

Extraction Oil & Gas

Adams County (NAD 83)

Sec 12-T01S-R66W

Duck Club 12W-20-3N

Wellbore #1

Design: Wellbore #1

Standard Survey Report

24 December, 2018

Survey Report

Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Duck Club 12W-20-3N
Project:	Adams County (NAD 83)	TVD Reference:	KB=25 @ 5062.00usft (Patt 901)
Site:	Sec 12-T01S-R66W	MD Reference:	KB=25 @ 5062.00usft (Patt 901)
Well:	Duck Club 12W-20-3N	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1

Project	Adams County (NAD 83)		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	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-20-3N					
Well Position	+N/-S	0.00 usft	Northing:	1,236,240.94 usft	Latitude:	39.97930
	+E/-W	0.00 usft	Easting:	3,215,517.62 usft	Longitude:	-104.73094
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	5,037.00 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	11/6/2018	8.20	66.32	51,945

Design	Wellbore #1				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.00	0.00	0.00	280.52	

Survey Program	Date	12/24/2018			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
129.00	1,588.00	Surface Surveys (Wellbore #1)	MWD	MWD - Standard	
1,663.00	17,898.00	Atlas MWD Surveys (Wellbore #1)	MWD	MWD - Standard	

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)	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
129.00	0.31	309.91	129.00	0.22	-0.27	0.30	0.24	0.24	0.00	
First Surface Survey										
225.00	0.18	301.92	225.00	0.47	-0.59	0.67	0.14	-0.14	-8.32	
320.00	0.35	224.75	320.00	0.34	-0.93	0.97	0.38	0.18	-81.23	
415.00	0.44	213.94	415.00	-0.17	-1.33	1.28	0.12	0.09	-11.38	
510.00	0.18	83.33	509.99	-0.45	-1.39	1.28	0.60	-0.27	-137.48	
604.00	2.29	44.66	603.97	0.90	0.08	0.09	2.29	2.24	-41.14	
699.00	4.35	46.86	698.80	4.72	4.04	-3.11	2.17	2.17	2.32	
795.00	5.71	48.00	794.43	10.40	10.25	-8.18	1.42	1.42	1.19	

