

Extraction Oil & Gas

Adams County (NAD 83)

Sec 12-T01S-R66W

Duck Club 12W-20-7N

Wellbore #1

Design: Wellbore #1

Standard Survey Report

07 December, 2018



Survey Report



Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Duck Club 12W-20-7N
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-20-7N	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-20-7N					
Well Position	+N/-S	0.00 usft	Northing:	1,236,127.99 usft	Latitude:	39.97899
	+E/-W	0.00 usft	Easting:	3,215,515.79 usft	Longitude:	-104.73095
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	270.29	

Survey Program	Date	12/7/2018			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
129.00	1,543.00	Surface Surveys (Wellbore #1)	MWD	MWD - Standard	
1,662.00	17,699.00	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	0.35	18.47	129.00	0.37	0.12	-0.12	0.27	0.27	0.00	
225.00	0.57	1.77	225.00	1.13	0.23	-0.23	0.27	0.23	-17.40	
320.00	1.01	20.14	319.99	2.39	0.54	-0.52	0.53	0.46	19.34	
415.00	0.40	29.37	414.98	3.46	0.99	-0.97	0.65	-0.64	9.72	
510.00	0.26	112.07	509.98	3.67	1.35	-1.33	0.47	-0.15	87.05	
604.00	0.40	120.69	603.98	3.42	1.83	-1.81	0.16	0.15	9.17	
699.00	0.70	119.10	698.97	2.97	2.62	-2.61	0.32	0.32	-1.67	
795.00	0.70	119.54	794.96	2.40	3.64	-3.63	0.01	0.00	0.46	
890.00	0.13	157.51	889.96	2.01	4.19	-4.18	0.63	-0.60	39.97	

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Well:	Duck Club 12W-20-7N	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)
985.00	0.48	273.44	984.96	1.94	3.83	-3.82	0.58	0.37	122.03
1,080.00	1.23	39.39	1,079.95	2.75	4.08	-4.07	1.64	0.79	132.58
1,175.00	3.34	80.34	1,174.88	4.00	7.46	-7.44	2.68	2.22	43.11
1,270.00	5.45	89.22	1,269.59	4.53	14.70	-14.68	2.33	2.22	9.35
1,364.00	6.15	90.89	1,363.11	4.51	24.20	-24.17	0.77	0.74	1.78
1,459.00	9.14	88.61	1,457.26	4.61	36.83	-36.81	3.16	3.15	-2.40
1,543.00	12.09	90.19	1,539.81	4.75	52.30	-52.28	3.53	3.51	1.88
Tie into Surface Surveys									
1,662.00	12.90	92.50	1,655.99	4.12	78.03	-78.01	0.80	0.68	1.94
1,758.00	16.13	93.73	1,748.92	2.79	102.05	-102.04	3.38	3.36	1.28
1,853.00	18.87	92.41	1,839.51	1.28	130.58	-130.57	2.91	2.88	-1.39
