



# **Extraction Oil & Gas**

**Weld County, CO (NAD83)**

**Sec 32-T6N-R65W**

**WS-SUNRISE 2-5-5**

**Wellbore #1**

**Design: Wellbore #1**

## **Standard Survey Report**

**16 March, 2018**

<b>Company:</b>	Extraction Oil & Gas	<b>Local Co-ordinate Reference:</b>	Well WS-SUNRISE 2-5-5
<b>Project:</b>	Weld County, CO (NAD83)	<b>TVD Reference:</b>	KB=25' @ 4666.00ft (P346)
<b>Site:</b>	Sec 32-T6N-R65W	<b>MD Reference:</b>	KB=25' @ 4666.00ft (P346)
<b>Well:</b>	WS-SUNRISE 2-5-5	<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>	Weld County, CO (NAD83)		
<b>Map System:</b>	US State Plane 1983	<b>System Datum:</b>	Ground Level
<b>Geo Datum:</b>	North American Datum 1983		
<b>Map Zone:</b>	Colorado Northern Zone		

Site						Sec 32-T6N-R65W											
Site Position:						Northing:			1,403,150.90 usft			Latitude:			40.437180		
From:			Map			Easting:			3,227,225.68 usft			Longitude:			-104.683680		
Position Uncertainty:			0.00 ft			Slot Radius:			13-3/16 "			Grid Convergence:			0.53 °		

Well	WS-SUNRISE 2-5-5					
Well Position	+N/-S	0.00 ft	Northing:	1,403,154.21 usfl	Latitude:	40.437190
	+E/-W	0.00 ft	Easting:	3,227,189.46 usfl	Longitude:	-104.683810
Position Uncertainty		0.00 ft	Wellhead Elevation:	0.00 ft	Ground Level:	4,641.00 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>
	HDGM	3/10/2018	8.13	66.92	52,299

<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) (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Direction (°)</b>	
	0.00	0.00	0.00	180.12	

<b>Survey Program</b>	<b>Date</b>	3/16/2018			
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
110.00	1,537.00	Surface (Wellbore #1)	MWD	MWD - Standard	
1,661.00	11,782.00	MWD Surveys (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 (°/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	
110.00	0.74	181.82	110.00	-0.71	-0.02	0.71	0.67	0.67	0.00	
206.00	0.96	190.08	205.99	-2.12	-0.18	2.12	0.26	0.23	8.60	
301.00	0.87	207.92	300.97	-3.54	-0.66	3.54	0.31	-0.09	18.78	
396.00	0.70	246.15	395.97	-4.41	-1.53	4.42	0.57	-0.18	40.24	
493.00	0.57	227.78	492.96	-4.98	-2.43	4.98	0.25	-0.13	-18.94	
589.00	0.57	256.44	588.96	-5.41	-3.25	5.42	0.29	0.00	29.85	
684.00	0.74	85.58	683.95	-5.47	-3.09	5.48	1.37	0.18	-179.85	
779.00	1.88	82.15	778.93	-5.21	-0.94	5.22	1.20	1.20	-3.61	
874.00	0.04	98.15	873.91	-5.01	0.64	5.00	1.94	-1.94	16.84	

