

# KERR-MCGEE OIL & GAS ONSHORE LP



Location: COLORADO Slot: SLOT#44 COPPERHEAD 2C-15HZ (2368'FSL & 2195'FEL, SEC.22)

Field: WELD COUNTY (KERR MCGEE) Well: COPPERHEAD 2C-15HZ

Facility: SEC.22-T2N-R67W Wellbore: COPPERHEAD 2C-15HZ PWB

Plot reference wellpath is COPPERHEAD 2C-15HZ (REV-B.0) PWP

True vertical depths are referenced to XTREME 20 (16KB) (RKB)	Grid System: NAD83 / Lambert Colorado SP, Northern Zone (501), US feet
Measured depths are referenced to XTREME 20 (16KB) (RKB)	North Reference: True north
XTREME 20 (16KB) (RKB) to Mean Sea Level: 5045 feet	Scale: True distance
Mean Sea Level to Mud line (At Slot: SLOT#44 COPPERHEAD 2C-15HZ (2368'FSL & 2195'FEL, SEC.22)): 0 feet	Depths are in feet
Coordinates are in feet referenced to Slot	Created by: preccin on 1/12/2015

## Location Information

Facility Name				Grid East (US ft)	Grid North (US ft)	Latitude	Longitude
SEC.22-T2N-R67W				3173770.270	1290629.950	40°07'46.204"N	104°52'42.789"W
Slot	Local N (ft)	Local E (ft)	Grid East (US ft)	Grid North (US ft)	Latitude	Longitude	
SLOT#44 COPPERHEAD 2C-15HZ (2368'FSL & 2195'FEL, SEC.22)	-2388.34	912.24	3174699.188	1288248.164	40°07'22.602"N	104°52'31.026"W	
XTREME 20 (16KB) (RKB) to Mud line (At Slot: SLOT#44 COPPERHEAD 2C-15HZ (2368'FSL & 2195'FEL, SEC.22))					5045R		
Mean Sea Level to Mud line (At Slot: SLOT#44 COPPERHEAD 2C-15HZ (2368'FSL & 2195'FEL, SEC.22))					0R		
XTREME 20 (16KB) (RKB) to Mean Sea Level					5045R		

## Survey Program

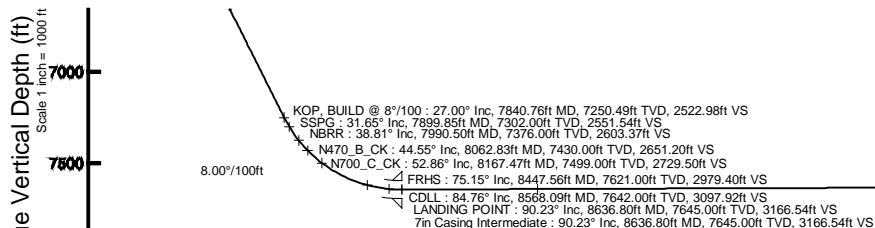
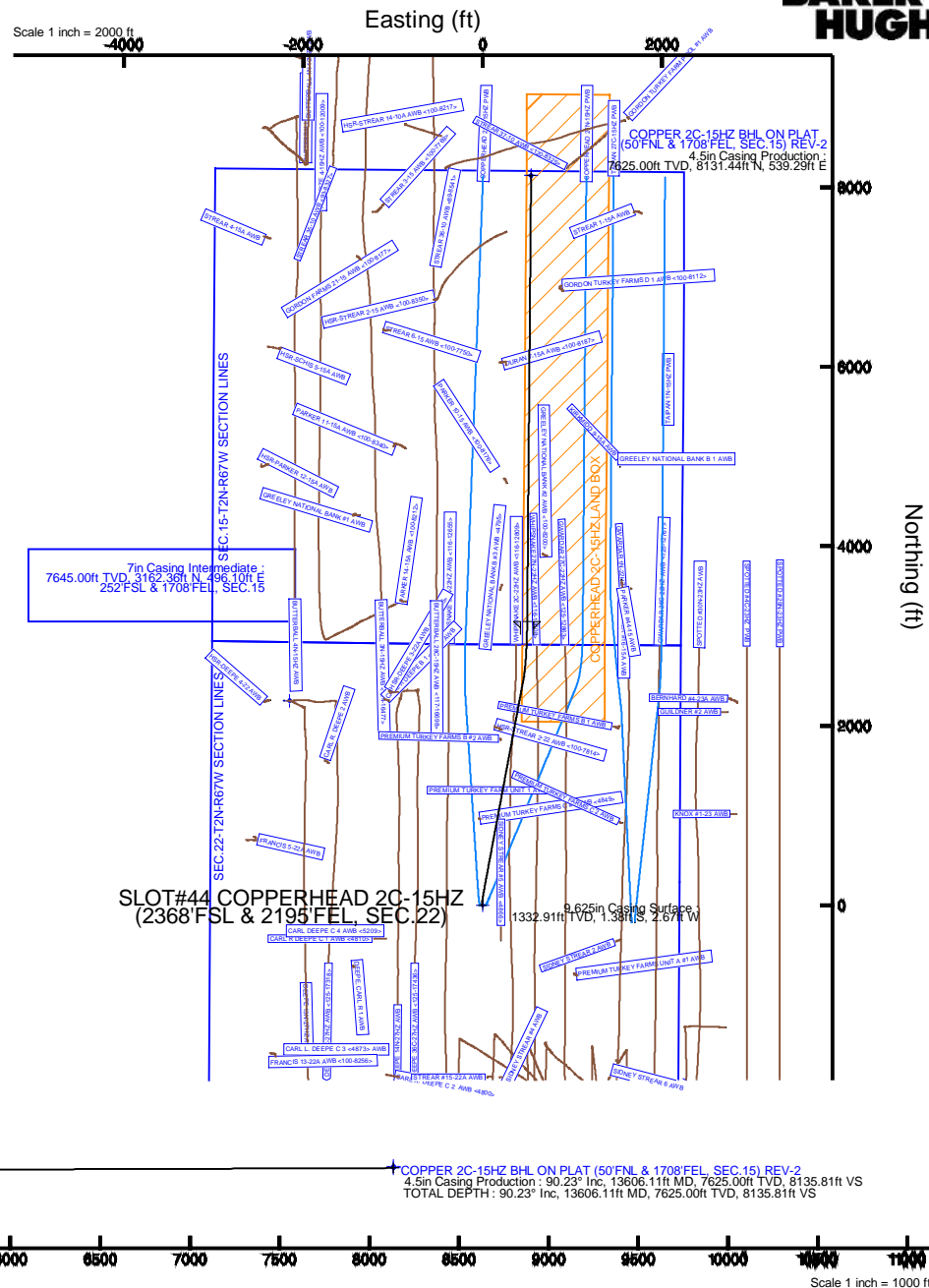
Start MD (ft)	End MD (ft)	Tool	Model	Log Name/Comment	Wellbore
16.00	1289.00	ISCWSA MWD, Rev. 2	ISCWSA MWD, Rev. 2 (Standard)		COPPERHEAD 2C-15HZ AWB <92-1289>
1289.00	8636.80	NavitTrak	NavitTrak (MAGCORR, IFR)		COPPERHEAD 2C-15HZ PWB
8636.80	13606.11	NavitTrak	NavitTrak (MAGCORR, IFR)		COPPERHEAD 2C-15HZ PWB

