

KERR-MCGEE OIL & GAS ONSHORE LP

Location: COLORADO Slot: SLOT#13 HOWARD 27C-33HZ (400' FNL & 1094' FEL, SEC. 28)
Field: WELD COUNTY (KERR MCGEE) Well: HOWARD 27C-33HZ
Facility: SEC.28-T1N-R67W Wellbore: HOWARD 27C-33HZ PWB

Plot reference wellpath is HOWARD 27C-33HZ (PERMIT REV-2) PWP

True vertical depths are referenced to ENSING 145 (RKB)	Grid System: NAD83 / Lambert Colorado SP, Northern Zone (501), US feet
Measured depths are referenced to ENSING 145 (RKB)	North Reference: True north
ENSING 145 (RKB) to Mean Sea Level: 4996 feet	Scale: True distance
Mean Sea Level to Mud line (At Slot: SLOT#13 HOWARD 27C-33HZ (400' FNL & 1094' FEL, SEC. 28)): 0 feet	Depths are in feet
Coordinates are in feet referenced to Slot	Created by: wllajef02 on 8/8/2013

Location Information

Facility Name				Grid East (US ft)	Grid North (US ft)	Latitude	Longitude
SEC.28-T1N-R67W				316923.760	121463.460	36°32'36.656"N	114°37'52.006"W
Slot	Local N (ft)	Local E (ft)	Grid East (US ft)	Grid North (US ft)	Latitude	Longitude	
SLOT#13 HOWARD 27C-33HZ (400' FNL & 1094' FEL, SEC. 28)	1416767.97	2716936.85	3170813.754	1253716.677	40°01'41.617"N	104°53'24.101"W	
ENSING 145 (RKB) to Mud line (At Slot: SLOT#13 HOWARD 27C-33HZ (400' FNL & 1094' FEL, SEC. 28))				4996ft			
Mean Sea Level to Mud line (At Slot: SLOT#13 HOWARD 27C-33HZ (400' FNL & 1094' FEL, SEC. 28))				0ft			
ENSING 145 (RKB) to Mean Sea Level				4996ft			

Survey Program

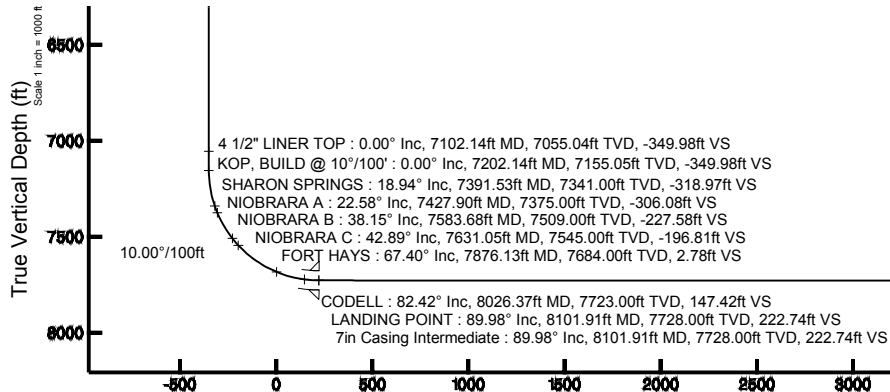
Start MD (ft)	End MD (ft)	Tool	Model	Log Name/Comment	Wellbore
13.00	8101.91	NaviTrak	NaviTrak (MagCorr)		HOWARD 27C-33HZ PWB
8101.91	12960.32	OnTrak	OnTrak (MagCorr)		HOWARD 27C-33HZ PWB

