



Gyroscopic Survey Report  
for  
KPK

Well Location	WELD
Well Name	MARIE GERHARDT B #5
Rig Number	
Survey Date	11/19/2014
Latitude	40.1290710°N
Longitude	104.8557580°W
North Reference	True North
Grid Correction	None
Depth Reference	GL (4925.00 ft)
Calculation Method	Minimum Curvature
Section (VS) Ref	0.00N (ft), 0.00E (ft), 310.32Azim (deg)
Definitive Survey	MARIE GERHARDT B #5
Operator(s)	C KIRBY

**Well Notes**

API-05-123-08916



Well Name: MARIE GERHARDT B #5

Survey: MARIE GERHARDT B #5

Survey Date: 11/19/2014

MD ft	Inc deg	Azim deg	TVD ft	VS ft	+N/-S ft	+E/-W ft	Closure Distance ft	Closure Direction deg	DLS %/100ft
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Invalid
86.96	0.27	29.35	86.96	0.04	0.18	0.10	0.20	29.35	0.30
123.84	0.46	27.94	123.84	0.09	0.38	0.21	0.44	28.87	0.54
148.62	0.53	0.72	148.62	0.18	0.58	0.26	0.64	23.86	0.98
174.79	0.52	4.57	174.78	0.33	0.82	0.27	0.87	18.12	0.14
197.96	0.48	17.45	197.95	0.43	1.02	0.31	1.07	16.74	0.51
224.94	0.49	28.12	224.94	0.50	1.23	0.40	1.29	17.80	0.33
247.35	0.53	33.88	247.35	0.53	1.40	0.50	1.49	19.56	0.29
274.07	0.48	29.34	274.07	0.56	1.60	0.62	1.72	21.20	0.23
297.46	0.41	37.72	297.45	0.58	1.75	0.72	1.89	22.34	0.40
324.16	0.42	48.52	324.15	0.57	1.89	0.85	2.07	24.24	0.30
347.41	0.44	50.57	347.40	0.55	2.00	0.98	2.23	26.16	0.08
370.53	0.49	44.36	370.52	0.52	2.13	1.12	2.41	27.76	0.32
397.47	0.46	38.70	397.46	0.52	2.30	1.27	2.63	28.93	0.20
420.45	0.33	37.82	420.44	0.52	2.42	1.37	2.78	29.46	0.59
447.97	0.25	47.37	447.96	0.52	2.53	1.46	2.92	30.05	0.33
470.34	0.27	12.04	470.32	0.54	2.61	1.51	3.02	30.01	0.72
498.09	0.24	353.87	498.08	0.61	2.73	1.52	3.13	29.00	0.31
524.96	0.14	321.06	524.95	0.69	2.82	1.49	3.19	27.86	0.55
548.10	0.10	215.80	548.09	0.71	2.82	1.46	3.18	27.34	0.83
570.62	0.15	187.26	570.60	0.70	2.78	1.44	3.13	27.47	0.34
598.46	0.16	192.85	598.44	0.66	2.71	1.43	3.06	27.88	0.07
621.72	0.16	210.35	621.70	0.64	2.64	1.41	3.00	28.01	0.21
648.81	0.21	212.11	648.80	0.63	2.57	1.36	2.91	27.91	0.15
672.07	0.17	170.82	672.05	0.59	2.50	1.35	2.84	28.28	0.59
699.78	0.31	190.30	699.77	0.52	2.38	1.34	2.73	29.30	0.59
722.30	0.15	235.80	722.28	0.50	2.31	1.30	2.65	29.45	1.05
745.65	0.49	193.16	745.64	0.46	2.19	1.26	2.53	29.79	1.69
772.59	0.55	198.43	772.58	0.36	1.96	1.19	2.29	31.25	0.29
799.66	0.44	204.27	799.65	0.28	1.74	1.10	2.06	32.41	0.47
822.15	0.28	183.27	822.14	0.23	1.61	1.07	1.93	33.56	0.90
849.82	0.25	155.42	849.81	0.13	1.48	1.09	1.84	36.24	0.47
873.78	0.40	191.92	873.76	0.04	1.35	1.09	1.74	38.88	1.03
895.62	0.33	205.08	895.61	-0.01	1.22	1.05	1.61	40.63	0.50
923.05	0.37	212.16	923.04	-0.04	1.08	0.97	1.45	41.97	0.21
949.66	0.42	192.67	949.64	-0.10	0.91	0.90	1.28	44.74	0.53

