DIRECTIONAL SURVEY CALCULATION

MINIMUM CURVATURE METHOD

Well Name	Target Direction	Slot	N / S	E / W	Hole Size	Calculation by	Date
Mary Ann 2622 1-1	182.55	Coordinate					1/7/13
Job Number	Type of Survey	Tie-in Point				Directional Co.	
0							

Meaured Depth	Hole Angle	Hole Direction	Course Length	True Vertical Depth	Vertical Section	Total Coordinate N + / S -	Total Coordinate E + / W -	Dogleg Severity	Build Up °/100 ft	Walk/ °/100 ft
0	0	0	0	0.00	0.00			<< TIE-IN POINT >>		
0	0	0		0.00	0.00	0.00	0.00			
253	0	267	253	253.00	0.04	-0.02	-0.44	0.08	0.08	105.45
557	1	267	304	556.98	0.36	-0.20	-3.62	0.26	0.26	0.00
735	1	267	178	734.96	0.66	-0.37	-6.57	0.06	-0.06	0.00
1229	0	201	494	1,228.93	2.28	-1.79	-10.90	0.17	-0.12	-13.36
1594	0	220	365	1,593.93	3.94	-3.42	-11.85	0.03	0.00	5.29
2042	0	226	448	2,041.92	6.00	-5.40	-13.74	0.02	0.02	1.36
2587	1	280	545	2,586.89	6.96	-6.15	-18.39	0.10	0.06	9.83
3044	1	281	457	3,043.86	6.16	-5.09	-24.28	0.02	0.02	0.15
3409	1	356	365	3,408.84	4.23	-3.04	-26.89	0.23	-0.08	20.77
3470	0	25	61	3,469.84	3.77	-2.58	-26.81	0.40	-0.16	-542.62
3501	0	31	31	3,500.83	3.57	-2.39	-26.71	0.13	0.00	18.71
3531	0	44	30	3,530.83	3.40	-2.22	-26.58	0.31	0.00	44.00
3562	0	88	31	3,561.83	3.32	-2.14	-26.45	0.94	-0.65	141.94
3592	1	171	30	3,591.83	3.49	-2.32	-26.37	2.34	1.67	275.67
3623	2	217	31	3,622.82	4.21	-3.03	-26.74	6.40	5.48	149.68
3653	4	229	30	3,652.78	5.42	-4.18	-27.87	5.06	4.67	37.33
3684	4	231	31	3,683.70	6.85	-5.55	-29.47	0.81	0.65	7.10
3714	4	233	30	3,713.63	8.25	-6.88	-31.16	0.78	0.67	5.67
3744	4	233	30	3,743.55	9.65	-8.19	-32.88	0.35	-0.33	1.33
3775	5	220	31	3,774.46	11.33	-9.81	-34.57	3.45	1.61	-40.32
3805	5	214	30	3,804.35	13.43	-11.83	-36.09	2.54	1.67	-22.67
3836	5	210	31	3,835.23	15.87	-14.22	-37.58	1.16	0.65	-10.65
3866	6	213	30	3,865.09	18.33	-16.61	-39.07	1.18	0.67	10.33
3957	5	214	91	3,955.69	25.66	-23.74	-43.82	0.23	-0.22	0.66
3988	5	213	31	3,986.56	28.07	-26.08	-45.38	0.67	-0.65	-1.94
4018	5	213	30	4,016.44	30.37	-28.31	-46.83	0.27	0.00	-3.00
4049	6	212	31	4,047.29	33.07	-30.94	-48.48	4.20	4.19	-1.61
4079	9	213	30	4,077.02	36.48	-34.26	-50.60	7.68	7.67	3.00
4110	10	210	31	4,107.60	40.95	-38.62	-53.28	5.33	5.16	-8.06
4140	12	206	30	4,137.04	46.14	-43.69	-55.99	5.67	5.00	-14.00
4171	13	204	31	4,167.31	52.31	-49.75	-58.81	4.49	4.19	-7.42
4201	14	201	30	4,196.46	58.97	-56.29	-61.51	4.32	3.67	-9.67
4232	15	200	31	4,226.44	66.47	-63.67	-64.30	3.58	3.55	-1.94
4262	17	199	30	4,255.26	74.43	-71.52	-67.06	5.61	5.33	-6.33
4292	19	196	30	4,283.82	83.32	-80.29	-69.80	6.72	6.33	-7.33
4323	21	196	31	4,313.01	93.45	-90.31	-72.70	5.49	5.48	-0.97
4353	22	196	30	4,340.93	104.12	-100.86	-75.70	6.34	6.33	-0.67
4384	24	197	31	4,369.38	116.08	-112.67	-79.17	6.60	6.45	3.55
4414	26	197	30	4,396.52	128.48	-124.91	-82.89	5.67	5.67	0.00
4445	27	197	31	4,424.20	142.00	-138.27	-86.93	4.20	4.19	-0.65
4475	29	196	30	4,450.61	155.82	-151.93	-90.89	6.20	6.00	-3.33
4506	31	197	31	4,477.50	170.82	-166.75	-95.17	4.39	4.19	2.58
4536	32	196	30	4,503.09	186.03	-181.79	-99.52	6.45	6.33	-2.33
4567	35	196	31	4,528.92	202.69	-198.25	-104.26	7.47	7.42	1.61
4597	37	195	30	4,553.19	219.85	-215.21	-109.07	8.84	8.67	-3.00
4628	40	196	31	4,577.37	238.76	-233.91	-114.26	9.36	9.35	0.65
4658	43	196	30	4,599.75	258.20	-253.13	-119.70	10.37	10.33	1.33
4688	46	196	30	4,621.09	278.69	-273.38	-125.55	9.01	9.00	0.67
4719	48	197	31	4,642.15	300.74	-295.16	-132.10	8.17	7.74	3.55
4749	49	199	30	4,661.93	322.46	-316.59	-139.13	4.86	2.33	5.67
4780	49	199	31	4,682.23	344.96	-338.77	-146.68	0.98	0.00	-1.29
4810	49	199	30	4,701.85	366.74	-360.25	-154.00	1.06	0.33	1.33
4841	49	198	31	4,722.06	389.33	-382.53	-161.49	2.06	0.65	-2.58
4871	49	198	30	4,741.59	411.26	-404.16	-168.62	0.25	0.00	0.33
4902	50	199	31	4,761.68	433.97	-426.56	-176.08	1.38	1.29	0.65
4932	50	199	30	4,781.08	455.97	-448.26	-183.34	0.67	-0.67	0.00
4963	51	198	31	4,800.82	478.98	-470.96	-190.82	5.62	5.48	-1.61
4993	55	196	30	4,818.89	502.15	-493.84	-197.85	12.00	11.00	-6.00
