

# **EXTRACTION OIL & GAS**

**Broomfield County**

**Sec 9-T1S-R68W**

**UNITED B S16-20-17N**

**OWB**

**Design: FINAL SURVEY**

## **Standard Survey Report**

**12 January, 2022**



Project: Broomfield County  
Site: Sec 9-T1S-R68W  
Well: UNITED B S16-20-17N  
Wellbore: OWB  
Design: FINAL SURVEY

PROJECT DETAILS: Broomfield County  
Geodetic System: US State Plane 1983  
Datum: North American Datum 1983  
Ellipsoid: GRS 1980  
Zone: Colorado Northern Zone  
System Datum: Mean Sea Level



Azimuths to True North  
Magnetic North: 7.97°  
Magnetic Field  
Strength: 51745.9snT  
Dip Angle: 66.30°  
Date: 2/4/2021  
Model: IGRF2020

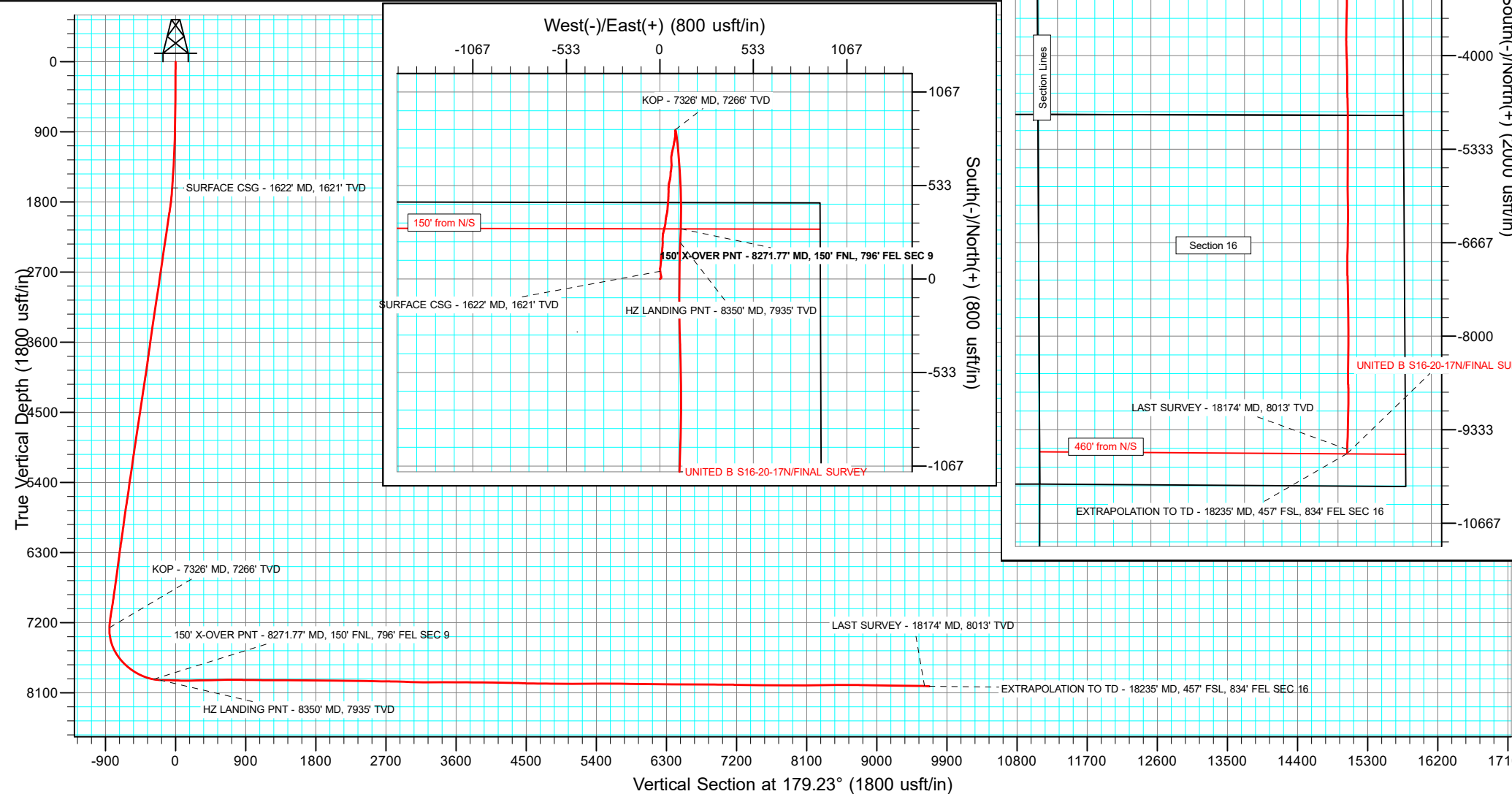
WELL DETAILS: UNITED B S16-20-17N

		5254.00					
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot	
0.00	0.00	1237951.42	3139969.70	39.985479°N	105.000486°W		

