

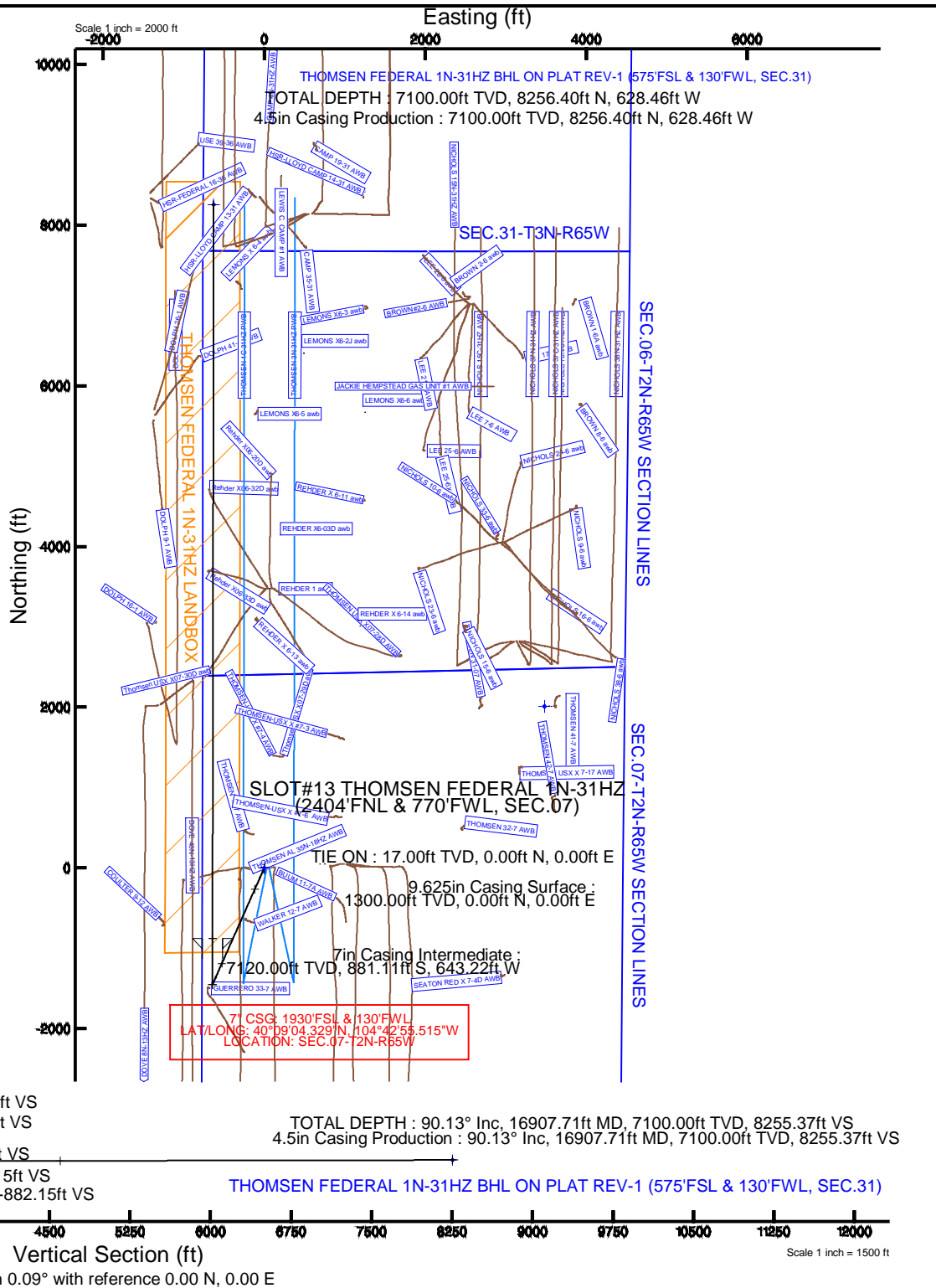
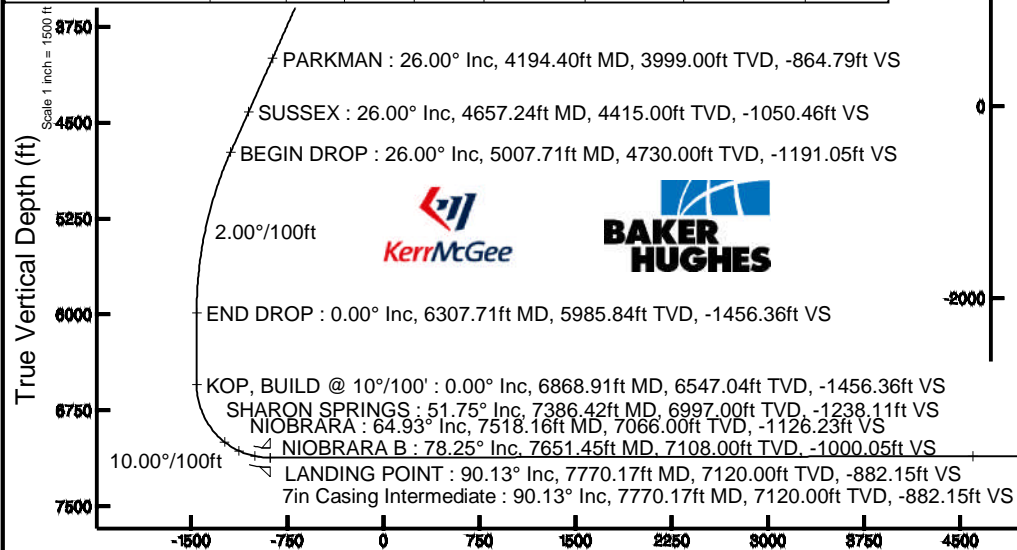
Location:	COLORADO	Slot:	SLOT#13 THOMSEN FEDERAL 1N-31HZ (2404FNL & 770FWL, SEC.07)
Field:	WELD COUNTY (KERR MCGEE)	Well:	THOMSEN FEDERAL 1N-31HZ
Facility:	SEC.07-T2N-R65W	Wellbore:	THOMSEN FEDERAL 1N-31HZ PWB
Plot reference wellpath is THOMSEN FEDERAL 1N-31HZ (PERMIT REV-1) PWP			
True vertical depths are referenced to PERMIT (17KB) (RKB)		Grid System: NAD83 / Lambert Colorado SP, Northern Zone (501), US feet	
Measured depths are referenced to PERMIT (17KB) (RKB)		North Reference: True north	
PERMIT (17KB) (RKB) to Mean Sea Level: 4964 feet		Scale: True distance	
Mean Sea Level to Mud line (At Slot: SLOT#13 THOMSEN FEDERAL 1N-31HZ (2404FNL & 770FWL, SEC.07))		Depths are in feet	
Coordinates are in feet referenced to Slot		Created by: robaleo01 on 9/5/2014	

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-31H2 (2404FNL & 770FWL SEC.07)	2291.12	246.84	3219947.789	1299783.360	40°09'13.036"N	104°42'47.232"W
PERMIT (17KB) (RKB) to Mud line (At Slot: SLOT#13 THOMSEN FEDERAL 1N-31H2 (2404FNL & 770FWL SEC.07))					4964ft	
Mean Sea Level to Mud line (At Slot: SLOT#13 THOMSEN FEDERAL 1N-31H2 (2404FNL & 770FWL SEC.07))					0ft	
PERMIT (17KB) (RKB) to Mean Sea Level					4964ft	

Start MD (ft)	End MD (ft)	Tool	Model	Log Name/Comment	Wellbore
17.00	16907.71	NaviTrak	NaviTrak (MAGCORR,IFR)		THOMSEN FEDERAL 1N-31HZ PWB

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	0.00	0.00	0.00	3219947.79	1299783.36	40°09'13.036"N	104°42'47.232"W	
SEC-31-T2N-R65W SECTION LINES	0.00	0.00	0.00	3219947.79	1299783.36	40°09'13.036"N	104°42'47.232"W	
SEC-07-T2N-R65W SECTION LINES	35.00	2010.35	9479.93	3223409.59	1301824.42	40°09'32.900"N	104°42'02.412"W	
THOMSEN FEDERAL 1N-31HZ BHL ON PLAT REV1 (S75FSL & 130FWL, SEC.31)	16907.71	7100.00	8266.40	628.46	3219246.12	40°10'34.626"N	104°42'56.328"W	
THOMSEN FEDERAL 1N-31HZ LINDBOX	7100.00	0.00	0.00	3219947.79	1299783.36	40°09'13.036"N	104°42'47.232"W	

Design Comment	MD (ft)	Inc (°)	Az (°)	TVD (ft)	Local N (ft)	Local E (ft)	DLS (°/100ft)	VS (ft)
TIE ON	17.00	0.000	203.875	17.00	0.00	0.00	0.00	0.00
BEGIN NUDGE	1400.00	0.000	203.875	1400.00	0.00	0.00	0.00	0.00
END NUDGE	2700.00	26.000	203.875	2655.84	-265.12	-117.35	2.00	-265.31
BEGIN DROP	5007.71	26.000	203.875	4730.00	-1190.19	-526.80	0.00	-1191.05
END DROP	6307.71	0.000	0.093	5985.84	-1455.32	-644.15	2.00	-1456.36
KOP, BUILD @ 10°/100'	6868.91	0.000	0.093	6547.04	-1455.32	-644.15	0.00	-1456.36
LANDING POINT	7770.17	90.125	0.093	7120.00	-881.11	-643.22	10.00	-882.15
TOTAL DEPTH	16907.71	90.125	0.093	7100.00	8256.40	-628.46	0.00	8255.37



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	9/5/2014 at 12:04:33 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	PERMIT (17'KB) (RKB) to Facility Vertical Datum	4964.00ft
Horizontal Reference Pt	Slot	PERMIT (17'KB) (RKB) to Mean Sea Level	4964.00ft
