

# CUB CREEK ENERGY, LLC

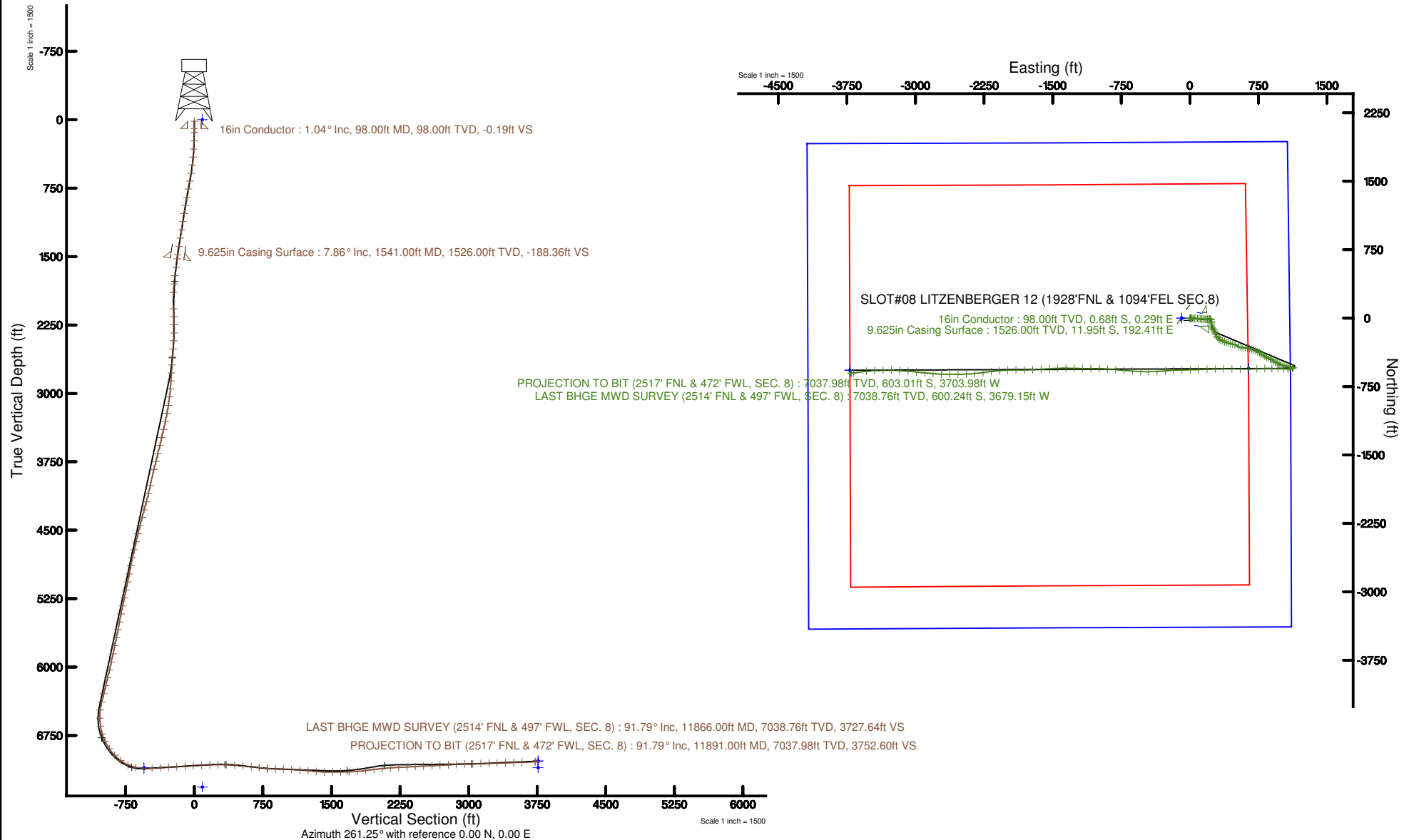
Location: COLORADO Slot: SLOT#08 LITZENBERGER 12 (1928'FNL & 1094'FEL SEC.8)  
Field: WELD COUNTY (NAD83, TRUE NORTH) Well: LITZENBERGER 12  
Facility: SEC.08-T03N-R68W Wellbore: LITZENBERGER 12 PWB

