

KERR-MCGEE OIL & GAS ONSHORE LP

Location: COLORADO Slot: SLOT#13 THOMSEN FEDERAL 1N-31HZ (2404'FNL & 770'FWL, SEC.07)
Field: WELD COUNTY (KERR MCGEE) Well: THOMSEN FEDERAL 1N-31HZ
Facility: SEC.07-T2N-R65W Wellbore: THOMSEN FEDERAL 1N-31HZ PWB

Plot reference wellpath is THOMSEN FEDERAL 1N-31HZ (REV-A.0) PWP

True vertical depths are referenced to H&P 307 (25KB) (RKB)	Grid System: NAD83 / Lambert Colorado SP, Northern Zone (501), US feet
Measured depths are referenced to H&P 307 (25KB) (RKB)	North Reference: True north
H&P 307 (25KB) (RKB) to Mean Sea Level: 4972 feet	Scale: True distance
Mean Sea Level to Mud line (At Slot: SLOT#13 THOMSEN FEDERAL 1N-31HZ (2404'FNL & 770'FWL, SEC.07)): 0 feet	Depths are in feet
Coordinates are in feet referenced to Slot	Created by: robale01 on 12/3/2014

Location Information

Facility Name			Grid East (US ft)	Grid North (US ft)	Latitude	Longitude
SEC.07-T2N-R65W			3219721.272	1297490.241	40°08'50.395"N	104°42'50.411"W
Slot	Local N (ft)	Local E (ft)	Grid East (US ft)	Grid North (US ft)	Latitude	Longitude
SLOT#13 THOMSEN FEDERAL 1N-31HZ (2404'FNL & 770'FWL, SEC.07)	2291.12	246.84	3219947.789	1299783.360	40°09'13.036"N	104°42'47.232"W
H&P 307 (25KB) (RKB) to Mud line (At Slot: SLOT#13 THOMSEN FEDERAL 1N-31HZ (2404'FNL & 770'FWL, SEC.07))					4972ft	
Mean Sea Level to Mud line (At Slot: SLOT#13 THOMSEN FEDERAL 1N-31HZ (2404'FNL & 770'FWL, SEC.07))					0ft	
H&P 307 (25KB) (RKB) to Mean Sea Level					4972ft	

Survey Program

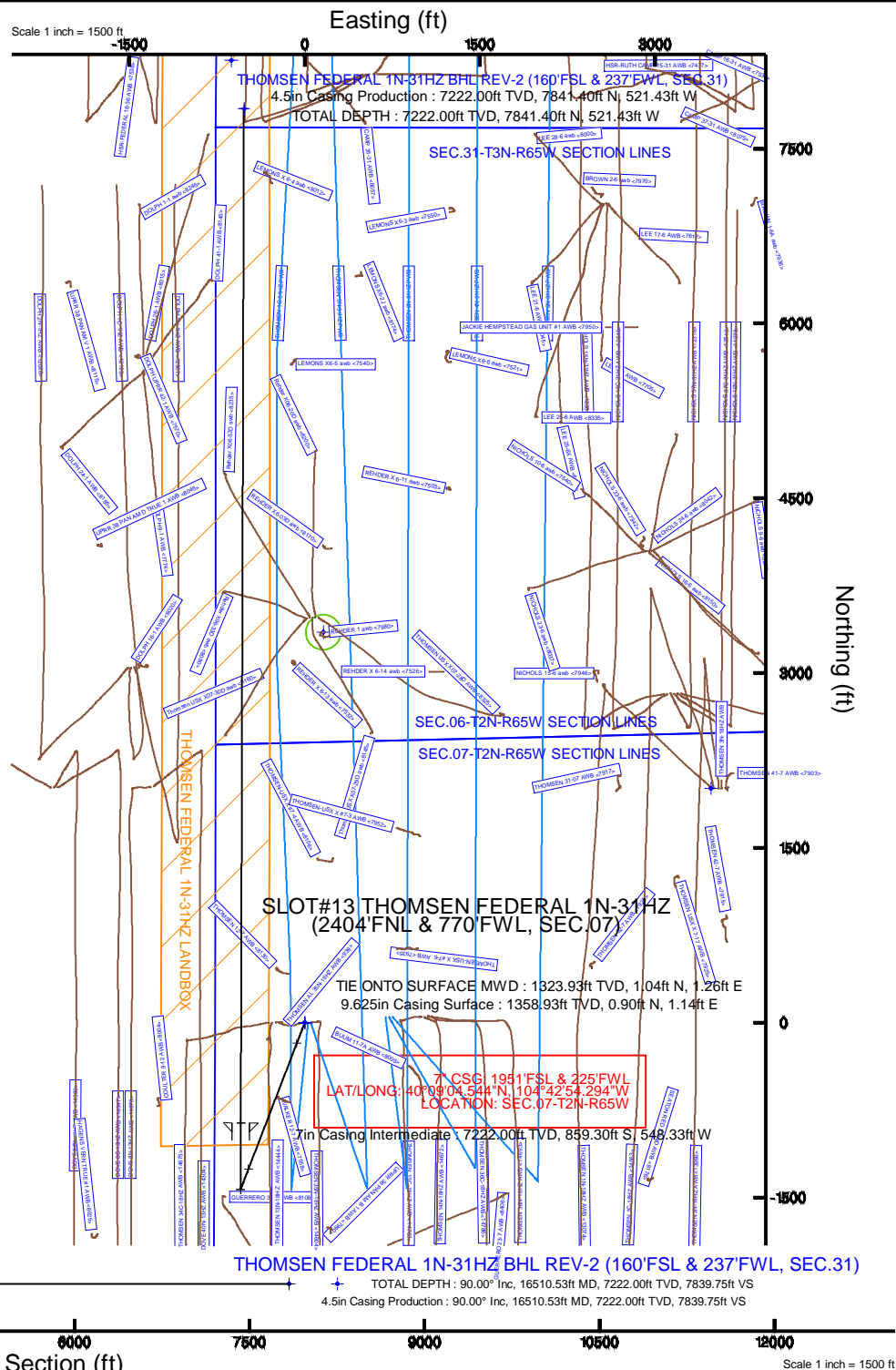
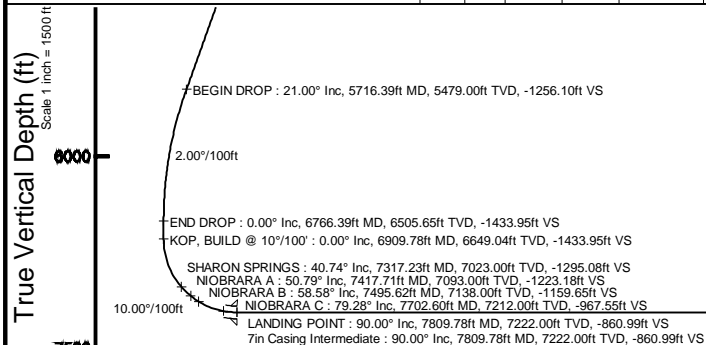
Start MD (ft)	End MD (ft)	Tool	Model	Log Name/Comment	Wellbore
25.00	1324.00	SCWSA MWD, Rev. 2	SCWSA MWD, Rev. 2 (Standard)		THOMSEN FEDERAL 1N-31HZ AWB <1324>
1324.00	7809.78	NaviTrak	NaviTrak (MAGCORR,IFR)		THOMSEN FEDERAL 1N-31HZ PWB
7809.78	16510.53	NaviTrak	NaviTrak (MAGCORR,IFR)		THOMSEN FEDERAL 1N-31HZ PWB

