

30-025-43240



BC Operating, Inc.

Lea County, NM (NAD27 NME)
Rusty Anchor 7 Federal COM
1H

OH / Job #60664

Design: Surveys (Patterson 244)

Standard Survey Report

21 January, 2017



Company: BC Operating, Inc.
Project: Lea County, NM (NAD27 NME)
Site: Rusty Anchor 7 Federal COM
Well: 1H
Wellbore: OH / Job #60664
Design: Surveys (Patterson 244)

Local Co-ordinate Reference: Well 1H
TVD Reference: RKB @ 3561.50usft (Patterson 244)
MD Reference: RKB @ 3561.50usft (Patterson 244)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: Compass 5000 GCR

Project	Lea County, NM (NAD27 NME)		
Map System:	US State Plane 1927 (Exact solution)	System Datum:	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	New Mexico East 3001		

Site Rusty Anchor 7 Federal COM

Site Position: Northing: 574,866.71 usft Latitude: 32° 34' 43.78019 N
From: Map Easting: 694,542.68 usft Longitude: 103° 42' 6.37667 W
Position Uncertainty: 0.00 usft Slot Radius: 13-3/16 " Grid Convergence: 0.34 °

Well 1H

Well Position +N-S 0.00 usft Northing: 575,822.28 usft Latitude: 32° 34' 53.33819 N
 +E-W 0.00 usft Easting: 692,791.01 usft Longitude: 103° 42' 26.78171 W
Position Uncertainty 0.00 usft Wellhead Elevation: 0.00 usft Ground Level: 3,533.00 usft

Wellbore OH / Job #60664

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	12/15/2016	7.08	60.57	48,472

Design Surveys (Patterson 244)

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	357.82

Survey Program Date 1/21/2017

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
100.00	1,142.00	Phoenix Gyro Surveys (OH / Job #60664)	SPT_GTD	Continuous north-seeking gyro
1,246.00	19,654.00	Phoenix MWD Surveys (OH / Job #60664)	MWD+HDGM	OWSG Rev.2 MWD + HDGM

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
100.00	0.39	341.49	100.00	0.32	-0.11	0.33	0.39	0.39	0.00
200.00	0.27	26.96	200.00	0.86	-0.11	0.86	0.28	-0.12	45.47
300.00	0.32	221.17	300.00	0.86	-0.19	0.86	0.59	0.05	-165.79
400.00	0.47	205.89	399.99	0.28	-0.55	0.30	0.18	0.15	-15.28
500.00	0.69	97.56	499.99	-0.17	-0.13	-0.17	0.95	0.22	-108.33
600.00	0.54	191.41	599.99	-0.71	0.37	-0.73	0.90	-0.15	93.85
700.00	0.56	205.35	699.98	-1.62	0.07	-1.62	0.13	0.02	13.94
800.00	0.39	220.71	799.98	-2.32	-0.36	-2.30	0.21	-0.17	15.36
900.00	0.31	176.87	899.98	-2.84	-0.57	-2.82	0.27	-0.08	-43.84