ANNOTATIONS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Vsect	Departure	Annotation
1622.00	4.22	352.17	1620.89	44.39	2.13	-44.36	49.13	SURFACE CSG - 1622' MD, 1621' TVD
7326.00	3.08	7.58	7265.71	851.87	88.33	-850.61	864.67	KOP - 7326' MD, 7266' TVD
8271.77	80.93	181.45	7926.49	285.95	119.55	-284.31	1437.66	150' X-OVER PNT - 8271.77' MD, 150' FNL, 796' FEL SEC 9
8350.00	86.34	182.81	7934.94	208.26	116.58	-206.67	1515.30	HZ LANDING PNT - 8350' MD, 7935' TVD
18174.00	88.22	182.12	8013.48	-9612.28	132.57	9613.19	11337.80	LAST SURVEY - 18174' MD, 8013' TVD
18235.00	88.22	182.12	8015.38	-9673.21	130.32	9674.09	11398.77	EXTRAPOLATION TO TD - 18235' MD, 457' FSL, 834' FEL SEC 16

SHL:  
436' FNL, 916' FEL  
Sec 9-T1S-R68W  
150' SETBACK X-OVER:  
150' FNL, 796' FEL  
Sec 9-T1S-R68W  
BHL:  
457' FSL, 834' FEL  
Sec 16-T1S-R68W



## Survey Report

<b>Company:</b>	EXTRACTION OIL & GAS	<b>Local Co-ordinate Reference:</b>	Well UNITED B S16-20-17N
<b>Project:</b>	Broomfield County	<b>TVD Reference:</b>	KB 28' @ 5282.00usft
<b>Site:</b>	Sec 9-T1S-R68W	<b>MD Reference:</b>	KB 28' @ 5282.00usft
<b>Well:</b>	UNITED B S16-20-17N	<b>North Reference:</b>	True
<b>Wellbore:</b>	OWB	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	FINAL SURVEY	<b>Database:</b>	EDT_32Bit_ODBC

<b>Project</b>	Broomfield County		
<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 9-T1S-R68W					
Site Position:		Northing:	1,238,372.37	usft	Latitude:	39.986700°N	
From:	Lat/Long	Easting:	3,135,664.83	usft	Longitude:	105.015841°W	
Position Uncertainty:	0.00	usft	Slot Radius:	13.200	in	Grid Convergence:	0.31 °

Well		UNITED B S16-20-17N				
Well Position	+N/-S	0.00 usft	Northing:	1,237,951.42 usft	Latitude:	39.985479°N
	+E/-W	0.00 usft	Easting:	3,139,969.70 usft	Longitude:	105.000486°W
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level:	5,254.00 usft

<b>Wellbore</b>	OWB				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2020	2/4/2021	7.97	66.30	51,745.94320132

<b>Design</b>	FINAL SURVEY				
<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	179.23	

<b>Survey Program</b>	<b>Date</b>	1/12/2022			
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
135.00	1,565.00	SURFACE (OWB)	MWD OWSG	OWSG MWD - Standard	
1,675.00	18,235.00	FINAL SURVEY (OWB)	MWD OWSG	OWSG 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 (°/100ft)</b>	<b>Build Rate (°/100ft)</b>	<b>Turn Rate (°/100ft)</b>	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
135.00	0.52	12.98	135.00	0.60	0.14	-0.60	0.39	0.39	0.00	
227.00	0.74	49.98	226.99	1.39	0.69	-1.38	0.49	0.24	40.22	
318.00	0.83	59.66	317.98	2.10	1.71	-2.07	0.18	0.10	10.64	
407.00	0.79	63.96	406.98	2.69	2.81	-2.65	0.08	-0.04	4.83	
496.00	0.97	68.27	495.96	3.24	4.06	-3.18	0.22	0.20	4.84	
586.00	0.79	61.06	585.95	3.82	5.31	-3.75	0.23	-0.20	-8.01	
675.00	0.79	31.18	674.95	4.64	6.17	-4.56	0.46	0.00	-33.57	
764.00	1.01	21.07	763.94	5.90	6.77	-5.81	0.30	0.25	-11.36	
854.00	1.23	20.98	853.92	7.54	7.40	-7.44	0.24	0.24	-0.10	

## Survey Report

<b>Company:</b>	EXTRACTION OIL & GAS	<b>Local Co-ordinate Reference:</b>	Well UNITED B S16-20-17N
<b>Project:</b>	Broomfield County	<b>TVD Reference:</b>	KB 28' @ 5282.00usft
<b>Site:</b>	Sec 9-T1S-R68W	<b>MD Reference:</b>	KB 28' @ 5282.00usft
<b>Well:</b>	UNITED B S16-20-17N	<b>North Reference:</b>	True
<b>Wellbore:</b>	OWB	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	FINAL SURVEY	<b>Database:</b>	EDT_32Bit_ODBC