Well Profile Data

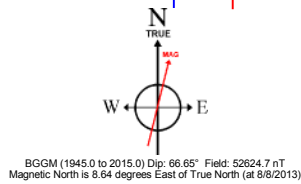
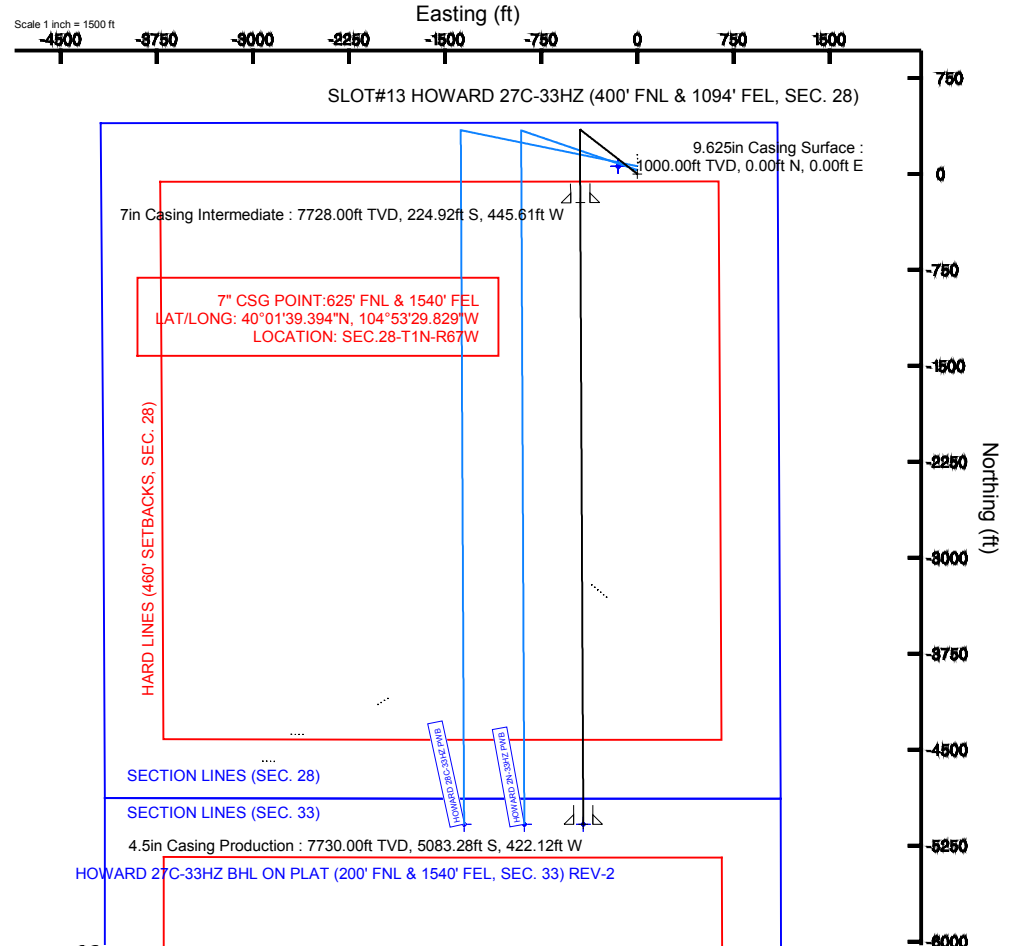
Design Comment	MD (ft)	Inc (°)	Az (°)	TVD (ft)	Local N (ft)	Local E (ft)	DLS (°/100ft)	VS (ft)
TIE-ON	13.00	0.000	307.800	13.00	0.00	0.00	0.00	0.00
BEGIN NUDGE	1100.00	0.000	307.800	1100.00	0.00	0.00	0.00	0.00
END NUDGE	1600.00	10.000	307.800	1597.47	26.68	-34.39	2.00	-26.84
BEGIN DROP	4366.56	10.000	307.800	4322.00	321.12	-413.99	0.00	-323.14
END DROP	4866.56	0.000	179.723	4819.47	347.80	-448.38	2.00	-349.98
KOP, BUILD @ 10°/100'	7202.14	0.000	179.723	7155.05	347.80	-448.38	0.00	-349.98
LANDING POINT	8101.91	89.976	179.723	7728.00	-224.92	-445.61	10.00	222.74
TOTAL DEPTH	12960.32	89.976	179.723	7730.00	-5083.28	-422.12	0.00	5081.15

Targets

Name	MD (ft)	TVD (ft)	Local N (ft)	Local E (ft)	Grid East (US ft)	Grid North (US ft)	Latitude	Longitude
HOWARD 27W-28HZ HARD LINES (460' SETBACKS, SEC. 28)		4996.00	60.11	-150.37	3170662.98	1253775.75	40°01'42.211"N	104°53'26.034"W
HOWARD 27W-28HZ HARD LINES (460' SETBACKS, SEC. 33)		4996.00	60.11	-150.37	3170662.98	1253775.75	40°01'42.211"N	104°53'26.034"W
HOWARD 27W-28HZ SECTION LINES (SEC. 28)		4996.00	60.11	-150.37	3170662.98	1253775.75	40°01'42.211"N	104°53'26.034"W
HOWARD 27W-28HZ SECTION LINES (SEC. 33)		4996.00	60.11	-150.37	3170662.98	1253775.75	40°01'42.211"N	104°53'26.034"W
HOWARD 27C-33HZ BHL ON PLAT (200' FNL & 1540' FEL, SEC. 33) REV-1		7726.00	-5083.24	-422.10	3170426.64	1248630.85	40°00'51.383"N	104°53'29.526"W
HOWARD 27C-33HZ BHL ON PLAT (200' FNL & 1540' FEL, SEC. 33) REV-2		7730.00	-5083.26	-422.10	3170426.64	1248630.83	40°00'51.383"N	104°53'29.526"W



Azimuth 179.72° with reference 0.00 N, 0.00 E



To correct azimuth from Magnetic to True add 8.64 degrees

4.5in Casing Production : 89.98° Inc, 12960.32ft MD, 7730.00ft TVD, 5081.15ft VS
TOTAL DEPTH : 89.98° Inc, 12960.32ft MD, 7730.00ft TVD, 5081.15ft VS
HOWARD 27C-33HZ BHL ON PLAT (200' FNL & 1540' FEL, SEC. 33) REV-2