Plot reference wellpath is LITZENBERGER 12 PWB REV 0.1	Grid System: NAD83 / Lambert Colorado SP, Northern Zone (2011), US feet
True vertical depths are referenced to XTREME 18 (17') (RKB)	North Reference: True north
Measured depths are referenced to XTREME 18 (17') (RKB)	Scale: True distance
XTREME 18 (17') (RKB) is Mean Sea Level: 5098 feet	Depths are in feet
Mean Sea Level to Mud line (At Slot) SLOT#08 LITZENBERGER 12 (1928'FNL & 1094'FEL SEC.8): 0 feet	Created by: cartwright on 2017.08.07
Coordinates are in feet referenced to Slot	Database: Denver



BGGM (1900.0 to 2018.0) Dip: 66.70° Field: 52306.2 nT  
Magnetic North is 8.50 degrees East of True North (at 7/18/2017)

To correct azimuth from Magnetic to True add 8.50 degrees





# Actual Wellpath Report

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## REFERENCE WELLPATH IDENTIFICATION

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Area	COLORADO	Well	LITZENBERGER 12
Field	WELD COUNTY (NAD83, TRUE NORTH)	Wellbore	LITZENBERGER 12 AWP
Facility	SEC.08-T03N-R68W		

## REPORT SETUP INFORMATION

Projection System	NAD83 / Lambert Colorado SP, Northern Zone (501), US feet	Software System	WellArchitect® 5.1
North Reference	True	User	Cantryat
Scale	0.999957	Report Generated	8/7/2017 at 1:55:43 PM
Convergence at slot	0.31° East	Database/Source file	Denver/LITZENBERGER_12_AWP.xml

## WELLPATH LOCATION

	Local coordinates		Grid coordinates		Geographic coordinates	
	North[ft]	East[ft]	Easting[US ft]	Northing[US ft]	Latitude	Longitude
Slot Location	0.00	89.33	3133573.71	1331483.00	40°14'32.388"N	105°01'17.436"W
Facility Reference Pt			3133484.38	1331482.52	40°14'32.388"N	105°01'18.588"W
Field Reference Pt			3133072.77	1341057.53	40°16'07.032"N	105°01'23.232"W

## WELLPATH DATUM

Calculation method	Minimum curvature	XTREME 18 (17") (RKB) to Facility Vertical Datum	5098.00ft
Horizontal Reference Pt	Slot	XTREME 18 (17") (RKB) to Mean Sea Level	5098.00ft
Vertical Reference Pt	XTREME 18 (17") (RKB)	XTREME 18 (17") (RKB) to Mud Line at Slot (SLOT#08 LITZENBERGER 12 (1928'FNL & 1094'FEL SEC.8))	5098.00ft
MD Reference Pt	XTREME 18 (17") (RKB)	Section Origin	N 0.00, E 0.00 ft
Field Vertical Reference	Mean Sea Level	Section Azimuth	261.25°



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Field	WELD COUNTY (NAD83, TRUE NORTH)	Wellbore	LITZENBERGER 12 AWB
Facility	SEC.08-T03N-R68W		