5024	58	194	31	4,836.12	527.28	-518.70	-204.64	11.69	10.65	-5.81
5054	60	193	30	4,851.50	552.56	-543.73	-210.67	9.65	8.33	-5.67
5085	64	191	31	4,866.07	579.55	-570.50	-216.33	10.87	10.00	-4.84
5115	66	189	30	4,878.78	606.50	-597.27	-221.00	12.45	9.67	-8.67
5146	69	187	31	4,890.49	635.07	-625.69	-224.99	9.72	9.03	-3.87
5175	72	185	29	4,900.03	662.39	-652.90	-228.03	12.81	11.03	-6.90
5205	76	183	30	4,908.32	691.20	-681.64	-230.24	12.16	10.33	-6.67
5236	79	183	31	4,915.19	721.43	-711.82	-231.82	11.25	10.97	-2.58
5266	82	182	30	4,920.06	751.02	-741.40	-232.96	11.96	11.67	-2.67
5296	86	182	30	4,923.22	780.85	-771.21	-233.87	10.34	10.33	-0.33
5308	87	182	12	4,924.02	792.82	-783.18	-234.23	11.70	11.67	0.83
5386	90	181	78	4,925.86	870.77	-861.12	-236.21	4.58	4.49	-0.90
5418	91	181	32	4,925.44	902.76	-893.11	-236.77	2.28	2.19	-0.62
5449	91	181	31	4,924.76	933.73	-924.10	-237.20	1.16	0.97	-0.65
5481	92	181	32	4,923.75	965.70	-956.08	-237.53	2.58	2.50	-0.62
5512	93	180	31	4,922.43	996.65	-987.05	-237.78	1.64	1.61	-0.32
5544	93	180	32	4,920.81	1,028.59	-1,019.01	-238.00	1.25	1.25	0.00
5575	92	180	31	4,919.32	1,059.53	-1,049.98	-238.22	2.26	-2.26	0.00
5607	93	181	32	4,917.93	1,091.48	-1,081.94	-238.49	0.88	0.62	0.62
5638	93	181	31	4,916.36	1,122.42	-1,112.90	-238.82	1.94	1.94	0.00
5670	94	180	32	4,914.49	1,154.34	-1,144.85	-239.04	1.56	0.94	-1.25
5701	93	180	31	4,912.79	1,185.27	-1,175.80	-239.12	2.28	-2.26	-0.32
5733	93	180	32	4,911.19	1,217.20	-1,207.76	-239.09	0.99	0.31	-0.94
5764	92	180	31	4,909.98	1,248.14	-1,238.74	-239.09	4.39	-4.19	1.29
5796	91	179	32	4,909.39	1,280.09	-1,270.73	-238.84	5.32	-3.44	-4.06
5827	91	179	31	4,909.12	1,311.03	-1,301.72	-238.33	0.97	0.00	0.97
5859	90	179	32	4,909.12	1,342.98	-1,333.72	-237.94	3.19	-3.13	0.63
5890	90	180	31	4,909.39	1,373.94	-1,364.72	-237.72	1.29	0.00	1.29
5922	90	180	32	4,909.61	1,405.90	-1,396.72	-237.61	0.62	0.63	0.00
5953	90	180	31	4,909.67	1,436.86	-1,427.72	-237.42	1.61	1.29	-0.97
5985	90	179	32	4,909.78	1,468.81	-1,459.71	-237.03	2.25	-1.87	-1.25
6016	89	180	31	4,910.19	1,499.76	-1,490.71	-236.68	2.28	-1.61	1.61
6048	89	179	32	4,910.77	1,531.71	-1,522.70	-236.40	0.70	-0.31	-0.62
6079	89	180	31	4,911.34	1,562.66	-1,553.70	-236.16	1.02	0.32	0.97
6111	89	181	32	4,911.90	1,594.63	-1,585.69	-236.21	2.50	0.00	2.50
6142	89	180	31	4,912.52	1,625.60	-1,616.68	-236.43	1.16	-0.97	-0.65
6174	89	180	32	4,913.16	1,657.56	-1,648.68	-236.51	1.33	0.94	-0.94
6205	91	180	31	4,913.30	1,688.54	-1,679.68	-236.62	5.01	4.84	1.29
6237	91	181	32	4,912.91	1,720.51	-1,711.67	-236.93	1.56	1.25	0.94
6268	92	180	31	4,912.26	1,751.49	-1,742.66	-237.22	2.16	1.94	-0.97
6300	91	180	32	4,911.48	1,783.45	-1,774.65	-237.28	1.98	-0.63	-1.87
6331	91	181	31	4,910.88	1,814.42	-1,805.65	-237.47	3.78	-1.29	3.55
6363	90	182	32	4,910.52	1,846.41	-1,837.63	-238.28	3.78	-1.56	3.44
6394	91	183	31	4,910.19	1,877.41	-1,868.61	-239.50	2.07	1.29	1.61
6426	91	183	32	4,909.75	1,909.41	-1,900.57	-240.92	0.31	0.00	0.31
6457	91	183	31	4,909.18	1,940.40	-1,931.54	-242.30	1.64	1.61	-0.32
6489	92	182	32	4,908.37	1,972.39	-1,963.50	-243.50	2.38	0.94	-2.19
6520	92	182	31	4,907.50	2,003.37	-1,994.48	-244.50	0.32	0.00	0.32
6552	92	182	32	4,906.58	2,035.36	-2,026.45	-245.56	0.31	0.31	0.00
6583	92	182	31	4,905.53	2,066.34	-2,057.41	-246.56	1.64	1.61	-0.32
6615	92	182	32	4,904.44	2,098.32	-2,089.37	-247.70	2.21	-1.56	1.56
6646	91	183	31	4,903.76	2,129.31	-2,120.33	-249.06	3.18	-2.90	1.29
6677	90	183	31	4,903.68	2,160.31	-2,151.30	-250.57	4.24	-4.19	0.65
6709	90	183	32	4,903.96	2,192.31	-2,183.25	-252.27	0.94	0.00	0.94
6740	90	183	31	4,904.12	2,223.31	-2,214.20	-254.00	1.29	1.29	0.00
6772	91	183	32	4,904.01	2,255.30	-2,246.15	-255.82	1.90	1.87	0.31
6803	89	183	31	4,904.09	2,286.30	-2,277.11	-257.44	4.62	-4.19	-1.94
6835	89	183	32	4,904.57	2,318.30	-2,309.07	-258.92	0.44	-0.31	-0.31
6866	89	183	31	4,905.00	2,349.29	-2,340.03	-260.30	0.72	0.65	-0.32
6898	90	183	32	4,905.28	2,381.29	-2,372.00	-261.75	1.40	1.25	0.62