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Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	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	7.56	49.32	888.79	17.64	18.50	-14.97	1.95	1.95	1.39	
985.00	10.15	51.96	982.65	26.87	29.83	-24.43	2.76	2.73	2.78	
1,080.00	11.73	52.75	1,075.92	37.88	44.11	-36.46	1.67	1.66	0.83	
1,175.00	14.02	56.53	1,168.53	50.07	61.40	-51.23	2.57	2.41	3.98	
1,270.00	15.47	56.88	1,260.40	63.34	81.61	-68.68	1.53	1.53	0.37	
1,364.00	15.82	59.16	1,350.92	76.76	103.11	-87.37	0.75	0.37	2.43	
1,459.00	17.97	53.80	1,441.82	92.05	126.06	-107.14	2.79	2.26	-5.64	
1,555.00	20.92	53.01	1,532.33	111.12	151.71	-128.87	3.09	3.07	-0.82	
1,588.00	21.09	53.63	1,563.14	118.18	161.19	-136.91	0.85	0.52	1.88	
Last Surface Survey - Tie into Surface Surveys										
1,663.00	21.65	55.44	1,632.98	134.03	183.45	-155.90	1.15	0.75	2.41	
First MWD Survey @ 1663.00' MD										
1,759.00	24.22	56.54	1,721.39	154.94	214.47	-182.58	2.71	2.68	1.15	
1,855.00	28.15	55.79	1,807.52	178.54	249.64	-212.85	4.11	4.09	-0.78	
1,950.00	27.88	55.13	1,891.39	203.83	286.40	-244.37	0.43	-0.28	-0.69	
2,046.00	30.53	52.84	1,975.18	231.40	324.25	-276.56	3.00	2.76	-2.39	
2,142.00	29.96	50.68	2,058.11	261.32	362.23	-308.44	1.28	-0.59	-2.25	
2,237.00	29.12	49.62	2,140.76	291.33	398.19	-338.32	1.04	-0.88	-1.12	
2,333.00	30.71	54.91	2,223.98	320.56	436.05	-370.20	3.21	1.66	5.51	
2,429.00	29.61	52.36	2,306.99	349.14	474.89	-403.18	1.76	-1.15	-2.66	
2,524.00	28.37	50.99	2,390.09	377.68	511.02	-433.48	1.48	-1.31	-1.44	
2,620.00	29.39	54.34	2,474.15	405.77	547.88	-464.60	1.99	1.06	3.49	
2,715.00	27.49	52.75	2,557.68	432.63	584.28	-495.48	2.15	-2.00	-1.67	
2,811.00	30.14	54.12	2,641.79	460.18	621.45	-527.00	2.84	2.76	1.43	
2,906.00	27.71	52.97	2,724.93	487.46	658.42	-558.36	2.62	-2.56	-1.21	
3,002.00	32.48	54.03	2,807.97	516.06	697.12	-591.19	5.00	4.97	1.10	
3,097.00	31.68	53.41	2,888.46	545.91	737.79	-625.73	0.91	-0.84	-0.65	
3,193.00	29.03	52.27	2,971.30	575.20	776.46	-658.41	2.82	-2.76	-1.19	
3,288.00	26.43	51.39	3,055.38	602.50	811.22	-687.60	2.77	-2.74	-0.93	
3,384.00	29.61	52.14	3,140.12	630.40	846.65	-717.34	3.33	3.31	0.78	
3,479.00	28.94	52.18	3,222.98	658.89	883.33	-748.20	0.71	-0.71	0.04	
3,575.00	32.97	55.09	3,305.30	688.10	923.12	-781.99	4.48	4.20	3.03	
3,670.00	31.73	55.13	3,385.55	717.18	964.82	-817.68	1.31	-1.31	0.04	
3,765.00	28.72	54.21	3,467.63	744.81	1,003.84	-851.00	3.21	-3.17	-0.97	
3,861.00	25.54	54.12	3,553.05	770.44	1,039.32	-881.21	3.31	-3.31	-0.09	
3,956.00	28.63	54.07	3,637.62	795.80	1,074.36	-911.02	3.25	3.25	-0.05	
4,051.00	27.13	53.50	3,721.60	822.04	1,110.20	-941.47	1.60	-1.58	-0.60	
4,147.00	27.22	54.91	3,807.00	847.68	1,145.76	-971.75	0.68	0.09	1.47	
4,242.00	30.84	54.96	3,890.05	874.16	1,183.49	-1,004.01	3.81	3.81	0.05	
4,337.00	27.49	54.65	3,972.99	900.84	1,221.32	-1,036.34	3.53	-3.53	-0.33	
4,433.00	30.89	55.62	4,056.79	927.58	1,259.74	-1,069.23	3.58	3.54	1.01	
4,528.00	29.08	56.81	4,139.07	953.99	1,299.19	-1,103.20	2.01	-1.91	1.25	
4,624.00	24.97	56.23	4,224.57	978.04	1,335.57	-1,134.58	4.29	-4.28	-0.60	