## WELLPATH DATA (130 stations) † = interpolated/extrapolated station

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	DLS [°/100ft]	Comments
0.00†	0.000	156.620	0.00	0.00	0.00	0.00	0.00	
17.00	0.000	156.620	17.00	0.00	0.00	0.00	0.00	
140.00	1.580	156.620	139.98	-0.43	-1.56	0.67	1.28	
231.00	2.460	119.860	230.93	-2.27	-3.68	2.86	1.67	
323.00	3.030	87.430	322.83	-6.23	-4.55	7.01	1.77	
411.00	5.420	82.500	410.58	-12.70	-3.91	13.45	2.74	
498.00	6.950	88.940	497.08	-22.03	-3.27	22.79	1.93	
588.00	8.760	91.290	586.23	-34.17	-3.33	35.09	2.04	
676.00	10.390	90.770	673.00	-48.60	-3.59	49.72	1.85	
765.00	10.760	95.050	760.49	-64.58	-4.42	66.02	0.98	
857.00	10.480	96.620	850.91	-80.99	-6.14	82.89	0.44	
947.00	9.820	97.670	939.50	-96.24	-8.11	98.62	0.76	
1037.00	9.330	95.780	1028.25	-110.67	-9.87	113.49	0.65	
1128.00	9.560	95.230	1118.02	-125.14	-11.30	128.35	0.27	
1220.00	9.200	92.130	1208.79	-139.78	-12.27	143.31	0.67	
1311.00	8.640	88.410	1298.69	-153.70	-12.35	157.41	0.88	
1403.00	9.260	92.100	1389.57	-167.83	-12.43	171.72	0.92	
1495.00	8.480	87.300	1480.47	-181.85	-12.39	185.89	1.17	
1634.00	6.660	79.130	1618.25	-200.09	-10.38	204.05	1.52	
1726.00	7.230	88.580	1709.58	-211.17	-9.23	215.07	1.39	
1818.00	6.610	118.590	1800.94	-221.12	-11.62	225.51	3.94	
1910.00	6.700	141.220	1892.34	-228.02	-18.34	233.53	2.83	
2093.00	8.800	194.810	2073.88	-227.77	-40.23	236.64	3.94	
2182.00	9.060	185.400	2161.80	-223.34	-53.79	234.24	1.67	
2270.00	10.160	177.390	2248.57	-220.81	-68.44	233.94	1.96	
2361.00	10.980	166.270	2338.03	-220.71	-84.88	236.36	2.41	
2449.00	11.970	151.850	2424.29	-224.47	-101.07	242.66	3.44	
2539.00	11.820	141.950	2512.37	-232.08	-116.56	252.74	2.27	
2628.00	10.940	150.830	2599.62	-239.49	-131.11	262.48	2.20	
2718.00	11.760	159.820	2687.87	-244.29	-147.18	269.81	2.16	



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## REFERENCE WELLPATH IDENTIFICATION

Operator	CUB CREEK ENERGY, LLC	Slot	SLOT#08 LITZENBERGER 12 (1928'FNL & 1094'FEL SEC.8)
Area	COLORADO	Well	LITZENBERGER 12
Field	WELD COUNTY (NAD83, TRUE NORTH)	Wellbore	LITZENBERGER 12 AWB
Facility	SEC.08-T03N-R68W		

## WELLPATH DATA (130 stations)

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	DLS [°/100ft]	Comments
2808.00	11.700	153.690	2775.99	-248.86	-163.97	277.02	1.39	
2898.00	12.790	153.000	2863.95	-254.74	-181.02	285.58	1.22	
2986.00	12.990	149.120	2949.73	-261.51	-198.19	295.08	1.01	
3078.00	12.770	136.960	3039.43	-271.14	-214.50	307.33	2.95	
3171.00	12.980	134.350	3130.09	-283.20	-229.31	321.81	0.66	
3262.00	13.550	116.020	3218.70	-298.10	-241.14	338.71	4.64	
3353.00	14.030	109.640	3307.09	-316.57	-249.52	358.68	1.75	
3445.00	14.240	110.600	3396.30	-336.24	-257.25	379.77	0.34	
3535.00	14.710	111.790	3483.44	-355.73	-265.39	400.75	0.62	
3626.00	15.280	110.040	3571.35	-376.19	-273.79	422.74	0.80	
3718.00	15.090	100.320	3660.15	-398.14	-280.09	445.91	2.77	
3808.00	15.280	103.480	3747.01	-420.19	-284.95	468.97	0.94	
3899.00	15.150	109.220	3834.82	-441.79	-291.66	491.86	1.66	
4081.00	15.430	121.770	4010.43	-481.22	-312.24	534.92	1.82	
4173.00	15.390	104.770	4099.17	-501.72	-321.80	557.14	4.89	
4265.00	15.200	90.900	4187.94	-524.82	-325.11	581.01	3.97	
4356.00	15.420	96.280	4275.71	-548.26	-326.62	604.96	1.58	
4443.00	15.270	99.180	4359.61	-570.33	-329.71	627.77	0.90	
4535.00	15.330	104.240	4448.36	-593.06	-334.64	651.52	1.45	
4627.00	15.130	108.840	4537.13	-614.90	-341.51	674.67	1.33	
4720.00	15.410	110.710	4626.85	-636.41	-349.79	697.71	0.61	
4812.00	15.090	111.290	4715.61	-657.42	-358.46	720.31	0.39	
4902.00	14.590	115.260	4802.61	-676.96	-367.56	741.47	1.26	
4992.00	14.800	123.430	4889.67	-694.88	-378.73	761.32	2.31	
5084.00	15.190	128.180	4978.54	-711.82	-392.65	780.60	1.40	
5175.00	15.290	123.220	5066.35	-728.88	-406.60	800.01	1.44	
5267.00	14.750	120.920	5155.20	-746.92	-419.26	820.21	0.87	
5358.00	14.260	118.240	5243.30	-764.79	-430.51	840.02	0.91	
5446.00	14.290	110.070	5328.59	-782.96	-439.37	859.77	2.29	
5538.00	13.180	113.350	5417.96	-801.80	-447.42	880.07	1.47	