## Well Profile Data

Design Comment	MD (ft)	Inc (°)	Az (°)	TVD (ft)	Local N (ft)	Local E (ft)	DLS (°/100ft)	VS (ft)
TIE-INTO CATHEDRAL ENERGY MWD SURVEYS	1289.00	1.300	239.600	1288.93	-0.88	-1.81	0.48	-0.89
BEGIN NUDGE	1487.13	1.300	239.600	1487.00	-3.15	-5.69	0.00	-3.20
END NUDGE	2880.59	27.000	10.623	2830.95	305.85	39.89	2.00	306.19
KOP, BUILD @ 8°/100	7840.76	27.000	10.623	7250.49	2519.13	455.01	0.00	2522.98
LANDING POINT	8636.80	90.231	0.498	7645.00	3162.36	496.10	8.00	3166.54
TOTAL DEPTH	13606.11	90.231	0.498	7625.00	8131.44	539.29	0.00	8135.81

## Targets

Name	MD (ft)	TVD (ft)	Local N (ft)	Local E (ft)	Grid East (US ft)	Grid North (US ft)	Latitude	Longitude
SEC.15-T2N-R67W SECTION LINES	30.00	12820.29	-1016.89	3172592.05	3171060.42	40°09'29.293"N	104°52'44.123"W	
SEC.22-T2N-R67W SECTION LINES	30.00	2280.17	-2152.64	3172530.63	1290513.02	40°07'45.134"N	104°52'58.730"W	
COPPER 2C-15HZ BHL ON PLAT (50FNL & 1708FEL, SEC.15) REV-1	7615.00	8131.44	539.29	3175181.16	1296382.85	40°08'42.958"N	104°52'24.082"W	
COPPERHEAD 2C-15HZ LAND BOX	7615.00	0.00	0.00	3174699.19	1288248.16	40°07'22.602"N	104°52'31.026"W	
COPPER 2C-15HZ BHL ON PLAT (50FNL & 1708FEL, SEC.15) REV-2	13606.11	7625.00	8131.44	539.29	3175181.16	1296382.85	40°08'42.958"N	104°52'24.082"W



Vertical Section (ft)  
Azimuth 0.50° with reference 0.00 N, 0.00 E

Scale 1 inch = 1000 ft

## REFERENCE WELLPATH IDENTIFICATION

Operator	KERR-MCGEE OIL & GAS ONSHORE LP	Slot	SLOT#44 COPPERHEAD 2C-15HZ (2368'FSL & 2195'FEL, SEC.22)
Area	COLORADO	Well	COPPERHEAD 2C-15HZ
Field	WELD COUNTY (KERR MCGEE)	Wellbore	COPPERHEAD 2C-15HZ PWB
Facility	SEC.22-T2N-R67W		

## REPORT SETUP INFORMATION

Projection System	NAD83 / Lambert Colorado SP, Northern Zone (501), US feet	Software System	WellArchitect@ 4.0.0
North Reference	True	User	Precain
Scale	0.999959	Report Generated	1/12/2015 at 9:48:58 AM
Convergence at slot	n/a	Database/Source file	WellArchitectDB/COPPERHEAD_2C-15HZ_PWB.xml