Well Profile Data

Design Comment	MD (ft)	Inc (°)	Az (°)	TVD (ft)	Local N (ft)	Local E (ft)	DLS (°/100ft)	VS (ft)
TIE ONTO SURFACE MWD	1324.00	0.300	219.500	1323.93	1.04	1.26	0.40	1.05
BEGIN NUDGE	1459.07	0.300	219.500	1459.00	0.50	0.81	0.00	0.50
END NUDGE	2494.85	21.000	201.000	2471.43	-176.80	-68.18	2.00	-177.01
BEGIN DROP	5716.39	21.000	201.000	5479.00	-1254.62	-481.91	0.00	-1256.10
END DROP	6766.39	0.000	0.177	6505.65	-1432.26	-550.10	2.00	-1433.95
KOP, BUILD @ 10°/100'	6909.78	0.000	0.177	6649.04	-1432.26	-550.10	0.00	-1433.95
LANDING POINT	7809.78	90.000	0.177	7222.00	-859.30	-548.33	10.00	-860.99
TOTAL DEPTH	16510.53	90.000	0.177	7222.00	7841.40	-521.43	0.00	7839.75

Targets

Name	MD (ft)	TVD (ft)	Local N (ft)	Local E (ft)	Grid East (US ft)	Grid North (US ft)	Latitude	Longitude
SEC.06-T2N-R65W SECTION LINES		8.00	0.00	0.00	3219947.79	1299783.36	40°09'13.036"N	104°42'47.232"W
SEC.31-T3N-R65W SECTION LINES		8.00	0.00	0.00	3219947.79	1299783.36	40°09'13.036"N	104°42'47.232"W
SEC.07-T2N-R65W SECTION LINES		43.00	2010.35	3479.93	3223409.59	1301824.42	40°09'32.900"N	104°42'02.412"W
REHDER 1 (150' Radius)		7222.00	3350.42	158.63	3220076.68	1303134.91	40°09'46.145"N	104°42'45.189"W
THOMSEN FEDERAL 1N-31HZ BHL ON PLAT REV-1 (575'FSL & 130'FWL, SEC.31)		7222.00	8256.40	-626.43	3219246.15	1308033.50	40°10'34.626"N	104°42'55.328"W
THOMSEN FEDERAL 1N-31HZ BHL REV-2 (160'FSL & 237'FWL, SEC.31)	16510.53	7222.00	7841.40	-521.43	3219356.82	1307619.48	40°10'30.525"N	104°42'53.949"W
THOMSEN FEDERAL 1N-31HZ LANDBOX		7222.00	0.00	0.00	3219947.79	1299783.36	40°09'13.036"N	104°42'47.232"W