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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)
1,000.00	0.49	47.92	999.98	-2.83	-0.24	-2.82	0.73	0.18	-128.95
1,100.00	0.45	81.03	1,099.97	-2.48	0.47	-2.50	0.27	-0.04	33.11
1,142.00	0.30	104.02	1,141.97	-2.48	0.74	-2.51	0.50	-0.36	54.74
Tie In									
1,246.00	0.17	246.74	1,245.97	-2.61	0.86	-2.64	0.43	-0.13	137.23
1,338.00	0.24	220.69	1,337.97	-2.81	0.61	-2.83	0.12	0.08	-28.32
1,431.00	0.25	215.91	1,430.97	-3.12	0.36	-3.13	0.02	0.01	-5.14
1,523.00	0.40	233.83	1,522.97	-3.47	-0.01	-3.47	0.20	0.16	19.48
1,615.00	0.54	219.03	1,614.97	-4.00	-0.55	-3.97	0.20	0.15	-16.09
1,708.00	0.57	226.31	1,707.96	-4.66	-1.16	-4.61	0.08	0.03	7.83
1,800.00	0.44	230.12	1,799.96	-5.20	-1.76	-5.13	0.15	-0.14	4.14
1,893.00	0.60	249.87	1,892.95	-5.60	-2.49	-5.50	0.26	0.17	21.24
1,985.00	0.66	241.58	1,984.95	-6.02	-3.41	-5.88	0.12	0.07	-9.01
2,079.00	0.64	231.11	2,078.94	-6.60	-4.29	-6.43	0.13	-0.02	-11.14
2,174.00	0.50	240.31	2,173.94	-7.14	-5.07	-6.94	0.18	-0.15	9.68
2,268.00	0.53	216.16	2,267.94	-7.70	-5.68	-7.47	0.23	0.03	-25.69
2,362.00	0.37	194.34	2,361.93	-8.34	-6.01	-8.11	0.25	-0.17	-23.21
2,456.00	0.21	184.55	2,455.93	-8.81	-6.10	-8.57	0.18	-0.17	-10.41
2,549.00	0.36	139.60	2,548.93	-9.20	-5.92	-8.97	0.28	0.16	-48.33
2,644.00	0.49	143.10	2,643.93	-9.75	-5.49	-9.54	0.14	0.14	3.68
2,720.00	0.55	134.58	2,719.92	-10.27	-5.03	-10.07	0.13	0.08	-11.21
2,833.00	0.46	131.70	2,832.92	-10.95	-4.31	-10.78	0.08	-0.08	-2.55
2,928.00	0.31	140.65	2,927.92	-11.40	-3.86	-11.25	0.17	-0.16	9.42
3,023.00	0.48	149.12	3,022.92	-11.94	-3.49	-11.80	0.19	0.18	8.92
3,118.00	0.49	144.93	3,117.91	-12.62	-3.05	-12.49	0.04	0.01	-4.41
3,213.00	0.52	111.71	3,212.91	-13.11	-2.42	-13.01	0.31	0.03	-34.97
3,308.00	0.35	80.08	3,307.91	-13.22	-1.73	-13.14	0.30	-0.18	-33.29
3,403.00	0.34	71.14	3,402.90	-13.08	-1.18	-13.02	0.06	-0.01	-9.41
3,499.00	0.30	49.29	3,498.90	-12.82	-0.72	-12.78	0.13	-0.04	-22.76
3,594.00	0.41	45.55	3,593.90	-12.42	-0.29	-12.40	0.12	0.12	-3.94
3,689.00	0.54	60.02	3,688.90	-11.96	0.34	-11.96	0.19	0.14	15.23
3,783.00	0.68	58.93	3,782.89	-11.45	1.20	-11.49	0.15	0.15	-1.16
3,877.00	0.93	53.75	3,876.88	-10.71	2.30	-10.79	0.28	0.27	-5.51
3,971.00	1.03	62.20	3,970.87	-9.86	3.66	-10.00	0.19	0.11	8.99
4,065.00	1.08	49.30	4,064.85	-8.89	5.08	-9.08	0.26	0.05	-13.72
4,159.00	1.09	58.89	4,158.84	-7.85	6.51	-8.10	0.19	0.01	10.20
4,253.00	1.37	61.65	4,252.81	-6.86	8.27	-7.17	0.30	0.30	2.94
4,347.00	0.88	15.45	4,346.80	-5.63	9.45	-5.98	1.05	-0.52	-49.15
4,441.00	0.91	343.26	4,440.79	-4.22	9.43	-4.57	0.53	0.03	-34.24
4,535.00	0.69	348.10	4,534.78	-2.95	9.10	-3.29	0.24	-0.23	5.15
4,629.00	0.77	337.93	4,628.77	-1.81	8.74	-2.14	0.16	0.09	-10.82
4,723.00	0.93	338.92	4,722.76	-0.51	8.23	-0.83	0.17	0.17	1.05
4,818.00	0.92	338.46	4,817.75	0.92	7.67	0.62	0.01	-0.01	-0.48