## WELLPATH LOCATION

	Local coordinates		Grid coordinates		Geographic coordinates	
	North[ft]	East[ft]	Easting[US ft]	Northing[US ft]	Latitude	Longitude
Slot Location	-2388.34	912.24	3174699.19	1288248.16	40°07'22.602"N	104°52'31.026"W
Facility Reference Pt			3173770.27	1290629.95	40°07'46.204"N	104°52'42.769"W
Field Reference Pt			3197771.84	1268891.29	40°04'09.600"N	104°47'36.000"W

## WELLPATH DATUM

Calculation method	Minimum curvature	XTREME 20 (16'KB) (RKB) to Facility Vertical Datum	5045.00ft
Horizontal Reference Pt	Slot	XTREME 20 (16'KB) (RKB) to Mean Sea Level	5045.00ft
Vertical Reference Pt	XTREME 20 (16'KB) (RKB)	XTREME 20 (16'KB) (RKB) to Mud Line at Slot (SLOT#44 COPPERHEAD 2C-15HZ (2368'FSL & 2195'FEL, SEC.22))	5045.00ft
MD Reference Pt	XTREME 20 (16'KB) (RKB)	Section Origin	N 0.00, E 0.00 ft
Field Vertical Reference	Mean Sea Level	Section Azimuth	0.50°

## REFERENCE WELLPATH IDENTIFICATION

Operator	KERR-MCGEE OIL & GAS ONSHORE LP	Slot	SLOT#44 COPPERHEAD 2C-15HZ (2368'FSL & 2195'FEL, SEC.22)
Area	COLORADO	Well	COPPERHEAD 2C-15HZ
Field	WELD COUNTY (KERR MCGEE)	Wellbore	COPPERHEAD 2C-15HZ PWB
Facility	SEC.22-T2N-R67W		