Vertical Reference Pt	PERMIT (17'KB) (RKB)	PERMIT (17'KB) (RKB) to Mud Line at Slot (SLOT#13 THOMSEN FEDERAL 1N-31HZ (2404'FNL & 770'FWL, SEC.07))	4964.00ft
MD Reference Pt	PERMIT (17'KB) (RKB)	Section Origin	N 0.00, E 0.00 ft
Field Vertical Reference	Mean Sea Level	Section Azimuth	0.09°

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 (185 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	203.875	0.00	0.00	0.00	0.00	40°09'13.036"N	104°42'47.232"W	0.00	
17.00	0.000	203.875	17.00	0.00	0.00	0.00	40°09'13.036"N	104°42'47.232"W	0.00	TIE ON
117.00†	0.000	203.875	117.00	0.00	0.00	0.00	40°09'13.036"N	104°42'47.232"W	0.00	
217.00†	0.000	203.875	217.00	0.00	0.00	0.00	40°09'13.036"N	104°42'47.232"W	0.00	
317.00†	0.000	203.875	317.00	0.00	0.00	0.00	40°09'13.036"N	104°42'47.232"W	0.00	
417.00†	0.000	203.875	417.00	0.00	0.00	0.00	40°09'13.036"N	104°42'47.232"W	0.00	
517.00†	0.000	203.875	517.00	0.00	0.00	0.00	40°09'13.036"N	104°42'47.232"W	0.00	
617.00†	0.000	203.875	617.00	0.00	0.00	0.00	40°09'13.036"N	104°42'47.232"W	0.00	
717.00†	0.000	203.875	717.00	0.00	0.00	0.00	40°09'13.036"N	104°42'47.232"W	0.00	
817.00†	0.000	203.875	817.00	0.00	0.00	0.00	40°09'13.036"N	104°42'47.232"W	0.00	
917.00†	0.000	203.875	917.00	0.00	0.00	0.00	40°09'13.036"N	104°42'47.232"W	0.00	
949.00†	0.000	203.875	949.00	0.00	0.00	0.00	40°09'13.036"N	104°42'47.232"W	0.00	BASE FOX HILLS
1017.00†	0.000	203.875	1017.00	0.00	0.00	0.00	40°09'13.036"N	104°42'47.232"W	0.00	
1117.00†	0.000	203.875	1117.00	0.00	0.00	0.00	40°09'13.036"N	104°42'47.232"W	0.00	
1217.00†	0.000	203.875	1217.00	0.00	0.00	0.00	40°09'13.036"N	104°42'47.232"W	0.00	
1300.00†	0.000	203.875	1300.00	0.00	0.00	0.00	40°09'13.036"N	104°42'47.232"W	0.00	SURFACE CSG SETTING DEPTH
1317.00†	0.000	203.875	1317.00	0.00	0.00	0.00	40°09'13.036"N	104°42'47.232"W	0.00	
1400.00	0.000	203.875	1400.00	0.00	0.00	0.00	40°09'13.036"N	104°42'47.232"W	0.00	BEGIN NUDGE
1417.00†	0.340	203.875	1417.00	-0.05	-0.05	-0.02	40°09'13.036"N	104°42'47.232"W	2.00	
1517.00†	2.340	203.875	1516.97	-2.19	-2.18	-0.97	40°09'13.014"N	104°42'47.244"W	2.00	
1617.00†	4.340	203.875	1616.79	-7.52	-7.51	-3.32	40°09'12.962"N	104°42'47.275"W	2.00	
1717.00†	6.340	203.875	1716.35	-16.03	-16.02	-7.09	40°09'12.878"N	104°42'47.323"W	2.00	
1817.00†	8.340	203.875	1815.53	-27.72	-27.70	-12.26	40°09'12.762"N	104°42'47.390"W	2.00	
1917.00†	10.340	203.875	1914.20	-42.57	-42.54	-18.83	40°09'12.616"N	104°42'47.475"W	2.00	
2017.00†	12.340	203.875	2012.24	-60.57	-60.52	-26.79	40°09'12.438"N	104°42'47.577"W	2.00	
2117.00†	14.340	203.875	2109.54	-81.68	-81.62	-36.13	40°09'12.229"N	104°42'47.697"W	2.00	
2217.00†	16.340	203.875	2205.97	-105.89	-105.81	-46.83	40°09'11.990"N	104°42'47.835"W	2.00	
2317.00†	18.340	203.875	2301.42	-133.16	-133.06	-58.90	40°09'11.721"N	104°42'47.990"W	2.00	
2417.00†	20.340	203.875	2395.77	-163.46	-163.34	-72.30	40°09'11.422"N	104°42'48.163"W	2.00	