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4,912.00	0.91	348.17	4,911.74	2.35	7.24	2.07	0.17	-0.01	10.33
5,007.00	0.94	346.90	5,006.72	3.85	6.91	3.58	0.04	0.03	-1.34
5,078.00	0.93	339.58	5,077.71	4.95	6.58	4.70	0.17	-0.01	-10.31
5,192.00	1.02	344.13	5,191.70	6.80	5.98	6.56	0.10	0.08	3.99
5,287.00	0.75	0.27	5,286.69	8.23	5.75	8.01	0.38	-0.28	16.99
5,383.00	0.81	347.73	5,382.68	9.52	5.61	9.30	0.19	0.06	-13.06
5,478.00	0.69	11.67	5,477.67	10.74	5.58	10.52	0.35	-0.13	25.20
5,573.00	0.59	31.37	5,572.66	11.72	5.95	11.48	0.25	-0.11	20.74
5,669.00	0.47	4.06	5,668.66	12.53	6.24	12.28	0.29	-0.13	-28.45
5,764.00	0.40	54.90	5,763.66	13.11	6.54	12.85	0.40	-0.07	53.52
5,859.00	0.59	16.65	5,858.65	13.77	6.95	13.50	0.39	0.20	-40.26
5,954.00	0.44	9.01	5,953.65	14.60	7.14	14.32	0.17	-0.16	-8.04
6,049.00	0.28	18.56	6,048.65	15.18	7.28	14.89	0.18	-0.17	10.05
6,145.00	0.29	45.22	6,144.65	15.57	7.52	15.28	0.14	0.01	27.77
6,240.00	0.51	40.78	6,239.64	16.06	7.97	15.75	0.23	0.23	-4.67
6,335.00	0.41	332.25	6,334.64	16.68	8.09	16.36	0.55	-0.11	-72.14
6,430.00	0.50	300.54	6,429.64	17.19	7.57	16.89	0.28	0.09	-33.38
6,525.00	0.43	246.89	6,524.64	17.27	6.89	16.99	0.45	-0.07	-56.47
6,619.00	0.64	229.56	6,618.63	16.79	6.16	16.54	0.28	0.22	-18.44
6,713.00	0.56	213.04	6,712.63	16.06	5.51	15.84	0.20	-0.09	-17.57
6,808.00	0.70	228.29	6,807.62	15.29	4.83	15.09	0.23	0.15	16.05
6,902.00	1.65	223.39	6,901.60	13.92	3.47	13.78	1.02	1.01	-5.21
6,996.00	1.85	219.85	6,995.56	11.77	1.57	11.70	0.24	0.21	-3.77
7,091.00	1.98	209.31	7,090.50	9.16	-0.22	9.16	0.39	0.14	-11.09
7,185.00	1.82	199.94	7,184.45	6.34	-1.52	6.40	0.37	-0.17	-9.97
7,279.00	1.74	198.24	7,278.41	3.59	-2.48	3.68	0.10	-0.09	-1.81
7,373.00	1.60	203.25	7,372.37	1.02	-3.44	1.15	0.22	-0.15	5.33
7,468.00	1.48	203.35	7,467.33	-1.32	-4.45	-1.15	0.13	-0.13	0.11
7,562.00	1.62	207.03	7,561.30	-3.62	-5.54	-3.41	0.18	0.15	3.91
7,656.00	1.74	199.00	7,655.26	-6.15	-6.61	-5.90	0.28	0.13	-8.54
7,750.00	1.53	197.07	7,749.22	-8.70	-7.44	-8.41	0.23	-0.22	-2.05
7,844.00	1.35	200.26	7,843.19	-10.94	-8.19	-10.62	0.21	-0.19	3.39
7,938.00	1.44	209.32	7,937.16	-13.01	-9.15	-12.65	0.25	0.10	9.64
8,032.00	1.35	250.30	8,031.14	-14.41	-10.77	-13.99	1.04	-0.10	43.60
8,126.00	1.10	206.59	8,125.12	-15.59	-12.22	-15.11	1.00	-0.27	-46.50
8,220.00	1.43	188.45	8,219.09	-17.56	-12.80	-17.06	0.55	0.35	-19.30
8,314.00	1.25	194.37	8,313.07	-19.71	-13.22	-19.19	0.24	-0.19	6.30
8,408.00	0.62	177.44	8,407.06	-21.21	-13.46	-20.69	0.72	-0.67	-18.01
8,502.00	0.45	252.67	8,501.05	-21.83	-13.79	-21.29	0.71	-0.18	80.03
8,597.00	1.04	305.28	8,596.05	-21.44	-14.85	-20.86	0.89	0.62	55.38
8,691.00	0.93	311.58	8,690.03	-20.45	-16.11	-19.82	0.16	-0.12	6.70
8,785.00	1.06	326.54	8,784.02	-19.21	-17.16	-18.55	0.31	0.14	15.91
8,879.00	1.22	323.99	8,878.00	-17.68	-18.23	-16.97	0.18	0.17	-2.71