Directional Survey Calculation
Minimum Curvature Method - version 2.0

For Microsoft Excel Version 3.0 for Macintosh
and Microsoft Excel Version 3.0 for Windows (IBM)

	Direction Azimuth	Interval's Dog Leg	Ratio Factor	D N / S	D E / S	D TVD	Closure Distance	Closure Direction
4.00								
2.00								
3.00	0.00						0.00	#DIV/0!
0.30	0.00	0.00	1.00	######	######	######	0.00	0.00
	266.80	0.20	1.00	-0.02	-0.44	253.00	0.44	-93.20
	266.80	0.80	1.00	-0.18	-3.18	303.98	3.62	-93.20
	266.80	0.10	1.00	-0.16	-2.95	177.98	6.58	-93.20
	200.80	0.82	1.00	-1.43	-4.33	493.97	11.05	-99.34
	220.10	0.10	1.00	-1.62	-0.95	365.00	12.34	-106.08
	226.20	0.11	1.00	-1.98	-1.88	447.99	14.76	-111.45
	279.80	0.56	1.00	-0.75	-4.65	544.98	19.39	-108.48
	280.50	0.10	1.00	1.06	-5.89	456.96	24.81	-101.84
	356.30	0.83	1.00	2.05	-2.61	364.98	27.06	-96.44
	25.30	0.25	1.00	0.46	0.07	61.00	26.94	-95.49
	31.10	0.04	1.00	0.19	0.10	31.00	26.82	-95.11
	44.30	0.09	1.00	0.16	0.13	30.00	26.68	-94.78
	88.30	0.29	1.00	0.08	0.13	31.00	26.54	-94.63
	171.00	0.70	1.00	-0.18	0.08	30.00	26.48	-95.03
	217.40	1.98	1.00	-0.70	-0.36	30.99	26.91	-96.46
	228.60	1.52	1.00	-1.16	-1.13	29.96	28.18	-98.54
	230.80	0.25	1.00	-1.36	-1.61	30.93	29.99	-100.66
	232.50	0.23	1.00	-1.33	-1.68	29.92	31.91	-102.44
	232.90	0.10	1.00	-1.32	-1.73	29.92	33.89	-103.99
	220.40	1.07	1.00	-1.62	-1.69	30.91	35.94	-105.84
	213.60	0.76	1.00	-2.03	-1.52	29.89	37.98	-108.15
	210.30	0.36	1.00	-2.38	-1.48	30.87	40.18	-110.72
	213.40	0.35	1.00	-2.40	-1.49	29.87	42.45	-113.04
	214.00	0.21	1.00	-7.13	-4.75	90.60	49.83	-118.45
	213.40	0.21	1.00	-2.34	-1.56	30.87	52.33	-119.88
	212.50	0.08	1.00	-2.24	-1.45	29.88	54.72	-121.16
	212.00	1.30	1.00	-2.63	-1.66	30.84	57.51	-122.55
	212.90	2.30	1.00	-3.32	-2.12	29.74	61.11	-124.10
	210.40	1.65	1.00	-4.36	-2.68	30.57	65.80	-125.94
	206.20	1.70	1.00	-5.07	-2.71	29.44	71.02	-127.97
	203.90	1.39	1.00	-6.06	-2.82	30.27	77.03	-130.23
	201.00	1.30	1.00	-6.54	-2.70	29.15	83.38	-132.46
	200.40	1.11	1.00	-7.38	-2.79	29.98	90.49	-134.72
	198.50	1.68	1.00	-7.85	-2.76	28.82	98.04	-136.84
	196.30	2.02	1.00	-8.78	-2.74	28.55	106.39	-139.00
	196.00	1.70	1.00	-10.01	-2.90	29.19	115.93	-141.17
	195.80	1.90	1.00	-10.55	-3.00	27.92	126.11	-143.11
	196.90	2.05	1.00	-11.81	-3.47	28.45	137.71	-144.90
3.50	196.90	1.70	1.00	-12.24	-3.72	27.13	149.92	-146.43
1.25	196.70	1.30	1.00	-13.36	-4.03	27.68	163.32	-147.84
	195.70	1.86	1.00	-13.66	-3.96	26.41	177.04	-149.11
	196.50	1.36	1.00	-14.82	-4.28	26.89	192.00	-150.29
	195.80	1.93	1.00	-15.03	-4.35	25.59	207.25	-151.30
	196.30	2.32	1.00	-16.46	-4.74	25.83	223.99	-152.26
	195.40	2.65	1.00	-16.96	-4.81	24.27	241.27	-153.12
	195.60	2.90	1.00	-18.70	-5.19	24.17	260.32	-153.97
	196.00	3.11	1.00	-19.22	-5.44	22.38	280.00	-154.69
	196.20	2.70	1.00	-20.25	-5.85	21.34	300.83	-155.33
	197.30	2.53	1.00	-21.78	-6.56	21.06	323.37	-155.89
	199.00	1.46	1.00	-21.43	-7.03	19.78	345.81	-156.28
	198.60	0.30	1.00	-22.18	-7.55	20.30	369.16	-156.59
	199.00	0.32	1.00	-21.48	-7.31	19.62	391.79	-156.85
	198.20	0.64	1.00	-22.27	-7.50	20.22	415.22	-157.11
	198.30	0.08	1.00	-21.63	-7.13	19.52	437.92	-157.35
	198.50	0.43	1.00	-22.40	-7.45	20.09	461.47	-157.57
	198.50	0.20	1.00	-21.70	-7.26	19.40	484.30	-157.76
	198.00	1.74	1.00	-22.70	-7.48	19.74	508.15	-157.94
	196.20	3.60	1.00	-22.88	-7.03	18.07	532.00	-158.17
	194.40	3.62	1.00	-24.86	-6.79	17.22	557.61	-158.47
	192.70	2.89	1.00	-25.04	-6.03	15.38	583.12	-158.82
	191.20	3.37	1.00	-26.76	-5.66	14.58	610.14	-159.23
	188.60	3.74	1.00	-26.77	-4.66	12.70	636.84	-159.69
	187.40	3.01	1.00	-28.42	-3.99	11.71	664.91	-160.22
	185.40	3.72	1.00	-27.21	-3.05	9.54	691.57	-160.75
	183.40	3.65	1.00	-28.74	-2.21	8.29	719.47	-161.34
	182.60	3.49	1.00	-30.18	-1.58	6.87	748.62	-161.96
	181.80	3.59	1.00	-29.57	-1.14	4.87	777.13	-162.56
	181.70	3.10	1.00	-29.82	-0.91	3.16	805.89	-163.13
	181.80	1.40	1.00	-11.97	-0.37	0.80	817.46	-163.35
	181.10	3.57	1.00	-77.94	-1.97	1.84	892.93	-164.66
	180.90	0.73	1.00	-31.99	-0.56	-0.42	923.96	-165.15
	180.70	0.36	1.00	-30.99	-0.43	-0.68	954.06	-165.60
	180.50	0.82	1.00	-31.98	-0.33	-1.01	985.15	-166.05
	180.40	0.51	1.00	-30.97	-0.24	-1.33	1,015.29	-166.46
	180.40	0.40	1.00	-31.96	-0.22	-1.62	1,046.44	-166.85
	180.40	0.70	1.00	-30.96	-0.22	-1.49	1,076.66	-167.22
	180.60	0.28	1.00	-31.97	-0.28	-1.40	1,107.92	-167.57
	180.60	0.60	1.00	-30.96	-0.32	-1.57	1,138.24	-167.89
	180.20	0.50	1.00	-31.94	-0.22	-1.87	1,169.54	-168.21
	180.10	0.71	1.00	-30.95	-0.08	-1.70	1,199.87	-168.50
	179.80	0.32	1.00	-31.96	0.03	-1.59	1,231.20	-168.80
	180.20	1.36	1.00	-30.98	0.00	-1.22	1,261.60	-169.08
	178.90	1.70	1.00	-31.99	0.25	-0.59	1,292.98	-169.36
	179.20	0.30	1.00	-30.99	0.51	-0.27	1,323.36	-169.62
	179.40	1.02	1.00	-32.00	0.39	0.00	1,354.78	-169.88
	179.80	0.40	1.00	-31.00	0.22	0.27	1,385.27	-170.12
	179.80	0.20	1.00	-32.00	0.11	0.22	1,416.78	-170.35
	179.50	0.50	1.00	-31.00	0.19	0.05	1,447.32	-170.56
	179.10	0.72	1.00	-32.00	0.39	0.11	1,478.83	-170.78
	179.60	0.71	1.00	-31.00	0.35	0.41	1,509.38	-170.98
	179.40	0.22	1.00	-31.99	0.28	0.59	1,540.94	-171.18
	179.70	0.32	1.00	-30.99	0.24	0.57	1,571.54	-171.36
	180.50	0.80	1.00	-31.99	-0.06	0.56	1,603.19	-171.53
	180.30	0.36	1.00	-30.99	-0.22	0.62	1,633.88	-171.68
	180.00	0.42	1.00	-31.99	-0.08	0.64	1,665.56	-171.84
	180.40	1.55	1.00	-31.00	-0.11	0.14	1,696.26	-171.98
	180.70	0.50	1.00	-32.00	-0.31	-0.39	1,727.99	-172.12
	180.40	0.67	1.00	-30.99	-0.30	-0.65	1,758.74	-172.25
	179.80	0.63	1.00	-31.99	-0.06	-0.78	1,790.45	-172.38
	180.90	1.17	1.00	-30.99	-0.19	-0.60	1,821.20	-172.51
	182.00	1.21	1.00	-31.99	-0.81	-0.36	1,853.02	-172.61
	182.50	0.64	1.00	-30.97	-1.22	-0.32	1,883.89	-172.70
	182.60	0.10	1.00	-31.97	-1.42	-0.45	1,915.78	-172.78
	182.50	0.51	1.00	-30.96	-1.38	-0.57	1,946.68	-172.85
	181.80	0.76	1.00	-31.97	-1.20	-0.81	1,978.55	-172.93
	181.90	0.10	1.00	-30.97	-1.00	-0.87	2,009.41	-173.01
	181.90	0.10	1.00	-31.97	-1.06	-0.92	2,041.27	-173.09
	181.80	0.51	1.00	-30.97	-1.00	-1.05	2,072.13	-173.17
	182.30	0.71	1.00	-31.96	-1.14	-1.09	2,104.00	-173.24
	182.70	0.98	1.00	-30.96	-1.35	-0.68	2,134.91	-173.30
	182.90	1.32	1.00	-30.96	-1.51	-0.08	2,165.84	-173.36
	183.20	0.30	1.00	-31.95	-1.70	0.28	2,197.78	-173.41
	183.20	0.40	1.00	-30.95	-1.73	0.16	2,228.72	-173.46
	183.30	0.61	1.00	-31.95	-1.81	-0.11	2,260.67	-173.50
	182.70	1.43	1.00	-30.96	-1.62	0.08	2,291.61	-173.55
	182.60	0.14	1.00	-31.96	-1.48	0.47	2,323.54	-173.60
	182.50	0.22	1.00	-30.97	-1.38	0.43	2,354.47	-173.65
	182.70	0.45	1.00	-31.97	-1.45	0.28	2,386.40	-173.70