2517.00†	22.340	203.875	2488.91	-196.76	-196.62	-87.03	40°09'11.093"N	104°42'48.353"W	2.00	
2617.00†	24.340	203.875	2580.72	-233.01	-232.85	-103.06	40°09'10.735"N	104°42'48.559"W	2.00	
2700.00	26.000	203.875	2655.84	-265.31	-265.12	-117.35	40°09'10.416"N	104°42'48.743"W	2.00	END NUDGE
2717.00†	26.000	203.875	2671.12	-272.13	-271.94	-120.36	40°09'10.349"N	104°42'48.782"W	0.00	
2817.00†	26.000	203.875	2761.00	-312.25	-312.02	-138.11	40°09'09.953"N	104°42'49.011"W	0.00	
2917.00†	26.000	203.875	2850.88	-352.36	-352.11	-155.85	40°09'09.556"N	104°42'49.239"W	0.00	
3017.00†	26.000	203.875	2940.76	-392.48	-392.20	-173.59	40°09'09.160"N	104°42'49.468"W	0.00	
3117.00†	26.000	203.875	3030.64	-432.59	-432.28	-191.34	40°09'08.764"N	104°42'49.696"W	0.00	
3217.00†	26.000	203.875	3120.52	-472.71	-472.37	-209.08	40°09'08.368"N	104°42'49.925"W	0.00	
3317.00†	26.000	203.875	3210.40	-512.82	-512.45	-226.82	40°09'07.972"N	104°42'50.153"W	0.00	
3417.00†	26.000	203.875	3300.28	-552.94	-552.54	-244.56	40°09'07.576"N	104°42'50.382"W	0.00	
3517.00†	26.000	203.875	3390.16	-593.05	-592.63	-262.31	40°09'07.180"N	104°42'50.610"W	0.00	
3617.00†	26.000	203.875	3480.03	-633.17	-632.71	-280.05	40°09'06.783"N	104°42'50.839"W	0.00	
3717.00†	26.000	203.875	3569.91	-673.28	-672.80	-297.79	40°09'06.387"N	104°42'51.067"W	0.00	
3817.00†	26.000	203.875	3659.79	-713.40	-712.88	-315.54	40°09'05.991"N	104°42'51.296"W	0.00	
3917.00†	26.000	203.875	3749.67	-753.51	-752.97	-333.28	40°09'05.595"N	104°42'51.524"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 (185 stations) † = interpolated/extrapolated station										
MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Latitude	Longitude	DLS [°/100ft]	Comments
4017.00†	26.000	203.875	3839.55	-793.63	-793.06	-351.02	40°09'05.199"N	104°42'51.752"W	0.00	
4117.00†	26.000	203.875	3929.43	-833.74	-833.14	-368.76	40°09'04.803"N	104°42'51.981"W	0.00	
4194.40†	26.000	203.875	3999.00	-864.79	-864.17	-382.50	40°09'04.496"N	104°42'52.158"W	0.00	PARKMAN
4217.00†	26.000	203.875	4019.31	-873.86	-873.23	-386.51	40°09'04.407"N	104°42'52.209"W	0.00	
4317.00†	26.000	203.875	4109.19	-913.97	-913.31	-404.25	40°09'04.011"N	104°42'52.438"W	0.00	
4417.00†	26.000	203.875	4199.07	-954.08	-953.40	-421.99	40°09'03.614"N	104°42'52.666"W	0.00	
4517.00†	26.000	203.875	4288.95	-994.20	-993.49	-439.73	40°09'03.218"N	104°42'52.895"W	0.00	
4617.00†	26.000	203.875	4378.83	-1034.31	-1033.57	-457.48	40°09'02.822"N	104°42'53.123"W	0.00	
4657.24†	26.000	203.875	4415.00	-1050.46	-1049.71	-464.62	40°09'02.663"N	104°42'53.215"W	0.00	SUSSEX
4717.00†	26.000	203.875	4468.71	-1074.43	-1073.66	-475.22	40°09'02.426"N	104°42'53.352"W	0.00	
4817.00†	26.000	203.875	4558.59	-1114.54	-1113.74	-492.96	40°09'02.030"N	104°42'53.580"W	0.00	
4917.00†	26.000	203.875	4648.47	-1154.66	-1153.83	-510.71	40°09'01.634"N	104°42'53.809"W	0.00	
5007.71	26.000	203.875	4730.00	-1191.05	-1190.19	-526.80	40°09'01.274"N	104°42'54.016"W	0.00	BEGIN DROP