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8,973.00	1.39	286.90	8,971.98	-16.54	-19.91	-15.77	0.90	0.18	-39.46
9,068.00	1.36	308.21	9,066.95	-15.51	-21.90	-14.66	0.54	-0.03	22.43
9,162.00	1.28	307.51	9,160.92	-14.18	-23.61	-13.27	0.09	-0.09	-0.74
9,256.00	1.30	324.80	9,254.90	-12.67	-25.05	-11.70	0.41	0.02	18.39
9,319.00	1.08	323.42	9,317.89	-11.60	-25.82	-10.61	0.35	-0.35	-2.19
9,358.00	1.20	312.07	9,356.88	-11.04	-26.34	-10.03	0.65	0.31	-29.10
9,453.00	5.59	351.67	9,451.70	-5.79	-27.75	-4.73	4.98	4.62	41.68
9,500.00	13.36	359.25	9,498.02	1.92	-28.16	2.99	16.71	16.53	16.13
9,547.00	18.73	0.44	9,543.18	14.90	-28.17	15.96	11.45	11.43	2.53
9,594.00	24.19	358.06	9,586.90	32.09	-28.44	33.15	11.76	11.62	-5.06
9,642.00	28.29	358.93	9,629.95	53.30	-28.98	54.36	8.58	8.54	1.81
9,689.00	31.74	1.23	9,670.64	76.80	-28.92	77.84	7.74	7.34	4.89
9,736.00	34.73	2.94	9,709.95	102.54	-27.97	103.53	6.67	6.36	3.64
9,783.00	38.76	2.00	9,747.60	130.62	-26.77	131.55	8.66	8.57	-2.00
9,830.00	42.77	2.46	9,783.19	161.28	-25.57	162.14	8.56	8.53	0.98
9,877.00	45.81	2.52	9,816.83	194.07	-24.15	194.84	6.47	6.47	0.13
9,924.00	48.47	2.14	9,848.80	228.49	-22.75	229.19	5.69	5.66	-0.81
9,971.00	50.20	359.47	9,879.43	264.13	-22.26	264.78	5.67	3.68	-5.68
10,018.00	56.21	357.59	9,907.57	301.73	-23.25	302.40	13.18	12.79	-4.00
10,042.00	58.96	357.25	9,920.43	321.97	-24.16	322.65	11.52	11.46	-1.42
10,074.00	62.33	357.05	9,936.11	349.82	-25.55	350.54	10.55	10.53	-0.63
10,105.00	64.12	356.54	9,950.08	377.45	-27.10	378.21	5.96	5.77	-1.65
10,136.00	66.16	355.54	9,963.11	405.51	-29.04	406.32	7.20	6.58	-3.23
10,168.00	68.33	355.79	9,975.49	434.93	-31.27	435.81	6.82	6.78	0.78
10,199.00	70.54	355.59	9,986.38	463.87	-33.45	464.81	7.15	7.13	-0.65
10,246.00	72.91	355.60	10,001.11	508.37	-36.88	509.40	5.04	5.04	0.02
10,293.00	76.47	356.55	10,013.52	553.59	-39.98	554.71	7.82	7.57	2.02
10,340.00	79.89	356.54	10,023.15	599.50	-42.75	600.69	7.28	7.28	-0.02
10,388.00	84.25	357.37	10,029.77	646.96	-45.27	648.22	9.24	9.08	1.73
10,435.00	88.96	358.01	10,032.55	693.83	-47.16	695.12	10.11	10.02	1.36
10,482.00	91.59	358.36	10,032.33	740.80	-48.65	742.11	5.65	5.60	0.74
10,574.00	92.40	357.90	10,029.12	832.69	-51.65	834.06	1.01	0.88	-0.50
10,667.00	92.04	358.86	10,025.52	925.59	-54.28	926.98	1.10	-0.39	1.03
10,759.00	90.79	359.01	10,023.25	1,017.54	-55.99	1,018.93	1.37	-1.36	0.16
10,852.00	91.79	359.03	10,021.15	1,110.50	-57.58	1,111.89	1.08	1.08	0.02
10,944.00	89.94	358.05	10,019.77	1,202.46	-59.92	1,203.87	2.28	-2.01	-1.07
11,036.00	89.41	357.90	10,020.29	1,294.40	-63.17	1,295.86	0.60	-0.58	-0.16
11,127.00	90.03	357.68	10,020.73	1,385.33	-66.68	1,386.86	0.72	0.68	-0.24
11,220.00	91.71	357.77	10,019.32	1,478.24	-70.37	1,479.85	1.81	1.81	0.10
11,312.00	89.36	358.00	10,018.46	1,570.17	-73.77	1,571.84	2.57	-2.55	0.25
11,405.00	90.40	358.20	10,018.66	1,663.11	-76.85	1,664.83	1.14	1.12	0.22
11,497.00	92.60	358.46	10,016.25	1,755.04	-79.53	1,756.79	2.41	2.39	0.28
11,586.00	90.40	358.00	10,013.92	1,843.96	-82.28	1,845.76	2.53	-2.47	-0.52
11,678.00	90.09	358.81	10,013.52	1,935.92	-84.84	1,937.75	0.94	-0.34	0.88