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
943.00	1.89	24.41	942.88	9.77	8.35	-9.66	0.75	0.74	3.85
1,033.00	1.80	346.62	1,032.84	12.50	8.63	-12.38	1.33	-0.10	-41.99
1,121.00	2.59	341.61	1,120.78	15.73	7.69	-15.62	0.92	0.90	-5.69
1,211.00	2.64	345.04	1,210.68	19.66	6.51	-19.57	0.18	0.06	3.81
1,300.00	2.81	348.64	1,299.58	23.78	5.55	-23.70	0.27	0.19	4.04
1,390.00	3.34	350.75	1,389.45	28.53	4.70	-28.47	0.60	0.59	2.34
1,480.00	3.91	350.84	1,479.27	34.15	3.79	-34.09	0.63	0.63	0.10
1,565.00	4.35	350.31	1,564.05	40.19	2.78	-40.15	0.52	0.52	-0.62
1,622.00	4.22	352.17	1,620.89	44.39	2.13	-44.36	0.34	-0.23	3.26
SURFACE CSG - 1622' MD, 1621' TVD									
1,675.00	4.10	354.00	1,673.75	48.21	1.67	-48.18	0.34	-0.22	3.46
1,765.00	6.07	3.11	1,763.39	56.16	1.59	-56.14	2.36	2.19	10.12
1,854.00	8.07	6.48	1,851.71	67.07	2.55	-67.03	2.29	2.25	3.79
1,943.00	9.07	7.65	1,939.72	80.23	4.19	-80.17	1.14	1.12	1.31
2,032.00	8.64	5.52	2,027.66	93.84	5.77	-93.75	0.61	-0.48	-2.39
2,121.00	8.06	3.75	2,115.71	106.72	6.82	-106.61	0.71	-0.65	-1.99
2,210.00	8.54	8.23	2,203.78	119.48	8.17	-119.36	0.90	0.54	5.03
2,299.00	7.78	5.11	2,291.88	132.02	9.65	-131.88	0.99	-0.85	-3.51
2,389.00	9.33	8.15	2,380.88	145.31	11.23	-145.15	1.79	1.72	3.38
2,478.00	8.59	6.22	2,468.79	159.06	12.97	-158.87	0.90	-0.83	-2.17
2,567.00	7.62	2.86	2,556.90	171.56	13.99	-171.36	1.21	-1.09	-3.78
2,656.00	8.98	5.25	2,644.97	184.37	14.92	-184.16	1.58	1.53	2.69
2,745.00	8.62	2.76	2,732.92	197.95	15.88	-197.72	0.59	-0.40	-2.80
2,834.00	7.04	358.84	2,821.09	210.07	16.09	-209.83	1.87	-1.78	-4.40
2,923.00	8.53	358.10	2,909.27	222.12	15.76	-221.89	1.68	1.67	-0.83
3,012.00	9.75	5.40	2,997.14	236.22	16.25	-235.98	1.89	1.37	8.20
3,101.00	8.65	3.24	3,084.99	250.41	17.34	-250.15	1.30	-1.24	-2.43
3,190.00	9.25	15.00	3,172.91	264.00	19.57	-263.71	2.16	0.67	13.21
3,279.00	7.91	14.55	3,260.92	276.84	22.96	-276.50	1.51	-1.51	-0.51
3,368.00	9.31	13.30	3,348.91	289.77	26.15	-289.39	1.59	1.57	-1.40
3,457.00	7.79	12.29	3,436.92	302.67	29.09	-302.25	1.72	-1.71	-1.13
3,546.00	8.43	7.38	3,525.03	315.03	31.21	-314.58	1.06	0.72	-5.52
3,635.00	7.42	3.12	3,613.18	327.24	32.36	-326.78	1.31	-1.13	-4.79
3,724.00	8.87	7.84	3,701.28	339.78	33.61	-339.29	1.79	1.63	5.30
3,813.00	7.13	7.58	3,789.41	352.05	35.28	-351.54	1.96	-1.96	-0.29
3,902.00	8.72	14.98	3,877.56	364.04	37.75	-363.50	2.12	1.79	8.31
3,990.00	7.91	11.78	3,964.64	376.42	40.71	-375.83	1.06	-0.92	-3.64
4,079.00	9.67	5.95	4,052.59	389.85	42.73	-389.24	2.21	1.98	-6.55
4,168.00	8.13	3.44	4,140.51	403.56	43.89	-402.94	1.78	-1.73	-2.82
4,258.00	9.58	6.14	4,229.44	417.36	45.07	-416.72	1.68	1.61	3.00
4,347.00	7.88	2.31	4,317.41	430.82	46.11	-430.16	2.02	-1.91	-4.30
4,435.00	9.14	5.90	4,404.44	443.80	47.07	-443.13	1.55	1.43	4.08
4,524.00	7.75	2.82	4,492.47	456.83	48.09	-456.14	1.64	-1.56	-3.46