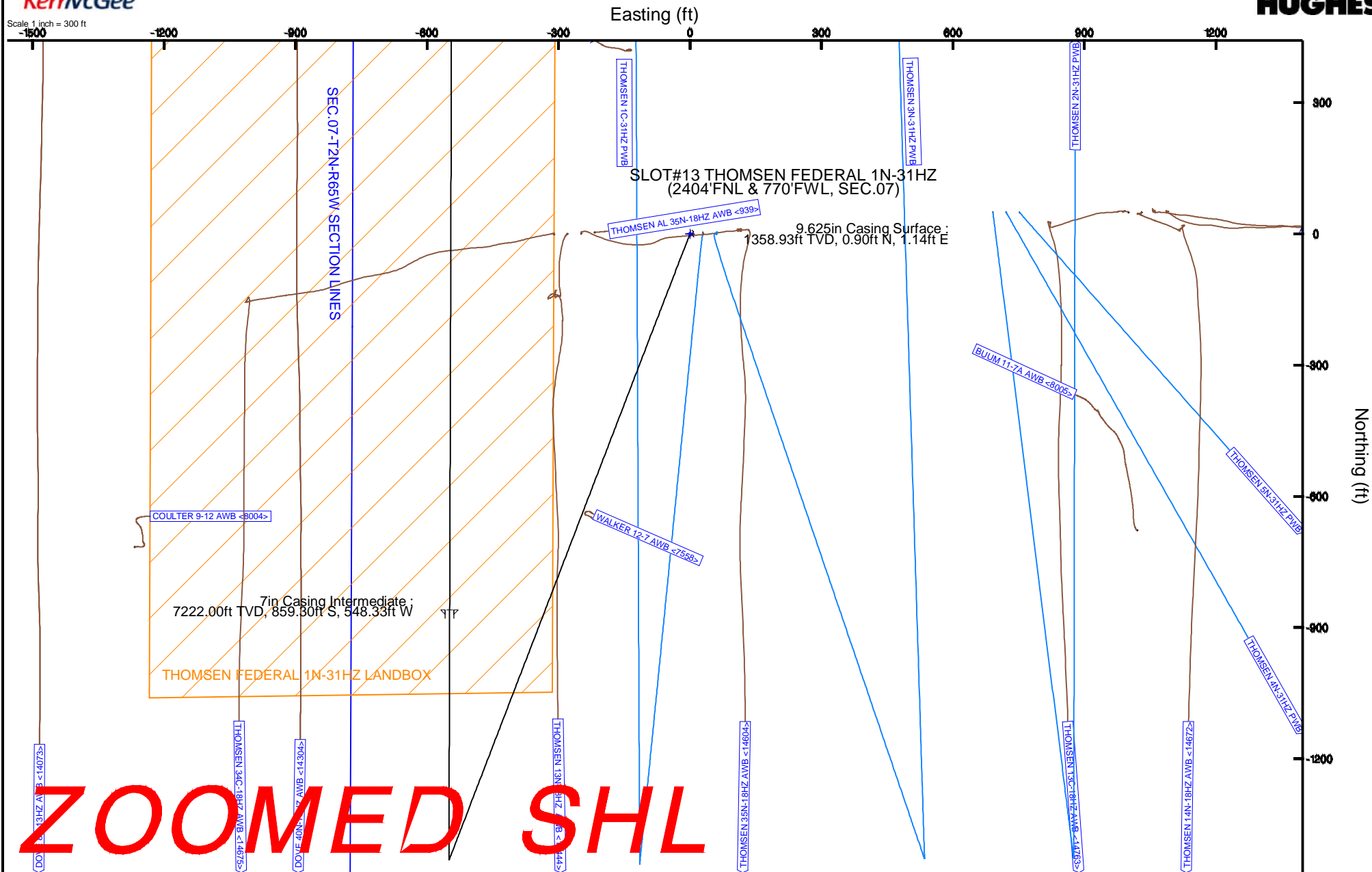


KERR-MCGEE OIL & GAS ONSHORE LP

Location:	COLORADO	Slot:	SLOT#13 THOMSEN FEDERAL 1N-31HZ (2404'FNL & 770'FWL, SEC.07)
Field:	WELD COUNTY (KERR MCGEE)	Well:	THOMSEN FEDERAL 1N-31HZ
Facility:	SEC.07-T2N-R65W	Wellbore:	THOMSEN FEDERAL 1N-31HZ PWB

Plot reference wellpath is THOMSEN FEDERAL 1N-31HZ (REV-A.0) PWP

True vertical depths are referenced to H&P 307 (25KB) (RKB)	Grid System: NAD83 / Lambert Colorado SP, Northern Zone (501), US feet
Measured depths are referenced to H&P 307 (25KB) (RKB)	North Reference: True north
H&P 307 (25KB) (RKB) to Mean Sea Level: 4972 feet	Scale: True distance
Mean Sea Level to Mud line (At Slot: SLOT#13 THOMSEN FEDERAL 1N-31HZ (2404FNL & 770FWL, SEC.07): 0 feet)	Depths are in feet
Coordinates are in feet referenced to Slot	Created by: robale01 on 12/3/2014



REFERENCE WELLPATH IDENTIFICATION			
Operator	KERR-MCGEE OIL & GAS ONSHORE LP	Slot	SLOT#13 THOMSEN FEDERAL 1N-31HZ (2404'FNL & 770'FWL, SEC.07)
Area	COLORADO	Well	THOMSEN FEDERAL 1N-31HZ
Field	WELD COUNTY (KERR MCGEE)	Wellbore	THOMSEN FEDERAL 1N-31HZ PWB
Facility	SEC.07-T2N-R65W		

REPORT SETUP INFORMATION			
Projection System	NAD83 / Lambert Colorado SP, Northern Zone (501), US feet	Software System	WellArchitect® 4.0.0
North Reference	True	User	Robiale01
Scale	0.999958	Report Generated	12/3/2014 at 4:03:06 PM
Convergence at slot	n/a	Database/Source file	WellArchitectDB/THOMSEN_FEDERAL_1N-31HZ_PWB.xml

WELLPATH LOCATION						
	Local coordinates		Grid coordinates		Geographic coordinates	
	North[ft]	East[ft]	Easting[US ft]	Northing[US ft]	Latitude	Longitude
Slot Location	2291.12	246.84	3219947.79	1299783.36	40°09'13.036"N	104°42'47.232"W
Facility Reference Pt			3219721.27	1297490.24	40°08'50.395"N	104°42'50.411"W
Field Reference Pt			3197771.84	1268891.29	40°04'09.600"N	104°47'36.000"W

WELLPATH DATUM			
Calculation method	Minimum curvature	H&P 307 (25'KB) (RKB) to Facility Vertical Datum	4972.00ft
Horizontal Reference Pt	Slot	H&P 307 (25'KB) (RKB) to Mean Sea Level	4972.00ft
Vertical Reference Pt	H&P 307 (25'KB) (RKB)	H&P 307 (25'KB) (RKB) to Mud Line at Slot (SLOT#13 THOMSEN FEDERAL 1N-31HZ (2404'FNL & 770'FWL, SEC.07))	4972.00ft
MD Reference Pt	H&P 307 (25'KB) (RKB)	Section Origin	N 0.00, E 0.00 ft
Field Vertical Reference	Mean Sea Level	Section Azimuth	0.18°

REFERENCE WELLPATH IDENTIFICATION			
Operator	KERR-MCGEE OIL & GAS ONSHORE LP	Slot	SLOT#13 THOMSEN FEDERAL 1N-31HZ (2404'FNL & 770'FWL, SEC.07)
Area	COLORADO	Well	THOMSEN FEDERAL 1N-31HZ
Field	WELD COUNTY (KERR MCGEE)	Wellbore	THOMSEN FEDERAL 1N-31HZ PWB
Facility	SEC.07-T2N-R65W		