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Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
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Survey										
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4,719.00	27.31	55.26	4,309.85	1,001.60	1,370.15	-1,164.28	2.50	2.46	-1.02	
4,815.00	31.60	55.53	4,393.42	1,028.40	1,409.00	-1,197.58	4.47	4.47	0.28	
4,910.00	29.08	55.26	4,475.41	1,055.65	1,448.50	-1,231.44	2.66	-2.65	-0.28	
5,005.00	31.64	50.33	4,557.38	1,084.72	1,486.67	-1,263.66	3.76	2.69	-5.19	
5,101.00	29.39	49.89	4,640.08	1,115.97	1,524.07	-1,294.72	2.36	-2.34	-0.46	
5,196.00	30.23	54.87	4,722.52	1,144.76	1,561.46	-1,326.24	2.75	0.88	5.24	
5,388.00	28.50	50.99	4,889.86	1,201.41	1,636.60	-1,389.77	1.34	-0.90	-2.02	
5,483.00	26.87	50.06	4,973.98	1,229.47	1,670.67	-1,418.15	1.78	-1.72	-0.98	
5,578.00	30.76	51.43	5,057.21	1,258.41	1,706.14	-1,447.73	4.15	4.09	1.44	
5,674.00	29.25	50.55	5,140.34	1,288.62	1,743.45	-1,478.90	1.64	-1.57	-0.92	
5,794.00	25.45	48.83	5,246.91	1,324.23	1,785.51	-1,513.75	3.23	-3.17	-1.43	
5,889.00	27.22	54.29	5,332.06	1,350.36	1,818.52	-1,541.44	3.16	1.86	5.75	
5,984.00	28.15	57.20	5,416.18	1,375.18	1,855.00	-1,572.78	1.73	0.98	3.06	
6,080.00	25.41	56.85	5,501.88	1,398.71	1,891.29	-1,604.16	2.86	-2.85	-0.36	
6,176.00	23.99	57.03	5,589.09	1,420.60	1,924.91	-1,633.22	1.48	-1.48	0.19	
6,271.00	20.55	55.35	5,677.00	1,440.59	1,954.84	-1,658.99	3.68	-3.62	-1.77	
6,367.00	18.47	59.27	5,767.48	1,457.95	1,981.77	-1,682.31	2.56	-2.17	4.08	
6,462.00	13.88	57.11	5,858.70	1,471.83	2,004.29	-1,701.91	4.87	-4.83	-2.27	
6,557.00	13.92	56.54	5,950.92	1,484.32	2,023.39	-1,718.41	0.15	0.04	-0.60	
6,653.00	10.65	54.51	6,044.71	1,495.84	2,040.25	-1,732.89	3.44	-3.41	-2.11	
6,748.00	8.35	52.44	6,138.40	1,505.14	2,052.87	-1,743.59	2.45	-2.42	-2.18	
6,844.00	6.50	52.66	6,233.59	1,512.69	2,062.72	-1,751.90	1.93	-1.93	0.23	
6,939.00	1.10	44.07	6,328.34	1,516.61	2,067.63	-1,756.01	5.70	-5.68	-9.04	
7,035.00	1.33	48.61	6,424.32	1,518.01	2,069.11	-1,757.21	0.26	0.24	4.73	
7,130.00	0.80	31.34	6,519.31	1,519.30	2,070.28	-1,758.13	0.65	-0.56	-18.18	
7,226.00	0.18	94.75	6,615.30	1,519.86	2,070.78	-1,758.51	0.77	-0.65	66.05	
7,322.00	0.40	23.58	6,711.30	1,520.16	2,071.06	-1,758.74	0.40	0.23	-74.14	
7,417.00	5.26	267.36	6,806.17	1,520.26	2,066.84	-1,754.57	5.74	5.12	-122.34	
7,513.00	15.64	280.36	6,900.46	1,522.39	2,049.67	-1,737.30	11.02	10.81	13.54	
7,609.00	26.60	274.76	6,989.88	1,526.51	2,015.41	-1,702.86	11.60	11.42	-5.83	
7,704.00	32.21	274.94	7,072.61	1,530.46	1,968.95	-1,656.47	5.91	5.91	0.19	
7,800.00	40.43	274.41	7,149.90	1,535.07	1,912.33	-1,599.95	8.57	8.56	-0.55	
7,895.00	43.22	268.15	7,220.71	1,536.39	1,849.07	-1,537.51	5.28	2.94	-6.59	
7,991.00	53.96	267.49	7,284.12	1,533.62	1,777.23	-1,467.38	11.20	11.19	-0.69	
8,086.00	63.77	271.28	7,333.19	1,532.88	1,696.04	-1,387.69	10.87	10.33	3.99	
8,181.00	70.61	269.78	7,370.00	1,533.66	1,608.52	-1,301.51	7.35	7.20	-1.58	
8,277.00	82.32	270.45	7,392.43	1,533.87	1,515.35	-1,209.87	12.22	12.20	0.70	
8,314.88	83.64	270.41	7,397.06	1,534.15	1,477.76	-1,172.85	3.50	3.49	-0.10	
LP Duck Club 12W-20-3N										
8,372.00	85.64	270.36	7,402.39	1,534.53	1,420.89	-1,116.87	3.50	3.49	-0.09	
8,468.00	87.45	269.74	7,408.18	1,534.62	1,325.07	-1,022.65	1.99	1.89	-0.65	
8,563.00	89.40	270.80	7,410.79	1,535.06	1,230.11	-929.20	2.34	2.05	1.12	
8,658.00	89.97	270.58	7,411.31	1,536.21	1,135.12	-835.60	0.64	0.60	-0.23	
8,754.00	91.25	271.81	7,410.29	1,538.21	1,039.15	-740.88	1.85	1.33	1.28	