## Survey Report

<b>Company:</b>	EXTRACTION OIL & GAS	<b>Local Co-ordinate Reference:</b>	Well UNITED B S16-20-17N
<b>Project:</b>	Broomfield County	<b>TVD Reference:</b>	KB 28' @ 5282.00usft
<b>Site:</b>	Sec 9-T1S-R68W	<b>MD Reference:</b>	KB 28' @ 5282.00usft
<b>Well:</b>	UNITED B S16-20-17N	<b>North Reference:</b>	True
<b>Wellbore:</b>	OWB	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	FINAL SURVEY	<b>Database:</b>	EDT_32Bit_ODBC

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
4,613.00	9.09	3.74	4,580.51	469.84	48.85	-469.14	1.51	1.51	1.03	
4,703.00	7.58	1.25	4,669.56	482.87	49.44	-482.16	1.72	-1.68	-2.77	
4,792.00	9.31	1.29	4,757.59	495.94	49.73	-495.22	1.94	1.94	0.04	
4,881.00	8.11	357.71	4,845.56	509.41	49.64	-508.69	1.48	-1.35	-4.02	
4,970.00	9.31	5.48	4,933.53	522.85	50.08	-522.12	1.89	1.35	8.73	
5,059.00	8.11	2.92	5,021.51	536.28	51.08	-535.55	1.42	-1.35	-2.88	
5,148.00	8.59	14.85	5,109.57	548.98	53.11	-548.21	2.02	0.54	13.40	
5,237.00	7.57	12.96	5,197.69	561.12	56.13	-560.31	1.18	-1.15	-2.12	
5,326.00	9.63	9.93	5,285.68	574.16	58.72	-573.32	2.37	2.31	-3.40	
5,415.00	8.33	5.29	5,373.59	587.92	60.60	-587.05	1.67	-1.46	-5.21	
5,527.00	6.93	0.40	5,484.60	602.75	61.40	-601.87	1.38	-1.25	-4.37	
5,616.00	9.01	9.40	5,572.73	615.00	62.57	-614.10	2.72	2.34	10.11	
5,705.00	9.20	8.53	5,660.61	628.91	64.77	-627.98	0.26	0.21	-0.98	
5,794.00	8.66	3.63	5,748.54	642.63	66.25	-641.68	1.05	-0.61	-5.51	
5,883.00	7.92	359.20	5,836.61	655.45	66.59	-654.50	1.10	-0.83	-4.98	
5,972.00	6.85	354.93	5,924.87	666.87	66.03	-665.92	1.35	-1.20	-4.80	
6,061.00	8.36	0.07	6,013.08	678.63	65.57	-677.68	1.86	1.70	5.78	
6,150.00	7.68	358.34	6,101.21	691.04	65.41	-690.10	0.81	-0.76	-1.94	
6,239.00	8.84	9.49	6,189.29	703.73	66.36	-702.78	2.22	1.30	12.53	
6,328.00	8.12	10.02	6,277.32	716.67	68.58	-715.68	0.81	-0.81	0.60	
6,417.00	7.02	12.81	6,365.54	728.16	70.88	-727.14	1.30	-1.24	3.13	
6,506.00	8.24	13.22	6,453.75	739.67	73.55	-738.62	1.37	1.37	0.46	
6,595.00	7.20	13.74	6,541.94	751.30	76.33	-750.20	1.17	-1.17	0.58	
6,684.00	8.70	9.70	6,630.09	763.35	78.79	-762.22	1.80	1.69	-4.54	
6,773.00	7.23	9.58	6,718.23	775.51	80.85	-774.35	1.65	-1.65	-0.13	
6,862.00	9.04	11.14	6,806.33	787.89	83.14	-786.70	2.05	2.03	1.75	
6,951.00	7.86	10.78	6,894.36	800.73	85.63	-799.51	1.33	-1.33	-0.40	
7,040.00	9.13	4.20	6,982.38	813.75	87.28	-812.51	1.79	1.43	-7.39	
7,129.00	9.54	0.91	7,070.21	828.17	87.92	-826.91	0.76	0.46	-3.70	
7,219.00	7.00	0.71	7,159.26	841.11	88.10	-839.85	2.82	-2.82	-0.22	
7,308.00	5.21	1.11	7,247.75	850.58	88.25	-849.31	2.01	-2.01	0.45	
7,326.00	3.08	7.58	7,265.71	851.87	88.33	-850.61	12.09	-11.83	35.95	
KOP - 7326' MD, 7266' TVD										
7,397.00	5.68	163.60	7,336.61	850.39	89.57	-849.11	12.09	3.66	219.74	
7,486.00	14.13	172.26	7,424.21	835.38	92.29	-834.06	9.61	9.49	9.73	
7,575.00	22.10	170.80	7,508.73	808.04	96.43	-806.67	8.97	8.96	-1.64	
7,664.00	29.58	173.66	7,588.78	769.62	101.54	-768.19	8.52	8.40	3.21	
7,753.00	38.95	177.14	7,662.26	719.74	105.37	-718.25	10.75	10.53	3.91	
7,842.00	46.65	174.10	7,727.52	659.51	110.10	-657.97	8.96	8.65	-3.42	
7,931.00	53.41	176.25	7,784.66	591.59	115.77	-589.97	7.82	7.60	2.42	
8,020.00	57.36	178.90	7,835.21	518.43	118.83	-516.78	5.07	4.44	2.98	
8,110.00	63.87	179.75	7,879.35	440.06	119.74	-438.40	7.28	7.23	0.94	
8,199.00	74.44	179.60	7,910.98	357.00	120.21	-355.35	11.88	11.88	-0.17	
8,271.77	80.93	181.45	7,926.49	285.95	119.55	-284.31	9.26	8.92	2.54	