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<b>Site:</b>	Sec 32-T6N-R65W	<b>MD Reference:</b>	KB=25' @ 4666.00ft (P346)
<b>Well:</b>	WS-SUNRISE 2-5-5	<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 (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
969.00	0.79	170.74	968.91	-5.66	0.78	5.66	0.82	0.79	76.41
1,063.00	1.88	210.38	1,062.88	-7.63	0.10	7.63	1.46	1.16	42.17
1,158.00	1.84	257.84	1,157.84	-9.29	-2.18	9.30	1.58	-0.04	49.96
1,252.00	2.50	150.79	1,251.80	-11.40	-2.65	11.41	3.74	0.70	-113.88
1,347.00	3.73	140.86	1,346.66	-15.61	0.31	15.61	1.41	1.29	-10.45
1,442.00	2.46	138.93	1,441.52	-19.54	3.60	19.53	1.34	-1.34	-2.03
1,537.00	1.49	174.08	1,536.46	-22.31	5.07	22.30	1.59	-1.02	37.00
1,661.00	1.28	187.53	1,660.42	-25.28	5.05	25.27	0.31	-0.17	10.85
<b>First MWD Survey @ 1661'MD</b>									
1,755.00	1.06	172.72	1,754.41	-27.19	5.02	27.18	0.40	-0.23	-15.76
1,849.00	3.00	160.16	1,848.34	-30.36	5.97	30.35	2.11	2.06	-13.36
1,944.00	2.61	156.46	1,943.23	-34.68	7.68	34.67	0.45	-0.41	-3.89
2,038.00	2.17	153.95	2,037.15	-38.24	9.31	38.23	0.48	-0.47	-2.67
2,132.00	1.99	154.92	2,131.08	-41.32	10.79	41.30	0.20	-0.19	1.03
2,226.00	1.59	156.24	2,225.04	-43.99	12.00	43.97	0.43	-0.43	1.40
2,321.00	1.46	152.45	2,320.00	-46.27	13.09	46.25	0.17	-0.14	-3.99
2,415.00	1.19	151.39	2,413.98	-48.19	14.12	48.16	0.29	-0.29	-1.13
2,509.00	2.70	149.01	2,507.92	-50.95	15.72	50.91	1.61	1.61	-2.53
2,603.00	2.61	148.88	2,601.82	-54.68	17.97	54.64	0.10	-0.10	-0.14
2,697.00	2.74	146.72	2,695.72	-58.39	20.31	58.34	0.17	0.14	-2.30
2,792.00	2.56	149.81	2,790.62	-62.12	22.62	62.07	0.24	-0.19	3.25
2,886.00	2.17	150.95	2,884.54	-65.49	24.54	65.44	0.42	-0.41	1.21
2,980.00	2.03	153.16	2,978.47	-68.53	26.16	68.48	0.17	-0.15	2.35
3,075.00	1.59	166.64	3,073.43	-71.31	27.22	71.26	0.64	-0.46	14.19
3,169.00	1.50	177.61	3,167.39	-73.81	27.57	73.76	0.33	-0.10	11.67
3,263.00	1.72	194.23	3,261.36	-76.41	27.28	76.35	0.55	0.23	17.68
3,357.00	1.86	188.45	3,355.31	-79.29	26.71	79.23	0.24	0.15	-6.15
3,452.00	1.02	110.50	3,450.29	-81.11	27.27	81.05	2.03	-0.88	-82.05
3,546.00	0.80	119.22	3,544.28	-81.72	28.63	81.66	0.28	-0.23	9.28
3,640.00	0.71	123.72	3,638.27	-82.36	29.69	82.30	0.11	-0.10	4.79
3,734.00	0.88	128.08	3,732.26	-83.13	30.74	83.07	0.19	0.18	4.64
3,828.00	2.56	148.18	3,826.21	-85.36	32.41	85.29	1.87	1.79	21.38
3,923.00	2.78	148.31	3,921.11	-89.12	34.74	89.05	0.23	0.23	0.14
4,017.00	3.05	144.61	4,014.99	-93.10	37.39	93.03	0.35	0.29	-3.94
4,112.00	2.74	140.55	4,109.87	-96.92	40.29	96.83	0.39	-0.33	-4.27
4,206.00	2.39	140.99	4,203.77	-100.17	42.96	100.09	0.37	-0.37	0.47
4,300.00	2.21	143.90	4,297.70	-103.16	45.26	103.07	0.23	-0.19	3.10
4,394.00	1.90	148.09	4,391.64	-105.95	47.15	105.85	0.37	-0.33	4.46
4,489.00	1.68	149.23	4,486.59	-108.48	48.69	108.38	0.23	-0.23	1.20
4,583.00	1.24	151.75	4,580.56	-110.56	49.88	110.46	0.47	-0.47	2.68
4,677.00	0.97	164.44	4,674.54	-112.23	50.58	112.12	0.39	-0.29	13.50
4,772.00	0.88	178.19	4,769.53	-113.73	50.81	113.62	0.25	-0.09	14.47
4,866.00	0.62	176.20	4,863.52	-114.96	50.87	114.85	0.28	-0.28	-2.12