Company: BC Operating, Inc.
Project: Lea County, NM (NAD27 NME)
Site: Rusty Anchor 7 Federal COM
Well: 1H
Wellbore: OH / Job #60664
Design: Surveys (Patterson 244)

Local Co-ordinate Reference: Well 1H
TVD Reference: RKB @ 3561.50usft (Patterson 244)
MD Reference: RKB @ 3561.50usft (Patterson 244)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: Compass 5000 GCR

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)
11,771.00	90.19	358.25	10,013.30	2,028.89	-87.23	2,030.74	0.61	0.11	-0.60
11,866.00	89.47	0.04	10,013.58	2,123.88	-88.64	2,125.71	2.03	-0.76	1.88
11,961.00	91.18	359.22	10,013.04	2,218.87	-89.26	2,220.66	2.00	1.80	-0.86
12,055.00	93.30	358.42	10,009.37	2,312.77	-91.19	2,314.56	2.41	2.26	-0.85
12,149.00	94.40	358.17	10,003.06	2,406.51	-93.98	2,408.35	1.20	1.17	-0.27
12,243.00	95.21	359.70	9,995.18	2,500.16	-95.72	2,502.00	1.84	0.86	1.63
12,338.00	93.45	1.29	9,988.01	2,594.88	-94.90	2,596.62	2.49	-1.85	1.67
12,432.00	91.71	358.99	9,983.78	2,688.78	-94.68	2,690.43	3.07	-1.85	-2.45
12,526.00	91.15	1.36	9,981.43	2,782.74	-94.39	2,784.32	2.59	-0.60	2.52
12,620.00	89.81	0.00	9,980.64	2,876.73	-93.27	2,878.19	2.03	-1.43	-1.45
12,714.00	90.09	359.62	9,980.72	2,970.73	-93.58	2,972.14	0.50	0.30	-0.40
12,808.00	90.28	359.64	9,980.42	3,064.72	-94.19	3,066.09	0.20	0.20	0.02
12,902.00	90.42	358.70	9,979.85	3,158.71	-95.55	3,160.06	1.01	0.15	-1.00
12,996.00	92.21	357.18	9,977.69	3,252.62	-98.93	3,254.03	2.50	1.90	-1.62
13,090.00	91.93	357.79	9,974.29	3,346.47	-103.05	3,347.96	0.71	-0.30	0.65
13,184.00	91.77	358.12	9,971.26	3,440.36	-106.41	3,441.91	0.39	-0.17	0.35
13,278.00	91.09	358.30	9,968.91	3,534.28	-109.34	3,535.88	0.75	-0.72	0.19
13,372.00	92.10	359.00	9,966.30	3,628.22	-111.55	3,629.83	1.31	1.07	0.74
13,465.00	90.22	358.59	9,964.41	3,721.17	-113.51	3,722.80	2.07	-2.02	-0.44
13,559.00	90.95	358.43	9,963.46	3,815.14	-115.95	3,816.79	0.80	0.78	-0.17
13,653.00	91.57	359.61	9,961.39	3,909.10	-117.56	3,910.74	1.42	0.66	1.26
13,747.00	89.36	356.28	9,960.62	4,003.01	-120.93	4,004.72	4.25	-2.35	-3.54
13,841.00	89.47	356.70	9,961.58	4,096.83	-126.69	4,098.69	0.46	0.12	0.45
13,935.00	90.64	357.63	9,961.49	4,190.72	-131.34	4,192.68	1.59	1.24	0.99
14,029.00	90.36	359.00	9,960.67	4,284.67	-134.10	4,286.67	1.49	-0.30	1.46
14,124.00	89.36	358.09	9,960.91	4,379.64	-136.51	4,381.66	1.42	-1.05	-0.96
14,218.00	89.47	358.27	9,961.87	4,473.58	-139.50	4,475.65	0.22	0.12	0.19
14,312.00	89.39	355.92	9,962.80	4,567.45	-144.26	4,569.63	2.50	-0.09	-2.50
14,407.00	88.99	355.63	9,964.14	4,662.18	-151.26	4,664.56	0.52	-0.42	-0.31
14,501.00	88.91	356.13	9,965.87	4,755.92	-158.01	4,758.49	0.54	-0.09	0.53
14,595.00	88.91	356.65	9,967.65	4,849.72	-163.93	4,852.45	0.55	0.00	0.55
14,689.00	89.61	357.73	9,968.87	4,943.60	-168.54	4,946.43	1.37	0.74	1.15
14,783.00	89.89	359.09	9,969.28	5,037.56	-171.14	5,040.42	1.48	0.30	1.45
14,877.00	90.28	358.26	9,969.14	5,131.53	-173.32	5,134.41	0.98	0.41	-0.88
14,971.00	91.18	359.25	9,967.94	5,225.50	-175.36	5,228.39	1.42	0.96	1.05
15,066.00	91.09	359.19	9,966.06	5,320.47	-176.65	5,323.34	0.11	-0.09	-0.06
15,160.00	91.40	359.50	9,964.02	5,414.44	-177.73	5,417.29	0.47	0.33	0.33
15,254.00	89.89	358.24	9,962.96	5,508.42	-179.58	5,511.26	2.09	-1.61	-1.34
15,348.00	89.80	358.55	9,963.21	5,602.38	-182.21	5,605.25	0.34	-0.10	0.33
15,442.00	89.89	357.80	9,963.47	5,696.33	-185.21	5,699.25	0.80	0.10	-0.80
15,536.00	88.54	359.74	9,964.76	5,790.29	-187.23	5,793.22	2.51	-1.44	2.06
15,630.00	88.88	0.08	9,966.87	5,884.27	-187.37	5,887.14	0.51	0.36	0.36
15,724.00	90.31	357.51	9,967.54	5,978.23	-189.35	5,981.11	3.13	1.52	-2.73