1,949.00	20.95	89.94	1,929.77	0.65	163.25	-163.25	2.34	2.17	-2.57
2,045.00	22.67	90.34	2,018.90	0.56	198.92	-198.91	1.80	1.79	0.42
2,141.00	23.82	90.39	2,107.10	0.32	236.81	-236.80	1.20	1.20	0.05
2,236.00	23.55	89.02	2,194.10	0.51	274.96	-274.96	0.65	-0.28	-1.44
2,332.00	24.75	86.90	2,281.70	1.93	314.21	-314.19	1.54	1.25	-2.21
2,428.00	23.82	86.55	2,369.20	4.18	353.63	-353.60	0.98	-0.97	-0.36
2,523.00	22.67	86.02	2,456.49	6.60	391.04	-391.00	1.23	-1.21	-0.56
2,619.00	23.42	89.72	2,544.83	7.98	428.58	-428.53	1.70	0.78	3.85
2,714.00	24.61	90.91	2,631.61	7.76	467.24	-467.19	1.35	1.25	1.25
2,809.00	22.93	89.86	2,718.55	7.49	505.52	-505.48	1.82	-1.77	-1.11
2,905.00	25.72	89.77	2,806.01	7.62	545.06	-545.02	2.91	2.91	-0.09
3,001.00	24.22	89.42	2,893.04	7.90	585.59	-585.54	1.57	-1.56	-0.36
3,096.00	24.88	90.25	2,979.45	8.01	625.06	-625.01	0.78	0.69	0.87
3,192.00	23.07	90.61	3,067.16	7.72	664.06	-664.01	1.89	-1.89	0.38
3,287.00	24.30	89.02	3,154.16	7.86	702.22	-702.17	1.46	1.29	-1.67
3,383.00	25.01	90.39	3,241.41	8.06	742.26	-742.21	0.95	0.74	1.43
3,478.00	22.89	88.40	3,328.23	8.44	780.82	-780.77	2.39	-2.23	-2.09
3,573.00	24.17	90.87	3,415.33	8.66	818.74	-818.68	1.70	1.35	2.60
3,668.00	25.14	89.33	3,501.67	8.60	858.36	-858.31	1.22	1.02	-1.62
3,764.00	22.80	89.59	3,589.38	8.97	897.36	-897.30	2.44	-2.44	0.27
3,860.00	25.10	87.96	3,677.11	9.83	936.31	-936.25	2.49	2.40	-1.70
3,955.00	22.93	86.02	3,763.88	11.83	974.92	-974.84	2.43	-2.28	-2.04
4,050.00	23.86	89.55	3,851.08	13.27	1,012.59	-1,012.51	1.77	0.98	3.72
4,146.00	25.01	89.46	3,938.48	13.61	1,052.30	-1,052.22	1.20	1.20	-0.09
4,241.00	22.76	89.42	4,025.34	13.99	1,090.76	-1,090.68	2.37	-2.37	-0.04
4,336.00	24.57	88.53	4,112.34	14.68	1,128.89	-1,128.80	1.94	1.91	-0.94
4,431.00	25.67	88.18	4,198.36	15.84	1,169.20	-1,169.10	1.17	1.16	-0.37
4,527.00	23.11	87.35	4,285.78	17.37	1,208.81	-1,208.70	2.69	-2.67	-0.86
4,622.00	24.35	89.20	4,372.75	18.51	1,247.02	-1,246.91	1.52	1.31	1.95
4,718.00	22.63	90.78	4,460.79	18.53	1,285.28	-1,285.17	1.91	-1.79	1.65
4,813.00	25.01	95.01	4,547.70	16.53	1,323.57	-1,323.46	3.08	2.51	4.45
4,909.00	24.75	89.68	4,634.80	14.87	1,363.88	-1,363.79	2.35	-0.27	-5.55