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<b>Design:</b>	Wellbore #1	<b>Database:</b>	EDM 5000.1

## Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
4,960.00	1.55	163.64	4,957.50	-116.69	51.26	116.58	1.02	0.99	-13.36
5,055.00	1.28	161.93	5,052.47	-118.93	51.95	118.82	0.29	-0.28	-1.80
5,149.00	2.17	145.62	5,146.43	-121.39	53.28	121.28	1.07	0.95	-17.35
5,243.00	1.15	127.24	5,240.39	-123.43	55.04	123.32	1.21	-1.09	-19.55
5,338.00	0.62	87.05	5,335.38	-123.98	56.31	123.87	0.83	-0.56	-42.31
5,431.00	2.03	153.07	5,428.36	-125.43	57.56	125.31	2.01	1.52	70.99
5,525.00	3.18	153.77	5,522.26	-129.25	59.47	129.13	1.22	1.22	0.74
5,620.00	2.56	154.43	5,617.14	-133.53	61.55	133.40	0.65	-0.65	0.69
5,714.00	2.08	153.73	5,711.06	-136.95	63.21	136.82	0.51	-0.51	-0.74
5,808.00	1.68	146.19	5,805.01	-139.63	64.73	139.49	0.50	-0.43	-8.02
5,902.00	0.22	355.43	5,899.00	-140.59	65.48	140.45	1.99	-1.55	-160.38
5,997.00	0.31	356.61	5,994.00	-140.15	65.45	140.02	0.09	0.09	1.24
6,091.00	0.62	355.65	6,087.99	-139.39	65.40	139.26	0.33	0.33	-1.02
6,185.00	1.15	356.66	6,181.98	-137.94	65.31	137.81	0.56	0.56	1.07
6,303.00	6.94	186.47	6,299.73	-143.85	64.43	143.72	6.84	4.91	-144.23
6,397.00	16.70	188.15	6,391.63	-162.91	61.87	162.78	10.39	10.38	1.79
6,491.00	22.45	180.52	6,480.17	-194.26	59.79	194.14	6.68	6.12	-8.12
6,585.00	32.13	176.82	6,563.62	-237.27	61.02	237.14	10.45	10.30	-3.94
6,632.72	35.81	179.52	6,603.19	-263.91	61.84	263.78	8.33	7.70	5.65
<b>Enter Section @ 6632.72'MD</b>									
6,679.00	39.42	181.71	6,639.85	-292.15	61.52	292.02	8.33	7.81	4.74
6,774.00	50.86	182.28	6,706.75	-359.33	59.14	359.21	12.05	12.04	0.60
6,869.00	58.29	180.65	6,761.78	-436.66	57.22	436.54	7.94	7.82	-1.72
6,963.00	65.40	180.30	6,806.10	-519.48	56.54	519.36	7.57	7.56	-0.37
7,018.58	70.00	181.02	6,827.19	-570.89	55.94	570.77	8.36	8.27	1.29
<b>70°INC @ 7018.58'MD / 6827.19'TVD</b>									
7,057.00	73.18	181.49	6,839.32	-607.33	55.14	607.21	8.36	8.28	1.23
7,151.00	79.54	180.92	6,861.48	-698.61	53.23	698.50	6.79	6.77	-0.61
7,177.45	80.86	180.73	6,865.98	-724.67	52.85	724.56	5.03	4.98	-0.70
<b>Hardline Crossing @ 7177.45'MD (460'FNL &amp; 1669'FEL)</b>									
7,246.00	84.27	180.26	6,874.85	-792.63	52.26	792.52	5.03	4.98	-0.69
7,340.00	85.73	180.48	6,883.04	-886.27	51.66	886.16	1.57	1.55	0.23
7,434.00	89.44	180.39	6,887.00	-980.17	50.94	980.06	3.95	3.95	-0.10
7,528.00	89.88	180.61	6,887.56	-1,074.16	50.12	1,074.05	0.52	0.47	0.23
7,623.00	90.28	180.13	6,887.43	-1,169.16	49.51	1,169.05	0.66	0.42	-0.51
7,717.00	90.23	179.77	6,887.01	-1,263.16	49.59	1,263.05	0.39	-0.05	-0.38
7,811.00	91.43	181.01	6,885.65	-1,357.14	48.95	1,357.04	1.84	1.28	1.32
7,905.00	91.83	179.86	6,882.97	-1,451.10	48.24	1,451.00	1.29	0.43	-1.22
7,999.00	90.06	181.23	6,881.42	-1,545.08	47.35	1,544.97	2.38	-1.88	1.46
8,093.00	90.15	181.18	6,881.25	-1,639.06	45.37	1,638.96	0.11	0.10	-0.05
8,187.00	90.46	180.48	6,880.75	-1,733.04	44.01	1,732.95	0.81	0.33	-0.74
8,281.00	90.46	179.95	6,880.00	-1,827.04	43.65	1,826.94	0.56	0.00	-0.56
8,376.00	90.50	180.48	6,879.20	-1,922.03	43.30	1,921.94	0.56	0.04	0.56
8,469.00	90.15	179.60	6,878.67	-2,015.03	43.23	2,014.94	1.02	-0.38	-0.95