Company: BC Operating, Inc.
Project: Lea County, NM (NAD27 NME)
Site: Rusty Anchor 7 Federal COM
Well: 1H
Wellbore: OH / Job #60664
Design: Surveys (Patterson 244)

Local Co-ordinate Reference: Well 1H
TVD Reference: RKB @ 3561.50usft (Patterson 244)
MD Reference: RKB @ 3561.50usft (Patterson 244)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: Compass 5000 GCR

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)
15,817.00	91.34	357.11	9,966.20	6,071.12	-193.71	6,074.10	1.19	1.11	-0.43
15,911.00	91.82	356.66	9,963.61	6,164.95	-198.82	6,168.05	0.70	0.51	-0.48
16,005.00	88.54	356.83	9,963.31	6,258.78	-204.16	6,262.02	3.49	-3.49	0.18
16,099.00	88.23	355.77	9,965.96	6,352.55	-210.22	6,355.95	1.17	-0.33	-1.13
16,194.00	89.80	356.07	9,967.59	6,447.29	-216.98	6,450.88	1.68	1.65	0.32
16,288.00	90.48	355.14	9,967.36	6,541.01	-224.18	6,544.80	1.23	0.72	-0.99
16,382.00	92.10	355.22	9,965.25	6,634.65	-232.08	6,638.68	1.73	1.72	0.09
16,476.00	92.55	354.53	9,961.43	6,728.20	-240.47	6,732.47	0.88	0.48	-0.73
16,570.00	95.44	356.22	9,954.89	6,821.65	-248.03	6,826.15	3.56	3.07	1.80
16,664.00	93.17	356.30	9,947.83	6,915.18	-254.14	6,919.84	2.42	-2.41	0.09
16,759.00	90.48	356.27	9,944.80	7,009.92	-260.29	7,014.75	2.83	-2.83	-0.03
16,854.00	90.09	354.10	9,944.33	7,104.58	-268.27	7,109.64	2.32	-0.41	-2.28
16,948.00	89.90	355.70	9,944.34	7,198.21	-276.62	7,203.52	1.71	-0.20	1.70
17,043.00	89.36	355.18	9,944.95	7,292.90	-284.18	7,298.43	0.79	-0.57	-0.55
17,137.00	87.03	355.01	9,947.91	7,386.50	-292.21	7,392.27	2.49	-2.48	-0.18
17,231.00	88.88	353.96	9,951.27	7,480.00	-301.24	7,486.05	2.26	1.97	-1.12
17,325.00	90.98	356.66	9,951.38	7,573.68	-308.92	7,579.95	3.64	2.23	2.87
17,419.00	91.07	357.56	9,949.70	7,667.54	-313.66	7,673.92	0.96	0.10	0.96
17,513.00	91.60	358.02	9,947.51	7,761.44	-317.28	7,767.90	0.75	0.56	0.49
17,607.00	92.32	358.05	9,944.30	7,855.33	-320.51	7,861.84	0.77	0.77	0.03
17,702.00	92.66	356.74	9,940.17	7,950.14	-324.82	7,956.75	1.42	0.36	-1.38
17,796.00	92.73	357.50	9,935.75	8,043.92	-329.54	8,050.63	0.81	0.07	0.81
17,890.00	92.86	357.62	9,931.17	8,137.72	-333.53	8,144.52	0.19	0.14	0.13
17,984.00	93.05	357.45	9,926.32	8,231.51	-337.57	8,238.39	0.27	0.20	-0.18