WELLPATH DATA (183 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	197.400	0.00	0.00	0.00	0.00	40°09'13.036"N	104°42'47.232"W	0.00	
25.00	0.000	197.400	25.00	0.00	0.00	0.00	40°09'13.036"N	104°42'47.232"W	0.00	
102.00	0.700	197.400	102.00	-0.45	-0.45	-0.14	40°09'13.032"N	104°42'47.234"W	0.91	
182.00	0.700	177.600	181.99	-1.40	-1.40	-0.27	40°09'13.022"N	104°42'47.235"W	0.30	
271.00	0.800	183.000	270.98	-2.57	-2.57	-0.28	40°09'13.011"N	104°42'47.236"W	0.14	
351.00	0.900	205.900	350.98	-3.69	-3.69	-0.58	40°09'13.000"N	104°42'47.239"W	0.44	
431.00	0.400	214.700	430.97	-4.49	-4.48	-1.01	40°09'12.992"N	104°42'47.245"W	0.64	
511.00	0.700	44.400	510.97	-4.37	-4.37	-0.83	40°09'12.993"N	104°42'47.243"W	1.37	
591.00	0.010	220.600	590.97	-4.02	-4.02	-0.49	40°09'12.996"N	104°42'47.238"W	0.89	
671.00	0.300	143.600	670.97	-4.20	-4.20	-0.37	40°09'12.995"N	104°42'47.237"W	0.37	
751.00	0.600	19.800	750.97	-3.97	-3.97	-0.11	40°09'12.997"N	104°42'47.233"W	1.01	
831.00	0.800	20.100	830.96	-3.05	-3.05	0.23	40°09'13.006"N	104°42'47.229"W	0.25	
911.00	0.700	28.000	910.95	-2.09	-2.10	0.65	40°09'13.015"N	104°42'47.224"W	0.18	
957.05†	0.698	22.357	957.00	-1.58	-1.59	0.89	40°09'13.020"N	104°42'47.221"W	0.15	BASE FOX HILLS
991.00	0.700	18.200	990.95	-1.20	-1.20	1.03	40°09'13.024"N	104°42'47.219"W	0.15	
1071.00	0.500	17.500	1070.94	-0.40	-0.40	1.29	40°09'13.032"N	104°42'47.215"W	0.25	
1151.00	0.800	12.400	1150.94	0.48	0.48	1.51	40°09'13.041"N	104°42'47.213"W	0.38	
1231.00	0.200	313.700	1230.93	1.12	1.12	1.53	40°09'13.047"N	104°42'47.212"W	0.90	
1324.00	0.300	219.500	1323.93	1.05	1.04	1.26	40°09'13.046"N	104°42'47.216"W	0.40	TIE ONTO SURFACE MWD
1424.00†	0.300	219.500	1423.93	0.64	0.64	0.93	40°09'13.042"N	104°42'47.220"W	0.00	
1459.07	0.300	219.500	1459.00	0.50	0.50	0.81	40°09'13.041"N	104°42'47.222"W	0.00	BEGIN NUDGE
1524.00†	1.586	204.235	1523.92	-0.45	-0.45	0.33	40°09'13.032"N	104°42'47.228"W	2.00	
1624.00†	3.584	202.289	1623.81	-4.61	-4.61	-1.42	40°09'12.990"N	104°42'47.250"W	2.00	
1724.00†	5.584	201.735	1723.49	-12.03	-12.02	-4.41	40°09'12.917"N	104°42'47.289"W	2.00	
1824.00†	7.583	201.473	1822.83	-22.71	-22.68	-8.63	40°09'12.812"N	104°42'47.343"W	2.00	
1924.00†	9.583	201.320	1921.70	-36.62	-36.58	-14.07	40°09'12.675"N	104°42'47.413"W	2.00	
2024.00†	11.583	201.219	2019.99	-53.75	-53.69	-20.73	40°09'12.505"N	104°42'47.499"W	2.00	
2124.00†	13.583	201.148	2117.59	-74.09	-74.00	-28.60	40°09'12.305"N	104°42'47.600"W	2.00	
2224.00†	15.583	201.095	2214.36	-97.61	-97.49	-37.67	40°09'12.073"N	104°42'47.717"W	2.00	
2324.00†	17.583	201.053	2310.20	-124.27	-124.12	-47.93	40°09'11.809"N	104°42'47.849"W	2.00	
2424.00†	19.583	201.020	2404.98	-154.05	-153.86	-59.37	40°09'11.516"N	104°42'47.997"W	2.00	
2494.85	21.000	201.000	2471.43	-177.01	-176.80	-68.18	40°09'11.289"N	104°42'48.110"W	2.00	END NUDGE
2524.00†	21.000	201.000	2498.64	-186.77	-186.55	-71.92	40°09'11.192"N	104°42'48.158"W	0.00	
2624.00†	21.000	201.000	2592.00	-220.27	-220.01	-84.77	40°09'10.862"N	104°42'48.324"W	0.00	
2724.00†	21.000	201.000	2685.36	-253.76	-253.46	-97.61	40°09'10.531"N	104°42'48.489"W	0.00	
2824.00†	21.000	201.000	2778.72	-287.26	-286.92	-110.45	40°09'10.201"N	104°42'48.654"W	0.00	
2924.00†	21.000	201.000	2872.08	-320.76	-320.38	-123.29	40°09'09.870"N	104°42'48.820"W	0.00	
3024.00†	21.000	201.000	2965.43	-354.25	-353.83	-136.14	40°09'09.539"N	104°42'48.985"W	0.00	
3124.00†	21.000	201.000	3058.79	-387.75	-387.29	-148.98	40°09'09.209"N	104°42'49.151"W	0.00	
3224.00†	21.000	201.000	3152.15	-421.25	-420.75	-161.82	40°09'08.878"N	104°42'49.316"W	0.00	
3324.00†	21.000	201.000	3245.51	-454.74	-454.20	-174.67	40°09'08.548"N	104°42'49.481"W	0.00	
3424.00†	21.000	201.000	3338.87	-488.24	-487.66	-187.51	40°09'08.217"N	104°42'49.647"W	0.00	
3524.00†	21.000	201.000	3432.22	-521.73	-521.12	-200.35	40°09'07.886"N	104°42'49.812"W	0.00	
3624.00†	21.000	201.000	3525.58	-555.23	-554.57	-213.19	40°09'07.556"N	104°42'49.978"W	0.00	
3724.00†	21.000	201.000	3618.94	-588.73	-588.03	-226.04	40°09'07.225"N	104°42'50.143"W	0.00	

REFERENCE WELLPATH IDENTIFICATION			
Operator	KERR-MCGEE OIL & GAS ONSHORE LP	Slot	SLOT#13 THOMSEN FEDERAL 1N-31HZ (2404'FNL & 770'FWL, SEC.07)
Area	COLORADO	Well	THOMSEN FEDERAL 1N-31HZ
Field	WELD COUNTY (KERR MCGEE)	Wellbore	THOMSEN FEDERAL 1N-31HZ PWB
Facility	SEC.07-T2N-R65W		