DIRECTIONAL SURVEY CALCULATION

MINIMUM CURVATURE METHOD

Well Name	Target Direction	Slot Coordinate	N / S	E / W	Hole Size	Calculation by	Date
Mary Ann 2622 1-1	182.55						1/7/13
Job Number	**Type of Survey**	**Tie-in Point**				**Directional Co.**	
0							

Meaured Depth	Hole Angle	Hole Direction	Course Length	True Vertical Depth	Vertical Section	Total Coordinate N + / S -	Total Coordinate E + / W -	Dogleg Severity	Build Up °/100 ft	Walk/ °/100 ft
0	0	0	0	0.00	0.00	<< TIE-IN POINT >>				
6929	90	182	31	4,905.31	2,412.29	-2,402.98	-262.97	3.32	1.61	-2.90
6961	90	182	32	4,905.19	2,444.29	-2,434.96	-263.97	0.00	0.00	0.00
6992	88	180	31	4,905.57	2,475.27	-2,465.95	-264.57	7.36	-5.81	-4.52
7024	89	180	32	4,906.41	2,507.24	-2,497.94	-264.79	0.62	0.62	0.00
7055	89	180	31	4,907.11	2,538.21	-2,528.93	-265.01	0.65	0.65	0.00
7087	89	181	32	4,907.67	2,570.19	-2,560.92	-265.26	1.29	1.25	0.31
7118	90	180	31	4,908.02	2,601.16	-2,591.92	-265.50	1.02	0.97	-0.32
7150	90	181	32	4,908.30	2,633.14	-2,623.92	-265.89	1.87	0.00	1.87
7181	90	180	31	4,908.57	2,664.13	-2,654.91	-266.27	1.94	0.00	-1.94
7213	90	180	32	4,908.77	2,696.10	-2,686.91	-266.38	1.56	0.94	-1.25
7244	89	180	31	4,909.01	2,727.07	-2,717.91	-266.46	1.88	-1.61	0.97
7276	88	180	32	4,909.74	2,759.04	-2,749.90	-266.60	3.76	-3.75	-0.31
7307	88	180	31	4,910.77	2,789.99	-2,780.88	-266.71	0.00	0.00	0.00
7339	88	180	32	4,911.80	2,821.94	-2,812.87	-266.71	1.29	0.31	-1.25
7370	87	179	31	4,913.10	2,852.87	-2,843.84	-266.44	4.33	-3.87	-1.94
7370	87	179	0	4,913.10	2,852.87	-2,843.84	-266.44	#DIV/0!	#DIV/0!	#DIV/0!
7402	86	179	32	4,914.94	2,884.76	-2,875.78	-265.97	1.90	-1.87	-0.31
7433	88	180	31	4,916.56	2,915.67	-2,906.74	-265.64	4.33	3.87	1.94
7464	89	180	31	4,917.62	2,946.62	-2,937.72	-265.59	3.18	2.90	1.29
7496	90	181	32	4,918.01	2,978.60	-2,969.71	-265.84	5.46	5.00	2.19
7527	89	180	31	4,918.17	3,009.58	-3,000.71	-266.08	3.43	-2.58	-2.26
7559	89	180	32	4,918.73	3,041.54	-3,032.71	-266.14	1.87	-1.87	0.00
7590	89	180	31	4,919.38	3,072.50	-3,063.70	-266.14	0.91	0.65	-0.65
7622	90	180	32	4,919.74	3,104.47	-3,095.70	-266.20	3.08	2.81	1.25
7654	91	180	32	4,919.60	3,136.45	-3,127.70	-266.39	2.83	2.81	0.31
7685	91	181	31	4,919.09	3,167.42	-3,158.69	-266.69	1.88	1.61	0.97
7717	92	180	32	4,918.28	3,199.39	-3,190.68	-266.97	2.00	1.56	-1.25
7748	92	180	31	4,917.22	3,230.35	-3,221.66	-267.05	1.88	1.61	-0.97
7780	93	180	32	4,915.86	3,262.29	-3,253.63	-266.99	1.68	1.56	-0.62
7811	92	180	31	4,914.56	3,293.23	-3,284.60	-266.99	2.33	-1.94	1.29
7843	92	181	32	4,913.47	3,325.19	-3,316.58	-267.38	3.26	-0.94	3.13
7874	91	182	31	4,912.68	3,356.18	-3,347.56	-268.17	2.77	-2.26	1.61
7905	92	182	31	4,911.95	3,387.17	-3,378.54	-269.20	2.07	1.61	1.29
7968	90	183	63	4,910.85	3,450.15	-3,441.48	-271.72	2.01	-1.90	0.63
8000	91	192	32	4,910.57	3,482.01	-3,473.18	-275.79	30.01	0.62	30.00
8031	91	182	31	4,910.06	3,512.86	-3,503.90	-279.61	32.33	2.26	-32.26
8063	91	182	32	4,909.47	3,544.86	-3,535.87	-280.70	1.82	-1.56	-0.94
8094	90	182	31	4,909.26	3,575.85	-3,566.86	-281.67	2.58	-2.58	0.00
8126	90	182	32	4,909.20	3,607.85	-3,598.84	-282.62	0.88	0.63	-0.63
8157	91	182	31	4,908.96	3,638.84	-3,629.83	-283.46	1.64	1.61	-0.32
8189	91	181	32	4,908.40	3,670.83	-3,661.82	-284.19	2.25	1.87	-1.25
8220	92	181	31	4,907.64	3,701.81	-3,692.80	-284.76	0.72	0.65	-0.32
8252	91	181	32	4,906.86	3,733.79	-3,724.79	-285.40	1.13	-0.63	0.94
8283	91	182	31	4,906.29	3,764.78	-3,755.77	-286.16	1.74	-1.61	0.65
8315	89	182	32	4,906.24	3,796.78	-3,787.76	-287.13	4.65	-4.37	1.56
8346	89	182	31	4,906.56	3,827.77	-3,818.73	-288.24	0.32	0.00	0.32
8378	90	182	32	4,906.70	3,859.77	-3,850.71	-289.50	2.38	2.19	0.94
8409	90	182	31	4,906.62	3,890.77	-3,881.68	-290.71	1.02	0.32	-0.97
8441	89	182	32	4,906.90	3,922.77	-3,913.66	-291.83	4.42	-4.38	-0.62
8472	89	182	31	4,907.47	3,953.76	-3,944.64	-292.75	1.61	0.97	-1.29
8504	90	182	32	4,907.83	3,985.75	-3,976.63	-293.59	1.56	1.56	0.00
8535	90	181	31	4,907.94	4,016.75	-4,007.62	-294.35	1.44	1.29	-0.65
8566	91	181	31	4,907.80	4,047.74	-4,038.61	-295.02	1.64	1.61	-0.32
8598	90	181	32	4,907.63	4,079.73	-4,070.60	-295.75	1.40	-1.25	0.63
8629	90	182	31	4,907.55	4,110.72	-4,101.59	-296.59	1.02	0.32	0.97
8661	89	181	32	4,907.69	4,142.72	-4,133.58	-297.34	3.56	-2.81	-2.19