5017.00†	25.814	203.875	4738.35	-1194.76	-1193.90	-528.44	40°09'01.238"N	104°42'54.037"W	2.00	
5117.00†	23.814	203.875	4829.12	-1233.16	-1232.28	-545.43	40°09'00.858"N	104°42'54.256"W	2.00	
5217.00†	21.814	203.875	4921.29	-1268.64	-1267.73	-561.12	40°09'00.508"N	104°42'54.458"W	2.00	
5317.00†	19.814	203.875	5014.76	-1301.16	-1300.23	-575.50	40°09'00.187"N	104°42'54.643"W	2.00	
5417.00†	17.814	203.875	5109.41	-1330.67	-1329.71	-588.55	40°08'59.896"N	104°42'54.811"W	2.00	
5517.00†	15.814	203.875	5205.13	-1357.14	-1356.17	-600.26	40°08'59.634"N	104°42'54.962"W	2.00	
5617.00†	13.814	203.875	5301.80	-1380.53	-1379.54	-610.61	40°08'59.403"N	104°42'55.095"W	2.00	
5717.00†	11.814	203.875	5399.30	-1400.83	-1399.83	-619.59	40°08'59.203"N	104°42'55.211"W	2.00	
5817.00†	9.814	203.875	5497.52	-1418.00	-1416.98	-627.18	40°08'59.033"N	104°42'55.309"W	2.00	
5917.00†	7.814	203.875	5596.34	-1432.02	-1430.99	-633.38	40°08'58.895"N	104°42'55.389"W	2.00	
6017.00†	5.814	203.875	5695.63	-1442.88	-1441.84	-638.18	40°08'58.788"N	104°42'55.450"W	2.00	
6117.00†	3.814	203.875	5795.27	-1450.56	-1449.52	-641.58	40°08'58.712"N	104°42'55.494"W	2.00	
6217.00†	1.814	203.875	5895.14	-1455.05	-1454.01	-643.57	40°08'58.667"N	104°42'55.520"W	2.00	
6307.71	0.000	0.093	5985.84	-1456.36	-1455.32	-644.15	40°08'58.654"N	104°42'55.527"W	2.00	END DROP
6317.00†	0.000	0.093	5995.13	-1456.36	-1455.32	-644.15	40°08'58.654"N	104°42'55.527"W	0.00	
6417.00†	0.000	0.093	6095.13	-1456.36	-1455.32	-644.15	40°08'58.654"N	104°42'55.527"W	0.00	
6517.00†	0.000	0.093	6195.13	-1456.36	-1455.32	-644.15	40°08'58.654"N	104°42'55.527"W	0.00	
6617.00†	0.000	0.093	6295.13	-1456.36	-1455.32	-644.15	40°08'58.654"N	104°42'55.527"W	0.00	
6717.00†	0.000	0.093	6395.13	-1456.36	-1455.32	-644.15	40°08'58.654"N	104°42'55.527"W	0.00	
6817.00†	0.000	0.093	6495.13	-1456.36	-1455.32	-644.15	40°08'58.654"N	104°42'55.527"W	0.00	
6868.91	0.000	0.093	6547.04	-1456.36	-1455.32	-644.15	40°08'58.654"N	104°42'55.527"W	0.00	KOP, BUILD @ 10°/100'
6917.00†	4.809	0.093	6595.07	-1454.35	-1453.30	-644.15	40°08'58.674"N	104°42'55.527"W	10.00	
7017.00†	14.809	0.093	6693.48	-1437.33	-1436.29	-644.12	40°08'58.842"N	104°42'55.527"W	10.00	
7117.00†	24.809	0.093	6787.45	-1403.49	-1402.44	-644.06	40°08'59.177"N	104°42'55.526"W	10.00	
7217.00†	34.809	0.093	6874.11	-1353.84	-1352.80	-643.98	40°08'59.668"N	104°42'55.525"W	10.00	
7317.00†	44.809	0.093	6950.83	-1289.90	-1288.85	-643.88	40°09'00.299"N	104°42'55.524"W	10.00	
7386.42†	51.751	0.093	6997.00	-1238.11	-1237.07	-643.80	40°09'00.811"N	104°42'55.523"W	10.00	SHARON SPRINGS
7417.00†	54.809	0.093	7015.28	-1213.61	-1212.56	-643.76	40°09'01.053"N	104°42'55.522"W	10.00	
7517.00†	64.809	0.093	7065.51	-1127.28	-1126.24	-643.62	40°09'01.906"N	104°42'55.520"W	10.00	
7518.16†	64.925	0.093	7066.00	-1126.23	-1125.18	-643.62	40°09'01.917"N	104°42'55.520"W	10.00	NIOBRARA