## WELLPATH DATA (156 stations) † = interpolated/extrapolated station

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Latitude	Longitude	DLS [°/100ft]	Comments
0.00†	0.000	309.800	0.00	0.00	0.00	0.00	40°07'22.602"N	104°52'31.026"W	0.00	
16.00	0.000	309.800	16.00	0.00	0.00	0.00	40°07'22.602"N	104°52'31.026"W	0.00	
92.00	0.500	309.800	92.00	0.21	0.21	-0.25	40°07'22.604"N	104°52'31.029"W	0.66	
161.00	0.400	326.700	161.00	0.60	0.61	-0.62	40°07'22.608"N	104°52'31.034"W	0.24	
238.00	0.700	342.200	237.99	1.27	1.28	-0.91	40°07'22.615"N	104°52'31.038"W	0.43	
318.00	0.300	64.800	317.99	1.83	1.83	-0.87	40°07'22.620"N	104°52'31.037"W	0.91	
398.00	0.300	46.100	397.99	2.06	2.07	-0.53	40°07'22.622"N	104°52'31.033"W	0.12	
478.00	0.800	41.200	477.99	2.63	2.63	-0.01	40°07'22.628"N	104°52'31.026"W	0.63	
558.00	0.500	41.900	557.98	3.32	3.31	0.59	40°07'22.635"N	104°52'31.018"W	0.38	
638.00	0.500	126.300	637.98	3.38	3.37	1.11	40°07'22.635"N	104°52'31.012"W	0.84	
717.02†	0.298	52.732	717.00	3.30	3.29	1.55	40°07'22.634"N	104°52'31.006"W	0.64	Base Fox Hills
718.00	0.300	51.600	717.98	3.30	3.29	1.55	40°07'22.635"N	104°52'31.006"W	0.64	
798.00	0.300	75.100	797.98	3.49	3.47	1.92	40°07'22.636"N	104°52'31.001"W	0.15	
878.00	0.100	134.200	877.98	3.50	3.48	2.17	40°07'22.636"N	104°52'30.998"W	0.33	
959.00	0.500	200.700	958.97	3.12	3.10	2.10	40°07'22.633"N	104°52'30.999"W	0.58	
1039.00	1.100	224.500	1038.97	2.24	2.22	1.43	40°07'22.624"N	104°52'31.008"W	0.84	
1119.00	0.900	219.100	1118.95	1.19	1.19	0.50	40°07'22.614"N	104°52'31.020"W	0.28	
1199.00	1.000	224.200	1198.94	0.20	0.20	-0.38	40°07'22.604"N	104°52'31.031"W	0.16	
1289.00	1.300	239.600	1288.93	-0.89	-0.88	-1.81	40°07'22.593"N	104°52'31.049"W	0.48	TIE-INTO CATHEDRAL ENERGY MWD SURVEYS
1389.00†	1.300	239.600	1388.90	-2.06	-2.03	-3.77	40°07'22.582"N	104°52'31.075"W	0.00	
1487.13	1.300	239.600	1487.00	-3.20	-3.15	-5.69	40°07'22.571"N	104°52'31.099"W	0.00	BEGIN NUDGE
1489.00†	1.275	240.835	1488.87	-3.22	-3.17	-5.73	40°07'22.571"N	104°52'31.100"W	2.00	
1589.00†	1.495	332.931	1588.85	-2.62	-2.55	-7.29	40°07'22.577"N	104°52'31.120"W	2.00	
1689.00†	3.293	355.699	1688.76	1.40	1.47	-8.10	40°07'22.617"N	104°52'31.130"W	2.00	
1789.00†	5.240	2.048	1788.48	8.83	8.90	-8.15	40°07'22.690"N	104°52'31.131"W	2.00	
1889.00†	7.216	4.947	1887.89	19.66	19.72	-7.45	40°07'22.797"N	104°52'31.122"W	2.00	
1989.00†	9.202	6.602	1986.86	33.87	33.92	-5.99	40°07'22.937"N	104°52'31.103"W	2.00	
2089.00†	11.193	7.673	2085.27	51.45	51.49	-3.77	40°07'23.111"N	104°52'31.075"W	2.00	
2189.00†	13.187	8.424	2183.02	72.38	72.39	-0.80	40°07'23.317"N	104°52'31.036"W	2.00	
2289.00†	15.182	8.980	2279.96	96.63	96.61	2.91	40°07'23.557"N	104°52'30.989"W	2.00	
2389.00†	17.178	9.410	2376.00	124.17	124.11	7.37	40°07'23.829"N	104°52'30.931"W	2.00	
2489.00†	19.175	9.753	2471.00	154.97	154.87	12.57	40°07'24.132"N	104°52'30.864"W	2.00	
2589.00†	21.173	10.033	2564.86	189.00	188.84	18.50	40°07'24.468"N	104°52'30.788"W	2.00	
2689.00†	23.171	10.267	2657.46	226.20	225.99	25.15	40°07'24.835"N	104°52'30.702"W	2.00	
2789.00†	25.170	10.465	2748.69	266.54	266.26	32.52	40°07'25.233"N	104°52'30.607"W	2.00	
2880.59	27.000	10.623	2830.95	306.19	305.85	39.89	40°07'25.624"N	104°52'30.512"W	2.00	END NUDGE
2889.00†	27.000	10.623	2838.44	309.95	309.61	40.59	40°07'25.662"N	104°52'30.503"W	0.00	
2989.00†	27.000	10.623	2927.54	354.64	354.23	48.96	40°07'26.103"N	104°52'30.396"W	0.00	
3089.00†	27.000	10.623	3016.64	399.33	398.85	57.33	40°07'26.543"N	104°52'30.288"W	0.00	
3189.00†	27.000	10.623	3105.74	444.02	443.47	65.70	40°07'26.984"N	104°52'30.180"W	0.00	
3289.00†	27.000	10.623	3194.84	488.71	488.09	74.07	40°07'27.425"N	104°52'30.072"W	0.00	
3389.00†	27.000	10.623	3283.94	533.41	532.71	82.44	40°07'27.866"N	104°52'29.965"W	0.00	
3489.00†	27.000	10.623	3373.05	578.10	577.33	90.81	40°07'28.307"N	104°52'29.857"W	0.00	
3589.00†	27.000	10.623	3462.15	622.79	621.95	99.18	40°07'28.748"N	104°52'29.749"W	0.00	
3689.00†	27.000	10.623	3551.25	667.48	666.57	107.55	40°07'29.189"N	104°52'29.642"W	0.00	

# Planned Wellpath Report

COPPERHEAD 2C-15HZ (REV-B.0) PWP

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## REFERENCE WELLPATH IDENTIFICATION

Operator	KERR-MCGEE OIL & GAS ONSHORE LP	Slot	SLOT#44 COPPERHEAD 2C-15HZ (2368'FSL & 2195'FEL, SEC.22)
Area	COLORADO	Well	COPPERHEAD 2C-15HZ
Field	WELD COUNTY (KERR MCGEE)	Wellbore	COPPERHEAD 2C-15HZ PWB
Facility	SEC.22-T2N-R67W		