# Survey Report

<b>Well Name:</b>		MARIE GERHARDT B #5							
<b>Survey:</b>		MARIE GERHARDT B #5							
<b>Survey Date:</b>		11/19/2014							
MD ft	Inc deg	Azim deg	TVD ft	VS ft	+N/-S ft	+E/-W ft	Closure Distance ft	Closure Direction deg	DLS °/100ft
972.50	0.39	184.83	972.48	-0.18	0.75	0.88	1.16	49.43	0.26
999.58	0.29	198.39	999.56	-0.26	0.59	0.85	1.04	55.02	0.48
1021.69	0.37	213.18	1021.67	-0.29	0.48	0.79	0.93	58.73	0.52
1048.87	0.44	206.73	1048.85	-0.33	0.32	0.70	0.77	65.70	0.30
1071.93	0.36	203.39	1071.91	-0.37	0.17	0.63	0.65	74.93	0.34
1098.52	0.33	222.06	1098.49	-0.39	0.03	0.54	0.55	86.34	0.44
1121.32	0.40	208.55	1121.29	-0.41	-0.08	0.46	0.47	100.26	0.46
1147.87	0.51	230.07	1147.84	-0.41	-0.24	0.33	0.41	126.31	0.77
1175.00	0.37	221.75	1174.98	-0.38	-0.38	0.18	0.42	155.33	0.58
1197.77	0.46	242.98	1197.75	-0.35	-0.48	0.05	0.48	174.49	0.77
1224.30	0.42	234.89	1224.28	-0.28	-0.58	-0.13	0.60	192.42	0.27
1247.07	0.50	234.89	1247.05	-0.23	-0.69	-0.28	0.74	202.03	0.34
1273.60	0.39	231.07	1273.57	-0.19	-0.81	-0.44	0.93	208.65	0.43
1296.35	0.40	238.12	1296.32	-0.15	-0.90	-0.57	1.07	212.32	0.21
1323.46	0.46	237.87	1323.43	-0.09	-1.01	-0.74	1.26	216.32	0.22
1349.97	0.44	231.57	1349.94	-0.04	-1.13	-0.91	1.45	218.90	0.20
1372.71	0.43	234.50	1372.68	0.00	-1.23	-1.05	1.62	220.38	0.10
1399.80	0.59	230.32	1399.77	0.05	-1.38	-1.24	1.86	221.90	0.63
1421.93	0.50	238.12	1421.90	0.10	-1.51	-1.41	2.06	223.11	0.54
1449.01	0.39	231.01	1448.98	0.15	-1.63	-1.58	2.27	224.21	0.47
1471.02	0.44	224.93	1470.99	0.17	-1.73	-1.70	2.43	224.44	0.30
1498.09	0.41	216.58	1498.06	0.18	-1.88	-1.83	2.63	224.17	0.25
1521.48	0.43	237.74	1521.45	0.20	-2.00	-1.95	2.79	224.36	0.66
1549.64	0.55	237.74	1549.60	0.27	-2.13	-2.16	3.03	225.42	0.44
1574.29	0.54	241.29	1574.25	0.35	-2.25	-2.36	3.26	226.43	0.14
1597.90	0.45	238.87	1597.86	0.42	-2.35	-2.54	3.46	227.23	0.42
1622.29	0.46	236.29	1622.25	0.47	-2.45	-2.70	3.65	227.78	0.10
1646.68	0.56	236.00	1646.64	0.53	-2.57	-2.88	3.86	228.25	0.42
1674.99	0.38	217.75	1674.95	0.57	-2.73	-3.06	4.09	228.27	0.83
1699.49	0.47	244.55	1699.45	0.60	-2.83	-3.20	4.27	228.45	0.88
1723.07	0.47	229.82	1723.03	0.66	-2.94	-3.36	4.46	228.82	0.51
1747.40	0.43	235.68	1747.35	0.70	-3.05	-3.51	4.65	228.98	0.24
1770.60	0.41	233.58	1770.56	0.74	-3.15	-3.65	4.82	229.18	0.10
1799.26	0.49	235.58	1799.22	0.80	-3.28	-3.83	5.04	229.43	0.27
1823.23	0.43	240.17	1823.18	0.86	-3.38	-3.99	5.23	229.73	0.28
1846.42	0.44	237.09	1846.38	0.91	-3.48	-4.15	5.41	230.02	0.11

# Survey Report

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**Survey:** MARIE GERHARDT B #5  
**Survey Date:** 11/19/2014