7617.00†	74.809	0.093	7099.98	-1033.54	-1032.50	-643.47	40°09'02.833"N	104°42'55.519"W	10.00	
7651.45†	78.254	0.093	7108.00	-1000.05	-999.00	-643.41	40°09'03.164"N	104°42'55.518"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 (185 stations) † = interpolated/extrapolated station										
MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Latitude	Longitude	DLS [°/100ft]	Comments
7717.00†	84.809	0.093	7117.65	-935.25	-934.20	-643.31	40°09'03.804"N	104°42'55.517"W	10.00	
7770.17	90.125	0.093	7120.00	-882.15	-881.11	-643.22	40°09'04.329"N	104°42'55.515"W	10.00	LANDING POINT
7817.00†	90.125	0.093	7119.89	-835.32	-834.28	-643.15	40°09'04.792"N	104°42'55.515"W	0.00	
7917.00†	90.125	0.093	7119.68	-735.32	-734.28	-642.98	40°09'05.780"N	104°42'55.512"W	0.00	
8017.00†	90.125	0.093	7119.46	-635.32	-634.28	-642.82	40°09'06.768"N	104°42'55.510"W	0.00	
8117.00†	90.125	0.093	7119.24	-535.32	-534.28	-642.66	40°09'07.756"N	104°42'55.508"W	0.00	
8217.00†	90.125	0.093	7119.02	-435.32	-434.28	-642.50	40°09'08.744"N	104°42'55.506"W	0.00	
8317.00†	90.125	0.093	7118.80	-335.32	-334.28	-642.34	40°09'09.733"N	104°42'55.504"W	0.00	
8417.00†	90.125	0.093	7118.58	-235.32	-234.28	-642.18	40°09'10.721"N	104°42'55.502"W	0.00	
8517.00†	90.125	0.093	7118.36	-135.32	-134.28	-642.02	40°09'11.709"N	104°42'55.500"W	0.00	
8617.00†	90.125	0.093	7118.14	-35.32	-34.28	-641.85	40°09'12.697"N	104°42'55.498"W	0.00	
8717.00†	90.125	0.093	7117.93	64.68	65.72	-641.69	40°09'13.685"N	104°42'55.496"W	0.00	
8817.00†	90.125	0.093	7117.71	164.68	165.72	-641.53	40°09'14.674"N	104°42'55.494"W	0.00	
8917.00†	90.125	0.093	7117.49	264.68	265.72	-641.37	40°09'15.662"N	104°42'55.492"W	0.00	
9017.00†	90.125	0.093	7117.27	364.68	365.72	-641.21	40°09'16.650"N	104°42'55.490"W	0.00	
9117.00†	90.125	0.093	7117.05	464.68	465.72	-641.05	40°09'17.638"N	104°42'55.488"W	0.00	
9217.00†	90.125	0.093	7116.83	564.68	565.72	-640.88	40°09'18.626"N	104°42'55.486"W	0.00	
9317.00†	90.125	0.093	7116.61	664.68	665.72	-640.72	40°09'19.615"N	104°42'55.484"W	0.00	
9417.00†	90.125	0.093	7116.39	764.68	765.72	-640.56	40°09'20.603"N	104°42'55.482"W	0.00	
9517.00†	90.125	0.093	7116.17	864.68	865.72	-640.40	40°09'21.591"N	104°42'55.480"W	0.00	
9617.00†	90.125	0.093	7115.96	964.68	965.72	-640.24	40°09'22.579"N	104°42'55.478"W	0.00	
9717.00†	90.125	0.093	7115.74	1064.68	1065.72	-640.08	40°09'23.567"N	104°42'55.476"W	0.00	
9817.00†	90.125	0.093	7115.52	1164.68	1165.72	-639.92	40°09'24.556"N	104°42'55.474"W	0.00	
9917.00†	90.125	0.093	7115.30	1264.68	1265.72	-639.75	40°09'25.544"N	104°42'55.472"W	0.00	
10017.00†	90.125	0.093	7115.08	1364.68	1365.72	-639.59	40°09'26.532"N	104°42'55.469"W	0.00	
10117.00†	90.125	0.093	7114.86	1464.68	1465.72	-639.43	40°09'27.520"N	104°42'55.467"W	0.00	
10217.00†	90.125	0.093	7114.64	1564.68	1565.72	-639.27	40°09'28.508"N	104°42'55.465"W	0.00	
10317.00†	90.125	0.093	7114.42	1664.68	1665.72	-639.11	40°09'29.497"N	104°42'55.463"W	0.00	