Survey Report



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Site:	Sec 12-T01S-R66W	MD Reference:	KB=25 @ 5062.00usft (Patt 901)
Well:	Duck Club 12W-20-7N	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)	
5,004.00	24.70	93.56	4,721.10	13.75	1,403.58	-1,403.49	1.71	-0.05	4.08	
5,099.00	27.40	93.56	4,806.44	11.16	1,445.22	-1,445.14	2.84	2.84	0.00	
5,195.00	26.07	92.41	4,892.18	8.90	1,488.34	-1,488.28	1.49	-1.39	-1.20	
5,291.00	23.73	91.18	4,979.25	7.61	1,528.74	-1,528.68	2.50	-2.44	-1.28	
5,386.00	26.60	87.04	5,065.23	8.32	1,569.10	-1,569.04	3.54	3.02	-4.36	
5,482.00	26.34	88.49	5,151.17	9.99	1,611.85	-1,611.78	0.73	-0.27	1.51	
5,577.00	24.53	87.43	5,236.95	11.43	1,652.63	-1,652.55	1.96	-1.91	-1.12	
5,673.00	26.38	85.93	5,323.63	13.84	1,693.81	-1,693.72	2.04	1.93	-1.56	
5,768.00	24.79	86.55	5,409.31	16.53	1,734.75	-1,734.64	1.70	-1.67	0.65	
5,888.00	21.87	86.68	5,519.49	19.34	1,782.18	-1,782.06	2.43	-2.43	0.11	
5,983.00	24.44	82.85	5,606.84	22.81	1,819.35	-1,819.21	3.13	2.71	-4.03	
6,079.00	23.69	84.00	5,694.49	27.30	1,858.24	-1,858.08	0.92	-0.78	1.20	
6,174.00	20.77	83.86	5,782.42	31.10	1,893.98	-1,893.79	3.07	-3.07	-0.15	
6,270.00	20.68	85.41	5,872.21	34.28	1,927.80	-1,927.60	0.58	-0.09	1.61	
6,365.00	17.32	84.52	5,962.02	36.97	1,958.60	-1,958.39	3.55	-3.54	-0.94	
6,461.00	14.36	83.38	6,054.37	39.71	1,984.66	-1,984.43	3.10	-3.08	-1.19	
6,556.00	12.02	80.12	6,146.85	42.76	2,006.11	-2,005.87	2.58	-2.46	-3.43	
6,652.00	9.59	77.21	6,241.15	46.25	2,023.76	-2,023.50	2.59	-2.53	-3.03	
6,747.00	7.29	77.47	6,335.11	49.31	2,037.36	-2,037.08	2.42	-2.42	0.27	
6,842.00	5.48	75.09	6,429.52	51.78	2,047.63	-2,047.34	1.93	-1.91	-2.51	
6,938.00	4.29	70.64	6,525.17	54.15	2,055.45	-2,055.14	1.30	-1.24	-4.64	
7,033.00	0.75	142.03	6,620.07	54.84	2,059.18	-2,058.88	4.33	-3.73	75.15	
7,129.00	0.44	195.93	6,716.07	53.99	2,059.47	-2,059.17	0.63	-0.32	56.15	
7,225.00	0.80	283.80	6,812.06	53.80	2,058.72	-2,058.42	0.94	0.38	91.53	
7,320.00	12.11	277.63	6,906.31	55.28	2,048.16	-2,047.85	11.91	11.91	-6.49	
7,416.00	24.44	277.28	6,997.29	59.15	2,018.37	-2,018.04	12.84	12.84	-0.36	
7,512.00	30.58	275.12	7,082.40	63.85	1,974.30	-1,973.95	6.48	6.40	-2.25	
7,607.00	37.65	264.98	7,161.06	63.47	1,921.22	-1,920.87	9.53	7.44	-10.67	
7,703.00	42.47	260.66	7,234.53	55.64	1,859.98	-1,859.67	5.79	5.02	-4.50	
7,799.00	52.89	264.36	7,299.09	46.59	1,789.70	-1,789.44	11.22	10.85	3.85	
7,894.00	63.90	267.10	7,348.80	40.69	1,709.14	-1,708.91	11.85	11.59	2.88	
7,990.00	72.65	269.26	7,384.31	37.91	1,620.10	-1,619.88	9.35	9.11	2.25	
8,085.00	79.19	269.87	7,407.41	37.22	1,528.01	-1,527.80	6.91	6.88	0.64	
8,131.15	83.18	270.24	7,414.48	37.26	1,482.41	-1,482.20	8.69	8.65	0.80	
LP Duck Club 12W-20-7N										
8,180.00	87.41	270.62	7,418.48	37.63	1,433.74	-1,433.53	8.69	8.65	0.78	
8,275.00	88.42	271.06	7,421.94	39.02	1,338.81	-1,338.60	1.16	1.06	0.46	
8,371.00	87.05	271.86	7,425.73	41.46	1,242.92	-1,242.69	1.65	-1.43	0.83	
8,466.00	89.09	271.59	7,428.93	44.32	1,148.02	-1,147.78	2.17	2.15	-0.28	
8,562.00	89.26	270.93	7,430.31	46.43	1,052.06	-1,051.81	0.71	0.18	-0.69	
8,657.00	90.32	269.70	7,430.66	46.95	957.06	-956.81	1.71	1.12	-1.29	
8,753.00	89.79	270.05	7,430.57	46.74	861.06	-860.81	0.66	-0.55	0.36	
8,848.00	90.72	270.84	7,430.15	47.48	766.07	-765.82	1.28	0.98	0.83	
8,943.00	90.99	271.77	7,428.73	49.65	671.10	-670.84	1.02	0.28	0.98	

Survey Report



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Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1