8692	88	181	31	4,908.31	4,173.70	-4,164.57	-297.91	2.92	-2.90	0.32
8724	89	180	32	4,909.10	4,205.67	-4,196.56	-298.33	2.52	1.25	-2.19
8755	89	180	31	4,909.75	4,236.64	-4,227.55	-298.54	0.00	0.00	0.00
8787	88	180	32	4,910.53	4,268.61	-4,259.54	-298.77	1.25	-1.25	0.00
8818	88	180	31	4,911.39	4,299.58	-4,290.53	-298.98	0.00	0.00	0.00
8850	89	181	32	4,912.26	4,331.55	-4,322.52	-299.26	0.70	0.31	0.62
8881	88	180	31	4,913.10	4,362.51	-4,353.50	-299.51	1.02	-0.32	-0.97
8913	89	180	32	4,913.91	4,394.48	-4,385.49	-299.62	1.13	0.94	-0.63
8944	89	180	31	4,914.53	4,425.44	-4,416.49	-299.70	1.02	0.97	0.32
8976	88	180	32	4,915.42	4,457.40	-4,448.47	-299.75	3.80	-3.75	-0.62
9007	87	180	31	4,916.72	4,488.34	-4,479.45	-299.75	1.29	-1.29	0.00
9039	88	180	32	4,918.09	4,520.28	-4,511.42	-299.78	0.99	0.94	0.31
9070	88	180	31	4,919.28	4,551.23	-4,542.39	-299.86	0.72	0.65	0.32
9102	88	180	32	4,920.34	4,583.19	-4,574.38	-299.97	1.25	1.25	0.00
9133	89	180	31	4,921.15	4,614.15	-4,605.36	-300.08	1.29	1.29	0.00
9165	89	180	32	4,921.77	4,646.12	-4,637.36	-300.25	1.40	1.25	0.63
9196	89	180	31	4,922.20	4,677.10	-4,668.35	-300.47	0.65	0.65	0.00
9228	88	180	32	4,922.87	4,709.07	-4,700.35	-300.63	3.19	-3.13	-0.63
9259	88	180	31	4,923.76	4,740.02	-4,731.33	-300.61	1.64	0.32	-1.61
9291	89	180	32	4,924.57	4,771.97	-4,763.32	-300.47	0.99	0.94	0.31
9322	89	179	31	4,925.25	4,802.92	-4,794.32	-300.25	1.33	0.32	-1.29
9354	89	180	32	4,925.83	4,834.88	-4,826.31	-300.03	1.56	0.94	1.25
9385	89	180	31	4,926.37	4,865.84	-4,857.30	-299.92	0.65	-0.65	0.00
9417	89	180	32	4,926.99	4,897.79	-4,889.30	-299.84	0.31	0.00	0.31
9448	89	180	31	4,927.58	4,928.75	-4,920.29	-299.67	1.29	0.00	-1.29
9480	90	179	32	4,928.00	4,960.70	-4,952.29	-299.37	2.21	2.19	-0.31
9511	90	179	31	4,928.11	4,991.65	-4,983.28	-298.93	1.82	1.29	-1.29
9543	90	179	32	4,928.00	5,023.58	-5,015.28	-298.29	1.56	1.25	-0.94
9574	91	179	31	4,927.70	5,054.51	-5,046.27	-297.59	0.97	0.97	0.00
9606	91	178	32	4,927.34	5,086.42	-5,078.25	-296.72	1.59	-0.31	-1.56
9637	91	178	31	4,926.99	5,117.33	-5,109.24	-295.72	0.46	0.32	-0.32
9669	91	178	32	4,926.48	5,149.23	-5,141.21	-294.61	1.40	1.25	-0.62
9700	91	178	31	4,925.84	5,180.11	-5,172.18	-293.36	1.44	0.65	-1.29
9731	92	178	31	4,925.05	5,210.98	-5,203.14	-292.04	1.02	0.97	0.32
9763	92	177	32	4,924.05	5,242.84	-5,235.09	-290.61	1.56	1.25	-0.94
9794	92	178	31	4,923.02	5,273.71	-5,266.05	-289.40	2.97	-0.65	2.90
9826	92	178	32	4,921.96	5,305.61	-5,298.02	-288.42	0.70	0.63	0.31
9857	92	178	31	4,921.01	5,336.50	-5,328.99	-287.39	2.07	-1.61	-1.29
9889	91	179	32	4,920.34	5,368.41	-5,360.97	-286.50	3.64	-1.87	3.13
9920	91	179	31	4,919.80	5,399.34	-5,391.96	-286.01	1.44	0.65	1.29
9952	91	181	32	4,919.24	5,431.31	-5,423.95	-285.96	3.80	-0.62	3.75
9983	91	182	31	4,918.78	5,462.29	-5,454.95	-286.50	3.24	-0.32	3.23
10015	91	181	32	4,918.42	5,494.28	-5,486.93	-287.31	0.99	-0.94	-0.31
10046	89	182	31	4,918.50	5,525.28	-5,517.92	-288.12	4.24	-4.19	0.65
10078	87	181	32	4,919.45	5,557.25	-5,549.90	-288.85	5.93	-5.62	-1.87
10109	87	181	31	4,920.91	5,588.20	-5,580.86	-289.30	1.16	-0.65	-0.97
10172	88	181	63	4,923.66	5,651.11	-5,643.80	-289.96	1.00	0.95	-0.32
10203	88	181	31	4,924.68	5,682.07	-5,674.78	-290.29	2.04	1.94	0.65
10235	89	181	32	4,925.52	5,714.05	-5,706.76	-290.71	0.70	0.62	0.31
10266	89	181	31	4,926.20	5,745.02	-5,737.75	-291.09	1.16	0.97	-0.65
10298	89	181	32	4,926.76	5,777.00	-5,769.75	-291.39	0.70	0.62	-0.31
10329	88	182	31	4,927.49	5,807.98	-5,800.73	-292.01	5.10	-2.90	4.19
10361	88	182	32	4,928.58	5,839.96	-5,832.70	-293.02	0.94	-0.94	0.00
10392	88	182	31	4,929.79	5,870.93	-5,863.66	-294.02	1.02	-0.97	0.32
10424	88	182	32	4,931.10	5,902.90	-5,895.62	-295.02	0.70	0.31	-0.63
10455	89	182	31	4,932.13	5,933.88	-5,926.58	-295.94	2.58	2.58	0.00
10487	89	182	32	4,932.94	5,965.87	-5,958.56	-296.92	0.44	0.31	0.31
10518	89	183	31	4,933.48	5,996.86	-5,989.53	-298.08	3.43	2.58	2.26
10550	90	183	32	4,933.57	6,028.86	-6,021.49	-299.70	3.76	2.81	2.50
10581	90	183	31	4,933.43	6,059.86	-6,052.44	-301.38	1.33	-0.32	-1.29
10613	91	183	32	4,933.24	6,091.86	-6,084.41	-302.94	1.13	0.94	-0.63
10644	91	182	31	4,932.97	6,122.86	-6,115.38	-304.29	1.29	0.00	-1.29
10676	91	183	32	4,932.69	6,154.86	-6,147.35	-305.63	0.62	0.00	0.62