WELLPATH DATA (183 stations) † = interpolated/extrapolated station										
MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Latitude	Longitude	DLS [°/100ft]	Comments
3824.00†	21.000	201.000	3712.30	-622.22	-621.49	-238.88	40°09'06.894"N	104°42'50.308"W	0.00	
3924.00†	21.000	201.000	3805.66	-655.72	-654.94	-251.72	40°09'06.564"N	104°42'50.474"W	0.00	
4024.00†	21.000	201.000	3899.01	-689.21	-688.40	-264.56	40°09'06.233"N	104°42'50.639"W	0.00	
4124.00†	21.000	201.000	3992.37	-722.71	-721.86	-277.41	40°09'05.903"N	104°42'50.804"W	0.00	
4139.67†	21.000	201.000	4007.00	-727.96	-727.10	-279.42	40°09'05.851"N	104°42'50.830"W	0.00	PARKMAN
4224.00†	21.000	201.000	4085.73	-756.21	-755.31	-290.25	40°09'05.572"N	104°42'50.970"W	0.00	
4324.00†	21.000	201.000	4179.09	-789.70	-788.77	-303.09	40°09'05.241"N	104°42'51.135"W	0.00	
4424.00†	21.000	201.000	4272.45	-823.20	-822.23	-315.94	40°09'04.911"N	104°42'51.301"W	0.00	
4524.00†	21.000	201.000	4365.80	-856.69	-855.68	-328.78	40°09'04.580"N	104°42'51.466"W	0.00	
4585.26†	21.000	201.000	4423.00	-877.22	-876.18	-336.65	40°09'04.378"N	104°42'51.567"W	0.00	SUSSEX
4624.00†	21.000	201.000	4459.16	-890.19	-889.14	-341.62	40°09'04.249"N	104°42'51.631"W	0.00	
4724.00†	21.000	201.000	4552.52	-923.69	-922.60	-354.46	40°09'03.919"N	104°42'51.797"W	0.00	
4824.00†	21.000	201.000	4645.88	-957.18	-956.05	-367.31	40°09'03.588"N	104°42'51.962"W	0.00	
4924.00†	21.000	201.000	4739.24	-990.68	-989.51	-380.15	40°09'03.258"N	104°42'52.128"W	0.00	
5024.00†	21.000	201.000	4832.59	-1024.17	-1022.96	-392.99	40°09'02.927"N	104°42'52.293"W	0.00	
5124.00†	21.000	201.000	4925.95	-1057.67	-1056.42	-405.83	40°09'02.596"N	104°42'52.458"W	0.00	
5224.00†	21.000	201.000	5019.31	-1091.17	-1089.88	-418.68	40°09'02.266"N	104°42'52.624"W	0.00	
5324.00†	21.000	201.000	5112.67	-1124.66	-1123.33	-431.52	40°09'01.935"N	104°42'52.789"W	0.00	
5424.00†	21.000	201.000	5206.03	-1158.16	-1156.79	-444.36	40°09'01.604"N	104°42'52.954"W	0.00	
5524.00†	21.000	201.000	5299.38	-1191.65	-1190.25	-457.21	40°09'01.274"N	104°42'53.120"W	0.00	
5624.00†	21.000	201.000	5392.74	-1225.15	-1223.70	-470.05	40°09'00.943"N	104°42'53.285"W	0.00	
5716.39	21.000	201.000	5479.00	-1256.10	-1254.62	-481.91	40°09'00.638"N	104°42'53.438"W	0.00	BEGIN DROP
5724.00†	20.848	201.000	5486.10	-1258.64	-1257.15	-482.89	40°09'00.613"N	104°42'53.451"W	2.00	
5824.00†	18.848	201.000	5580.16	-1290.37	-1288.85	-495.05	40°09'00.299"N	104°42'53.607"W	2.00	
5924.00†	16.848	201.000	5675.34	-1319.02	-1317.46	-506.04	40°09'00.017"N	104°42'53.749"W	2.00	
6024.00†	14.848	201.000	5771.54	-1344.54	-1342.95	-515.82	40°08'59.765"N	104°42'53.875"W	2.00	
6124.00†	12.848	201.000	5868.62	-1366.91	-1365.30	-524.40	40°08'59.544"N	104°42'53.985"W	2.00	
6224.00†	10.848	201.000	5966.49	-1386.10	-1384.46	-531.76	40°08'59.355"N	104°42'54.080"W	2.00	
6324.00†	8.848	201.000	6065.01	-1402.08	-1400.43	-537.89	40°08'59.197"N	104°42'54.159"W	2.00	
6424.00†	6.848	201.000	6164.07	-1414.85	-1413.18	-542.78	40°08'59.071"N	104°42'54.222"W	2.00	
6524.00†	4.848	201.000	6263.54	-1424.37	-1422.69	-546.43	40°08'58.977"N	104°42'54.269"W	2.00	
6624.00†	2.848	201.000	6363.31	-1430.64	-1428.95	-548.84	40°08'58.915"N	104°42'54.300"W	2.00	
6724.00†	0.848	201.000	6463.26	-1433.66	-1431.96	-549.99	40°08'58.885"N	104°42'54.315"W	2.00	
6766.39	0.000	0.177	6505.65	-1433.95	-1432.26	-550.10	40°08'58.882"N	104°42'54.316"W	2.00	END DROP
6824.00†	0.000	0.177	6563.25	-1433.95	-1432.26	-550.10	40°08'58.882"N	104°42'54.316"W	0.00	
6909.78	0.000	0.177	6649.04	-1433.95	-1432.26	-550.10	40°08'58.882"N	104°42'54.316"W	0.00	KOP, BUILD @ 10°/100'
6924.00†	1.422	0.177	6663.25	-1433.77	-1432.08	-550.10	40°08'58.884"N	104°42'54.316"W	10.00	
7024.00†	11.422	0.177	6762.50	-1422.60	-1420.91	-550.07	40°08'58.994"N	104°42'54.316"W	10.00	
7124.00†	21.422	0.177	6858.30	-1394.37	-1392.67	-549.98	40°08'59.273"N	104°42'54.315"W	10.00	
7224.00†	31.422	0.177	6947.74	-1349.93	-1348.23	-549.84	40°08'59.713"N	104°42'54.313"W	10.00	
7317.23†	40.744	0.177	7023.00	-1295.08	-1293.39	-549.68	40°09'00.255"N	104°42'54.311"W	10.00	SHARON SPRINGS
7324.00†	41.422	0.177	7028.10	-1290.63	-1288.94	-549.66	40°09'00.299"N	104°42'54.310"W	10.00	
7417.71†	50.792	0.177	7093.00	-1223.18	-1221.49	-549.45	40°09'00.965"N	104°42'54.308"W	10.00	NIOBRARA A
7424.00†	51.422	0.177	7096.95	-1218.28	-1216.59	-549.44	40°09'01.014"N	104°42'54.308"W	10.00	
7495.62†	58.583	0.177	7138.00	-1159.65	-1157.96	-549.26	40°09'01.593"N	104°42'54.305"W	10.00	NIOBRARA B

REFERENCE WELLPATH IDENTIFICATION			
Operator	KERR-MCGEE OIL & GAS ONSHORE LP	Slot	SLOT#13 THOMSEN FEDERAL 1N-31HZ (2404'FNL & 770'FWL, SEC.07)
Area	COLORADO	Well	THOMSEN FEDERAL 1N-31HZ
Field	WELD COUNTY (KERR MCGEE)	Wellbore	THOMSEN FEDERAL 1N-31HZ PWB
Facility	SEC.07-T2N-R65W		