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8,849.00	89.13	271.68	7,409.97	1,541.10	944.20	-646.99	2.24	-2.23	-0.14
8,945.00	89.22	271.41	7,411.36	1,543.69	848.25	-552.18	0.30	0.09	-0.28
9,040.00	89.79	271.41	7,412.18	1,546.03	753.28	-458.38	0.60	0.60	0.00
9,135.00	91.21	271.86	7,411.35	1,548.74	658.33	-364.53	1.57	1.49	0.47
9,231.00	90.50	268.68	7,409.91	1,549.19	562.35	-270.08	3.39	-0.74	-3.31
9,326.00	89.17	266.74	7,410.19	1,545.39	467.43	-177.45	2.48	-1.40	-2.04
9,422.00	89.09	266.30	7,411.65	1,539.57	371.62	-84.31	0.47	-0.08	-0.46
9,517.00	89.26	268.77	7,413.01	1,535.48	276.73	8.24	2.61	0.18	2.60
9,613.00	88.29	267.98	7,415.07	1,532.76	180.79	102.07	1.30	-1.01	-0.82
9,708.00	90.63	267.80	7,415.96	1,529.26	85.86	194.76	2.47	2.46	-0.19
9,804.00	89.44	266.83	7,415.90	1,524.77	-10.03	288.22	1.60	-1.24	-1.01
9,899.00	90.77	266.83	7,415.73	1,519.51	-104.88	380.52	1.40	1.40	0.00
9,995.00	91.12	266.61	7,414.14	1,514.02	-200.71	473.73	0.43	0.36	-0.23
10,090.00	89.35	270.67	7,413.76	1,511.77	-295.66	566.68	4.66	-1.86	4.27
10,186.00	89.62	269.03	7,414.62	1,511.52	-391.65	661.01	1.73	0.28	-1.71
10,281.00	89.09	266.48	7,415.69	1,507.80	-486.56	753.65	2.74	-0.56	-2.68
10,377.00	90.63	271.46	7,415.92	1,506.07	-582.51	847.67	5.43	1.60	5.19
10,473.00	91.30	271.72	7,414.31	1,508.73	-678.46	942.49	0.75	0.70	0.27
10,568.00	92.14	271.59	7,411.45	1,511.48	-773.38	1,036.32	0.89	0.88	-0.14
10,663.00	89.84	270.22	7,409.81	1,512.98	-868.35	1,129.96	2.82	-2.42	-1.44
10,758.00	90.10	268.90	7,409.86	1,512.25	-963.34	1,223.23	1.42	0.27	-1.39
10,854.00	91.07	269.30	7,408.88	1,510.74	-1,059.32	1,317.32	1.09	1.01	0.42
10,949.00	89.70	268.24	7,408.24	1,508.70	-1,154.29	1,410.32	1.82	-1.44	-1.12
11,045.00	90.15	269.08	7,408.37	1,506.45	-1,250.27	1,504.27	0.99	0.47	0.88
11,140.00	89.48	269.12	7,408.68	1,504.96	-1,345.25	1,597.39	0.71	-0.71	0.04
11,236.00	88.07	269.92	7,410.73	1,504.16	-1,441.23	1,691.60	1.69	-1.47	0.83
11,332.00	88.82	270.09	7,413.33	1,504.17	-1,537.19	1,785.96	0.80	0.78	0.18
11,427.00	89.79	269.78	7,414.49	1,504.06	-1,632.18	1,879.33	1.07	1.02	-0.33
11,522.00	88.47	269.56	7,415.93	1,503.51	-1,727.17	1,972.62	1.41	-1.39	-0.23
11,617.00	89.97	270.18	7,417.22	1,503.30	-1,822.15	2,065.97	1.71	1.58	0.65
11,713.00	89.53	271.06	7,417.64	1,504.34	-1,918.15	2,160.54	1.02	-0.46	0.92
11,809.00	87.45	270.53	7,420.17	1,505.67	-2,014.10	2,255.12	2.24	-2.17	-0.55
11,904.00	87.36	270.31	7,424.47	1,506.36	-2,109.00	2,348.56	0.25	-0.09	-0.23
12,000.00	88.11	271.81	7,428.27	1,508.14	-2,204.90	2,443.17	1.75	0.78	1.56
12,095.00	88.78	272.30	7,430.84	1,511.54	-2,299.81	2,537.10	0.87	0.71	0.52
12,191.00	89.31	272.43	7,432.44	1,515.50	-2,395.71	2,632.12	0.57	0.55	0.14
12,286.00	89.70	272.30	7,433.26	1,519.42	-2,490.63	2,726.16	0.43	0.41	-0.14
12,382.00	90.06	271.46	7,433.47	1,522.57	-2,586.57	2,821.07	0.95	0.38	-0.88
12,477.00	87.89	271.06	7,435.16	1,524.66	-2,681.53	2,914.81	2.32	-2.28	-0.42
12,573.00	88.25	271.11	7,438.40	1,526.48	-2,777.46	3,009.45	0.38	0.38	0.05
12,668.00	88.42	270.97	7,441.16	1,528.20	-2,872.40	3,103.12	0.23	0.18	-0.15
12,763.00	88.82	270.97	7,443.45	1,529.81	-2,967.36	3,196.77	0.42	0.42	0.00
12,859.00	89.00	270.45	7,445.27	1,531.00	-3,063.34	3,291.35	0.57	0.19	-0.54