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Field	WELD COUNTY (NAD83, TRUE NORTH)	Wellbore	LITZENBERGER 12 AWB
Facility	SEC.08-T03N-R68W		

## WELLPATH DATA (130 stations)

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	DLS [°/100ft]	Comments
5627.00	13.270	120.980	5504.61	-818.25	-456.70	898.14	1.96	
5715.00	14.670	126.590	5590.01	-833.85	-468.55	915.75	2.21	
5805.00	14.720	118.180	5677.08	-851.01	-480.74	934.98	2.37	
5897.00	14.730	118.700	5766.05	-869.64	-491.88	955.54	0.14	
5989.00	14.560	111.740	5855.07	-888.89	-501.78	976.55	1.92	
6081.00	13.810	112.290	5944.27	-908.26	-510.23	997.45	0.83	
6172.00	14.480	109.260	6032.51	-927.62	-518.10	1018.24	1.10	
6260.00	14.540	104.380	6117.70	-947.49	-524.47	1039.33	1.39	
6350.00	14.450	100.040	6204.84	-968.51	-529.24	1061.33	1.21	
6442.00	14.560	97.670	6293.91	-990.47	-532.78	1084.09	0.66	
6534.00	14.130	100.890	6383.04	-1012.14	-536.45	1106.58	0.98	
6622.00	8.840	104.460	6469.25	-1028.48	-540.17	1123.69	6.06	
6713.00	2.920	197.640	6559.86	-1033.89	-544.13	1129.77	10.39	
6801.00	10.730	226.520	6647.18	-1026.15	-551.92	1123.13	9.42	
6888.00	16.700	265.320	6731.83	-1006.97	-558.53	1104.75	12.24	
6981.00	26.310	272.980	6818.27	-973.38	-558.55	1070.76	10.74	
7071.00	35.000	272.450	6895.62	-928.44	-556.40	1024.97	9.66	
7161.00	44.420	271.730	6964.78	-872.02	-554.34	967.57	10.48	
7253.00	53.430	272.050	7025.17	-803.93	-552.05	898.32	9.80	
7344.00	65.050	268.170	7071.64	-726.80	-552.06	820.28	13.28	
7436.00	77.620	266.610	7101.03	-640.31	-556.06	733.39	13.76	
7526.00	88.250	269.460	7112.08	-551.76	-559.09	644.26	12.22	
7618.00	93.570	271.810	7110.62	-461.04	-558.08	552.32	6.32	
7710.00	93.570	270.530	7104.89	-370.59	-556.20	460.52	1.39	
7800.00	93.570	269.730	7099.29	-281.84	-556.00	370.69	0.89	
7892.00	93.510	268.050	7093.61	-190.83	-557.78	278.89	1.82	
7983.00	93.540	267.660	7088.01	-100.61	-561.17	188.13	0.43	
8073.00	93.540	267.790	7082.46	-11.35	-564.74	98.37	0.14	
8165.00	93.570	269.320	7076.75	79.72	-567.06	6.58	1.66	
8257.00	92.310	268.780	7072.03	170.75	-568.58	-85.29	1.49	



# Actual Wellpath Report

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Area	COLORADO	Well	LITZENBERGER 12
Field	WELD COUNTY (NAD83, TRUE NORTH)	Wellbore	LITZENBERGER 12 AWB
Facility	SEC.08-T03N-R68W		