Directional Survey Calculation
Minimum Curvature Method - version 2.0

For Microsoft Excel Version 3.0 for Macintosh
and Microsoft Excel Version 3.0 for Windows (IBM)

4.00 Direction	Interval's	Ratio	D	D	D	Closure	Closure
2.00 Azimuth	Dog Leg	Factor	N / S	E / S	TVD	Distance	Direction
3.00 0.00						0.00	#DIV/0!
181.80	1.03	1.00	-30.98	-1.22	0.03	2,417.32	-173.75
181.80	0.00	1.00	-31.98	-1.01	-0.11	2,449.23	-173.81
180.40	2.28	1.00	-30.99	-0.60	0.38	2,480.10	-173.88
180.40	0.20	1.00	-31.99	-0.22	0.84	2,511.93	-173.95
180.40	0.20	1.00	-30.99	-0.22	0.70	2,542.78	-174.02
180.50	0.41	1.00	-31.99	-0.25	0.56	2,574.62	-174.09
180.40	0.32	1.00	-31.00	-0.24	0.35	2,605.48	-174.15
181.00	0.60	1.00	-32.00	-0.39	0.28	2,637.35	-174.21
180.40	0.60	1.00	-31.00	-0.38	0.27	2,668.23	-174.27
180.00	0.50	1.00	-32.00	-0.11	0.20	2,700.08	-174.34
180.30	0.58	1.00	-31.00	-0.08	0.24	2,730.94	-174.40
180.20	1.20	1.00	-31.99	-0.14	0.73	2,762.80	-174.46
180.20	0.00	1.00	-30.98	-0.11	1.03	2,793.65	-174.52
179.80	0.41	1.00	-31.98	0.00	1.03	2,825.48	-174.58
179.20	1.34	1.00	-30.97	0.27	1.30	2,856.29	-174.65
179.20	0.00	1.00	0.00	0.00	0.00	2,856.29	-174.65
179.10	0.61	1.00	-31.94	0.47	1.84	2,888.05	-174.72
179.70	1.34	1.00	-30.96	0.32	1.62	2,918.85	-174.78
180.10	0.98	1.00	-30.98	0.05	1.05	2,949.70	-174.83
180.80	1.75	1.00	-32.00	-0.25	0.39	2,981.59	-174.88
180.10	1.06	1.00	-31.00	-0.24	0.16	3,012.49	-174.93
180.10	0.60	1.00	-31.99	-0.06	0.56	3,044.36	-174.98
179.90	0.28	1.00	-30.99	0.00	0.65	3,075.24	-175.04
180.30	0.98	1.00	-32.00	-0.06	0.36	3,107.12	-175.09
180.40	0.91	1.00	-32.00	-0.20	-0.14	3,139.02	-175.13
180.70	0.58	1.00	-30.99	-0.30	-0.51	3,169.93	-175.17
180.30	0.64	1.00	-31.99	-0.28	-0.81	3,201.83	-175.22
180.00	0.58	1.00	-30.98	-0.08	-1.05	3,232.71	-175.26
179.80	0.54	1.00	-31.97	0.06	-1.37	3,264.57	-175.31
180.20	0.72	1.00	-30.97	0.00	-1.30	3,295.44	-175.35
181.20	1.04	1.00	-31.98	-0.39	-1.09	3,327.34	-175.39
181.70	0.86	1.00	-30.98	-0.78	-0.78	3,358.29	-175.42
182.10	0.64	1.00	-30.97	-1.03	-0.73	3,389.24	-175.44
182.50	1.26	1.00	-62.94	-2.53	-1.10	3,452.19	-175.49
192.10	9.60	1.00	-31.70	-4.06	-0.28	3,484.11	-175.46
182.10	10.02	1.00	-30.72	-3.83	-0.52	3,515.04	-175.44
181.80	0.58	1.00	-31.98	-1.09	-0.59	3,547.00	-175.46
181.80	0.80	1.00	-30.98	-0.97	-0.22	3,577.96	-175.48
181.60	0.28	1.00	-31.99	-0.95	-0.06	3,609.92	-175.51
181.50	0.51	1.00	-30.99	-0.84	-0.24	3,640.88	-175.53
181.10	0.72	1.00	-31.99	-0.73	-0.56	3,672.83	-175.56
181.00	0.22	1.00	-30.99	-0.57	-0.76	3,703.76	-175.59
181.30	0.36	1.00	-31.98	-0.64	-0.78	3,735.70	-175.62
181.50	0.54	1.00	-30.99	-0.76	-0.57	3,766.66	-175.64
182.00	1.49	1.00	-31.98	-0.98	-0.06	3,798.62	-175.66
182.10	0.10	1.00	-30.98	-1.11	0.32	3,829.60	-175.68
182.40	0.76	1.00	-31.97	-1.26	0.14	3,861.58	-175.70
182.10	0.32	1.00	-30.98	-1.22	-0.08	3,892.56	-175.72
181.90	1.41	1.00	-31.98	-1.12	0.28	3,924.53	-175.74
181.50	0.50	1.00	-30.98	-0.92	0.57	3,955.49	-175.76
181.50	0.50	1.00	-31.99	-0.84	0.36	3,987.45	-175.78
181.30	0.45	1.00	-30.99	-0.76	0.11	4,018.42	-175.80
181.20	0.51	1.00	-30.99	-0.68	-0.14	4,049.37	-175.82
181.40	0.45	1.00	-31.99	-0.73	-0.17	4,081.33	-175.84
181.70	0.32	1.00	-30.99	-0.84	-0.08	4,112.30	-175.86
181.00	1.14	1.00	-31.99	-0.75	0.14	4,144.26	-175.89
181.10	0.91	1.00	-30.99	-0.57	0.62	4,175.21	-175.91
180.40	0.81	1.00	-31.99	-0.42	0.78	4,207.15	-175.93
180.40	0.00	1.00	-30.99	-0.22	0.65	4,238.08	-175.96