Scale 1 inch = 1000 ft



Planned Wellpath Report

HOWARD 27C-33HZ (PERMIT REV-2) PWP

Page 1 of 7



REFERENCE WELLPATH IDENTIFICATION

Operator	KERR-MCGEE OIL & GAS ONSHORE LP	Slot	SLOT#13 HOWARD 27C-33HZ (400' FNL & 1094' FEL, SEC. 28)
Area	COLORADO	Well	HOWARD 27C-33HZ
Field	WELD COUNTY (KERR MCGEE)	Wellbore	HOWARD 27C-33HZ PWB
Facility	SEC.28-T1N-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	Wilsjef02
Scale	0.999964	Report Generated	8/8/2013 at 07:38:58
Convergence at slot	n/a	Database/Source file	WellArchitectDB/HOWARD_27C-33HZ_PWB.xml

WELLPATH LOCATION

	Local coordinates		Grid coordinates		Geographic coordinates	
	North[ft]	East[ft]	Easting[US ft]	Northing[US ft]	Latitude	Longitude
Slot Location	1416767.97	2716936.85	3170813.75	1253716.68	40°01'41.617"N	104°53'24.101"W
Facility Reference Pt			316923.76	121463.46	36°32'36.656"N	114°37'52.006"W
Field Reference Pt			3197771.84	1268891.29	40°04'09.600"N	104°47'36.000"W

WELLPATH DATUM

Calculation method	Minimum curvature	ENSING 145 (RKB) to Facility Vertical Datum	4996.00ft
Horizontal Reference Pt	Slot	ENSING 145 (RKB) to Mean Sea Level	4996.00ft
Vertical Reference Pt	ENSING 145 (RKB)	ENSING 145 (RKB) to Mud Line at Slot (SLOT#13 HOWARD 27C-33HZ (400' FNL & 1094' FEL, SEC. 28))	4996.00ft
MD Reference Pt	ENSING 145 (RKB)	Section Origin	N 0.00, E 0.00 ft
Field Vertical Reference	Mean Sea Level	Section Azimuth	179.72°



Planned Wellpath Report

HOWARD 27C-33HZ (PERMIT REV-2) PWP

Page 2 of 7



REFERENCE WELLPATH IDENTIFICATION

Operator	KERR-MCGEE OIL & GAS ONSHORE LP	Slot	SLOT#13 HOWARD 27C-33HZ (400' FNL & 1094' FEL, SEC. 28)
Area	COLORADO	Well	HOWARD 27C-33HZ
Field	WELD COUNTY (KERR MCGEE)	Wellbore	HOWARD 27C-33HZ PWB
Facility	SEC.28-T1N-R67W		