## WELLPATH DATA (130 stations)

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	DLS [°/100ft]	Comments
8347.00	90.180	266.610	7070.08	260.15	-572.20	-175.18	3.38	
8438.00	88.150	265.020	7071.40	350.85	-578.84	-265.92	2.83	
8530.00	85.630	267.190	7076.39	442.37	-585.08	-357.56	3.61	
8622.00	84.080	269.780	7084.65	533.26	-587.50	-449.15	3.27	
8712.00	83.840	271.930	7094.12	621.50	-586.17	-538.63	2.39	
8802.00	84.450	274.270	7103.30	709.12	-581.33	-628.02	2.67	
8894.00	85.880	275.350	7111.05	798.23	-573.64	-719.37	1.95	
8985.00	87.910	275.150	7115.98	886.40	-565.33	-809.85	2.24	
9075.00	87.970	273.710	7119.22	973.97	-558.38	-899.52	1.60	
9166.00	87.940	271.860	7122.47	1063.07	-553.96	-990.35	2.03	
9258.00	85.750	269.780	7127.53	1153.64	-552.64	-1082.19	3.28	
9350.00	82.900	270.300	7136.63	1244.11	-552.58	-1173.73	3.15	
9442.00	86.060	271.460	7145.47	1334.38	-551.17	-1265.28	3.66	
9532.00	88.000	270.560	7150.14	1422.95	-549.59	-1355.14	2.38	
9622.00	90.000	268.010	7151.71	1512.05	-550.71	-1445.11	3.60	
9712.00	91.080	266.250	7150.86	1601.56	-555.22	-1534.99	2.29	
9804.00	91.970	266.420	7148.41	1693.17	-561.10	-1626.77	0.98	
9896.00	94.530	267.500	7143.20	1784.56	-565.97	-1718.48	3.02	
9987.00	97.000	270.350	7134.05	1874.27	-567.67	-1808.99	4.13	
10079.00	97.060	270.050	7122.79	1964.47	-567.35	-1900.29	0.33	
10171.00	96.070	267.220	7112.27	2055.10	-569.53	-1991.65	3.24	
10262.00	93.420	264.260	7104.75	2145.49	-576.27	-2082.07	4.36	
10352.00	92.460	262.610	7100.13	2235.30	-586.55	-2171.36	2.12	
10443.00	92.920	263.210	7095.86	2326.16	-597.77	-2261.57	0.83	
10535.00	93.020	264.930	7091.09	2417.92	-607.26	-2352.95	1.87	
10625.00	93.050	266.580	7086.33	2507.52	-613.91	-2442.57	1.83	
10717.00	93.020	269.420	7081.45	2598.74	-617.12	-2534.38	3.08	
10807.00	92.980	270.840	7076.74	2687.54	-616.91	-2624.25	1.58	
10899.00	92.920	272.320	7072.01	2777.93	-614.38	-2716.09	1.61	
10990.00	92.950	274.720	7067.35	2866.73	-608.80	-2806.79	2.63	



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Facility	SEC.08-T03N-R68W		

## WELLPATH DATA (130 stations)

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	DLS [°/100ft]	Comments
11082.00	92.370	275.660	7063.08	2955.92	-600.49	-2898.32	1.20	
11174.00	91.020	276.170	7060.36	3044.89	-591.01	-2989.78	1.57	
11266.00	91.050	275.130	7058.70	3133.98	-581.96	-3081.32	1.13	
11358.00	92.090	273.580	7056.17	3223.55	-574.97	-3173.02	2.03	
11448.00	92.150	271.160	7052.84	3311.79	-571.25	-3262.87	2.69	
11540.00	91.910	268.670	7049.59	3402.68	-571.39	-3354.81	2.72	
11631.00	91.940	266.800	7046.53	3493.04	-574.98	-3445.68	2.05	
11721.00	91.940	262.800	7043.48	3582.80	-583.13	-3535.24	4.44	
11866.00	91.790	263.640	7038.76	3727.64	-600.24	-3679.15	0.59	LAST BHGE MWD SURVEY (2514' FNL & 497' FWL, SEC. 8)
11891.00	91.790	263.640	7037.98	3752.60	-603.01	-3703.98	0.00	PROJECTION TO BIT (2517' FNL & 472' FWL, SEC. 8)

