.41	-0.98	1.02
16,243.00	89.40	271.37	7,618.48	-1,818.94	-6,259.41	6,504.64	0.74	0.28	-0.69

## Survey Report

<b>Company:</b>	Extraction Oil & Gas	<b>Local Co-ordinate Reference:</b>	Well Duck Club 12W-20-12C
<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-20-12C	<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)	
16,338.00	89.40	270.89	7,619.47	-1,817.07	-6,354.39	6,596.96	0.51	0.00	-0.51	
16,434.00	89.44	269.56	7,620.44	-1,816.69	-6,450.38	6,690.60	1.39	0.04	-1.39	
16,529.00	89.70	271.37	7,621.16	-1,815.92	-6,545.37	6,783.18	1.92	0.27	1.91	
16,625.00	90.01	271.28	7,621.40	-1,813.70	-6,641.34	6,876.40	0.34	0.32	-0.09	
16,721.00	91.07	271.50	7,620.50	-1,811.37	-6,737.31	6,969.60	1.13	1.10	0.23	
16,816.00	89.97	269.70	7,619.63	-1,810.37	-6,832.30	7,062.12	2.22	-1.16	-1.89	
16,911.00	89.17	270.18	7,620.35	-1,810.47	-6,927.29	7,154.89	0.98	-0.84	0.51	
17,007.00	89.31	268.59	7,621.62	-1,811.50	-7,023.28	7,248.82	1.66	0.15	-1.66	
17,103.00	89.13	270.67	7,622.93	-1,812.12	-7,119.26	7,342.67	2.17	-0.19	2.17	
17,198.00	89.04	269.96	7,624.44	-1,811.60	-7,214.24	7,435.30	0.75	-0.09	-0.75	
17,294.00	88.82	271.02	7,626.24	-1,810.78	-7,310.22	7,528.83	1.13	-0.23	1.10	
17,390.00	89.66	270.67	7,627.51	-1,809.37	-7,406.20	7,622.23	0.95	0.88	-0.36	
17,485.00	90.85	270.40	7,627.09	-1,808.48	-7,501.20	7,714.78	1.28	1.25	-0.28	
17,581.00	89.70	269.70	7,626.63	-1,808.40	-7,597.19	7,808.49	1.40	-1.20	-0.73	
17,677.00	90.01	268.90	7,626.87	-1,809.57	-7,693.18	7,902.47	0.89	0.32	-0.83	
17,771.00	90.46	267.98	7,626.48	-1,812.13	-7,787.15	7,994.76	1.09	0.48	-0.98	
17,867.00	89.31	269.70	7,626.68	-1,814.07	-7,883.12	8,088.88	2.16	-1.20	1.79	
17,962.00	89.66	270.36	7,627.53	-1,814.02	-7,978.12	8,181.62	0.79	0.37	0.69	
18,001.00	89.66	270.36	7,627.76	-1,813.78	-8,017.12	8,219.64	0.00	0.00	0.00	
Last MWD Survey @ 18001' MD										
18,064.00	89.66	270.36	7,628.14	-1,813.38	-8,080.11	8,281.07	0.00	0.00	0.00	
Projection to TD @ 18064' MD 443.2' FSL/ 2138.4' FEL - PBHL Duck Club 12W-20-12C										

Design Targets										
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude	
Interp @ 1530.71 (Duck - actual wellpath hits target center - Point	0.00	0.00	1,530.71	-241.72	278.28	1,235,746.56	3,215,788.99	39.97794	-104.72999	
30° Inclination @ 7922.2 - actual wellpath misses target center by 0.01usft at 7922.20usft MD (7272.69 TVD, -1812.02 N, 1956.29 E) - Point	0.00	0.00	7,272.69	-1,812.02	1,956.29	1,234,190.88	3,217,480.55	39.97363	-104.72400	
70° Inclination @ 8325.8 - actual wellpath hits target center - Point	0.00	0.00	7,519.22	-1,821.18	1,649.02	1,234,179.04	3,217,173.37	39.97360	-104.72510	
Cross @ 10652.56' MD - actual wellpath hits target center - Point	0.00	0.00	7,576.82	-1,817.90	-671.50	1,234,162.21	3,214,852.91	39.97361	-104.73338	

## Survey Report

<b>Company:</b>	Extraction Oil & Gas	<b>Local Co-ordinate Reference:</b>	Well Duck Club 12W-20-12C
<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-20-12C	<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

### Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
129.00	129.00	0.01	0.89	First Surface Survey
1,593.00	1,530.71	-241.72	278.28	Last Surface Survey
1,593.00	1,530.71	-241.72	278.28	Tie into Surface Surveys
1,663.00	1,593.08	-262.62	302.22	First MWD Survey @ 1663' MD
18,001.00	7,627.76	-1,813.78	-8,017.12	Last MWD Survey @ 18001' MD
18,064.00	7,628.14	-1,813.38	-8,080.11	Projection to TD @ 18064' MD 443.2' FSL/ 2138.4' FEL

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