Survey									
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9,039.00	89.79	270.00	7,428.07	51.13	575.12	-574.86	2.23	-1.25	-1.84
9,134.00	89.66	271.68	7,428.53	52.52	480.14	-479.87	1.77	-0.14	1.77
9,230.00	90.06	273.40	7,428.77	56.77	384.24	-383.94	1.84	0.42	1.79
9,325.00	90.28	271.81	7,428.48	61.09	289.34	-289.02	1.69	0.23	-1.67
9,420.00	89.75	270.84	7,428.46	63.29	194.37	-194.04	1.16	-0.56	-1.02
9,516.00	90.06	270.31	7,428.62	64.25	98.37	-98.04	0.64	0.32	-0.55
9,611.00	89.57	269.70	7,428.92	64.26	3.37	-3.05	0.82	-0.52	-0.64
9,707.00	91.30	270.18	7,428.20	64.16	-92.62	92.95	1.87	1.80	0.50
9,802.00	90.81	269.65	7,426.45	64.02	-187.60	187.93	0.76	-0.52	-0.56
9,898.00	90.72	269.48	7,425.16	63.29	-283.59	283.91	0.20	-0.09	-0.18
9,993.00	90.32	268.95	7,424.30	61.99	-378.58	378.89	0.70	-0.42	-0.56
10,089.00	88.20	268.02	7,425.54	59.45	-474.53	474.83	2.41	-2.21	-0.97
10,184.00	88.91	268.15	7,427.94	56.28	-569.45	569.73	0.76	0.75	0.14
10,280.00	90.54	268.55	7,428.40	53.51	-665.40	665.67	1.75	1.70	0.42
10,376.00	90.23	268.55	7,427.75	51.08	-761.37	761.62	0.32	-0.32	0.00
10,471.00	90.41	268.20	7,427.22	48.39	-856.33	856.57	0.41	0.19	-0.37
10,567.00	90.50	268.15	7,426.46	45.33	-952.28	952.50	0.11	0.09	-0.05
10,662.00	90.54	267.49	7,425.60	41.72	-1,047.21	1,047.40	0.70	0.04	-0.69
10,757.00	89.70	265.73	7,425.40	36.10	-1,142.03	1,142.20	2.05	-0.88	-1.85
10,853.00	90.01	266.08	7,425.64	29.25	-1,237.79	1,237.92	0.49	0.32	0.36
10,948.00	89.48	265.42	7,426.07	22.21	-1,332.53	1,332.62	0.89	-0.56	-0.69
11,044.00	90.46	266.21	7,426.12	15.20	-1,428.27	1,428.33	1.31	1.02	0.82
11,139.00	91.65	270.49	7,424.37	12.47	-1,523.19	1,523.23	4.68	1.25	4.51
11,235.00	91.16	272.12	7,422.01	14.65	-1,619.13	1,619.18	1.77	-0.51	1.70
11,330.00	90.37	271.15	7,420.74	17.36	-1,714.08	1,714.15	1.32	-0.83	-1.02
11,426.00	91.12	270.80	7,419.50	19.00	-1,810.06	1,810.13	0.86	0.78	-0.36
11,521.00	90.54	270.80	7,418.12	20.32	-1,905.04	1,905.12	0.61	-0.61	0.00
11,616.00	88.95	271.59	7,418.54	22.30	-2,000.01	2,000.10	1.87	-1.67	0.83
11,712.00	88.29	271.24	7,420.85	24.67	-2,095.96	2,096.05	0.78	-0.69	-0.36
11,807.00	90.15	270.49	7,422.15	26.11	-2,190.93	2,191.04	2.11	1.96	-0.79
11,903.00	90.68	270.14	7,421.45	26.63	-2,286.93	2,287.03	0.66	0.55	-0.36
11,999.00	90.81	270.40	7,420.20	27.09	-2,382.92	2,383.03	0.30	0.14	0.27
12,094.00	89.40	269.48	7,420.03	26.99	-2,477.91	2,478.02	1.77	-1.48	-0.97
12,190.00	88.78	269.65	7,421.55	26.26	-2,573.90	2,574.00	0.67	-0.65	0.18
12,285.00	88.38	269.83	7,423.91	25.83	-2,668.87	2,668.97	0.46	-0.42	0.19
12,380.00	87.72	269.96	7,427.14	25.65	-2,763.81	2,763.91	0.71	-0.69	0.14
12,476.00	89.31	270.45	7,429.63	26.00	-2,859.78	2,859.87	1.73	1.66	0.51
12,572.00	89.62	271.24	7,430.52	27.41	-2,955.76	2,955.86	0.88	0.32	0.82
12,667.00	89.93	270.75	7,430.90	29.06	-3,050.75	3,050.85	0.61	0.33	-0.52
12,762.00	89.04	270.67	7,431.75	30.24	-3,145.73	3,145.85	0.94	-0.94	-0.08
12,858.00	91.56	270.80	7,431.25	31.47	-3,241.72	3,241.84	2.63	2.63	0.14
12,954.00	90.10	270.97	7,429.86	32.95	-3,337.69	3,337.82	1.53	-1.52	0.18
13,049.00	90.59	272.38	7,429.29	35.73	-3,432.65	3,432.79	1.57	0.52	1.48