WELLPATH DATA (183 stations) † = interpolated/extrapolated station										
MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Latitude	Longitude	DLS [°/100ft]	Comments
7524.00†	61.422	0.177	7152.19	-1135.07	-1133.38	-549.18	40°09'01.836"N	104°42'54.304"W	10.00	
7624.00†	71.422	0.177	7192.14	-1043.54	-1041.85	-548.90	40°09'02.740"N	104°42'54.301"W	10.00	
7702.60†	79.282	0.177	7212.00	-967.55	-965.86	-548.66	40°09'03.491"N	104°42'54.298"W	10.00	NIOBRARA C
7724.00†	81.422	0.177	7215.59	-946.45	-944.76	-548.60	40°09'03.700"N	104°42'54.297"W	10.00	
7809.78	90.000	0.177	7222.00	-860.99	-859.30	-548.33	40°09'04.544"N	104°42'54.294"W	10.00	LANDING POINT
7824.00†	90.000	0.177	7222.00	-846.77	-845.08	-548.29	40°09'04.685"N	104°42'54.293"W	0.00	
7924.00†	90.000	0.177	7222.00	-746.77	-745.09	-547.98	40°09'05.673"N	104°42'54.289"W	0.00	
8024.00†	90.000	0.177	7222.00	-646.77	-645.09	-547.67	40°09'06.661"N	104°42'54.285"W	0.00	
8124.00†	90.000	0.177	7222.00	-546.77	-545.09	-547.36	40°09'07.649"N	104°42'54.281"W	0.00	
8224.00†	90.000	0.177	7222.00	-446.77	-445.09	-547.05	40°09'08.638"N	104°42'54.277"W	0.00	
8324.00†	90.000	0.177	7222.00	-346.77	-345.09	-546.75	40°09'09.626"N	104°42'54.273"W	0.00	
8424.00†	90.000	0.177	7222.00	-246.77	-245.09	-546.44	40°09'10.614"N	104°42'54.269"W	0.00	
8524.00†	90.000	0.177	7222.00	-146.77	-145.09	-546.13	40°09'11.602"N	104°42'54.265"W	0.00	
8624.00†	90.000	0.177	7222.00	-46.77	-45.09	-545.82	40°09'12.590"N	104°42'54.261"W	0.00	
8724.00†	90.000	0.177	7222.00	53.23	54.91	-545.51	40°09'13.579"N	104°42'54.257"W	0.00	
8824.00†	90.000	0.177	7222.00	153.23	154.91	-545.20	40°09'14.567"N	104°42'54.253"W	0.00	
8924.00†	90.000	0.177	7222.00	253.23	254.91	-544.89	40°09'15.555"N	104°42'54.249"W	0.00	
9024.00†	90.000	0.177	7222.00	353.23	354.91	-544.58	40°09'16.543"N	104°42'54.246"W	0.00	
9124.00†	90.000	0.177	7222.00	453.23	454.91	-544.27	40°09'17.531"N	104°42'54.242"W	0.00	
9224.00†	90.000	0.177	7222.00	553.23	554.91	-543.96	40°09'18.520"N	104°42'54.238"W	0.00	
9324.00†	90.000	0.177	7222.00	653.23	654.91	-543.66	40°09'19.508"N	104°42'54.234"W	0.00	
9424.00†	90.000	0.177	7222.00	753.23	754.91	-543.35	40°09'20.496"N	104°42'54.230"W	0.00	
9524.00†	90.000	0.177	7222.00	853.23	854.91	-543.04	40°09'21.484"N	104°42'54.226"W	0.00	
9624.00†	90.000	0.177	7222.00	953.23	954.91	-542.73	40°09'22.472"N	104°42'54.222"W	0.00	
9724.00†	90.000	0.177	7222.00	1053.23	1054.91	-542.42	40°09'23.461"N	104°42'54.218"W	0.00	
9824.00†	90.000	0.177	7222.00	1153.23	1154.91	-542.11	40°09'24.449"N	104°42'54.214"W	0.00	
9924.00†	90.000	0.177	7222.00	1253.23	1254.91	-541.80	40°09'25.437"N	104°42'54.210"W	0.00	
10024.00†	90.000	0.177	7222.00	1353.23	1354.90	-541.49	40°09'26.425"N	104°42'54.206"W	0.00	
10124.00†	90.000	0.177	7222.00	1453.23	1454.90	-541.18	40°09'27.413"N	104°42'54.202"W	0.00	
10224.00†	90.000	0.177	7222.00	1553.23	1554.90	-540.87	40°09'28.402"N	104°42'54.198"W	0.00	
10324.00†	90.000	0.177	7222.00	1653.23	1654.90	-540.57	40°09'29.390"N	104°42'54.194"W	0.00	
10424.00†	90.000	0.177	7222.00	1753.23	1754.90	-540.26	40°09'30.378"N	104°42'54.190"W	0.00	
10524.00†	90.000	0.177	7222.00	1853.23	1854.90	-539.95	40°09'31.366"N	104°42'54.186"W	0.00	
10624.00†	90.000	0.177	7222.00	1953.23	1954.90	-539.64	40°09'32.354"N	104°42'54.182"W	0.00	
10724.00†	90.000	0.177	7222.00	2053.23	2054.90	-539.33	40°09'33.343"N	104°42'54.178"W	0.00	
10824.00†	90.000	0.177	7222.00	2153.23	2154.90	-539.02	40°09'34.331"N	104°42'54.174"W	0.00	
10924.00†	90.000	0.177	7222.00	2253.23	2254.90	-538.71	40°09'35.319"N	104°42'54.170"W	0.00	
11024.00†	90.000	0.177	7222.00	2353.23	2354.90	-538.40	40°09'36.307"N	104°42'54.166"W	0.00	
11124.00†	90.000	0.177	7222.00	2453.23	2454.90	-538.09	40°09'37.295"N	104°42'54.163"W	0.00	
11224.00†	90.000	0.177	7222.00	2553.23	2554.90	-537.78	40°09'38.284"N	104°42'54.159"W	0.00	
11324.00†	90.000	0.177	7222.00	2653.23	2654.90	-537.47	40°09'39.272"N	104°42'54.155"W	0.00	
11424.00†	90.000	0.177	7222.00	2753.23	2754.90	-537.16	40°09'40.260"N	104°42'54.151"W	0.00	
11524.00†	90.000	0.177	7222.00	2853.23	2854.90	-536.86	40°09'41.248"N	104°42'54.147"W	0.00	
11624.00†	90.000	0.177	7222.00	2953.23	2954.90	-536.55	40°09'42.236"N	104°42'54.143"W	0.00	
11724.00†	90.000	0.177	7222.00	3053.23	3054.90	-536.24	40°09'43.225"N	104°42'54.139"W	0.00	

REFERENCE WELLPATH IDENTIFICATION			
Operator	KERR-MCGEE OIL & GAS ONSHORE LP	Slot	SLOT#13 THOMSEN FEDERAL 1N-31HZ (2404'FNL & 770'FWL, SEC.07)
Area	COLORADO	Well	THOMSEN FEDERAL 1N-31HZ
Field	WELD COUNTY (KERR MCGEE)	Wellbore	THOMSEN FEDERAL 1N-31HZ PWB
Facility	SEC.07-T2N-R65W		