180.40	0.40	1.00	-31.99	-0.22	0.78	4,270.01	-175.99
180.40	0.00	1.00	-30.99	-0.22	0.87	4,300.93	-176.01
180.60	0.22	1.00	-31.99	-0.28	0.87	4,332.86	-176.04
180.30	0.32	1.00	-30.99	-0.24	0.84	4,363.79	-176.06
180.10	0.36	1.00	-31.99	-0.11	0.81	4,395.72	-176.09
180.20	0.32	1.00	-30.99	-0.08	0.62	4,426.64	-176.12
180.00	1.22	1.00	-31.99	-0.06	0.89	4,458.56	-176.15
180.00	0.40	1.00	-30.97	0.00	1.30	4,489.46	-176.17
180.10	0.32	1.00	-31.97	-0.03	1.37	4,521.37	-176.20
180.20	0.22	1.00	-30.98	-0.08	1.19	4,552.28	-176.22
180.20	0.40	1.00	-31.98	-0.11	1.06	4,584.20	-176.25
180.20	0.40	1.00	-30.99	-0.11	0.81	4,615.13	-176.27
180.40	0.45	1.00	-31.99	-0.17	0.61	4,647.07	-176.30
180.40	0.20	1.00	-31.00	-0.22	0.43	4,678.01	-176.32
180.20	1.02	1.00	-31.99	-0.17	0.67	4,709.95	-176.34
179.70	0.51	1.00	-30.99	0.03	0.89	4,740.87	-176.36
179.80	0.32	1.00	-31.99	0.14	0.81	4,772.79	-176.39
179.40	0.41	1.00	-30.99	0.22	0.68	4,803.71	-176.42
179.80	0.50	1.00	-31.99	0.22	0.59	4,835.63	-176.44
179.80	0.20	1.00	-31.00	0.11	0.54	4,866.55	-176.47
179.90	0.10	1.00	-31.99	0.08	0.61	4,898.48	-176.49
179.50	0.40	1.00	-30.99	0.16	0.60	4,929.41	-176.51
179.40	0.71	1.00	-32.00	0.31	0.42	4,961.33	-176.54
179.00	0.57	1.00	-31.00	0.43	0.11	4,992.24	-176.57
178.70	0.50	1.00	-31.99	0.64	-0.11	5,024.14	-176.60
178.70	0.30	1.00	-30.99	0.70	-0.30	5,055.03	-176.63
178.20	0.51	1.00	-31.99	0.87	-0.36	5,086.92	-176.66
178.10	0.14	1.00	-30.98	1.00	-0.35	5,117.79	-176.69
177.90	0.45	1.00	-31.98	1.12	-0.50	5,149.65	-176.72
177.50	0.45	1.00	-30.97	1.24	-0.65	5,180.49	-176.75
177.60	0.32	1.00	-30.96	1.32	-0.78	5,211.33	-176.79
177.30	0.50	1.00	-31.95	1.42	-1.01	5,243.15	-176.82
178.20	0.92	1.00	-30.96	1.22	-1.03	5,274.00	-176.85
178.30	0.22	1.00	-31.97	0.98	-1.06	5,305.87	-176.88
177.90	0.64	1.00	-30.97	1.03	-0.95	5,336.73	-176.91
178.90	1.17	1.00	-31.98	0.89	-0.67	5,368.62	-176.94
179.30	0.45	1.00	-30.99	0.49	-0.54	5,399.54	-176.96
180.50	1.22	1.00	-31.99	0.06	-0.56	5,431.49	-176.98
181.50	1.00	1.00	-30.99	-0.54	-0.46	5,462.46	-176.99
181.40	0.32	1.00	-31.99	-0.81	-0.36	5,494.45	-177.00
181.60	1.32	1.00	-30.99	-0.81	0.08	5,525.44	-177.01
181.00	1.90	1.00	-31.98	-0.73	0.95	5,557.41	-177.02
180.70	0.36	1.00	-30.96	-0.46	1.46	5,588.35	-177.03
180.50	0.63	1.00	-62.94	-0.66	2.75	5,651.24	-177.06
180.70	0.63	1.00	-30.98	-0.32	1.03	5,682.20	-177.07
180.80	0.22	1.00	-31.99	-0.42	0.84	5,714.16	-177.08
180.60	0.36	1.00	-30.99	-0.38	0.68	5,745.13	-177.10
180.50	0.22	1.00	-31.99	-0.31	0.56	5,777.10	-177.11
181.80	1.58	1.00	-30.98	-0.62	0.73	5,808.08	-177.12
181.80	0.30	1.00	-31.97	-1.00	1.09	5,840.05	-177.12
181.90	0.32	1.00	-30.96	-1.00	1.22	5,871.02	-177.13
181.70	0.22	1.00	-31.96	-1.00	1.31	5,902.99	-177.14
181.70	0.80	1.00	-30.97	-0.92	1.03	5,933.97	-177.14
181.80	0.14	1.00	-31.97	-0.98	0.81	5,965.95	-177.15
182.50	1.06	1.00	-30.97	-1.16	0.54	5,996.95	-177.15
183.30	1.20	1.00	-31.96	-1.62	0.08	6,028.94	-177.15
182.90	0.41	1.00	-30.95	-1.68	-0.14	6,059.94	-177.15
182.70	0.36	1.00	-31.96	-1.56	-0.20	6,091.94	-177.15
182.30	0.40	1.00	-30.97	-1.35	-0.27	6,122.94	-177.15
182.50	0.20	1.00	-31.97	-1.34	-0.28	6,154.94	-177.15

-100.00	4,870.00
4,680.00	4,915.00

DIRECTIONAL SURVEY CALCULATION

MINIMUM CURVATURE METHOD

Well Name	Target Direction	Slot Coordinate	N / S	E / W	Hole Size	Calculation by	Date
Mary Ann 2622 1-	182.55						1/7/13
Job Number	**Type of Survey**	**Tie-in Point**				**Directional Co.**	
0							