Survey Report

Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Duck Club 12W-20-3N
Project:	Adams County (NAD 83)	TVD Reference:	KB=25 @ 5062.00usft (Patt 901)
Site:	Sec 12-T01S-R66W	MD Reference:	KB=25 @ 5062.00usft (Patt 901)
Well:	Duck Club 12W-20-3N	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	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)	
12,955.00	89.48	269.87	7,446.55	1,531.27	-3,159.33	3,385.78	0.78	0.50	-0.60	
13,051.00	89.88	269.48	7,447.08	1,530.72	-3,255.32	3,480.06	0.58	0.42	-0.41	
13,146.00	90.41	269.39	7,446.84	1,529.79	-3,350.32	3,573.29	0.57	0.56	-0.09	
13,242.00	91.34	268.64	7,445.38	1,528.14	-3,446.29	3,667.35	1.24	0.97	-0.78	
13,337.00	90.32	268.42	7,444.00	1,525.70	-3,541.25	3,760.27	1.10	-1.07	-0.23	
13,432.00	91.69	269.26	7,442.33	1,523.78	-3,636.21	3,853.28	1.69	1.44	0.88	
13,528.00	89.26	268.42	7,441.54	1,521.83	-3,732.18	3,947.28	2.68	-2.53	-0.88	
13,623.00	89.97	268.33	7,442.18	1,519.14	-3,827.14	4,040.16	0.75	0.75	-0.09	
13,719.00	88.86	268.81	7,443.16	1,516.74	-3,923.10	4,134.07	1.26	-1.16	0.50	
13,814.00	89.84	268.51	7,444.23	1,514.52	-4,018.07	4,227.03	1.08	1.03	-0.32	
13,910.00	90.81	268.59	7,443.69	1,512.09	-4,114.04	4,320.94	1.01	1.01	0.08	
14,005.00	88.91	269.92	7,443.92	1,510.86	-4,209.02	4,414.11	2.44	-2.00	1.40	
14,101.00	90.06	269.34	7,444.78	1,510.24	-4,305.01	4,508.37	1.34	1.20	-0.60	
14,197.00	90.90	268.90	7,443.98	1,508.76	-4,401.00	4,602.48	0.99	0.88	-0.46	
14,292.00	90.59	270.53	7,442.74	1,508.29	-4,495.98	4,695.78	1.75	-0.33	1.72	
14,387.00	91.56	270.36	7,440.96	1,509.03	-4,590.96	4,789.30	1.04	1.02	-0.18	
14,483.00	87.98	270.09	7,441.35	1,509.41	-4,686.95	4,883.74	3.74	-3.73	-0.28	
14,579.00	88.78	270.00	7,444.06	1,509.48	-4,782.91	4,978.10	0.84	0.83	-0.09	
14,674.00	90.10	271.19	7,444.99	1,510.47	-4,877.89	5,071.67	1.87	1.39	1.25	
14,770.00	91.52	270.80	7,443.63	1,512.13	-4,973.87	5,166.33	1.53	1.48	-0.41	