10417.00†	90.125	0.093	7114.20	1764.68	1765.72	-638.95	40°09'30.485"N	104°42'55.461"W	0.00	
10517.00†	90.125	0.093	7113.99	1864.68	1865.71	-638.79	40°09'31.473"N	104°42'55.459"W	0.00	
10617.00†	90.125	0.093	7113.77	1964.68	1965.71	-638.62	40°09'32.461"N	104°42'55.457"W	0.00	
10717.00†	90.125	0.093	7113.55	2064.67	2065.71	-638.46	40°09'33.449"N	104°42'55.455"W	0.00	
10817.00†	90.125	0.093	7113.33	2164.67	2165.71	-638.30	40°09'34.438"N	104°42'55.453"W	0.00	
10917.00†	90.125	0.093	7113.11	2264.67	2265.71	-638.14	40°09'35.426"N	104°42'55.451"W	0.00	
11017.00†	90.125	0.093	7112.89	2364.67	2365.71	-637.98	40°09'36.414"N	104°42'55.449"W	0.00	
11117.00†	90.125	0.093	7112.67	2464.67	2465.71	-637.82	40°09'37.402"N	104°42'55.447"W	0.00	
11217.00†	90.125	0.093	7112.45	2564.67	2565.71	-637.65	40°09'38.390"N	104°42'55.445"W	0.00	
11317.00†	90.125	0.093	7112.24	2664.67	2665.71	-637.49	40°09'39.379"N	104°42'55.443"W	0.00	
11417.00†	90.125	0.093	7112.02	2764.67	2765.71	-637.33	40°09'40.367"N	104°42'55.441"W	0.00	
11517.00†	90.125	0.093	7111.80	2864.67	2865.71	-637.17	40°09'41.355"N	104°42'55.439"W	0.00	
11617.00†	90.125	0.093	7111.58	2964.67	2965.71	-637.01	40°09'42.343"N	104°42'55.437"W	0.00	
11717.00†	90.125	0.093	7111.36	3064.67	3065.71	-636.85	40°09'43.331"N	104°42'55.435"W	0.00	
11817.00†	90.125	0.093	7111.14	3164.67	3165.71	-636.69	40°09'44.320"N	104°42'55.433"W	0.00	
11917.00†	90.125	0.093	7110.92	3264.67	3265.71	-636.52	40°09'45.308"N	104°42'55.431"W	0.00	
12017.00†	90.125	0.093	7110.70	3364.67	3365.71	-636.36	40°09'46.296"N	104°42'55.429"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 (185 stations) † = interpolated/extrapolated station										
MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Latitude	Longitude	DLS [°/100ft]	Comments
12117.00†	90.125	0.093	7110.48	3464.67	3465.71	-636.20	40°09'47.284"N	104°42'55.426"W	0.00	
12217.00†	90.125	0.093	7110.27	3564.67	3565.71	-636.04	40°09'48.272"N	104°42'55.424"W	0.00	
12317.00†	90.125	0.093	7110.05	3664.67	3665.71	-635.88	40°09'49.261"N	104°42'55.422"W	0.00	
12417.00†	90.125	0.093	7109.83	3764.67	3765.71	-635.72	40°09'50.249"N	104°42'55.420"W	0.00	
12517.00†	90.125	0.093	7109.61	3864.67	3865.71	-635.56	40°09'51.237"N	104°42'55.418"W	0.00	
12617.00†	90.125	0.093	7109.39	3964.67	3965.71	-635.39	40°09'52.225"N	104°42'55.416"W	0.00	
12717.00†	90.125	0.093	7109.17	4064.67	4065.71	-635.23	40°09'53.213"N	104°42'55.414"W	0.00	
12817.00†	90.125	0.093	7108.95	4164.67	4165.71	-635.07	40°09'54.202"N	104°42'55.412"W	0.00	
12917.00†	90.125	0.093	7108.73	4264.67	4265.71	-634.91	40°09'55.190"N	104°42'55.410"W	0.00	
13017.00†	90.125	0.093	7108.51	4364.67	4365.71	-634.75	40°09'56.178"N	104°42'55.408"W	0.00	
13117.00†	90.125	0.093	7108.30	4464.67	4465.71	-634.59	40°09'57.166"N	104°42'55.406"W	0.00	
13217.00†	90.125	0.093	7108.08	4564.67	4565.70	-634.42	40°09'58.154"N	104°42'55.404"W	0.00	