18,079.00	90.36	357.55	9,923.49	8,326.37	-341.71	8,333.34	2.83	-2.83	0.11
18,173.00	89.61	358.37	9,923.52	8,420.31	-345.06	8,427.34	1.18	-0.80	0.87
18,267.00	89.58	359.18	9,924.18	8,514.28	-347.07	8,521.32	0.86	-0.03	0.86
18,361.00	89.39	359.32	9,925.03	8,608.27	-348.30	8,615.29	0.25	-0.20	0.15
18,455.00	89.14	358.89	9,926.23	8,702.25	-349.77	8,709.26	0.53	-0.27	-0.46
18,549.00	90.00	359.17	9,926.94	8,796.24	-351.36	8,803.23	0.96	0.91	0.30
18,644.00	90.53	358.24	9,926.50	8,891.21	-353.51	8,898.22	1.13	0.56	-0.98
18,738.00	90.76	358.13	9,925.44	8,985.16	-356.48	8,992.21	0.27	0.24	-0.12
18,832.00	90.79	358.34	9,924.17	9,079.10	-359.38	9,086.20	0.23	0.03	0.22
18,927.00	90.40	358.30	9,923.18	9,174.06	-362.16	9,181.19	0.41	-0.41	-0.04
19,021.00	90.11	358.57	9,922.76	9,268.02	-364.73	9,275.19	0.42	-0.31	0.29
19,115.00	92.41	358.32	9,920.70	9,361.96	-367.28	9,369.15	2.46	2.45	-0.27
19,209.00	92.55	358.56	9,916.63	9,455.83	-369.84	9,463.06	0.30	0.15	0.26
19,303.00	92.77	359.05	9,912.27	9,549.71	-371.79	9,556.94	0.57	0.23	0.52
19,397.00	92.69	359.55	9,907.79	9,643.60	-372.94	9,650.80	0.54	-0.09	0.53
19,491.00	92.89	0.42	9,903.22	9,737.49	-372.97	9,744.63	0.95	0.21	0.93
19,567.00	90.21	0.62	9,901.16	9,831.45	-372.28	9,820.51	3.53	-3.52	0.27
Hardline Crossing - 19567' MD									
19,585.00	89.58	0.67	9,901.19	9,831.45	-372.07	9,838.48	3.53	-3.52	0.27
19,598.00	89.33	0.65	9,901.31	9,844.44	-371.92	9,851.47	1.93	-1.92	-0.15

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Project: Lea County, NM (NAD27 NME)
Site: Rusty Anchor 7 Federal COM
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Local Co-ordinate Reference: Well 1H
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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)
Final Phoenix MWD Survey									
19,654.00	89.33	0.65	9,901.97	9,900.44	-371.29	9,907.40	0.00	0.00	0.00
Projection to TD									

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
1,142.00	1,141.97	-2.48	0.74	Tie In
19,567.00	9,901.16	9,813.45	-372.28	Hardline Crossing - 19567' MD
19,598.00	9,901.31	9,844.44	-371.92	Final Phoenix MWD Survey
19,654.00	9,901.97	9,900.44	-371.29	Projection to TD