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MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Latitude	Longitude	DLS [°/100ft]	Comments
3789.00†	27.000	10.623	3640.35	712.17	711.20	115.92	40°07'29.630"N	104°52'29.534"W	0.00	
3889.00†	27.000	10.623	3729.45	756.87	755.82	124.29	40°07'30.071"N	104°52'29.426"W	0.00	
3989.00†	27.000	10.623	3818.55	801.56	800.44	132.65	40°07'30.512"N	104°52'29.318"W	0.00	
4089.00†	27.000	10.623	3907.65	846.25	845.06	141.02	40°07'30.953"N	104°52'29.211"W	0.00	
4189.00†	27.000	10.623	3996.75	890.94	889.68	149.39	40°07'31.394"N	104°52'29.103"W	0.00	
4289.00†	27.000	10.623	4085.85	935.63	934.30	157.76	40°07'31.835"N	104°52'28.995"W	0.00	
4349.77†	27.000	10.623	4140.00	962.79	961.42	162.85	40°07'32.103"N	104°52'28.930"W	0.00	Parkman
4389.00†	27.000	10.623	4174.95	980.33	978.92	166.13	40°07'32.276"N	104°52'28.887"W	0.00	
4489.00†	27.000	10.623	4264.05	1025.02	1023.54	174.50	40°07'32.717"N	104°52'28.780"W	0.00	
4589.00†	27.000	10.623	4353.15	1069.71	1068.16	182.87	40°07'33.158"N	104°52'28.672"W	0.00	
4689.00†	27.000	10.623	4442.25	1114.40	1112.78	191.24	40°07'33.599"N	104°52'28.564"W	0.00	
4789.00†	27.000	10.623	4531.35	1159.09	1157.41	199.61	40°07'34.040"N	104°52'28.456"W	0.00	
4826.76†	27.000	10.623	4565.00	1175.97	1174.25	202.77	40°07'34.206"N	104°52'28.416"W	0.00	Sussex
4889.00†	27.000	10.623	4620.45	1203.78	1202.03	207.98	40°07'34.481"N	104°52'28.349"W	0.00	
4989.00†	27.000	10.623	4709.56	1248.48	1246.65	216.35	40°07'34.921"N	104°52'28.241"W	0.00	
5089.00†	27.000	10.623	4798.66	1293.17	1291.27	224.71	40°07'35.362"N	104°52'28.133"W	0.00	
5189.00†	27.000	10.623	4887.76	1337.86	1335.89	233.08	40°07'35.803"N	104°52'28.025"W	0.00	
5289.00†	27.000	10.623	4976.86	1382.55	1380.51	241.45	40°07'36.244"N	104°52'27.918"W	0.00	
5389.00†	27.000	10.623	5065.96	1427.24	1425.13	249.82	40°07'36.685"N	104°52'27.810"W	0.00	
5489.00†	27.000	10.623	5155.06	1471.94	1469.75	258.19	40°07'37.126"N	104°52'27.702"W	0.00	
5589.00†	27.000	10.623	5244.16	1516.63	1514.37	266.56	40°07'37.567"N	104°52'27.594"W	0.00	
5689.00†	27.000	10.623	5333.26	1561.32	1558.99	274.93	40°07'38.008"N	104°52'27.487"W	0.00	
5789.00†	27.000	10.623	5422.36	1606.01	1603.61	283.30	40°07'38.449"N	104°52'27.379"W	0.00	
5889.00†	27.000	10.623	5511.46	1650.70	1648.24	291.67	40°07'38.890"N	104°52'27.271"W	0.00	
5989.00†	27.000	10.623	5600.56	1695.40	1692.86	300.04	40°07'39.331"N	104°52'27.163"W	0.00	
6089.00†	27.000	10.623	5689.66	1740.09	1737.48	308.41	40°07'39.772"N	104°52'27.056"W	0.00	
6189.00†	27.000	10.623	5778.76	1784.78	1782.10	316.78	40°07'40.213"N	104°52'26.948"W	0.00	
6289.00†	27.000	10.623	5867.86	1829.47	1826.72	325.14	40°07'40.654"N	104°52'26.840"W	0.00	
6389.00†	27.000	10.623	5956.96	1874.16	1871.34	333.51	40°07'41.095"N	104°52'26.732"W	0.00	
6489.00†	27.000	10.623	6046.06	1918.86	1915.96	341.88	40°07'41.536"N	104°52'26.625"W	0.00	
6589.00†	27.000	10.623	6135.17	1963.55	1960.58	350.25	40°07'41.977"N	104°52'26.517"W	0.00	
6689.00†	27.000	10.623	6224.27	2008.24	2005.20	358.62	40°07'42.418"N	104°52'26.409"W	0.00	
6789.00†	27.000	10.623	6313.37	2052.93	2049.82	366.99	40°07'42.859"N	104°52'26.301"W	0.00	
6889.00†	27.000	10.623	6402.47	2097.62	2094.45	375.36	40°07'43.300"N	104°52'26.194"W	0.00	
6989.00†	27.000	10.623	6491.57	2142.31	2139.07	383.73	40°07'43.740"N	104°52'26.086"W	0.00	
7089.00†	27.000	10.623	6580.67	2187.01	2183.69	392.10	40°07'44.181"N	104°52'25.978"W	0.00	
7189.00†	27.000	10.623	6669.77	2231.70	2228.31	400.47	40°07'44.622"N	104°52'25.870"W	0.00	
7289.00†	27.000	10.623	6758.87	2276.39	2272.93	408.84	40°07'45.063"N	104°52'25.763"W	0.00	
7389.00†	27.000	10.623	6847.97	2321.08	2317.55	417.20	40°07'45.504"N	104°52'25.655"W	0.00	
7489.00†	27.000	10.623	6937.07	2365.77	2362.17	425.57	40°07'45.945"N	104°52'25.547"W	0.00	
7589.00†	27.000	10.623	7026.17	2410.47	2406.79	433.94	40°07'46.386"N	104°52'25.439"W	0.00	
7689.00†	27.000	10.623	7115.27	2455.16	2451.41	442.31	40°07'46.827"N	104°52'25.332"W	0.00	
7789.00†	27.000	10.623	7204.37	2499.85	2496.03	450.68	40°07'47.268"N	104°52'25.224"W	0.00	
7840.76	27.000	10.623	7250.49	2522.98	2519.13	455.01	40°07'47.496"N	104°52'25.168"W	0.00	KOP, BUILD @ 8°/100
7889.00†	30.793	9.145	7292.72	2545.98	2542.09	459.00	40°07'47.723"N	104°52'25.117"W	8.00	