MD ft	Inc deg	Azim deg	TVD ft	VS ft	+N/-S ft	+E/-W ft	Closure Distance ft	Closure Direction deg	DLS %/100ft
1870.38	0.50	241.87	1870.34	0.98	-3.58	-4.32	5.60	230.36	0.30
1898.29	0.50	235.34	1898.24	1.05	-3.70	-4.53	5.85	230.70	0.21
1922.24	0.49	239.33	1922.19	1.11	-3.82	-4.70	6.05	230.93	0.16
1945.41	0.49	242.93	1945.36	1.18	-3.91	-4.87	6.25	231.25	0.13
1974.05	0.59	227.29	1974.00	1.25	-4.07	-5.09	6.51	231.38	0.61
1997.98	0.40	238.50	1997.93	1.29	-4.19	-5.25	6.72	231.39	0.89
2021.14	0.39	250.55	2021.09	1.35	-4.26	-5.39	6.87	231.69	0.36
2049.77	0.45	234.15	2049.72	1.43	-4.36	-5.57	7.07	231.98	0.46
2073.69	0.35	230.00	2073.64	1.46	-4.46	-5.71	7.24	231.99	0.41
2096.97	0.39	241.87	2096.92	1.51	-4.54	-5.83	7.39	232.08	0.38
2121.00	0.42	229.87	2120.95	1.55	-4.64	-5.97	7.56	232.16	0.36
2148.07	0.43	231.10	2148.02	1.59	-4.77	-6.13	7.76	232.12	0.05
2171.71	0.36	230.41	2171.65	1.62	-4.87	-6.25	7.92	232.09	0.29
2199.66	0.38	216.42	2199.60	1.62	-5.00	-6.37	8.10	231.89	0.33
2223.27	0.34	230.49	2223.22	1.63	-5.10	-6.47	8.24	231.74	0.41
2246.64	0.26	238.74	2246.59	1.66	-5.18	-6.57	8.36	231.77	0.37
2270.65	0.30	226.61	2270.59	1.68	-5.25	-6.66	8.48	231.78	0.30
2299.10	0.26	213.85	2299.04	1.69	-5.35	-6.75	8.62	231.60	0.26
2322.30	0.20	203.98	2322.24	1.67	-5.43	-6.80	8.71	231.37	0.30
2346.04	0.12	198.24	2345.98	1.65	-5.50	-6.83	8.76	231.15	0.37
2373.20	0.24	212.56	2373.14	1.63	-5.57	-6.87	8.84	230.93	0.49
2397.05	0.21	218.81	2396.99	1.62	-5.65	-6.92	8.93	230.77	0.19
2424.99	0.16	204.27	2424.94	1.61	-5.72	-6.97	9.02	230.60	0.24
2449.04	0.08	237.80	2448.99	1.60	-5.76	-6.99	9.06	230.52	0.43
2472.33	0.25	160.33	2472.27	1.57	-5.82	-6.99	9.09	230.23	1.03
2496.33	0.31	184.57	2496.28	1.48	-5.93	-6.98	9.16	229.64	0.55
2520.35	0.17	201.45	2520.29	1.43	-6.03	-7.00	9.23	229.25	0.65
2548.33	0.10	269.04	2548.27	1.44	-6.07	-7.03	9.29	229.23	0.56
2572.34	0.23	202.28	2572.28	1.44	-6.11	-7.07	9.35	229.17	0.88
2595.19	0.31	190.96	2595.13	1.39	-6.21	-7.10	9.44	228.82	0.41
2623.43	0.24	189.20	2623.37	1.33	-6.34	-7.13	9.54	228.32	0.25
2647.04	0.26	202.36	2646.98	1.29	-6.44	-7.15	9.63	228.00	0.26
2674.42	0.19	205.38	2674.36	1.25	-6.54	-7.20	9.72	227.74	0.28
2698.02	0.25	204.41	2697.96	1.23	-6.62	-7.23	9.81	227.53	0.27
2720.86	0.28	199.95	2720.80	1.20	-6.72	-7.27	9.90	227.27	0.16
2749.11	0.21	180.54	2749.05	1.14	-6.83	-7.30	10.00	226.87	0.38