Survey Report



Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Duck Club 12W-20-7N
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-20-7N	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)
13,145.00	87.76	271.55	7,430.67	39.02	-3,528.57	3,528.72	3.07	-2.95	-0.86
13,240.00	87.89	272.43	7,434.27	42.32	-3,623.44	3,623.61	0.94	0.14	0.93
13,335.00	90.81	271.94	7,435.35	45.94	-3,718.36	3,718.54	3.12	3.07	-0.52
13,431.00	91.25	271.86	7,433.63	49.12	-3,814.29	3,814.49	0.47	0.46	-0.08
13,527.00	91.47	270.89	7,431.35	51.43	-3,910.23	3,910.45	1.04	0.23	-1.01
13,622.00	90.68	270.62	7,429.57	52.68	-4,005.21	4,005.42	0.88	-0.83	-0.28
13,718.00	89.88	270.09	7,429.10	53.27	-4,101.20	4,101.42	1.00	-0.83	-0.55
13,813.00	87.85	269.78	7,430.98	53.16	-4,196.18	4,196.40	2.16	-2.14	-0.33
13,909.00	88.73	269.87	7,433.84	52.87	-4,292.14	4,292.35	0.92	0.92	0.09
14,004.00	89.22	269.96	7,435.54	52.73	-4,387.12	4,387.33	0.52	0.52	0.09
14,100.00	89.26	269.87	7,436.82	52.59	-4,483.11	4,483.32	0.10	0.04	-0.09
14,195.00	89.48	270.18	7,437.86	52.63	-4,578.11	4,578.31	0.40	0.23	0.33
14,290.00	88.86	269.03	7,439.24	51.97	-4,673.09	4,673.30	1.38	-0.65	-1.21
14,386.00	89.48	269.17	7,440.63	50.47	-4,769.07	4,769.26	0.66	0.65	0.15
14,482.00	90.63	269.96	7,440.53	49.74	-4,865.06	4,865.25	1.45	1.20	0.82
14,577.00	91.21	269.74	7,439.01	49.49	-4,960.05	4,960.24	0.65	0.61	-0.23
14,673.00	89.17	267.80	7,438.69	47.43	-5,056.02	5,056.19	2.93	-2.13	-2.02
14,769.00	89.35	268.37	7,439.93	44.22	-5,151.96	5,152.12	0.62	0.19	0.59
14,864.00	89.22	267.80	7,441.12	41.05	-5,246.90	5,247.04	0.62	-0.14	-0.60
14,959.00	90.28	268.02	7,441.53	37.58	-5,341.83	5,341.95	1.14	1.12	0.23
15,054.00	89.84	270.75	7,441.43	36.56	-5,436.82	5,436.93	2.91	-0.46	2.87
15,149.00	89.40	271.55	7,442.06	38.47	-5,531.79	5,531.92	0.96	-0.46	0.84
15,244.00	89.44	272.34	7,443.02	41.69	-5,626.73	5,626.87	0.83	0.04	0.83
15,340.00	87.94	272.91	7,445.22	46.09	-5,722.60	5,722.76	1.67	-1.56	0.59
15,435.00	88.03	273.27	7,448.56	51.21	-5,817.41	5,817.59	0.39	0.09	0.38
15,530.00	87.50	272.96	7,452.26	56.36	-5,912.19	5,912.40	0.65	-0.56	-0.33
15,626.00	90.15	272.21	7,454.23	60.69	-6,008.07	6,008.30	2.87	2.76	-0.78
15,721.00	90.59	271.81	7,453.62	64.02	-6,103.01	6,103.25	0.63	0.46	-0.42
15,817.00	89.53	269.65	7,453.52	65.25	-6,198.99	6,199.24	2.51	-1.10	-2.25
15,912.00	89.17	269.96	7,454.59	64.92	-6,293.98	6,294.23	0.50	-0.38	0.33
16,008.00	89.97	271.33	7,455.32	66.00	-6,389.97	6,390.23	1.65	0.83	1.43
16,103.00	89.53	270.53	7,455.73	67.55	-6,484.96	6,485.22	0.96	-0.46	-0.84
16,199.00	87.85	267.49	7,457.93	65.89	-6,580.90	6,581.15	3.62	-1.75	-3.17
16,294.00	89.40	268.59	7,460.20	62.64	-6,675.82	6,676.05	2.00	1.63	1.16
16,389.00	88.95	268.59	7,461.57	60.30	-6,770.78	6,771.00	0.47	-0.47	0.00
16,485.00	90.41	268.68	7,462.11	58.02	-6,866.75	6,866.95	1.52	1.52	0.09
16,580.00	90.81	268.37	7,461.10	55.57	-6,961.71	6,961.90	0.53	0.42	-0.33
16,675.00	90.81	268.64	7,459.75	53.09	-7,056.67	7,056.85	0.28	0.00	0.28
16,771.00	88.42	266.79	7,460.40	49.27	-7,152.58	7,152.74	3.15	-2.49	-1.93
16,866.00	89.84	269.08	7,461.84	45.85	-7,247.50	7,247.64	2.84	1.49	2.41
16,962.00	90.63	269.96	7,461.45	45.04	-7,343.49	7,343.62	1.23	0.82	0.92
17,057.00	90.15	269.70	7,460.80	44.76	-7,438.49	7,438.62	0.57	-0.51	-0.27
17,153.00	90.19	269.26	7,460.52	43.89	-7,534.48	7,534.61	0.46	0.04	-0.46