13252.19†	90.125	0.093	7108.00	4599.86	4600.89	-634.37	40°09'58.502"N	104°42'55.403"W	0.00	NIOBRARA B
13317.00†	90.125	0.093	7107.86	4664.67	4665.70	-634.26	40°09'59.143"N	104°42'55.402"W	0.00	
13417.00†	90.125	0.093	7107.64	4764.67	4765.70	-634.10	40°10'00.131"N	104°42'55.400"W	0.00	
13517.00†	90.125	0.093	7107.42	4864.67	4865.70	-633.94	40°10'01.119"N	104°42'55.398"W	0.00	
13617.00†	90.125	0.093	7107.20	4964.67	4965.70	-633.78	40°10'02.107"N	104°42'55.396"W	0.00	
13717.00†	90.125	0.093	7106.98	5064.67	5065.70	-633.62	40°10'03.095"N	104°42'55.394"W	0.00	
13817.00†	90.125	0.093	7106.76	5164.67	5165.70	-633.46	40°10'04.084"N	104°42'55.392"W	0.00	
13917.00†	90.125	0.093	7106.55	5264.67	5265.70	-633.29	40°10'05.072"N	104°42'55.390"W	0.00	
14017.00†	90.125	0.093	7106.33	5364.67	5365.70	-633.13	40°10'06.060"N	104°42'55.388"W	0.00	
14117.00†	90.125	0.093	7106.11	5464.67	5465.70	-632.97	40°10'07.048"N	104°42'55.386"W	0.00	
14217.00†	90.125	0.093	7105.89	5564.67	5565.70	-632.81	40°10'08.036"N	104°42'55.383"W	0.00	
14317.00†	90.125	0.093	7105.67	5664.67	5665.70	-632.65	40°10'09.025"N	104°42'55.381"W	0.00	
14417.00†	90.125	0.093	7105.45	5764.67	5765.70	-632.49	40°10'10.013"N	104°42'55.379"W	0.00	
14517.00†	90.125	0.093	7105.23	5864.67	5865.70	-632.33	40°10'11.001"N	104°42'55.377"W	0.00	
14617.00†	90.125	0.093	7105.01	5964.67	5965.70	-632.16	40°10'11.989"N	104°42'55.375"W	0.00	
14717.00†	90.125	0.093	7104.79	6064.67	6065.70	-632.00	40°10'12.977"N	104°42'55.373"W	0.00	
14817.00†	90.125	0.093	7104.58	6164.67	6165.70	-631.84	40°10'13.966"N	104°42'55.371"W	0.00	
14917.00†	90.125	0.093	7104.36	6264.66	6265.70	-631.68	40°10'14.954"N	104°42'55.369"W	0.00	
15017.00†	90.125	0.093	7104.14	6364.66	6365.70	-631.52	40°10'15.942"N	104°42'55.367"W	0.00	
15117.00†	90.125	0.093	7103.92	6464.66	6465.70	-631.36	40°10'16.930"N	104°42'55.365"W	0.00	
15217.00†	90.125	0.093	7103.70	6564.66	6565.70	-631.19	40°10'17.918"N	104°42'55.363"W	0.00	
15317.00†	90.125	0.093	7103.48	6664.66	6665.70	-631.03	40°10'18.907"N	104°42'55.361"W	0.00	
15417.00†	90.125	0.093	7103.26	6764.66	6765.70	-630.87	40°10'19.895"N	104°42'55.359"W	0.00	
15517.00†	90.125	0.093	7103.04	6864.66	6865.70	-630.71	40°10'20.883"N	104°42'55.357"W	0.00	
15617.00†	90.125	0.093	7102.82	6964.66	6965.70	-630.55	40°10'21.871"N	104°42'55.355"W	0.00	
15717.00†	90.125	0.093	7102.61	7064.66	7065.70	-630.39	40°10'22.859"N	104°42'55.353"W	0.00	
15817.00†	90.125	0.093	7102.39	7164.66	7165.70	-630.23	40°10'23.848"N	104°42'55.351"W	0.00	
15917.00†	90.125	0.093	7102.17	7264.66	7265.69	-630.06	40°10'24.836"N	104°42'55.349"W	0.00	
16017.00†	90.125	0.093	7101.95	7364.66	7365.69	-629.90	40°10'25.824"N	104°42'55.347"W	0.00	
16117.00†	90.125	0.093	7101.73	7464.66	7465.69	-629.74	40°10'26.812"N	104°42'55.345"W	0.00	
16217.00†	90.125	0.093	7101.51	7564.66	7565.69	-629.58	40°10'27.800"N	104°42'55.343"W	0.00	
16317.00†	90.125	0.093	7101.29	7664.66	7665.69	-629.42	40°10'28.789"N	104°42'55.340"W	0.00	