## REFERENCE WELLPATH IDENTIFICATION

Operator	KERR-MCGEE OIL & GAS ONSHORE LP	Slot	SLOT#44 COPPERHEAD 2C-15HZ (2368'FSL & 2195'FEL, SEC.22)
Area	COLORADO	Well	COPPERHEAD 2C-15HZ
Field	WELD COUNTY (KERR MCGEE)	Wellbore	COPPERHEAD 2C-15HZ PWB
Facility	SEC.22-T2N-R67W		

## WELLPATH DATA (156 stations) † = interpolated/extrapolated station

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Latitude	Longitude	DLS [°/100ft]	Comments
7899.85†	31.648	8.858	7302.00	2551.54	2547.65	459.88	40°07'47.778"N	104°52'25.106"W	8.00	SSPG
7989.00†	38.694	6.926	7374.83	2602.44	2598.49	466.85	40°07'48.280"N	104°52'25.016"W	8.00	
7990.50†	38.813	6.899	7376.00	2603.37	2599.42	466.96	40°07'48.290"N	104°52'25.014"W	8.00	NBRR
8062.83†	44.547	5.729	7430.00	2651.20	2647.21	472.22	40°07'48.762"N	104°52'24.947"W	8.00	N470_B_CK
8089.00†	46.624	5.364	7448.31	2669.82	2665.81	474.03	40°07'48.946"N	104°52'24.923"W	8.00	
8167.47†	52.859	4.401	7499.00	2729.50	2725.45	479.10	40°07'49.535"N	104°52'24.858"W	8.00	N700_C_CK
8189.00†	54.570	4.165	7511.74	2746.81	2742.75	480.39	40°07'49.706"N	104°52'24.841"W	8.00	
8289.00†	62.526	3.183	7563.88	2831.92	2827.82	485.82	40°07'50.547"N	104°52'24.771"W	8.00	
8389.00†	70.488	2.334	7603.71	2923.49	2919.35	490.21	40°07'51.451"N	104°52'24.715"W	8.00	
8447.56†	75.153	1.876	7621.00	2979.40	2975.24	492.26	40°07'52.004"N	104°52'24.688"W	8.00	FRHS
8489.00†	78.454	1.565	7630.46	3019.73	3015.56	493.47	40°07'52.402"N	104°52'24.673"W	8.00	
8568.09†	84.756	0.989	7642.00	3097.92	3093.74	495.21	40°07'53.175"N	104°52'24.650"W	8.00	CDLL
8589.00†	86.422	0.839	7643.61	3118.77	3114.59	495.55	40°07'53.381"N	104°52'24.646"W	8.00	
8636.80	90.231	0.498	7645.00	3166.54	3162.36	496.10	40°07'53.853"N	104°52'24.639"W	8.00	LANDING POINT
8689.00†	90.231	0.498	7644.79	3218.74	3214.56	496.56	40°07'54.369"N	104°52'24.633"W	0.00	
8789.00†	90.231	0.498	7644.39	3318.74	3314.55	497.43	40°07'55.357"N	104°52'24.622"W	0.00	
8889.00†	90.231	0.498	7643.99	3418.74	3414.55	498.29	40°07'56.345"N	104°52'24.611"W	0.00	
8989.00†	90.231	0.498	7643.59	3518.74	3514.54	499.16	40°07'57.333"N	104°52'24.599"W	0.00	
9089.00†	90.231	0.498	7643.18	3618.74	3614.54	500.03	40°07'58.321"N	104°52'24.588"W	0.00	
9189.00†	90.231	0.498	7642.78	3718.74	3714.53	500.90	40°07'59.309"N	104°52'24.577"W	0.00	
9289.00†	90.231	0.498	7642.38	3818.74	3814.53	501.77	40°08'00.298"N	104°52'24.566"W	0.00	
9383.11†	90.231	0.498	7642.00	3912.85	3908.63	502.59	40°08'01.227"N	104°52'24.555"W	0.00	CDLL
9389.00†	90.231	0.498	7641.98	3918.74	3914.52	502.64	40°08'01.286"N	104°52'24.555"W	0.00	
9489.00†	90.231	0.498	7641.57	4018.74	4014.52	503.51	40°08'02.274"N	104°52'24.543"W	0.00	
9589.00†	90.231	0.498	7641.17	4118.73	4114.51	504.38	40°08'03.262"N	104°52'24.532"W	0.00	
9689.00†	90.231	0.498	7640.77	4218.73	4214.51	505.25	40°08'04.250"N	104°52'24.521"W	0.00	
9789.00†	90.231	0.498	7640.37	4318.73	4314.51	506.12	40°08'05.238"N	104°52'24.510"W	0.00	
9889.00†	90.231	0.498	7639.96	4418.73	4414.50	506.99	40°08'06.227"N	104°52'24.499"W	0.00	
9989.00†	90.231	0.498	7639.56	4518.73	4514.50	507.85	40°08'07.215"N	104°52'24.487"W	0.00	
10089.00†	90.231	0.498	7639.16	4618.73	4614.49	508.72	40°08'08.203"N	104°52'24.476"W	0.00	
10189.00†	90.231	0.498	7638.76	4718.73	4714.49	509.59	40°08'09.191"N	104°52'24.465"W	0.00	
10289.00†	90.231	0.498	7638.35	4818.73	4814.48	510.46	40°08'10.179"N	104°52'24.454"W	0.00	
10389.00†	90.231	0.498	7637.95	4918.73	4914.48	511.33	40°08'11.167"N	104°52'24.442"W	0.00	
10489.00†	90.231	0.498	7637.55	5018.73	5014.47	512.20	40°08'12.155"N	104°52'24.431"W	0.00	
10589.00†	90.231	0.498	7637.15	5118.73	5114.47	513.07	40°08'13.144"N	104°52'24.420"W	0.00	
10689.00†	90.231	0.498	7636.74	5218.73	5214.46	513.94	40°08'14.132"N	104°52'24.409"W	0.00	
10789.00†	90.231	0.498	7636.34	5318.73	5314.46	514.81	40°08'15.120"N	104°52'24.398"W	0.00	
10889.00†	90.231	0.498	7635.94	5418.72	5414.45	515.68	40°08'16.108"N	104°52'24.386"W	0.00	
10989.00†	90.231	0.498	7635.54	5518.72	5514.45	516.55	40°08'17.096"N	104°52'24.375"W	0.00	
11089.00†	90.231	0.498	7635.13	5618.72	5614.45	517.41	40°08'18.084"N	104°52'24.364"W	0.00	
11189.00†	90.231	0.498	7634.73	5718.72	5714.44	518.28	40°08'19.073"N	104°52'24.353"W	0.00	
11289.00†	90.231	0.498	7634.33	5818.72	5814.44	519.15	40°08'20.061"N	104°52'24.342"W	0.00	
11389.00†	90.231	0.498	7633.93	5918.72	5914.43	520.02	40°08'21.049"N	104°52'24.330"W	0.00	
11489.00†	90.231	0.498	7633.52	6018.72	6014.43	520.89	40°08'22.037"N	104°52'24.319"W	0.00	
11589.00†	90.231	0.498	7633.12	6118.72	6114.42	521.76	40°08'23.025"N	104°52'24.308"W	0.00	