## HOLE & CASING SECTIONS - Ref Wellbore: LITZENBERGER 12 AWB Ref Wellpath: LITZENBERGER 12 AWP

String/Diameter	Start MD [ft]	End MD [ft]	Interval [ft]	Start TVD [ft]	End TVD [ft]	Start N/S [ft]	Start E/W [ft]	End N/S [ft]	End E/W [ft]
16in Conductor	17.00	98.00	81.00	17.00	98.00	0.00	0.00	-0.68	0.29
13.5in Open Hole	98.00	1551.00	1453.00	98.00	1535.91	-0.68	0.29	-11.83	193.76
9.625in Casing Surface	17.00	1541.00	1524.00	17.00	1526.00	0.00	0.00	-11.95	192.41
8.5in Open Hole	1551.00	11891.00	10340.00	1535.91	7037.98	-11.83	193.76	-603.01	-3703.98



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Facility	SEC.08-T03N-R68W		

## TARGETS

Name	TVD [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Shape
SEC.08-T03N-R68W	-1.00	0.00	-89.33	3133484.38	1331482.52	40°14'32.388"N	105°01'18.588"W	polygon
LITZENBERGER 12 BHL REV-2 (2485'FNL & 460'FWL SEC.8)	7026.90	-571.68	-3715.85	3129861.16	1330891.31	40°14'26.736"N	105°02'05.352"W	point
LITZENBERGER 12 BHL REV-3 (2485'FNL & 460'FWL SEC.8)	7032.00	-571.68	-3715.85	3129861.16	1330891.31	40°14'26.736"N	105°02'05.352"W	point
LITZENBERGER 12 BHL REV-1 (2485'FNL & 460'FWL SEC.8)	7103.00	-571.68	-3715.85	3129861.17	1330891.31	40°14'26.736"N	105°02'05.352"W	point
LITZENBERGER 12 EP REV-1 (2485'FNL & 460'FEL SEC.8)	7103.00	-553.73	642.11	3134218.76	1330932.77	40°14'26.916"N	105°01'09.156"W	point
LITZENBERGER 12 EP REV-2 (2485'FNL & 460'FEL SEC.8)	7113.00	-553.73	642.11	3134218.76	1330932.77	40°14'26.916"N	105°01'09.156"W	point
SEC.08-T03N-R68W HARDLINES 460' SETBACKS	7315.00	0.00	-89.33	3133484.38	1331482.52	40°14'32.388"N	105°01'18.588"W	polygon

## WELLPATH COMPOSITION - Ref Wellbore: LITZENBERGER 12 AWB Ref Wellpath: LITZENBERGER 12 AWP

Start MD [ft]	End MD [ft]	Positional Uncertainty Model	Log Name/Comment	Wellbore
17.00	1495.00	Custom BHI NaviTrak (Standard Rotating+Axial Corr) (Rockies 0.03Gt model)	BHI NAVITRAK 13.5" (STD ROTATING, AXIAL, ROCKIES GT)<140-1495>	LITZENBERGER 12 AWB
1495.00	11866.00	Custom BHI AutoTrak Curve (Short) (Rockies 0.03Gt model)	BHI ATC 8.5" (SHORT, ROCKIES GT)<1634-11866>	LITZENBERGER 12 AWB
11866.00	11891.00	Blind Drilling (std)	Projection to bit	LITZENBERGER 12 AWB





## Actual Wellpath Report

LITZENBERGER 12 AWP

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### REFERENCE WELLPATH IDENTIFICATION

Operator	CUB CREEK ENERGY, LLC	Slot	SLOT#08 LITZENBERGER 12 (1928'FNL & 1094'FEL SEC.8)
Area	COLORADO	Well	LITZENBERGER 12
Field	WELD COUNTY (NAD83, TRUE NORTH)	Wellbore	LITZENBERGER 12 AWB
Facility	SEC.08-T03N-R68W		

### WELLPATH COMMENTS

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Comment
11866.00	91.790	263.640	7038.76	LAST BHGE MWD SURVEY (2514' FNL & 497' FWL, SEC. 8)
11891.00	91.790	263.640	7037.98	PROJECTION TO BIT (2517' FNL & 472' FWL, SEC. 8)