## Survey Report

<b>Company:</b>	EXTRACTION OIL & GAS	<b>Local Co-ordinate Reference:</b>	Well UNITED B S16-20-17N
<b>Project:</b>	Broomfield County	<b>TVD Reference:</b>	KB 28' @ 5282.00usft
<b>Site:</b>	Sec 9-T1S-R68W	<b>MD Reference:</b>	KB 28' @ 5282.00usft
<b>Well:</b>	UNITED B S16-20-17N	<b>North Reference:</b>	True
<b>Wellbore:</b>	OWB	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	FINAL SURVEY	<b>Database:</b>	EDT_32Bit_ODBC

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
150' X-OVER PNT - 8271.77' MD, 150' FNL, 796' FEL SEC 9									
8,288.00	82.38	181.85	7,928.85	269.90	119.08	-268.27	9.26	8.93	2.47
8,350.00	86.34	182.81	7,934.94	208.26	116.58	-206.67	6.57	6.39	1.54
HZ LANDING PNT - 8350' MD, 7935' TVD									
8,377.00	88.07	183.22	7,936.25	181.33	115.16	-179.77	6.57	6.39	1.53
8,466.00	88.61	180.81	7,938.83	92.43	112.03	-90.92	2.77	0.61	-2.71
8,555.00	88.06	180.06	7,941.42	3.47	111.36	-1.97	1.04	-0.62	-0.84
8,644.00	89.38	180.39	7,943.40	-85.50	111.01	86.99	1.53	1.48	0.37
8,733.00	90.70	179.63	7,943.34	-174.50	110.99	175.98	1.71	1.48	-0.85
8,822.00	90.99	178.84	7,942.03	-263.48	112.18	264.97	0.95	0.33	-0.89
8,911.00	91.62	177.92	7,940.00	-352.42	114.69	353.93	1.25	0.71	-1.03
9,000.00	91.04	179.02	7,937.94	-441.36	117.07	442.90	1.40	-0.65	1.24
9,089.00	91.86	178.22	7,935.68	-530.31	119.21	531.86	1.29	0.92	-0.90
9,179.00	91.23	179.41	7,933.26	-620.25	121.07	621.83	1.50	-0.70	1.32
9,268.00	89.21	180.77	7,932.92	-709.24	120.93	710.81	2.74	-2.27	1.53
9,357.00	90.01	180.50	7,933.52	-798.24	119.95	799.78	0.95	0.90	-0.30
9,446.00	89.13	181.76	7,934.19	-887.21	118.19	888.73	1.73	-0.99	1.42
9,535.00	89.62	181.51	7,935.16	-976.17	115.65	977.64	0.62	0.55	-0.28
9,624.00	88.49	181.88	7,936.63	-1,065.12	113.02	1,066.54	1.34	-1.27	0.42
9,713.00	89.66	182.88	7,938.07	-1,154.03	109.32	1,155.40	1.73	1.31	1.12
9,803.00	90.52	182.13	7,937.92	-1,243.94	105.39	1,245.25	1.27	0.96	-0.83
9,892.00	90.06	181.13	7,937.47	-1,332.90	102.86	1,334.17	1.24	-0.52	-1.12
9,981.00	88.34	180.14	7,938.72	-1,421.88	101.87	1,423.13	2.23	-1.93	-1.11
10,070.00	89.08	179.61	7,940.72	-1,510.86	102.07	1,512.10	1.02	0.83	-0.60
10,159.00	89.96	178.75	7,941.47	-1,599.85	103.34	1,601.09	1.38	0.99	-0.97
10,248.00	90.37	178.58	7,941.21	-1,688.82	105.41	1,690.09	0.50	0.46	-0.19
10,337.00	90.59	177.80	7,940.46	-1,777.77	108.23	1,779.07	0.91	0.25	-0.88
10,426.00	88.86	179.28	7,940.89	-1,866.74	110.49	1,868.06	2.56	-1.94	1.66
10,515.00	88.54	179.08	7,942.91	-1,955.70	111.77	1,957.03	0.42	-0.36	-0.22
10,605.00	88.89	178.50	7,944.93	-2,045.66	113.67	2,047.01	0.75	0.39	-0.64
10,694.00	88.77	178.03	7,946.75	-2,134.60	116.36	2,135.98	0.54	-0.13	-0.53
10,783.00	89.90	178.38	7,947.78	-2,223.55	119.15	2,224.95	1.33	1.27	0.39
10,872.00	90.52	177.60	7,947.45	-2,312.49	122.27	2,313.93	1.12	0.70	-0.88
10,961.00	88.70	179.66	7,948.06	-2,401.46	124.40	2,402.92	3.09	-2.04	2.31
11,050.00	88.78	179.84	7,950.02	-2,490.44	124.79	2,491.89	0.22	0.09	0.20
11,139.00	88.90	179.39	7,951.82	-2,579.42	125.38	2,580.87	0.52	0.13	-0.51
11,228.00	89.97	177.94	7,952.69	-2,668.38	127.46	2,669.86	2.02	1.20	-1.63
11,317.00	88.66	179.28	7,953.76	-2,757.35	129.62	2,758.84	2.11	-1.47	1.51
11,406.00	88.88	178.94	7,955.67	-2,846.32	131.00	2,847.82	0.45	0.25	-0.38
11,495.00	88.07	180.99	7,958.04	-2,935.28	131.05	2,936.78	2.48	-0.91	2.30
11,584.00	87.92	180.79	7,961.15	-3,024.21	129.67	3,025.69	0.28	-0.17	-0.22
11,673.00	88.07	181.15	7,964.27	-3,113.15	128.16	3,114.59	0.44	0.17	0.40
11,762.00	88.21	180.49	7,967.15	-3,202.09	126.89	3,203.51	0.76	0.16	-0.74