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**Survey Date:** 11/19/2014

MD ft	Inc deg	Azim deg	TVD ft	VS ft	+N/-S ft	+E/-W ft	Closure Distance ft	Closure Direction deg	DLS %/100ft
2772.69	0.15	191.39	2772.63	1.10	-6.91	-7.30	10.05	226.59	0.28
2795.52	0.19	201.46	2795.46	1.07	-6.97	-7.32	10.11	226.40	0.22
2823.73	0.26	202.22	2823.67	1.04	-7.08	-7.37	10.22	226.14	0.22
2846.54	0.23	192.10	2846.48	1.00	-7.17	-7.39	10.30	225.88	0.21
2874.75	0.19	197.34	2874.69	0.95	-7.27	-7.42	10.39	225.58	0.18
2898.31	0.12	209.24	2898.25	0.93	-7.33	-7.44	10.45	225.45	0.30
2921.11	0.14	264.62	2921.05	0.95	-7.35	-7.48	10.49	225.51	0.55
2949.18	0.17	269.49	2949.12	1.00	-7.36	-7.56	10.55	225.79	0.12
2972.10	0.22	292.63	2972.04	1.07	-7.34	-7.64	10.59	226.13	0.38
2995.66	0.19	267.92	2995.60	1.14	-7.32	-7.72	10.64	226.49	0.38
3023.72	0.15	282.49	3023.65	1.21	-7.32	-7.80	10.70	226.82	0.20
3046.63	0.17	294.22	3046.57	1.27	-7.30	-7.86	10.73	227.12	0.16
3074.69	0.25	310.01	3074.63	1.37	-7.24	-7.95	10.75	227.66	0.36
3097.47	0.38	296.03	3097.41	1.50	-7.18	-8.05	10.78	228.29	0.63
3121.01	0.23	315.96	3120.95	1.62	-7.11	-8.15	10.82	228.93	0.75
3149.17	0.24	312.81	3149.11	1.73	-7.03	-8.24	10.83	229.54	0.05
3172.70	0.23	303.85	3172.64	1.83	-6.97	-8.31	10.85	230.04	0.16
3195.47	0.24	317.00	3195.41	1.92	-6.91	-8.38	10.86	230.51	0.24
3222.11	0.29	331.36	3222.05	2.04	-6.81	-8.45	10.85	231.15	0.31
3245.64	0.30	349.72	3245.58	2.14	-6.70	-8.49	10.81	231.74	0.41
3272.92	0.38	325.66	3272.86	2.28	-6.55	-8.55	10.77	232.56	0.59
3296.58	0.42	332.83	3296.51	2.44	-6.41	-8.64	10.76	233.43	0.27
3324.61	0.44	324.07	3324.55	2.64	-6.23	-8.75	10.74	234.55	0.25
3347.35	0.48	329.12	3347.28	2.81	-6.08	-8.85	10.73	235.52	0.25
3370.83	0.52	322.33	3370.76	3.01	-5.91	-8.96	10.74	236.62	0.30
3397.90	0.49	323.51	3397.83	3.24	-5.72	-9.11	10.75	237.88	0.14
3420.95	0.40	336.44	3420.88	3.41	-5.57	-9.20	10.75	238.83	0.56
3447.10	0.42	342.82	3447.03	3.58	-5.39	-9.26	10.72	239.81	0.20
3474.60	0.48	335.28	3474.53	3.77	-5.19	-9.34	10.69	240.96	0.29
3497.66	0.51	338.01	3497.59	3.95	-5.00	-9.42	10.67	242.03	0.18
3524.52	0.41	338.52	3524.45	4.14	-4.80	-9.50	10.65	243.19	0.38
3547.57	0.32	326.34	3547.50	4.27	-4.67	-9.57	10.65	243.98	0.52
3574.31	0.28	330.51	3574.24	4.41	-4.55	-9.64	10.66	244.73	0.15
3597.48	0.32	327.56	3597.41	4.52	-4.45	-9.70	10.67	245.38	0.16
3624.93	0.28	327.56	3624.86	4.66	-4.32	-9.78	10.70	246.15	0.13
3647.22	0.22	352.04	3647.14	4.74	-4.24	-9.82	10.69	246.66	0.55