16417.00†	90.125	0.093	7101.07	7764.66	7765.69	-629.26	40°10'29.777"N	104°42'55.338"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 (185 stations) † = interpolated/extrapolated station										
MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Latitude	Longitude	DLS [°/100ft]	Comments
16517.00†	90.125	0.093	7100.86	7864.66	7865.69	-629.10	40°10'30.765"N	104°42'55.336"W	0.00	
16617.00†	90.125	0.093	7100.64	7964.66	7965.69	-628.93	40°10'31.753"N	104°42'55.334"W	0.00	
16717.00†	90.125	0.093	7100.42	8064.66	8065.69	-628.77	40°10'32.741"N	104°42'55.332"W	0.00	
16817.00†	90.125	0.093	7100.20	8164.66	8165.69	-628.61	40°10'33.730"N	104°42'55.330"W	0.00	
16907.71	90.125	0.093	7100.00†	8255.37	8256.40	-628.46	40°10'34.626"N	104°42'55.328"W	0.00	TOTAL DEPTH

HOLE & CASING SECTIONS -									
Ref Wellbore: THOMSEN FEDERAL 1N-31HZ PWB					Ref Wellpath: THOMSEN FEDERAL 1N-31HZ (PERMIT REV-1) 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	17.00	1300.00	1283.00	17.00	1300.00	0.00	0.00	0.00	0.00
9.625in Casing Surface	17.00	1300.00	1283.00	17.00	1300.00	0.00	0.00	0.00	0.00
8.75in Open Hole	1300.00	7770.17	6470.17	1300.00	7120.00	0.00	0.00	-881.11	-643.22
7in Casing Intermediate	17.00	7770.17	7753.17	17.00	7120.00	0.00	0.00	-881.11	-643.22
6.125in Open Hole	7770.17	16907.71	9137.54	7120.00	7100.00	-881.11	-643.22	8256.40	-628.46
4.5in Casing Production	17.00	16907.71	16890.71	17.00	7100.00	0.00	0.00	8256.40	-628.46

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		0.00	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		0.00	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		35.00	2010.35	3479.93	3223409.59	1301824.42	40°09'32.900"N	104°42'02.412"W	polygon
1) THOMSEN FEDERAL 1N-31HZ BHL ON PLAT REV-1 (575'FSL & 130'FWL, SEC.31)	16907.71	7100.00	8256.40	-628.46	3219246.12	1308033.50	40°10'34.626"N	104°42'55.328"W	point
THOMSEN FEDERAL 1N-31HZ LANDBOX		7100.00	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 (PERMIT REV-1) PWP		
Start MD [ft]	End MD [ft]	Positional Uncertainty Model	Log Name/Comment	Wellbore
17.00	16907.71	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
949.00	0.000	203.875	949.00	BASE FOX HILLS
1300.00	0.000	203.875	1300.00	SURFACE CSG SETTING DEPTH
4194.40	26.000	203.875	3999.00	PARKMAN
4657.24	26.000	203.875	4415.00	SUSSEX
7386.42	51.751	0.093	6997.00	SHARON SPRINGS
7518.16	64.925	0.093	7066.00	NIOBRARA
7651.45	78.254	0.093	7108.00	NIOBRARA B
13252.19	90.125	0.093	7108.00	NIOBRARA B

DESIGN COMMENTS				
MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Comment
17.00	0.000	203.875	17.00	TIE ON
1400.00	0.000	203.875	1400.00	BEGIN NUDGE
2700.00	26.000	203.875	2655.84	END NUDGE
5007.71	26.000	203.875	4730.00	BEGIN DROP
6307.71	0.000	0.093	5985.84	END DROP
6868.91	0.000	0.093	6547.04	KOP, BUILD @ 10°/100'
7770.17	90.125	0.093	7120.00	LANDING POINT
16907.71	90.125	0.093	7100.00	TOTAL DEPTH