## Survey Report

<b>Company:</b>	EXTRACTION OIL & GAS	<b>Local Co-ordinate Reference:</b>	Well UNITED B S16-20-17N
<b>Project:</b>	Broomfield County	<b>TVD Reference:</b>	KB 28' @ 5282.00usft
<b>Site:</b>	Sec 9-T1S-R68W	<b>MD Reference:</b>	KB 28' @ 5282.00usft
<b>Well:</b>	UNITED B S16-20-17N	<b>North Reference:</b>	True
<b>Wellbore:</b>	OWB	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	FINAL SURVEY	<b>Database:</b>	EDT_32Bit_ODBC

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
11,851.00	91.96	180.51	7,967.02	-3,291.07	126.12	3,292.47	4.21	4.21	0.02	
11,941.00	90.39	181.62	7,965.18	-3,381.03	124.44	3,382.40	2.14	-1.74	1.23	
12,030.00	91.25	180.75	7,963.90	-3,470.00	122.60	3,471.34	1.37	0.97	-0.98	
12,119.00	88.64	181.15	7,963.99	-3,558.98	121.13	3,560.29	2.97	-2.93	0.45	
12,208.00	89.31	181.02	7,965.58	-3,647.95	119.44	3,649.23	0.77	0.75	-0.15	
12,297.00	90.21	180.72	7,965.95	-3,736.94	118.09	3,738.19	1.07	1.01	-0.34	
12,386.00	89.01	178.62	7,966.56	-3,825.93	118.60	3,827.18	2.72	-1.35	-2.36	
12,475.00	89.65	178.10	7,967.60	-3,914.88	121.15	3,916.16	0.93	0.72	-0.58	
12,564.00	89.82	177.56	7,968.01	-4,003.82	124.52	4,005.13	0.64	0.19	-0.61	
12,653.00	88.84	179.08	7,969.05	-4,092.77	127.13	4,094.11	2.03	-1.10	1.71	
12,742.00	89.08	178.63	7,970.67	-4,181.74	128.91	4,183.10	0.57	0.27	-0.51	
12,831.00	89.65	177.82	7,971.65	-4,270.69	131.66	4,272.08	1.11	0.64	-0.91	
12,920.00	87.99	180.28	7,973.49	-4,359.65	133.14	4,361.05	3.33	-1.87	2.76	
13,009.00	87.25	180.06	7,977.18	-4,448.57	132.88	4,449.96	0.87	-0.83	-0.25	
13,098.00	89.31	178.35	7,979.85	-4,537.51	134.11	4,538.91	3.01	2.31	-1.92	
13,187.00	88.99	178.04	7,981.17	-4,626.46	136.91	4,627.88	0.50	-0.36	-0.35	
13,276.00	89.81	179.57	7,982.11	-4,715.43	138.77	4,716.87	1.95	0.92	1.72	
13,365.00	89.49	179.53	7,982.65	-4,804.43	139.47	4,805.87	0.36	-0.36	-0.04	
13,454.00	89.12	178.66	7,983.73	-4,893.41	140.87	4,894.86	1.06	-0.42	-0.98	
13,543.00	90.04	180.14	7,984.38	-4,982.40	141.81	4,983.86	1.96	1.03	1.66	
13,632.00	89.54	180.29	7,984.71	-5,071.40	141.47	5,072.84	0.59	-0.56	0.17	
13,722.00	89.64	180.23	7,985.35	-5,161.39	141.06	5,162.83	0.13	0.11	-0.07	
