DIRECTIONAL SURVEY CALCULATION

MINIMUM CURVATURE METHOD

Well Name	Target Direction	Slot Coordinate	N / S	E / W	Hole Size	Calculation by	Date
Teal 1-27H	1.17						8/27/12
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 >>		
966	0	330	966	965.99	2.89	2.92	-1.69	0.04	0.04	34.16
1438	1	334	472	1,437.95	7.95	8.04	-4.33	0.13	0.13	0.78
1913	0	272	475	1,912.93	11.64	11.80	-7.41	0.19	-0.15	-13.01
2388	1	345	475	2,387.92	13.65	13.84	-9.19	0.11	0.04	15.43
2862	1	353	474	2,861.88	18.91	19.12	-10.14	0.07	0.06	1.56
3337	1	353	475	3,336.83	25.89	26.12	-11.00	0.02	0.02	0.17
3813	2	333	476	3,812.69	36.57	36.89	-14.96	0.23	0.21	-4.20
3908	1	6	95	3,907.66	38.88	39.20	-15.57	1.20	-0.84	-344.42
4003	2	16	95	4,002.61	41.54	41.86	-14.96	1.19	1.16	10.63
4098	2	18	95	4,097.56	44.73	45.03	-13.99	0.42	-0.42	1.58
4130	2	15	32	4,129.54	45.70	45.99	-13.71	0.29	0.00	-9.38
4162	2	14	32	4,161.52	46.68	46.97	-13.46	0.13	0.00	-4.06
4194	3	7	32	4,193.50	47.90	48.18	-13.26	2.62	2.50	-20.63
4225	4	8	31	4,224.45	49.70	49.97	-13.03	4.84	4.84	2.26
4257	5	8	32	4,256.35	52.11	52.38	-12.69	1.57	1.56	2.19
4289	5	11	32	4,288.25	54.70	54.96	-12.26	0.84	0.63	6.88
4320	6	10	31	4,319.12	57.45	57.70	-11.75	2.26	2.26	-0.32
4352	7	8	32	4,350.93	60.93	61.17	-11.21	5.08	5.00	-8.13
4384	10	7	32	4,382.59	65.52	65.75	-10.61	7.50	7.50	-1.56
4447	14	8	63	4,444.22	78.43	78.63	-8.93	7.62	7.62	0.32
4479	17	7	32	4,475.04	86.96	87.14	-7.88	7.85	7.81	-2.81
4510	19	6	31	4,504.53	96.48	96.63	-6.84	7.44	7.42	-1.94
4542	21	6	32	4,534.57	107.46	107.60	-5.68	6.56	6.56	0.00
4700	34	9	158	4,674.38	179.83	179.78	4.54	8.10	8.04	2.15
4732	36	10	32	4,700.62	197.94	197.83	7.61	6.31	6.25	1.56
4795	39	8	63	4,750.60	235.94	235.71	13.52	5.43	5.08	-3.17
4859	45	8	64	4,798.03	278.56	278.22	19.50	9.53	9.53	0.31
4954	50	8	95	4,862.25	348.01	347.48	29.42	4.74	4.74	0.11
5080	48	7	126	4,945.33	442.15	441.39	41.80	1.72	-1.51	-1.11
5143	50	6	63	4,986.91	489.29	488.44	46.95	3.14	2.86	-1.75
5175	53	5	32	5,006.85	514.24	513.35	49.34	11.60	11.56	-1.25
5237	62	5	62	5,040.18	566.35	565.37	53.83	13.42	13.39	-1.13
5270	66	4	33	5,054.64	595.96	594.94	55.92	14.85	14.55	-3.33
5302	71	3	32	5,066.26	625.75	624.71	57.53	14.56	14.38	-2.50
5333	75	2	31	5,075.45	655.34	654.28	58.82	11.36	11.29	-1.29
5365	77	3	32	5,083.27	686.36	685.28	60.12	8.46	8.44	0.63
5397	80	2	32	5,089.71	717.70	716.60	61.27	7.89	7.50	-2.50
5428	82	1	31	5,094.64	748.30	747.19	62.02	8.29	8.06	-1.94
5460	84	1	32	5,098.42	780.08	778.96	62.46	7.12	6.88	-1.88
5557	88	1	97	5,105.02	876.83	875.71	63.90	3.78	3.71	0.72
5589	89	2	32	5,105.77	908.82	907.69	64.68	4.85	4.69	1.25
5621	91	2	32	5,105.75	940.82	939.68	65.57	4.06	4.06	0.00
5716	91	2	95	5,104.25	1,035.81	1,034.63	68.31	0.43	0.42	0.11
5811	91	1	95	5,102.18	1,130.78	1,129.59	70.13	1.30	0.32	-1.26
5906	91	359	95	5,100.44	1,225.72	1,224.56	69.30	2.23	-0.74	376.84
6001	91	358	95	5,098.87	1,320.60	1,319.51	66.73	0.54	0.53	-0.11
6096	91	358	95	5,097.29	1,415.45	1,414.45	63.58	0.82	-0.53	-0.63
6190	91	357	94	5,095.73	1,509.24	1,508.34	59.48	0.83	0.53	-0.64
6285	91	356	95	5,094.07	1,603.90	1,603.14	53.52	1.74	-0.42	-1.68
6412	94	357	127	5,089.09	1,730.33	1,729.77	45.44	2.57	2.28	1.18
6480	91	354	68	5,086.30	1,797.94	1,797.49	40.17	6.04	-3.97	-4.56
6570	92	353	90	5,084.02	1,887.05	1,886.83	29.59	1.94	1.00	-1.67
6665	92	353	95	5,081.04	1,980.99	1,981.04	17.69	0.67	-0.21	0.63
6760	92	355	95	5,077.97	2,075.19	2,075.46	7.77	1.92	0.32	1.89
6855	91	355	95	5,075.32	2,169.62	2,170.08	-0.35	0.94	-0.84	0.42
6950	90	356	95	5,073.99	2,264.19	2,264.81	-7.38	1.27	-0.84	0.95
7045	92	358	95	5,072.17	2,358.90	2,359.64	-12.60	2.01	1.47	1.37