14,865.00	89.35	270.62	7,442.91	1,513.31	-5,068.85	5,259.94	2.29	-2.28	-0.19	
14,960.00	89.35	270.18	7,443.99	1,513.97	-5,163.84	5,353.45	0.46	0.00	-0.46	
15,055.00	89.53	270.40	7,444.92	1,514.46	-5,258.84	5,446.94	0.30	0.19	0.23	
15,150.00	89.35	270.71	7,445.85	1,515.38	-5,353.83	5,540.50	0.38	-0.19	0.33	
15,246.00	89.09	270.93	7,447.15	1,516.75	-5,449.81	5,635.12	0.35	-0.27	0.23	
15,341.00	89.44	270.58	7,448.37	1,518.00	-5,544.79	5,728.74	0.52	0.37	-0.37	
15,436.00	90.50	270.97	7,448.42	1,519.29	-5,639.78	5,822.36	1.19	1.12	0.41	
15,531.00	91.12	270.49	7,447.08	1,520.50	-5,734.76	5,915.97	0.83	0.65	-0.51	
15,627.00	90.37	270.71	7,445.83	1,521.50	-5,830.75	6,010.53	0.81	-0.78	0.23	
15,723.00	90.81	270.31	7,444.84	1,522.36	-5,926.74	6,105.06	0.62	0.46	-0.42	
15,818.00	91.38	269.87	7,443.03	1,522.51	-6,021.72	6,198.47	0.76	0.60	-0.46	
15,913.00	88.91	270.00	7,442.79	1,522.40	-6,116.71	6,291.85	2.60	-2.60	0.14	
16,009.00	89.44	269.43	7,444.17	1,521.92	-6,212.70	6,386.14	0.81	0.55	-0.59	
16,104.00	89.88	269.52	7,444.73	1,521.05	-6,307.70	6,479.38	0.47	0.46	0.09	
16,200.00	90.72	269.52	7,444.23	1,520.25	-6,403.69	6,573.61	0.88	0.88	0.00	
16,295.00	88.47	269.17	7,444.90	1,519.16	-6,498.68	6,666.80	2.40	-2.37	-0.37	
16,391.00	89.13	269.12	7,446.91	1,517.73	-6,594.64	6,760.90	0.69	0.69	-0.05	
16,486.00	89.66	268.99	7,447.91	1,516.16	-6,689.63	6,853.99	0.57	0.56	-0.14	
16,581.00	90.28	269.52	7,447.96	1,514.93	-6,784.62	6,947.16	0.86	0.65	0.56	
16,677.00	90.85	268.95	7,447.02	1,513.64	-6,880.60	7,041.30	0.84	0.59	-0.59	
16,772.00	89.48	270.22	7,446.74	1,512.96	-6,975.60	7,134.57	1.97	-1.44	1.34	
16,868.00	90.28	270.05	7,446.95	1,513.18	-7,071.59	7,229.00	0.85	0.83	-0.18	
16,963.00	88.47	270.89	7,447.98	1,513.96	-7,166.58	7,322.53	2.10	-1.91	0.88	
17,058.00	88.82	270.58	7,450.23	1,515.18	-7,261.55	7,416.12	0.49	0.37	-0.33	