Survey Report



Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Duck Club 12W-20-7N
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-20-7N	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)
17,248.00	89.88	270.27	7,460.46	43.50	-7,629.48	7,629.60	1.11	-0.33	1.06
17,343.00	89.22	270.97	7,461.20	44.53	-7,724.47	7,724.60	1.01	-0.69	0.74
17,438.00	89.13	272.74	7,462.57	47.60	-7,819.41	7,819.55	1.87	-0.09	1.86
17,534.00	88.16	272.52	7,464.84	52.00	-7,915.28	7,915.44	1.04	-1.01	-0.23
17,630.00	90.50	274.50	7,465.97	57.88	-8,011.08	8,011.27	3.19	2.44	2.06
17,699.00	90.50	274.50	7,465.36	63.29	-8,079.87	8,080.08	0.00	0.00	0.00
PBHL Duck Club 12W-20-7N									

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
30° Inclination @ 7502.9	0.00	0.00	7,074.57	63.45	1,978.86	1,236,208.60	3,217,494.02	39.97916	-104.72389
- actual wellpath misses target center by 0.01usft at 7502.94usft MD (7074.57 TVD, 63.44 N, 1978.85 E)									
- Point									
70° Inclination @ 7960.9	0.00	0.00	7,375.00	38.40	1,647.63	1,236,180.68	3,217,163.03	39.97910	-104.72507
- actual wellpath misses target center by 0.02usft at 7960.94usft MD (7375.00 TVD, 38.42 N, 1647.62 E)									
- Point									
Cross @ 10300.30' MD	0.00	0.00	7,428.22	53.00	-685.70	1,236,175.04	3,214,829.66	39.97914	-104.73340
- actual wellpath hits target center									
- Point									
Cross @ 15576.89' MD	0.00	0.00	7,453.78	58.63	-5,959.00	1,236,134.94	3,209,556.51	39.97915	-104.75222
- actual wellpath hits target center									
- Point									
PBHL Duck Club 12W-2	0.00	0.00	7,465.00	41.41	-8,138.15	1,236,098.82	3,207,377.59	39.97910	-104.75999
- actual wellpath misses target center by 62.26usft at 17699.00usft MD (7465.36 TVD, 63.29 N, -8079.87 E)									
- Point									
Projection to TD @ 1769	0.00	0.00	7,465.36	63.29	-8,079.87	1,236,121.21	3,207,435.68	39.97916	-104.75978
- actual wellpath hits target center									
- Point									
Last MWD Survey @ 17	0.00	0.00	7,465.97	57.88	-8,011.08	1,236,116.39	3,207,504.51	39.97915	-104.75954
- actual wellpath hits target center									
- Point									

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
1,543.00	1,539.81	4.75	52.30	Tie into Surface Surveys	

Checked By: _____ Approved By: _____ Date: _____