WELLPATH DATA (147 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	307.800	0.00	0.00	0.00	0.00	40°01'41.617"N	104°53'24.101"W	0.00	
13.00	0.000	307.800	13.00	0.00	0.00	0.00	40°01'41.617"N	104°53'24.101"W	0.00	TIE-ON
113.00†	0.000	307.800	113.00	0.00	0.00	0.00	40°01'41.617"N	104°53'24.101"W	0.00	
213.00†	0.000	307.800	213.00	0.00	0.00	0.00	40°01'41.617"N	104°53'24.101"W	0.00	
313.00†	0.000	307.800	313.00	0.00	0.00	0.00	40°01'41.617"N	104°53'24.101"W	0.00	
413.00†	0.000	307.800	413.00	0.00	0.00	0.00	40°01'41.617"N	104°53'24.101"W	0.00	
513.00†	0.000	307.800	513.00	0.00	0.00	0.00	40°01'41.617"N	104°53'24.101"W	0.00	
613.00†	0.000	307.800	613.00	0.00	0.00	0.00	40°01'41.617"N	104°53'24.101"W	0.00	
713.00†	0.000	307.800	713.00	0.00	0.00	0.00	40°01'41.617"N	104°53'24.101"W	0.00	
813.00†	0.000	307.800	813.00	0.00	0.00	0.00	40°01'41.617"N	104°53'24.101"W	0.00	
913.00†	0.000	307.800	913.00	0.00	0.00	0.00	40°01'41.617"N	104°53'24.101"W	0.00	
1013.00†	0.000	307.800	1013.00	0.00	0.00	0.00	40°01'41.617"N	104°53'24.101"W	0.00	
1092.00†	0.000	307.800	1092.00	0.00	0.00	0.00	40°01'41.617"N	104°53'24.101"W	0.00	FOX HILLS BASE
1100.00	0.000	307.800	1100.00	0.00	0.00	0.00	40°01'41.617"N	104°53'24.101"W	0.00	BEGIN NUDGE
1113.00†	0.260	307.800	1113.00	-0.02	0.02	-0.02	40°01'41.617"N	104°53'24.101"W	2.00	
1213.00†	2.260	307.800	1212.97	-1.37	1.37	-1.76	40°01'41.630"N	104°53'24.124"W	2.00	
1313.00†	4.260	307.800	1312.80	-4.88	4.85	-6.25	40°01'41.665"N	104°53'24.181"W	2.00	
1413.00†	6.260	307.800	1412.38	-10.54	10.47	-13.50	40°01'41.720"N	104°53'24.275"W	2.00	
1513.00†	8.260	307.800	1511.57	-18.33	18.21	-23.48	40°01'41.797"N	104°53'24.403"W	2.00	
1600.00	10.000	307.800	1597.47	-26.84	26.68	-34.39	40°01'41.881"N	104°53'24.543"W	2.00	END NUDGE
1613.00†	10.000	307.800	1610.27	-28.24	28.06	-36.17	40°01'41.894"N	104°53'24.566"W	0.00	
1713.00†	10.000	307.800	1708.75	-38.95	38.70	-49.89	40°01'41.999"N	104°53'24.742"W	0.00	
1813.00†	10.000	307.800	1807.23	-49.66	49.34	-63.62	40°01'42.105"N	104°53'24.919"W	0.00	
1913.00†	10.000	307.800	1905.71	-60.37	59.99	-77.34	40°01'42.210"N	104°53'25.095"W	0.00	
2013.00†	10.000	307.800	2004.19	-71.08	70.63	-91.06	40°01'42.315"N	104°53'25.272"W	0.00	
2113.00†	10.000	307.800	2102.67	-81.79	81.27	-104.78	40°01'42.420"N	104°53'25.448"W	0.00	
2213.00†	10.000	307.800	2201.15	-92.49	91.92	-118.50	40°01'42.525"N	104°53'25.624"W	0.00	
2313.00†	10.000	307.800	2299.63	-103.20	102.56	-132.22	40°01'42.631"N	104°53'25.801"W	0.00	
2413.00†	10.000	307.800	2398.11	-113.91	113.20	-145.94	40°01'42.736"N	104°53'25.977"W	0.00	
2513.00†	10.000	307.800	2496.59	-124.62	123.85	-159.66	40°01'42.841"N	104°53'26.153"W	0.00	
2613.00†	10.000	307.800	2595.08	-135.33	134.49	-173.38	40°01'42.946"N	104°53'26.330"W	0.00	
2713.00†	10.000	307.800	2693.56	-146.04	145.13	-187.10	40°01'43.051"N	104°53'26.506"W	0.00	
2813.00†	10.000	307.800	2792.04	-156.75	155.78	-200.82	40°01'43.156"N	104°53'26.683"W	0.00	
2913.00†	10.000	307.800	2890.52	-167.46	166.42	-214.54	40°01'43.262"N	104°53'26.859"W	0.00	
3013.00†	10.000	307.800	2989.00	-178.17	177.06	-228.27	40°01'43.367"N	104°53'27.035"W	0.00	
3113.00†	10.000	307.800	3087.48	-188.88	187.70	-241.99	40°01'43.472"N	104°53'27.212"W	0.00	
3213.00†	10.000	307.800	3185.96	-199.59	198.35	-255.71	40°01'43.577"N	104°53'27.388"W	0.00	
3313.00†	10.000	307.800	3284.44	-210.30	208.99	-269.43	40°01'43.682"N	104°53'27.565"W	0.00	
3413.00†	10.000	307.800	3382.92	-221.01	219.63	-283.15	40°01'43.787"N	104°53'27.741"W	0.00	
3513.00†	10.000	307.800	3481.40	-231.72	230.28	-296.87	40°01'43.893"N	104°53'27.917"W	0.00	
3613.00†	10.000	307.800	3579.88	-242.43	240.92	-310.59	40°01'43.998"N	104°53'28.094"W	0.00	
3713.00†	10.000	307.800	3678.36	-253.14	251.56	-324.31	40°01'44.103"N	104°53'28.270"W	0.00	
3813.00†	10.000	307.800	3776.84	-263.85	262.21	-338.03	40°01'44.208"N	104°53'28.446"W	0.00	
3913.00†	10.000	307.800	3875.33	-274.56	272.85	-351.75	40°01'44.313"N	104°53'28.623"W	0.00	
4013.00†	10.000	307.800	3973.81	-285.27	283.49	-365.47	40°01'44.419"N	104°53'28.799"W	0.00	



Planned Wellpath Report

HOWARD 27C-33HZ (PERMIT REV-2) PWP

Page 3 of 7



REFERENCE WELLPATH IDENTIFICATION

Operator	KERR-MCGEE OIL & GAS ONSHORE LP	Slot	SLOT#13 HOWARD 27C-33HZ (400' FNL & 1094' FEL, SEC. 28)
Area	COLORADO	Well	HOWARD 27C-33HZ
Field	WELD COUNTY (KERR MCGEE)	Wellbore	HOWARD 27C-33HZ PWB
Facility	SEC.28-T1N-R67W		