Survey Report

Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Duck Club 12W-20-3N
Project:	Adams County (NAD 83)	TVD Reference:	KB=25 @ 5062.00usft (Patt 901)
Site:	Sec 12-T01S-R66W	MD Reference:	KB=25 @ 5062.00usft (Patt 901)
Well:	Duck Club 12W-20-3N	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	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)
17,154.00	89.09	270.18	7,451.98	1,515.82	-7,357.53	7,510.61	0.50	0.28	-0.42
17,249.00	89.70	270.75	7,452.98	1,516.59	-7,452.52	7,604.14	0.88	0.64	0.60
17,345.00	89.88	270.36	7,453.33	1,517.52	-7,548.51	7,698.70	0.45	0.19	-0.41
17,440.00	90.32	270.27	7,453.17	1,518.04	-7,643.51	7,792.19	0.47	0.46	-0.09
17,535.00	89.00	270.53	7,453.73	1,518.70	-7,738.51	7,885.71	1.42	-1.39	0.27
17,631.00	89.62	270.97	7,454.89	1,519.96	-7,834.49	7,980.31	0.79	0.65	0.46
17,727.00	89.79	270.27	7,455.38	1,521.00	-7,930.48	8,074.88	0.75	0.18	-0.73
17,822.00	90.46	270.22	7,455.17	1,521.40	-8,025.48	8,168.36	0.71	0.71	-0.05
Last MWD Survey @ 17822.00' MD									
17,898.00	90.46	270.22	7,454.56	1,521.70	-8,101.48	8,243.13	0.00	0.00	0.00
Projection to TD @ 17898.00' MD 1242' FNL/ 2136' FEL - PBHL Duck Club 12W-20-3N									

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
30° Inclination @ 7666.5	0.00	0.00	7,040.57	1,528.80	1,988.22	1,237,786.92	3,217,492.51	39.98350	-104.72385
- actual wellpath misses target center by 0.01usft at 7666.58usft MD (7040.57 TVD, 1528.81 N, 1988.22 E)									
- Point									
70° Inclination @ 8172.5	0.00	0.00	7,367.15	1,533.69	1,616.50	1,237,788.59	3,217,120.76	39.98351	-104.72517
- actual wellpath misses target center by 0.01usft at 8172.54usft MD (7367.15 TVD, 1533.69 N, 1616.49 E)									
- Point									
Cross @ 10487.55' MD	0.00	0.00	7,413.96	1,509.17	-693.00	1,237,744.04	3,214,811.56	39.98344	-104.73342
- actual wellpath hits target center									
- Point									
Cross @ 15764.77' MD	0.00	0.00	7,444.16	1,522.51	-5,968.50	1,237,711.63	3,209,536.14	39.98348	-104.75224
- actual wellpath hits target center									
- Point									

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
129.00	129.00	0.22	-0.27	First Surface Survey	
1,588.00	1,563.14	118.18	161.19	Last Surface Survey	
1,588.00	1,563.14	118.18	161.19	Tie into Surface Surveys	
1,663.00	1,632.98	134.03	183.45	First MWD Survey @ 1663.00' MD	
17,822.00	7,455.17	1,521.40	-8,025.48	Last MWD Survey @ 17822.00' MD	
17,898.00	7,454.56	1,521.70	-8,101.48	Projection to TD @ 17898.00' MD 1242' FNL/ 2136' FEL	

Checked By: _____ Approved By: _____ Date: _____