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## Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
8,563.00	89.75	180.92	6,878.75	-2,109.03	42.81	2,108.94	1.47	-0.43	1.40
8,657.00	88.07	182.33	6,880.54	-2,202.97	40.14	2,202.88	2.33	-1.79	1.50
8,751.00	88.33	182.06	6,883.49	-2,296.85	36.54	2,296.77	0.40	0.28	-0.29
8,845.00	88.91	181.71	6,885.76	-2,390.77	33.45	2,390.70	0.72	0.62	-0.37
8,939.00	89.13	181.67	6,887.37	-2,484.72	30.68	2,484.65	0.24	0.23	-0.04
9,034.00	89.57	181.09	6,888.44	-2,579.69	28.39	2,579.62	0.77	0.46	-0.61
9,128.00	90.32	181.14	6,888.53	-2,673.67	26.56	2,673.61	0.80	0.80	0.05
9,222.00	88.33	181.18	6,889.64	-2,767.64	24.66	2,767.58	2.12	-2.12	0.04
9,316.00	88.78	180.79	6,892.01	-2,861.59	23.05	2,861.54	0.63	0.48	-0.41
9,410.00	89.57	181.09	6,893.37	-2,955.57	21.50	2,955.52	0.90	0.84	0.32
9,504.00	90.72	180.35	6,893.13	-3,049.56	20.32	3,049.51	1.45	1.22	-0.79
9,598.00	89.97	180.04	6,892.56	-3,143.56	20.00	3,143.51	0.86	-0.80	-0.33
9,692.00	88.29	179.55	6,893.99	-3,237.54	20.34	3,237.49	1.86	-1.79	-0.52
9,786.00	88.33	179.11	6,896.76	-3,331.49	21.44	3,331.44	0.47	0.04	-0.47
9,880.00	88.33	178.32	6,899.50	-3,425.43	23.54	3,425.37	0.84	0.00	-0.84
9,973.00	89.09	177.79	6,901.59	-3,518.35	26.70	3,518.29	1.00	0.82	-0.57
10,067.00	89.70	179.46	6,902.59	-3,612.31	28.96	3,612.25	1.89	0.65	1.78
10,161.00	90.77	181.05	6,902.20	-3,706.31	28.54	3,706.24	2.04	1.14	1.69
10,255.00	89.26	182.50	6,902.18	-3,800.26	25.63	3,800.20	2.23	-1.61	1.54
10,349.00	89.44	181.40	6,903.24	-3,894.20	22.43	3,894.14	1.19	0.19	-1.17
10,444.00	90.01	180.70	6,903.70	-3,989.18	20.69	3,989.13	0.95	0.60	-0.74
10,538.00	91.52	179.33	6,902.44	-4,083.16	20.66	4,083.11	2.17	1.61	-1.46
10,632.00	90.85	179.90	6,900.50	-4,177.14	21.29	4,177.09	0.94	-0.71	0.61
10,726.00	90.99	181.45	6,898.99	-4,271.12	20.19	4,271.07	1.66	0.15	1.65