WELLPATH DATA (183 stations) † = interpolated/extrapolated station										
MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Latitude	Longitude	DLS [°/100ft]	Comments
11824.00†	90.000	0.177	7222.00	3153.23	3154.90	-535.93	40°09'44.213"N	104°42'54.135"W	0.00	
11924.00†	90.000	0.177	7222.00	3253.23	3254.90	-535.62	40°09'45.201"N	104°42'54.131"W	0.00	
12024.00†	90.000	0.177	7222.00	3353.23	3354.90	-535.31	40°09'46.189"N	104°42'54.127"W	0.00	
12124.00†	90.000	0.177	7222.00	3453.23	3454.89	-535.00	40°09'47.177"N	104°42'54.123"W	0.00	
12224.00†	90.000	0.177	7222.00	3553.23	3554.89	-534.69	40°09'48.166"N	104°42'54.119"W	0.00	
12324.00†	90.000	0.177	7222.00	3653.23	3654.89	-534.38	40°09'49.154"N	104°42'54.115"W	0.00	
12424.00†	90.000	0.177	7222.00	3753.23	3754.89	-534.07	40°09'50.142"N	104°42'54.111"W	0.00	
12524.00†	90.000	0.177	7222.00	3853.23	3854.89	-533.76	40°09'51.130"N	104°42'54.107"W	0.00	
12624.00†	90.000	0.177	7222.00	3953.23	3954.89	-533.45	40°09'52.118"N	104°42'54.103"W	0.00	
12724.00†	90.000	0.177	7222.00	4053.23	4054.89	-533.14	40°09'53.107"N	104°42'54.099"W	0.00	
12824.00†	90.000	0.177	7222.00	4153.23	4154.89	-532.84	40°09'54.095"N	104°42'54.095"W	0.00	
12924.00†	90.000	0.177	7222.00	4253.23	4254.89	-532.53	40°09'55.083"N	104°42'54.091"W	0.00	
13024.00†	90.000	0.177	7222.00	4353.23	4354.89	-532.22	40°09'56.071"N	104°42'54.087"W	0.00	
13124.00†	90.000	0.177	7222.00	4453.23	4454.89	-531.91	40°09'57.059"N	104°42'54.083"W	0.00	
13224.00†	90.000	0.177	7222.00	4553.23	4554.89	-531.60	40°09'58.048"N	104°42'54.079"W	0.00	
13324.00†	90.000	0.177	7222.00	4653.23	4654.89	-531.29	40°09'59.036"N	104°42'54.076"W	0.00	
13424.00†	90.000	0.177	7222.00	4753.23	4754.89	-530.98	40°10'00.024"N	104°42'54.072"W	0.00	
13524.00†	90.000	0.177	7222.00	4853.23	4854.89	-530.67	40°10'01.012"N	104°42'54.068"W	0.00	
13624.00†	90.000	0.177	7222.00	4953.23	4954.89	-530.36	40°10'02.000"N	104°42'54.064"W	0.00	
13724.00†	90.000	0.177	7222.00	5053.23	5054.89	-530.05	40°10'02.989"N	104°42'54.060"W	0.00	
13824.00†	90.000	0.177	7222.00	5153.23	5154.89	-529.74	40°10'03.977"N	104°42'54.056"W	0.00	
13924.00†	90.000	0.177	7222.00	5253.23	5254.89	-529.43	40°10'04.965"N	104°42'54.052"W	0.00	
14024.00†	90.000	0.177	7222.00	5353.23	5354.89	-529.12	40°10'05.953"N	104°42'54.048"W	0.00	
14124.00†	90.000	0.177	7222.00	5453.23	5454.89	-528.81	40°10'06.941"N	104°42'54.044"W	0.00	
14224.00†	90.000	0.177	7222.00	5553.23	5554.88	-528.51	40°10'07.930"N	104°42'54.040"W	0.00	
14324.00†	90.000	0.177	7222.00	5653.23	5654.88	-528.20	40°10'08.918"N	104°42'54.036"W	0.00	
14424.00†	90.000	0.177	7222.00	5753.23	5754.88	-527.89	40°10'09.906"N	104°42'54.032"W	0.00	
14524.00†	90.000	0.177	7222.00	5853.23	5854.88	-527.58	40°10'10.894"N	104°42'54.028"W	0.00	
14624.00†	90.000	0.177	7222.00	5953.23	5954.88	-527.27	40°10'11.882"N	104°42'54.024"W	0.00	
14724.00†	90.000	0.177	7222.00	6053.23	6054.88	-526.96	40°10'12.871"N	104°42'54.020"W	0.00	
14824.00†	90.000	0.177	7222.00	6153.23	6154.88	-526.65	40°10'13.859"N	104°42'54.016"W	0.00	
14924.00†	90.000	0.177	7222.00	6253.23	6254.88	-526.34	40°10'14.847"N	104°42'54.012"W	0.00	
15024.00†	90.000	0.177	7222.00	6353.23	6354.88	-526.03	40°10'15.835"N	104°42'54.008"W	0.00	
15124.00†	90.000	0.177	7222.00	6453.23	6454.88	-525.72	40°10'16.823"N	104°42'54.004"W	0.00	
15224.00†	90.000	0.177	7222.00	6553.23	6554.88	-525.41	40°10'17.812"N	104°42'54.000"W	0.00	
15324.00†	90.000	0.177	7222.00	6653.23	6654.88	-525.10	40°10'18.800"N	104°42'53.996"W	0.00	
15424.00†	90.000	0.177	7222.00	6753.23	6754.88	-524.79	40°10'19.788"N	104°42'53.992"W	0.00	
15524.00†	90.000	0.177	7222.00	6853.23	6854.88	-524.48	40°10'20.776"N	104°42'53.988"W	0.00	
15624.00†	90.000	0.177	7222.00	6953.23	6954.88	-524.17	40°10'21.764"N	104°42'53.984"W	0.00	
15724.00†	90.000	0.177	7222.00	7053.23	7054.88	-523.86	40°10'22.753"N	104°42'53.981"W	0.00	
15824.00†	90.000	0.177	7222.00	7153.23	7154.88	-523.55	40°10'23.741"N	104°42'53.977"W	0.00	
15924.00†	90.000	0.177	7222.00	7253.23	7254.88	-523.25	40°10'24.729"N	104°42'53.973"W	0.00	
16024.00†	90.000	0.177	7222.00	7353.23	7354.88	-522.94	40°10'25.717"N	104°42'53.969"W	0.00	
16124.00†	90.000	0.177	7222.00	7453.23	7454.88	-522.63	40°10'26.705"N	104°42'53.965"W	0.00	
16224.00†	90.000	0.177	7222.00	7553.23	7554.88	-522.32	40°10'27.694"N	104°42'53.961"W	0.00	