13,811.00	90.37	180.20	7,985.34	-5,250.39	140.73	5,251.81	0.82	0.82	-0.03	
13,900.00	90.85	180.47	7,984.40	-5,339.39	140.21	5,340.79	0.62	0.54	0.30	
13,989.00	91.11	180.44	7,982.88	-5,428.37	139.50	5,429.76	0.29	0.29	-0.03	
14,078.00	91.65	179.76	7,980.73	-5,517.34	139.35	5,518.72	0.98	0.61	-0.76	
14,167.00	88.52	180.47	7,980.60	-5,606.33	139.17	5,607.70	3.61	-3.52	0.80	
14,256.00	88.34	180.21	7,983.04	-5,695.30	138.64	5,696.65	0.36	-0.20	-0.29	
14,345.00	87.98	180.35	7,985.90	-5,784.25	138.21	5,785.59	0.43	-0.40	0.16	
14,434.00	89.74	179.79	7,987.67	-5,873.23	138.10	5,874.55	2.08	1.98	-0.63	
14,523.00	89.90	179.31	7,987.95	-5,962.22	138.80	5,963.55	0.57	0.18	-0.54	
14,612.00	89.61	178.82	7,988.33	-6,051.21	140.25	6,052.55	0.64	-0.33	-0.55	
14,701.00	88.84	178.14	7,989.53	-6,140.17	142.61	6,141.53	1.15	-0.87	-0.76	
14,790.00	89.46	179.16	7,990.85	-6,229.13	144.71	6,230.52	1.34	0.70	1.15	
14,879.00	89.88	181.60	7,991.36	-6,318.12	144.12	6,319.49	2.78	0.47	2.74	
14,968.00	89.75	181.16	7,991.65	-6,407.10	141.97	6,408.43	0.52	-0.15	-0.49	
15,057.00	89.78	180.65	7,992.02	-6,496.08	140.57	6,497.39	0.57	0.03	-0.57	
15,147.00	89.42	179.91	7,992.64	-6,586.08	140.13	6,587.37	0.91	-0.40	-0.82	
15,236.00	90.01	180.60	7,993.09	-6,675.08	139.73	6,676.35	1.02	0.66	0.78	
15,325.00	89.76	181.65	7,993.27	-6,764.06	137.98	6,765.30	1.21	-0.28	1.18	
15,414.00	89.60	181.00	7,993.76	-6,853.03	135.92	6,854.24	0.75	-0.18	-0.73	
15,503.00	88.83	179.17	7,994.98	-6,942.02	135.79	6,943.22	2.23	-0.87	-2.06	
15,592.00	90.12	181.03	7,995.80	-7,031.01	135.64	7,032.20	2.54	1.45	2.09	
15,681.00	89.33	178.91	7,996.22	-7,120.00	135.68	7,121.19	2.54	-0.89	-2.38	

## Survey Report

<b>Company:</b>	EXTRACTION OIL & GAS	<b>Local Co-ordinate Reference:</b>	Well UNITED B S16-20-17N
<b>Project:</b>	Broomfield County	<b>TVD Reference:</b>	KB 28' @ 5282.00usft
<b>Site:</b>	Sec 9-T1S-R68W	<b>MD Reference:</b>	KB 28' @ 5282.00usft
<b>Well:</b>	UNITED B S16-20-17N	<b>North Reference:</b>	True
<b>Wellbore:</b>	OWB	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	FINAL SURVEY	<b>Database:</b>	EDT_32Bit_ODBC