DIRECTIONAL SURVEY CALCULATION

MINIMUM CURVATURE METHOD

Well Name	Target Direction	Slot Coordinate	N / S	E / W	Hole Size	Calculation by	Date
Teal 1-27H	1.17						8/27/12
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 -	E + / W -	Dogleg Severity	Build Up °/100 ft	Walk/ °/100 ft
0	0	0	0	0.00	0.00			<< TIE-IN POINT >>		
7140	92	359	95	5,069.27	2,453.74	2,454.56	-15.26	1.90	-0.11	1.89
7235	90	2	95	5,067.77	2,548.71	2,549.53	-14.59	2.86	-1.68	-376.63
7330	92	2	95	5,066.45	2,643.69	2,644.47	-11.53	1.65	1.47	0.74
7424	92	2	94	5,063.82	2,737.64	2,738.39	-8.49	0.77	0.21	-0.74
7519	91	4	95	5,061.83	2,832.59	2,833.27	-4.35	2.35	-1.05	2.11
7614	91	5	95	5,060.26	2,927.44	2,927.99	2.69	1.66	0.53	1.58
7709	92	7	95	5,058.02	3,022.10	3,022.48	12.29	1.71	0.32	1.68
7804	92	7	95	5,055.53	3,116.58	3,116.74	23.78	0.74	0.00	0.74
7899	92	8	95	5,052.72	3,210.93	3,210.86	36.42	0.85	0.42	0.74
7994	92	7	95	5,049.32	3,305.26	3,304.95	49.06	0.80	0.32	-0.74
8089	93	6	95	5,044.84	3,399.71	3,399.18	60.21	1.56	1.05	-1.16
8184	92	6	95	5,040.95	3,494.28	3,493.57	70.22	1.82	-1.79	-0.32
8279	91	5	95	5,038.54	3,588.96	3,588.09	79.48	0.64	-0.11	-0.63
8374	90	4	95	5,037.71	3,683.77	3,682.75	87.35	2.22	-1.89	-1.16
8469	90	5	95	5,038.05	3,778.61	3,777.46	94.80	0.76	0.42	0.63
8564	90	3	95	5,038.05	3,873.49	3,872.23	101.26	1.89	0.00	-1.89
8659	90	3	95	5,037.71	3,968.46	3,967.12	105.82	0.67	0.42	-0.53
8754	90	0	95	5,037.55	4,063.45	4,062.09	107.98	2.60	-0.63	-2.53
8849	90	0	95	5,037.71	4,158.43	4,157.09	108.06	0.24	0.21	-0.11
8944	90	1	95	5,037.55	4,253.42	4,252.09	108.72	0.87	0.21	0.84
9039	91	1	95	5,036.88	4,348.41	4,347.08	109.80	0.53	0.42	-0.32
9134	89	360	95	5,037.13	4,443.40	4,442.08	110.05	1.74	-1.58	378.21
9324	89	359	190	5,040.61	4,633.28	4,632.03	108.23	0.40	-0.16	-0.37
9405	89	359	81	5,042.38	4,714.21	4,713.01	106.95	0.12	-0.12	0.00
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			

DIRECTIONAL SURVEY CALCULATION

MINIMUM CURVATURE METHOD

Well Name	Target Direction	Slot Coordinate	N / S	E / W	Hole Size	Calculation by	Date
Teal 1-27H	1.17						8/27/12
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 -	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		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			

DIRECTIONAL SURVEY CALCULATION

MINIMUM CURVATURE METHOD

Well Name Teal 1-27H	Target Direction 1.17	Slot Coordinate	N / S	E / W	Hole Size	Calculation by	Date 8/27/12
Job Number 0	Type of Survey	Tie-in Point				Directional Co.	

Meaured Depth	Hole Angle	Hole Direction	Course Length	True Vertical Depth	Vertical Section	Total Coordinate N + / S -	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		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			
0	0	0		5,042.38	4,714.21	4,713.01	106.95			