10,821.00	89.00	181.93	6,899.00	-4,366.07	17.38	4,366.03	2.15	-2.09	0.51
10,915.00	89.44	181.09	6,900.28	-4,460.03	14.91	4,459.99	1.01	0.47	-0.89
11,009.00	90.72	179.60	6,900.15	-4,554.03	14.34	4,553.99	2.09	1.36	-1.59
11,104.00	89.13	180.61	6,900.27	-4,649.02	14.17	4,648.98	1.98	-1.67	1.06
11,198.00	90.46	180.08	6,900.61	-4,743.02	13.60	4,742.98	1.52	1.41	-0.56
11,292.00	88.78	180.65	6,901.23	-4,837.01	13.00	4,836.97	1.89	-1.79	0.61
11,387.00	90.06	179.55	6,902.19	-4,932.00	12.84	4,931.96	1.78	1.35	-1.16
11,481.00	89.53	181.31	6,902.53	-5,025.99	12.13	5,025.96	1.96	-0.56	1.87
11,576.00	90.10	180.74	6,902.84	-5,120.98	10.43	5,120.94	0.85	0.60	-0.60
11,670.00	90.72	179.95	6,902.16	-5,214.97	9.87	5,214.94	1.07	0.66	-0.84
<b>Final MWD Survey @ 11670'MD</b>									
11,782.00	90.72	179.95	6,900.76	-5,326.96	9.96	5,326.93	0.00	0.00	0.00
<b>PTD @ 11782'MD (501'FSL &amp; 1647'FEL)</b>									



## Survey Report

<b>Company:</b>	Extraction Oil & Gas	<b>Local Co-ordinate Reference:</b>	Well WS-SUNRISE 2-5-5
<b>Project:</b>	Weld County, CO (NAD83)	<b>TVD Reference:</b>	KB=25' @ 4666.00ft (P346)
<b>Site:</b>	Sec 32-T6N-R65W	<b>MD Reference:</b>	KB=25' @ 4666.00ft (P346)
<b>Well:</b>	WS-SUNRISE 2-5-5	<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 (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
1,661.00	1,660.42	-25.28	5.05	First MWD Survey @ 1661'MD
6,632.72	6,603.19	-263.91	61.84	Enter Section @ 6632.72'MD
7,018.58	6,827.19	-570.89	55.94	70°INC @ 7018.58'MD / 6827.19'TVD
7,177.45	6,865.98	-724.67	52.85	Hardline Crossing @ 7177.45'MD (460'FNL & 1669'FEL)
11,670.00	6,902.16	-5,214.97	9.87	Final MWD Survey @ 11670'MD
11,782.00	6,900.76	-5,326.96	9.96	PTD @ 11782'MD (501'FSL & 1647'FEL)

Checked By: _____	Approved By: _____	Date: _____
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