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
15,770.00	88.89	177.79	7,997.61	-7,208.95	138.25	7,210.16	1.35	-0.49	-1.26
15,859.00	89.17	179.07	7,999.11	-7,297.91	140.68	7,299.14	1.47	0.31	1.44
15,948.00	89.09	178.89	8,000.47	-7,386.88	142.27	7,388.13	0.22	-0.09	-0.20
16,038.00	88.47	178.90	8,002.38	-7,476.84	144.00	7,478.11	0.69	-0.69	0.01
16,127.00	89.98	179.10	8,003.59	-7,565.82	145.56	7,567.09	1.71	1.70	0.22
16,215.00	89.68	179.48	8,003.85	-7,653.81	146.65	7,655.09	0.55	-0.34	0.43
16,305.00	89.83	179.66	8,004.23	-7,743.81	147.32	7,745.09	0.26	0.17	0.20
16,394.00	89.65	179.32	8,004.64	-7,832.80	148.11	7,834.09	0.43	-0.20	-0.38
16,483.00	89.06	178.98	8,005.64	-7,921.79	149.43	7,923.08	0.77	-0.66	-0.38
16,572.00	90.72	180.62	8,005.81	-8,010.78	149.75	8,012.07	2.62	1.87	1.84
16,661.00	91.01	180.72	8,004.46	-8,099.77	148.70	8,101.03	0.34	0.33	0.11
16,750.00	90.63	180.40	8,003.19	-8,188.75	147.84	8,190.00	0.56	-0.43	-0.36
16,839.00	90.65	179.80	8,002.20	-8,277.75	147.68	8,278.98	0.67	0.02	-0.67
16,928.00	90.71	180.97	8,001.14	-8,366.74	147.08	8,367.96	1.32	0.07	1.31
17,017.00	90.38	181.10	8,000.29	-8,455.72	145.47	8,456.91	0.40	-0.37	0.15
17,106.00	90.89	180.48	7,999.31	-8,544.70	144.25	8,545.87	0.90	0.57	-0.70
17,195.00	89.87	179.05	7,998.72	-8,633.70	144.61	8,634.86	1.97	-1.15	-1.61
17,284.00	89.01	177.36	7,999.59	-8,722.64	147.40	8,723.84	2.13	-0.97	-1.90
17,373.00	89.30	180.20	8,000.90	-8,811.61	149.29	8,812.82	3.21	0.33	3.19
17,462.00	89.27	180.27	8,002.01	-8,900.60	148.93	8,901.80	0.09	-0.03	0.08
17,551.00	88.79	180.95	8,003.52	-8,989.58	147.98	8,990.76	0.94	-0.54	0.76
17,641.00	88.25	181.13	8,005.84	-9,079.53	146.35	9,080.68	0.63	-0.60	0.20
17,730.00	89.80	181.31	8,007.36	-9,168.50	144.45	9,169.61	1.75	1.74	0.20
17,819.00	89.62	181.17	8,007.81	-9,257.48	142.53	9,258.56	0.26	-0.20	-0.16
17,908.00	89.35	181.41	8,008.61	-9,346.45	140.52	9,347.49	0.41	-0.30	0.27
17,997.00	89.18	181.46	8,009.75	-9,435.41	138.30	9,436.42	0.20	-0.19	0.06
18,086.00	88.88	181.92	8,011.25	-9,524.36	135.67	9,525.33	0.62	-0.34	0.52
18,174.00	88.22	182.12	8,013.48	-9,612.28	132.57	9,613.19	0.78	-0.75	0.23
LAST SURVEY - 18174' MD, 8013' TVD									
18,235.00	88.22	182.12	8,015.38	-9,673.21	130.32	9,674.09	0.00	0.00	0.00
EXTRAPOLATION TO TD - 18235' MD, 457' FSL, 834' FEL SEC 16									

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
UNITED B S16-17N - LF	0.00	0.00	7,934.00	285.95	48.76	1,238,237.64	3,140,016.84	39.986264°N	105.000312°W
- hit/miss target									
- Shape									
- actual wellpath misses target center by 71.12usft at 8274.88usft MD (7926.97 TVD, 282.88 N, 119.47 E)									
- Point									
UNITED B S16-17N - PE	0.00	0.00	7,985.00	-9,676.16	101.76	1,228,275.99	3,140,125.96	39.958916°N	105.000123°W
- hit/miss target									
- Shape									
- actual wellpath misses target center by 41.80usft at 18235.00usft MD (8015.38 TVD, -9673.21 N, 130.32 E)									
- Point									



## Survey Report

<b>Company:</b>	EXTRACTION OIL & GAS	<b>Local Co-ordinate Reference:</b>	Well UNITED B S16-20-17N
<b>Project:</b>	Broomfield County	<b>TVD Reference:</b>	KB 28' @ 5282.00usft
<b>Site:</b>	Sec 9-T1S-R68W	<b>MD Reference:</b>	KB 28' @ 5282.00usft
<b>Well:</b>	UNITED B S16-20-17N	<b>North Reference:</b>	True
<b>Wellbore:</b>	OWB	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	FINAL SURVEY	<b>Database:</b>	EDT_32Bit_ODBC

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
1,622.00	1,620.89	44.39	2.13	SURFACE CSG - 1622' MD, 1621' TVD
7,326.00	7,265.71	851.87	88.33	KOP - 7326' MD, 7266' TVD
8,271.77	7,926.49	285.95	119.55	150' X-OVER PNT - 8271.77' MD, 150' FNL, 796' FEL SEC 9
8,350.00	7,934.94	208.26	116.58	HZ LANDING PNT - 8350' MD, 7935' TVD
18,174.00	8,013.48	-9,612.28	132.57	LAST SURVEY - 18174' MD, 8013' TVD
18,235.00	8,015.38	-9,673.21	130.32	EXTRAPOLATION TO TD - 18235' MD, 457' FSL, 834' FEL SEC 16

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