REFERENCE WELLPATH IDENTIFICATION			
Operator	KERR-MCGEE OIL & GAS ONSHORE LP	Slot	SLOT#13 THOMSEN FEDERAL 1N-31HZ (2404'FNL & 770'FWL, SEC.07)
Area	COLORADO	Well	THOMSEN FEDERAL 1N-31HZ
Field	WELD COUNTY (KERR MCGEE)	Wellbore	THOMSEN FEDERAL 1N-31HZ PWB
Facility	SEC.07-T2N-R65W		

WELLPATH DATA (183 stations) † = interpolated/extrapolated station										
MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Latitude	Longitude	DLS [°/100ft]	Comments
16324.00†	90.000	0.177	7222.00	7653.23	7654.87	-522.01	40°10'28.682"N	104°42'53.957"W	0.00	
16424.00†	90.000	0.177	7222.00	7753.23	7754.87	-521.70	40°10'29.670"N	104°42'53.953"W	0.00	
16510.53	90.000	0.177	7222.00 ¹	7839.75	7841.40	-521.43	40°10'30.525"N	104°42'53.949"W	0.00	TOTAL DEPTH

HOLE & CASING SECTIONS -									
Ref Wellbore: THOMSEN FEDERAL 1N-31HZ PWB					Ref Wellpath: THOMSEN FEDERAL 1N-31HZ (REV-A.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	25.00	1369.00	1344.00	25.00	1368.93	0.00	0.00	0.86	1.11
9.625in Casing Surface	25.00	1359.00	1334.00	25.00	1358.93	0.00	0.00	0.90	1.14
8.75in Open Hole	1369.00	7809.78	6440.78	1368.93	7222.00	0.86	1.11	-859.30	-548.33
7in Casing Intermediate	25.00	7809.78	7784.78	25.00	7222.00	0.00	0.00	-859.30	-548.33
6.125in Open Hole	7809.78	16510.53	8700.75	7222.00	7222.00	-859.30	-548.33	7841.40	-521.43
4.5in Casing Production	25.00	16510.53	16485.53	25.00	7222.00	0.00	0.00	7841.40	-521.43

REFERENCE WELLPATH IDENTIFICATION			
Operator	KERR-MCGEE OIL & GAS ONSHORE LP	Slot	SLOT#13 THOMSEN FEDERAL 1N-31HZ (2404'FNL & 770'FWL, SEC.07)
Area	COLORADO	Well	THOMSEN FEDERAL 1N-31HZ
Field	WELD COUNTY (KERR MCGEE)	Wellbore	THOMSEN FEDERAL 1N-31HZ PWB
Facility	SEC.07-T2N-R65W		

TARGETS									
Name	MD [ft]	TVD [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Shape
SEC.06-T2N-R65W SECTION LINES		8.00	0.00	0.00	3219947.79	1299783.36	40°09'13.036"N	104°42'47.232"W	polygon
SEC.31-T3N-R65W SECTION LINES		8.00	0.00	0.00	3219947.79	1299783.36	40°09'13.036"N	104°42'47.232"W	polygon
SEC.07-T2N-R65W SECTION LINES		43.00	2010.35	3479.93	3223409.59	1301824.42	40°09'32.900"N	104°42'02.412"W	polygon
REHDER 1 (150' Radius)		7222.00	3350.42	158.63	3220076.68	1303134.91	40°09'46.145"N	104°42'45.189"W	circle
THOMSEN FEDERAL 1N-31HZ BHL ON PLAT REV-1 (575'FSL & 130'FWL, SEC.31)		7222.00	8256.40	-628.43	3219246.15	1308033.50	40°10'34.626"N	104°42'55.328"W	point
1) THOMSEN FEDERAL 1N-31HZ BHL REV-2 (160'FSL & 237'FWL, SEC.31)	16510.53	7222.00	7841.40	-521.43	3219356.82	1307619.48	40°10'30.525"N	104°42'53.949"W	point
THOMSEN FEDERAL 1N-31HZ LANDBOX		7222.00	0.00	0.00	3219947.79	1299783.36	40°09'13.036"N	104°42'47.232"W	polygon

SURVEY PROGRAM - Ref Wellbore: THOMSEN FEDERAL 1N-31HZ PWB Ref Wellpath: THOMSEN FEDERAL 1N-31HZ (REV-A.0) PWP				
Start MD [ft]	End MD [ft]	Positional Uncertainty Model	Log Name/Comment	Wellbore
25.00	1324.00	ISCWSA MWD, Rev. 2 (Standard)		THOMSEN FEDERAL 1N-31HZ AWB <1324>
1324.00	7809.78	NaviTrak (MAGCORR,IFR)		THOMSEN FEDERAL 1N-31HZ PWB
7809.78	16510.53	NaviTrak (MAGCORR,IFR)		THOMSEN FEDERAL 1N-31HZ PWB

REFERENCE WELLPATH IDENTIFICATION				
Operator	KERR-MCGEE OIL & GAS ONSHORE LP	Slot	SLOT#13 THOMSEN FEDERAL 1N-31HZ (2404'FNL & 770'FWL, SEC.07)	
Area	COLORADO	Well	THOMSEN FEDERAL 1N-31HZ	
Field	WELD COUNTY (KERR MCGEE)	Wellbore	THOMSEN FEDERAL 1N-31HZ PWB	
Facility	SEC.07-T2N-R65W			

WELLPATH COMMENTS				
MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Comment
957.05	0.698	22.357	957.00	BASE FOX HILLS
4139.67	21.000	201.000	4007.00	PARKMAN
4585.26	21.000	201.000	4423.00	SUSSEX
7317.23	40.744	0.177	7023.00	SHARON SPRINGS
7417.71	50.792	0.177	7093.00	NIOBRARA A
7495.62	58.583	0.177	7138.00	NIOBRARA B
7702.60	79.282	0.177	7212.00	NIOBRARA C

DESIGN COMMENTS				
MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Comment
1324.00	0.300	219.500	1323.93	TIE ONTO SURFACE MWD
1459.07	0.300	219.500	1459.00	BEGIN NUDGE
2494.85	21.000	201.000	2471.43	END NUDGE
5716.39	21.000	201.000	5479.00	BEGIN DROP
6766.39	0.000	0.177	6505.65	END DROP
6909.78	0.000	0.177	6649.04	KOP, BUILD @ 10°/100'
7809.78	90.000	0.177	7222.00	LANDING POINT
16510.53	90.000	0.177	7222.00	TOTAL DEPTH