WELLPATH DATA (147 stations) † = interpolated/extrapolated station

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Latitude	Longitude	DLS [°/100ft]	Comments
4113.00†	10.000	307.800	4072.29	-295.98	294.13	-379.20	40°01'44.524"N	104°53'28.976"W	0.00	
4213.00†	10.000	307.800	4170.77	-306.69	304.78	-392.92	40°01'44.629"N	104°53'29.152"W	0.00	
4313.00†	10.000	307.800	4269.25	-317.40	315.42	-406.64	40°01'44.734"N	104°53'29.328"W	0.00	
4366.56	10.000	307.800	4322.00	-323.14	321.12	-413.99	40°01'44.790"N	104°53'29.423"W	0.00	BEGIN DROP
4413.00†	9.071	307.800	4367.79	-327.88	325.84	-420.07	40°01'44.837"N	104°53'29.501"W	2.00	
4513.00†	7.071	307.800	4466.80	-336.54	334.44	-431.16	40°01'44.922"N	104°53'29.644"W	2.00	
4613.00†	5.071	307.800	4566.23	-343.07	340.92	-439.52	40°01'44.986"N	104°53'29.751"W	2.00	
4713.00†	3.071	307.800	4665.97	-347.45	345.27	-445.13	40°01'45.029"N	104°53'29.823"W	2.00	
4813.00†	1.071	307.800	4765.90	-349.67	347.49	-447.98	40°01'45.051"N	104°53'29.860"W	2.00	
4827.10†	0.789	307.800	4780.00	-349.82	347.63	-448.16	40°01'45.052"N	104°53'29.862"W	2.00	SUSSEX
4866.56	0.000	179.723	4819.47	-349.98	347.80	-448.38	40°01'45.054"N	104°53'29.865"W	2.00	END DROP
4913.00†	0.000	179.723	4865.90	-349.98	347.80	-448.38	40°01'45.054"N	104°53'29.865"W	0.00	
5013.00†	0.000	179.723	4965.90	-349.98	347.80	-448.38	40°01'45.054"N	104°53'29.865"W	0.00	
5113.00†	0.000	179.723	5065.90	-349.98	347.80	-448.38	40°01'45.054"N	104°53'29.865"W	0.00	
5213.00†	0.000	179.723	5165.90	-349.98	347.80	-448.38	40°01'45.054"N	104°53'29.865"W	0.00	
5313.00†	0.000	179.723	5265.90	-349.98	347.80	-448.38	40°01'45.054"N	104°53'29.865"W	0.00	
5413.00†	0.000	179.723	5365.90	-349.98	347.80	-448.38	40°01'45.054"N	104°53'29.865"W	0.00	
5513.00†	0.000	179.723	5465.90	-349.98	347.80	-448.38	40°01'45.054"N	104°53'29.865"W	0.00	
5613.00†	0.000	179.723	5565.90	-349.98	347.80	-448.38	40°01'45.054"N	104°53'29.865"W	0.00	
5713.00†	0.000	179.723	5665.90	-349.98	347.80	-448.38	40°01'45.054"N	104°53'29.865"W	0.00	
5813.00†	0.000	179.723	5765.90	-349.98	347.80	-448.38	40°01'45.054"N	104°53'29.865"W	0.00	
5913.00†	0.000	179.723	5865.90	-349.98	347.80	-448.38	40°01'45.054"N	104°53'29.865"W	0.00	
6013.00†	0.000	179.723	5965.90	-349.98	347.80	-448.38	40°01'45.054"N	104°53'29.865"W	0.00	
6113.00†	0.000	179.723	6065.90	-349.98	347.80	-448.38	40°01'45.054"N	104°53'29.865"W	0.00	
6213.00†	0.000	179.723	6165.90	-349.98	347.80	-448.38	40°01'45.054"N	104°53'29.865"W	0.00	
6313.00†	0.000	179.723	6265.90	-349.98	347.80	-448.38	40°01'45.054"N	104°53'29.865"W	0.00	
6413.00†	0.000	179.723	6365.90	-349.98	347.80	-448.38	40°01'45.054"N	104°53'29.865"W	0.00	
6513.00†	0.000	179.723	6465.90	-349.98	347.80	-448.38	40°01'45.054"N	104°53'29.865"W	0.00	
6613.00†	0.000	179.723	6565.90	-349.98	347.80	-448.38	40°01'45.054"N	104°53'29.865"W	0.00	
6713.00†	0.000	179.723	6665.90	-349.98	347.80	-448.38	40°01'45.054"N	104°53'29.865"W	0.00	
6813.00†	0.000	179.723	6765.90	-349.98	347.80	-448.38	40°01'45.054"N	104°53'29.865"W	0.00	
6913.00†	0.000	179.723	6865.90	-349.98	347.80	-448.38	40°01'45.054"N	104°53'29.865"W	0.00	
7013.00†	0.000	179.723	6965.90	-349.98	347.80	-448.38	40°01'45.054"N	104°53'29.865"W	0.00	
7102.14†	0.000	179.723	7055.04	-349.98	347.80	-448.38	40°01'45.054"N	104°53'29.865"W	0.00	4 1/2" LINER TOP
7113.00†	0.000	179.723	7065.90	-349.98	347.80	-448.38	40°01'45.054"N	104°53'29.865"W	0.00	
7202.14	0.000	179.723	7155.05	-349.98	347.80	-448.38	40°01'45.054"N	104°53'29.865"W	0.00	KOP, BUILD @ 10°/100'
7213.00†	1.086	179.723	7165.90	-349.88	347.69	-448.38	40°01'45.053"N	104°53'29.865"W	10.00	
7313.00†	11.086	179.723	7265.21	-339.29	337.11	-448.33	40°01'44.948"N	104°53'29.864"W	10.00	
7391.53†	18.938	179.723	7341.00	-318.97	316.78	-448.23	40°01'44.747"N	104°53'29.863"W	10.00	SHARON SPRINGS
7413.00†	21.086	179.723	7361.17	-311.62	309.43	-448.19	40°01'44.675"N	104°53'29.863"W	10.00	
7427.90†	22.575	179.723	7375.00	-306.08	303.90	-448.16	40°01'44.620"N	104°53'29.862"W	10.00	NIOBRARA A
7513.00†	31.086	179.723	7450.87	-267.71	265.52	-447.98	40°01'44.241"N	104°53'29.860"W	10.00	
7583.68†	38.153	179.723	7509.00	-227.58	225.39	-447.78	40°01'43.844"N	104°53'29.857"W	10.00	NIOBRARA B
7613.00†	41.086	179.723	7531.58	-208.88	206.70	-447.69	40°01'43.660"N	104°53'29.856"W	10.00	
7631.05†	42.890	179.723	7545.00	-196.81	194.62	-447.64	40°01'43.540"N	104°53'29.855"W	10.00	NIOBRARA C