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Area	COLORADO	Well	COPPERHEAD 2C-15HZ
Field	WELD COUNTY (KERR MCGEE)	Wellbore	COPPERHEAD 2C-15HZ PWB
Facility	SEC.22-T2N-R67W		

## WELLPATH DATA (156 stations) † = interpolated/extrapolated station

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Latitude	Longitude	DLS [°/100ft]	Comments
11689.00†	90.231	0.498	7632.72	6218.72	6214.42	522.63	40°08'24.013"N	104°52'24.297"W	0.00	
11789.00†	90.231	0.498	7632.31	6318.72	6314.41	523.50	40°08'25.002"N	104°52'24.285"W	0.00	
11889.00†	90.231	0.498	7631.91	6418.72	6414.41	524.37	40°08'25.990"N	104°52'24.274"W	0.00	
11989.00†	90.231	0.498	7631.51	6518.72	6514.40	525.24	40°08'26.978"N	104°52'24.263"W	0.00	
12089.00†	90.231	0.498	7631.11	6618.71	6614.40	526.11	40°08'27.966"N	104°52'24.252"W	0.00	
12189.00†	90.231	0.498	7630.70	6718.71	6714.40	526.97	40°08'28.954"N	104°52'24.241"W	0.00	
12289.00†	90.231	0.498	7630.30	6818.71	6814.39	527.84	40°08'29.942"N	104°52'24.229"W	0.00	
12389.00†	90.231	0.498	7629.90	6918.71	6914.39	528.71	40°08'30.931"N	104°52'24.218"W	0.00	
12489.00†	90.231	0.498	7629.50	7018.71	7014.38	529.58	40°08'31.919"N	104°52'24.207"W	0.00	
12589.00†	90.231	0.498	7629.09	7118.71	7114.38	530.45	40°08'32.907"N	104°52'24.196"W	0.00	
12689.00†	90.231	0.498	7628.69	7218.71	7214.37	531.32	40°08'33.895"N	104°52'24.184"W	0.00	
12789.00†	90.231	0.498	7628.29	7318.71	7314.37	532.19	40°08'34.883"N	104°52'24.173"W	0.00	
12889.00†	90.231	0.498	7627.89	7418.71	7414.36	533.06	40°08'35.871"N	104°52'24.162"W	0.00	
12989.00†	90.231	0.498	7627.48	7518.71	7514.36	533.93	40°08'36.860"N	104°52'24.151"W	0.00	
13089.00†	90.231	0.498	7627.08	7618.71	7614.35	534.80	40°08'37.848"N	104°52'24.140"W	0.00	
13189.00†	90.231	0.498	7626.68	7718.71	7714.35	535.67	40°08'38.836"N	104°52'24.128"W	0.00	
13289.00†	90.231	0.498	7626.28	7818.70	7814.34	536.53	40°08'39.824"N	104°52'24.117"W	0.00	
13389.00†	90.231	0.498	7625.87	7918.70	7914.34	537.40	40°08'40.812"N	104°52'24.106"W	0.00	
13489.00†	90.231	0.498	7625.47	8018.70	8014.34	538.27	40°08'41.800"N	104°52'24.095"W	0.00	
13589.00†	90.231	0.498	7625.07	8118.70	8114.33	539.14	40°08'42.789"N	104°52'24.083"W	0.00	
13606.11	90.231	0.498	7625.00 <sup>1</sup>	8135.81	8131.44	539.29	40°08'42.958"N	104°52'24.082"W	0.00	TOTAL DEPTH