Meaured Depth	Hole Angle	Hole Direction	Course Length	True Vertical Depth	Vertical Section	Total Coordinate N + / S -	Total Coordinate E + / W -	Dogleg Severity	Build Up °/100 ft	Walk/ °/100 ft
0	0	0	0	0.00	0.00			<< TIE-IN POINT >>		
10707	91	182	31	4,932.42	6,185.85	-6,178.32	-306.80	2.26	0.00	-2.26
10738	91	182	31	4,932.09	6,216.85	-6,209.31	-307.72	0.91	0.65	-0.65
10770	91	182	32	4,931.56	6,248.84	-6,241.29	-308.61	1.56	1.56	0.00
10801	91	182	31	4,930.88	6,279.83	-6,272.27	-309.53	0.72	0.32	0.65
10833	91	181	32	4,930.27	6,311.82	-6,304.25	-310.31	2.79	-1.25	-2.50
10864	91	181	31	4,929.68	6,342.80	-6,335.24	-310.74	1.82	1.29	-1.29
10896	92	181	32	4,928.87	6,374.77	-6,367.23	-311.19	1.56	0.94	1.25
10927	91	181	31	4,928.16	6,405.75	-6,398.22	-311.70	1.96	-1.94	-0.32
10959	91	181	32	4,927.49	6,437.73	-6,430.21	-312.23	1.29	1.25	0.31
10990	90	181	31	4,927.06	6,468.72	-6,461.20	-312.83	3.92	-3.87	0.65
11022	90	181	32	4,926.95	6,500.71	-6,493.19	-313.44	0.62	0.00	-0.62
11053	90	181	31	4,926.97	6,531.70	-6,524.19	-314.01	1.64	-1.61	0.32
11085	90	181	32	4,927.09	6,563.69	-6,556.18	-314.65	0.70	0.63	0.31
11148	90	181	63	4,927.09	6,626.66	-6,619.17	-315.70	0.85	0.32	-0.79
11179	90	180	31	4,927.09	6,657.64	-6,650.17	-315.94	1.74	-0.65	-1.61
11211	90	179	32	4,927.14	6,689.60	-6,682.17	-315.80	2.81	0.00	-2.81
11242	90	179	31	4,927.11	6,720.55	-6,713.17	-315.45	1.02	0.97	0.32
11273	90	180	31	4,927.01	6,751.51	-6,744.17	-315.15	0.32	0.00	0.32
11305	91	179	32	4,926.70	6,783.46	-6,776.16	-314.82	2.28	2.19	-0.62
11337	92	179	32	4,926.03	6,815.39	-6,808.15	-314.29	2.44	1.87	-1.56
11368	92	179	31	4,925.06	6,846.31	-6,839.13	-313.58	2.04	1.94	-0.65
11399	93	179	31	4,923.78	6,877.21	-6,870.09	-312.85	1.64	1.61	0.32
11431	92	179	32	4,922.47	6,909.11	-6,902.06	-312.21	1.82	-1.56	0.94
11462	92	179	31	4,921.47	6,940.05	-6,933.04	-311.78	2.07	-1.61	1.29
11494	92	179	32	4,920.44	6,971.98	-6,965.02	-311.45	1.56	1.56	0.00
11525	92	179	31	4,919.22	7,002.91	-6,996.00	-311.12	0.97	0.97	0.00
11557	93	179	32	4,917.77	7,034.82	-7,027.96	-310.67	1.77	1.25	-1.25
11588	94	179	31	4,916.07	7,065.71	-7,058.91	-310.11	2.28	2.26	-0.32
11620	94	179	32	4,914.06	7,097.58	-7,090.84	-309.44	0.88	0.63	-0.63
11649	94	179	29	4,912.11	7,126.46	-7,119.77	-308.86	1.46	1.03	1.03
11683	95	179	34	4,909.56	7,160.29	-7,153.66	-308.24	1.79	1.76	-0.29
11700	95	179	17	4,908.15	7,177.21	-7,170.60	-307.99	3.42	1.76	2.94
11746	95	179	46	4,904.22	7,222.97	-7,216.43	-307.51	0.00	0.00	0.00
11770	95	179	24	4,902.17	7,246.84	-7,240.34	-307.25	0.00	0.00	0.00

Directional Survey Calculation
Minimum Curvature Method - version 2.0

For Microsoft Excel Version 3.0 for Macintosh
and Microsoft Excel Version 3.0 for Windows (IBM)

4.00 Direction 2.00 Azimuth 3.00	Interval's Dog Leg	Ratio Factor	D N / S	D E / S	D TVD	Closure Distance	Closure Direction
0.00						0.00	#DIV/0!
181.80	0.70	1.00	-30.98	-1.16	-0.27	6,185.94	-177.16
181.60	0.28	1.00	-30.98	-0.92	-0.32	6,216.93	-177.16
181.60	0.50	1.00	-31.98	-0.89	-0.53	6,248.92	-177.17
181.80	0.22	1.00	-30.98	-0.92	-0.68	6,279.90	-177.17
181.00	0.89	1.00	-31.98	-0.78	-0.61	6,311.89	-177.18
180.60	0.57	1.00	-30.99	-0.43	-0.60	6,342.86	-177.19
181.00	0.50	1.00	-31.99	-0.45	-0.81	6,374.83	-177.20
180.90	0.61	1.00	-30.99	-0.51	-0.70	6,405.81	-177.21
181.00	0.41	1.00	-31.99	-0.53	-0.67	6,437.78	-177.22
181.20	1.22	1.00	-30.99	-0.60	-0.43	6,468.77	-177.23
181.00	0.20	1.00	-31.99	-0.61	-0.11	6,500.75	-177.24
181.10	0.51	1.00	-30.99	-0.57	0.03	6,531.74	-177.24
181.20	0.22	1.00	-31.99	-0.64	0.11	6,563.73	-177.25
180.70	0.54	1.00	-62.99	-1.04	0.00	6,626.70	-177.27
180.20	0.54	1.00	-31.00	-0.24	0.00	6,657.67	-177.28
179.30	0.90	1.00	-32.00	0.14	0.06	6,689.63	-177.29
179.40	0.32	1.00	-31.00	0.35	-0.03	6,720.57	-177.31
179.50	0.10	1.00	-31.00	0.30	-0.11	6,751.53	-177.32
179.30	0.73	1.00	-32.00	0.34	-0.31	6,783.47	-177.34
178.80	0.78	1.00	-31.99	0.53	-0.67	6,815.40	-177.36
178.60	0.63	1.00	-30.98	0.70	-0.97	6,846.31	-177.37
178.70	0.51	1.00	-30.97	0.73	-1.27	6,877.21	-177.39
179.00	0.58	1.00	-31.97	0.64	-1.31	6,909.12	-177.41
179.40	0.64	1.00	-30.98	0.43	-1.00	6,940.05	-177.43
179.40	0.50	1.00	-31.98	0.33	-1.03	6,971.98	-177.44
179.40	0.30	1.00	-30.97	0.32	-1.22	7,002.91	-177.45
179.00	0.57	1.00	-31.96	0.45	-1.45	7,034.82	-177.47
178.90	0.71	1.00	-30.95	0.57	-1.70	7,065.72	-177.48
178.70	0.28	1.00	-31.93	0.67	-2.01	7,097.59	-177.50
179.00	0.42	1.00	-28.93	0.58	-1.95	7,126.46	-177.52
178.90	0.61	1.00	-33.90	0.62	-2.55	7,160.30	-177.53
179.40	0.58	1.00	-16.94	0.25	-1.41	7,177.21	-177.54
179.40	0.00	1.00	-45.83	0.48	-3.93	7,222.98	-177.56
179.40	0.00	1.00	-23.91	0.25	-2.05	7,246.86	-177.57