Planned Wellpath Report

HOWARD 27C-33HZ (PERMIT REV-2) PWP

Page 4 of 7



REFERENCE WELLPATH IDENTIFICATION

Operator	KERR-MCGEE OIL & GAS ONSHORE LP	Slot	SLOT#13 HOWARD 27C-33HZ (400' FNL & 1094' FEL, SEC. 28)
Area	COLORADO	Well	HOWARD 27C-33HZ
Field	WELD COUNTY (KERR MCGEE)	Wellbore	HOWARD 27C-33HZ PWB
Facility	SEC.28-T1N-R67W		

WELLPATH DATA (147 stations) † = interpolated/extrapolated station

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Latitude	Longitude	DLS [°/100ft]	Comments
7713.00†	51.086	179.723	7600.85	-136.93	134.75	-447.35	40°01'42.949"N	104°53'29.852"W	10.00	
7813.00†	61.086	179.723	7656.58	-54.05	51.87	-446.95	40°01'42.130"N	104°53'29.846"W	10.00	
7876.13†	67.398	179.723	7684.00	2.78	-4.96	-446.67	40°01'41.568"N	104°53'29.843"W	10.00	FORT HAYS
7913.00†	71.086	179.723	7697.07	37.25	-39.43	-446.50	40°01'41.227"N	104°53'29.841"W	10.00	
8013.00†	81.086	179.723	7721.08	134.19	-136.37	-446.04	40°01'40.269"N	104°53'29.835"W	10.00	
8026.37†	82.423	179.723	7723.00	147.42	-149.60	-445.97	40°01'40.139"N	104°53'29.834"W	10.00	CODELL
8101.91	89.976	179.723	7728.00	222.74	-224.92	-445.61	40°01'39.394"N	104°53'29.829"W	10.00	LANDING POINT
8113.00†	89.976	179.723	7728.01	233.83	-236.01	-445.55	40°01'39.285"N	104°53'29.829"W	0.00	
8213.00†	89.976	179.723	7728.05	333.83	-336.01	-445.07	40°01'38.296"N	104°53'29.822"W	0.00	
8313.00†	89.976	179.723	7728.09	433.83	-436.01	-444.59	40°01'37.308"N	104°53'29.816"W	0.00	
8413.00†	89.976	179.723	7728.13	533.83	-536.01	-444.10	40°01'36.320"N	104°53'29.810"W	0.00	
8513.00†	89.976	179.723	7728.17	633.83	-636.00	-443.62	40°01'35.332"N	104°53'29.804"W	0.00	
8613.00†	89.976	179.723	7728.21	733.83	-736.00	-443.14	40°01'34.344"N	104°53'29.797"W	0.00	
8713.00†	89.976	179.723	7728.25	833.83	-836.00	-442.65	40°01'33.355"N	104°53'29.791"W	0.00	
8813.00†	89.976	179.723	7728.30	933.83	-936.00	-442.17	40°01'32.367"N	104°53'29.785"W	0.00	
8913.00†	89.976	179.723	7728.34	1033.83	-1036.00	-441.69	40°01'31.379"N	104°53'29.779"W	0.00	
9013.00†	89.976	179.723	7728.38	1133.83	-1136.00	-441.20	40°01'30.391"N	104°53'29.772"W	0.00	
9113.00†	89.976	179.723	7728.42	1233.83	-1236.00	-440.72	40°01'29.402"N	104°53'29.766"W	0.00	
9213.00†	89.976	179.723	7728.46	1333.83	-1336.00	-440.24	40°01'28.414"N	104°53'29.760"W	0.00	
9313.00†	89.976	179.723	7728.50	1433.83	-1436.00	-439.75	40°01'27.426"N	104°53'29.754"W	0.00	
9413.00†	89.976	179.723	7728.54	1533.83	-1535.99	-439.27	40°01'26.438"N	104°53'29.747"W	0.00	
9513.00†	89.976	179.723	7728.58	1633.83	-1635.99	-438.79	40°01'25.450"N	104°53'29.741"W	0.00	
9613.00†	89.976	179.723	7728.62	1733.83	-1735.99	-438.30	40°01'24.461"N	104°53'29.735"W	0.00	
9713.00†	89.976	179.723	7728.67	1833.83	-1835.99	-437.82	40°01'23.473"N	104°53'29.729"W	0.00	
9813.00†	89.976	179.723	7728.71	1933.83	-1935.99	-437.34	40°01'22.485"N	104°53'29.722"W	0.00	
9913.00†	89.976	179.723	7728.75	2033.83	-2035.99	-436.85	40°01'21.497"N	104°53'29.716"W	0.00	
10013.00†	89.976	179.723	7728.79	2133.83	-2135.99	-436.37	40°01'20.509"N	104°53'29.710"W	0.00	
10113.00†	89.976	179.723	7728.83	2233.83	-2235.99	-435.88	40°01'19.520"N	104°53'29.704"W	0.00	
10213.00†	89.976	179.723	7728.87	2333.83	-2335.98	-435.40	40°01'18.532"N	104°53'29.698"W	0.00	
10313.00†	89.976	179.723	7728.91	2433.83	-2435.98	-434.92	40°01'17.544"N	104°53'29.691"W	0.00	
10413.00†	89.976	179.723	7728.95	2533.83	-2535.98	-434.43	40°01'16.556"N	104°53'29.685"W	0.00	
10513.00†	89.976	179.723	7728.99	2633.83	-2635.98	-433.95	40°01'15.567"N	104°53'29.679"W	0.00	
10613.00†	89.976	179.723	7729.04	2733.83	-2735.98	-433.47	40°01'14.579"N	104°53'29.673"W	0.00	
10713.00†	89.976	179.723	7729.08	2833.83	-2835.98	-432.98	40°01'13.591"N	104°53'29.666"W	0.00	
10813.00†	89.976	179.723	7729.12	2933.83	-2935.98	-432.50	40°01'12.603"N	104°53'29.660"W	0.00	
10913.00†	89.976	179.723	7729.16	3033.83	-3035.98	-432.02	40°01'11.615"N	104°53'29.654"W	0.00	
11013.00†	89.976	179.723	7729.20	3133.83	-3135.98	-431.53	40°01'10.626"N	104°53'29.648"W	0.00	
11113.00†	89.976	179.723	7729.24	3233.83	-3235.97	-431.05	40°01'09.638"N	104°53'29.641"W	0.00	
11213.00†	89.976	179.723	7729.28	3333.83	-3335.97	-430.57	40°01'08.650"N	104°53'29.635"W	0.00	
11313.00†	89.976	179.723	7729.32	3433.83	-3435.97	-430.08	40°01'07.662"N	104°53'29.629"W	0.00	
11413.00†	89.976	179.723	7729.36	3533.83	-3535.97	-429.60	40°01'06.674"N	104°53'29.623"W	0.00	
11513.00†	89.976	179.723	7729.41	3633.83	-3635.97	-429.12	40°01'05.685"N	104°53'29.616"W	0.00	
11613.00†	89.976	179.723	7729.45	3733.83	-3735.97	-428.63	40°01'04.697"N	104°53'29.610"W	0.00	
11713.00†	89.976	179.723	7729.49	3833.83	-3835.97	-428.15	40°01'03.709"N	104°53'29.604"W	0.00	
11813.00†	89.976	179.723	7729.53	3933.83	-3935.97	-427.67	40°01'02.721"N	104°53'29.598"W	0.00	