## HOLE & CASING SECTIONS - Ref Wellbore: COPPERHEAD 2C-15HZ PWB Ref Wellpath: COPPERHEAD 2C-15HZ (REV-B.0) PWP

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]
13.5in Open Hole	16.00	1289.00	1273.00	16.00	1288.93	0.00	0.00	-0.88	-1.81
13.5in Open Hole	1289.00	1344.00	55.00	1288.93	1343.91	-0.88	-1.81	-1.51	-2.89
9.625in Casing Surface	16.00	1333.00	1317.00	16.00	1332.91	0.00	0.00	-1.38	-2.67
8.75in Open Hole	1344.00	8636.80	7292.80	1343.91	7645.00	-1.51	-2.89	3162.36	496.10
7in Casing Intermediate	16.00	8636.80	8620.80	16.00	7645.00	0.00	0.00	3162.36	496.10
6.125in Open Hole	8636.80	13606.11	4969.31	7645.00	7625.00	3162.36	496.10	8131.44	539.29
4.5in Casing Production	16.00	13606.11	13590.11	16.00	7625.00	0.00	0.00	8131.44	539.29

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Area	COLORADO	Well	COPPERHEAD 2C-15HZ
Field	WELD COUNTY (KERR MCGEE)	Wellbore	COPPERHEAD 2C-15HZ PWB
Facility	SEC.22-T2N-R67W		

## TARGETS

Name	MD [ft]	TVD [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Shape
SEC.15-T2N-67W SECTION LINES		30.00	12820.29	-1016.89	3173592.05	1301060.42	40°09'29.293"N	104°52'44.123"W	polygon
SEC.22-T2N-R67W SECTION LINES		30.00	2280.17	-2152.64	3172530.63	1290513.02	40°07'45.134"N	104°52'58.739"W	polygon
COPPER 2C-15HZ BHL ON PLAT (50'FNL & 1708'FEL, SEC.15) REV-1		7615.00	8131.44	539.29	3175181.16	1296382.85	40°08'42.958"N	104°52'24.082"W	point
COPPERHEAD 2C-15HZ LAND BOX		7615.00	0.00	0.00	3174699.19	1288248.16	40°07'22.602"N	104°52'31.026"W	polygon
1) COPPER 2C-15HZ BHL ON PLAT (50'FNL & 1708'FEL, SEC.15) REV-2	13606.11	7625.00	8131.44	539.29	3175181.16	1296382.85	40°08'42.958"N	104°52'24.082"W	point

## SURVEY PROGRAM - Ref Wellbore: COPPERHEAD 2C-15HZ PWB Ref Wellpath: COPPERHEAD 2C-15HZ (REV-B.0) PWP

Start MD [ft]	End MD [ft]	Positional Uncertainty Model	Log Name/Comment	Wellbore
16.00	1289.00	ISCWSA MWD, Rev. 2 (Standard)		COPPERHEAD 2C-15HZ AWB <92-1289>
1289.00	8636.80	NaviTrak (MAGCORR,IFR)		COPPERHEAD 2C-15HZ PWB
8636.80	13606.11	NaviTrak (MAGCORR,IFR)		COPPERHEAD 2C-15HZ PWB

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Area	COLORADO	Well	COPPERHEAD 2C-15HZ
Field	WELD COUNTY (KERR MCGEE)	Wellbore	COPPERHEAD 2C-15HZ PWB
Facility	SEC.22-T2N-R67W		

## WELLPATH COMMENTS

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Comment
717.02	0.298	52.732	717.00	Base Fox Hills
4349.77	27.000	10.623	4140.00	Parkman
4826.76	27.000	10.623	4565.00	Sussex
7899.85	31.648	8.858	7302.00	SSPG
7990.50	38.813	6.899	7376.00	NBRR
8062.83	44.547	5.729	7430.00	N470_B_CK
8167.47	52.859	4.401	7499.00	N700_C_CK
8447.56	75.153	1.876	7621.00	FRHS
8568.09	84.756	0.989	7642.00	CDLL
9383.11	90.231	0.498	7642.00	CDLL

## DESIGN COMMENTS

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Comment
1289.00	1.300	239.600	1288.93	TIE-INTO CATHEDRAL ENERGY MWD SURVEYS
1487.13	1.300	239.600	1487.00	BEGIN NUDGE
2880.59	27.000	10.623	2830.95	END NUDGE
7840.76	27.000	10.623	7250.49	KOP, BUILD @ 8°/100
8636.80	90.231	0.498	7645.00	LANDING POINT
13606.11	90.231	0.498	7625.00	TOTAL DEPTH