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<b>Survey Date:</b>		11/19/2014							
<b>MD</b> ft	<b>Inc</b> deg	<b>Azim</b> deg	<b>TVD</b> ft	<b>VS</b> ft	<b>+N/-S</b> ft	<b>+E/-W</b> ft	<b>Closure Distance</b> ft	<b>Closure Direction</b> deg	<b>DLS</b> %/100ft
3674.76	0.21	351.98	3674.69	4.82	-4.14	-9.83	10.67	247.19	0.05
3697.78	0.17	358.60	3697.70	4.87	-4.06	-9.84	10.64	247.57	0.19
3724.59	0.23	357.15	3724.52	4.94	-3.97	-9.84	10.61	248.05	0.25
3747.59	0.16	25.81	3747.51	4.98	-3.89	-9.83	10.57	248.40	0.53
3773.51	0.27	21.70	3773.44	5.00	-3.80	-9.79	10.50	248.78	0.45
3797.24	0.37	14.70	3797.17	5.06	-3.68	-9.75	10.42	249.35	0.46
3824.74	0.42	7.13	3824.67	5.15	-3.49	-9.72	10.32	250.25	0.25
3846.99	0.41	7.02	3846.92	5.24	-3.33	-9.70	10.25	251.05	0.04
3874.52	0.42	349.40	3874.44	5.37	-3.13	-9.70	10.20	252.11	0.47
3896.77	0.55	343.22	3896.69	5.52	-2.95	-9.75	10.19	253.17	0.61
3924.13	0.82	341.34	3924.05	5.80	-2.64	-9.85	10.20	255.01	1.01
3947.21	1.02	335.40	3947.12	6.13	-2.29	-9.99	10.25	257.07	0.97
3973.82	1.04	335.99	3973.73	6.56	-1.86	-10.19	10.35	259.67	0.06
3997.51	1.16	334.29	3997.42	6.98	-1.44	-10.38	10.48	262.08	0.55
4020.78	1.12	337.82	4020.68	7.40	-1.02	-10.57	10.62	264.49	0.35
4049.42	1.15	335.27	4049.32	7.91	-0.50	-10.79	10.80	267.36	0.20
4073.60	1.21	336.14	4073.49	8.36	-0.04	-11.00	11.00	269.77	0.25
4096.87	1.21	335.37	4096.76	8.80	0.40	-11.20	11.21	272.07	0.07
4121.03	1.17	336.09	4120.91	9.25	0.86	-11.41	11.44	274.32	0.17
4148.87	1.14	342.84	4148.75	9.74	1.39	-11.60	11.68	276.81	0.50
4172.85	1.08	336.16	4172.72	10.15	1.82	-11.76	11.90	278.80	0.59
4196.50	1.10	334.25	4196.37	10.56	2.23	-11.95	12.16	280.56	0.17
4223.85	1.10	335.73	4223.71	11.03	2.70	-12.17	12.47	282.52	0.11
4247.54	1.11	338.32	4247.40	11.44	3.12	-12.35	12.74	284.19	0.22
4274.72	1.13	340.54	4274.58	11.90	3.62	-12.54	13.05	286.11	0.18
4298.50	1.20	345.50	4298.34	12.31	4.08	-12.68	13.32	287.86	0.50
4321.21	1.11	346.68	4321.06	12.68	4.53	-12.79	13.57	289.50	0.39
4348.11	1.05	348.47	4347.95	13.09	5.02	-12.90	13.84	291.28	0.25
4370.64	0.95	355.75	4370.48	13.38	5.41	-12.95	14.04	292.67	0.73
4396.88	1.00	355.58	4396.71	13.69	5.86	-12.99	14.25	294.27	0.22
4423.81	1.11	356.52	4423.64	14.04	6.35	-13.02	14.49	296.00	0.40
4446.06	1.22	358.82	4445.88	14.34	6.80	-13.04	14.71	297.55	0.52
4472.35	1.28	356.57	4472.17	14.73	7.38	-13.06	15.00	299.45	0.32
4499.32	1.30	1.83	4499.13	15.13	7.99	-13.07	15.32	301.42	0.45
4521.73	1.20	8.08	4521.53	15.42	8.47	-13.03	15.54	303.04	0.76
4547.59	1.05	10.78	4547.39	15.68	8.98	-12.95	15.76	304.73	0.63

**Well Name:** MARIE GERHARDT B #5**Survey:** MARIE GERHARDT B #5**Survey Date:** 11/19/2014

<b>MD</b>	<b>Inc</b>	<b>Azim</b>	<b>TVD</b>	<b>VS</b>	<b>+N/-S</b>	<b>+E/-W</b>	<b>Closure Distance</b>	<b>Closure Direction</b>	<b>DLS</b>
<b>ft</b>	<b>deg</b>	<b>deg</b>	<b>ft</b>	<b>ft</b>	<b>ft</b>	<b>ft</b>	<b>ft</b>	<b>deg</b>	<b>°/100ft</b>
4572.54	1.03	3.13	4572.33	15.93	9.42	-12.89	15.97	306.17	0.56
4598.53	0.91	14.17	4598.32	16.16	9.86	-12.83	16.18	307.54	0.85
4624.07	0.87	358.18	4623.86	16.38	10.25	-12.79	16.39	308.71	0.98
4659.25	1.13	359.60	4659.04	16.79	10.86	-12.80	16.79	310.32	0.73