Planned Wellpath Report

HOWARD 27C-33HZ (PERMIT REV-2) PWP

Page 5 of 7



REFERENCE WELLPATH IDENTIFICATION

Operator	KERR-MCGEE OIL & GAS ONSHORE LP	Slot	SLOT#13 HOWARD 27C-33HZ (400' FNL & 1094' FEL, SEC. 28)
Area	COLORADO	Well	HOWARD 27C-33HZ
Field	WELD COUNTY (KERR MCGEE)	Wellbore	HOWARD 27C-33HZ PWB
Facility	SEC.28-T1N-R67W		

WELLPATH DATA (147 stations) † = interpolated/extrapolated station

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Latitude	Longitude	DLS [°/100ft]	Comments
11913.00†	89.976	179.723	7729.57	4033.83	-4035.96	-427.18	40°01'01.732"N	104°53'29.592"W	0.00	
12013.00†	89.976	179.723	7729.61	4133.83	-4135.96	-426.70	40°01'00.744"N	104°53'29.585"W	0.00	
12113.00†	89.976	179.723	7729.65	4233.83	-4235.96	-426.22	40°00'59.756"N	104°53'29.579"W	0.00	
12213.00†	89.976	179.723	7729.69	4333.83	-4335.96	-425.73	40°00'58.768"N	104°53'29.573"W	0.00	
12313.00†	89.976	179.723	7729.73	4433.83	-4435.96	-425.25	40°00'57.780"N	104°53'29.567"W	0.00	
12413.00†	89.976	179.723	7729.78	4533.83	-4535.96	-424.77	40°00'56.791"N	104°53'29.560"W	0.00	
12513.00†	89.976	179.723	7729.82	4633.83	-4635.96	-424.28	40°00'55.803"N	104°53'29.554"W	0.00	
12613.00†	89.976	179.723	7729.86	4733.83	-4735.96	-423.80	40°00'54.815"N	104°53'29.548"W	0.00	
12713.00†	89.976	179.723	7729.90	4833.83	-4835.96	-423.31	40°00'53.827"N	104°53'29.542"W	0.00	
12813.00†	89.976	179.723	7729.94	4933.83	-4935.95	-422.83	40°00'52.838"N	104°53'29.535"W	0.00	
12913.00†	89.976	179.723	7729.98	5033.83	-5035.95	-422.35	40°00'51.850"N	104°53'29.529"W	0.00	
12960.32	89.976	179.723	7730.00 ¹	5081.15	-5083.28	-422.12	40°00'51.383"N	104°53'29.526"W	0.00	TOTAL DEPTH

HOLE & CASING SECTIONS -

Ref Wellbore: HOWARD 27C-33HZ PWB Ref Wellpath: HOWARD 27C-33HZ (PERMIT REV-2) 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	13.00	1000.00	987.00	13.00	1000.00	0.00	0.00	0.00	0.00
9.625in Casing Surface	13.00	1000.00	987.00	13.00	1000.00	0.00	0.00	0.00	0.00
8.75in Open Hole	1000.00	8101.91	7101.91	1000.00	7728.00	0.00	0.00	-224.92	-445.61
7in Casing Intermediate	13.00	8101.91	8088.91	13.00	7728.00	0.00	0.00	-224.92	-445.61
6.125in Open Hole	8101.91	12960.32	4858.41	7728.00	7730.00	-224.92	-445.61	-5083.28	-422.12
4.5in Casing Production	13.00	12960.32	12947.32	13.00	7730.00	0.00	0.00	-5083.28	-422.12



Planned Wellpath Report

HOWARD 27C-33HZ (PERMIT REV-2) PWP

Page 6 of 7



REFERENCE WELLPATH IDENTIFICATION

Operator	KERR-MCGEE OIL & GAS ONSHORE LP	Slot	SLOT#13 HOWARD 27C-33HZ (400' FNL & 1094' FEL, SEC. 28)
Area	COLORADO	Well	HOWARD 27C-33HZ
Field	WELD COUNTY (KERR MCGEE)	Wellbore	HOWARD 27C-33HZ PWB
Facility	SEC.28-T1N-R67W		

TARGETS

Name	MD [ft]	TVD [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Shape
HOWARD 27W-28HZ HARD LINES (460' SETBACKS, SEC. 28)		4996.00	60.11	-150.37	3170662.98	1253775.75	40°01'42.211"N	104°53'26.034"W	polygon
HOWARD 27W-28HZ HARD LINES (460' SETBACKS, SEC. 33)		4996.00	60.11	-150.37	3170662.98	1253775.75	40°01'42.211"N	104°53'26.034"W	polygon
HOWARD 27W-28HZ SECTION LINES (SEC. 28)		4996.00	60.11	-150.37	3170662.98	1253775.75	40°01'42.211"N	104°53'26.034"W	polygon
HOWARD 27W-28HZ SECTION LINES (SEC. 33)		4996.00	60.11	-150.37	3170662.98	1253775.75	40°01'42.211"N	104°53'26.034"W	polygon
HOWARD 27C-33HZ BHL ON PLAT (200' FNL & 1540' FEL, SEC. 33) REV-1		7726.00	-5083.24	-422.10	3170426.64	1248630.85	40°00'51.383"N	104°53'29.526"W	point
1) HOWARD 27C-33HZ BHL ON PLAT (200' FNL & 1540' FEL, SEC. 33) REV-2		7730.00	-5083.26	-422.10	3170426.64	1248630.83	40°00'51.383"N	104°53'29.526"W	point

SURVEY PROGRAM - Ref Wellbore: HOWARD 27C-33HZ PWB Ref Wellpath: HOWARD 27C-33HZ (PERMIT REV-2) PWP

Start MD [ft]	End MD [ft]	Positional Uncertainty Model	Log Name/Comment	Wellbore
13.00	8101.91	NaviTrak (MagCorr)		HOWARD 27C-33HZ PWB
8101.91	12960.32	OnTrak (MagCorr)		HOWARD 27C-33HZ PWB



Planned Wellpath Report

HOWARD 27C-33HZ (PERMIT REV-2) PWP

Page 7 of 7



REFERENCE WELLPATH IDENTIFICATION

Operator	KERR-MCGEE OIL & GAS ONSHORE LP	Slot	SLOT#13 HOWARD 27C-33HZ (400' FNL & 1094' FEL, SEC. 28)
Area	COLORADO	Well	HOWARD 27C-33HZ
Field	WELD COUNTY (KERR MCGEE)	Wellbore	HOWARD 27C-33HZ PWB
Facility	SEC.28-T1N-R67W		

WELLPATH COMMENTS

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Comment
1092.00	0.000	307.800	1092.00	FOX HILLS BASE
4827.10	0.789	307.800	4780.00	SUSSEX
7102.14	0.000	179.723	7055.04	4 1/2" LINER TOP
7391.53	18.938	179.723	7341.00	SHARON SPRINGS
7427.90	22.575	179.723	7375.00	NIOBRARA A
7583.68	38.153	179.723	7509.00	NIOBRARA B
7631.05	42.890	179.723	7545.00	NIOBRARA C
7876.13	67.398	179.723	7684.00	FORT HAYS
8026.37	82.423	179.723	7723.00	CODELL