

APPENDIX III - Excel Extract for Tidal Analysis.

KEY:

1 - Minutes; 2 - DEGREES; 3 - RADS; 4 - SINE; 5 Value in Range; 6 - Rate of rise mm per minute HAT;

7 - Tide CD Level; 8 - Equiv Rate per Hr HAT; 9 - % age of max rise rate.

10 - Tide Level HAT; 11 Tide Level +6.6mOD; 12 Tide Level 7.1m OD

1	2	3	4	5	6	7	8	9	10	11	12
Sine Wave Tide Calc.					FROM MID TIDE TO HIGH	HAT	HAT	HAT	HAT - 5.4m OD	6.6m OD	7.1m OD
Minutes	DEGREES	RADS	SINE	VALUE in Range	RATE OF RISE per min mm	Tide CD LEVEL HAT	Equiv RATE Per HOUR m	% age of Max Rise Rate	Tide Level OD	Tide 1:1000 6.6m	Tide 1:100 +500mm
0	0	0	0	0		5.2	0		0.2	1.4	1.9
1	0.47	0.01	0.01	0.04	42.99	5.24	2.58	100.00	0.24	1.44	1.94
2	0.95	0.02	0.02	0.09	42.99	5.29	2.58	99.99	0.29	1.49	1.99
3	1.42	0.02	0.02	0.13	42.98	5.33	2.58	99.98	0.33	1.53	2.03
4	1.89	0.03	0.03	0.17	42.97	5.37	2.58	99.96	0.37	1.57	2.07
5	2.37	0.04	0.04	0.21	42.96	5.41	2.58	99.93	0.41	1.61	2.11
6	2.84	0.05	0.05	0.26	42.95	5.46	2.58	99.90	0.46	1.66	2.16
7	3.32	0.06	0.06	0.30	42.93	5.50	2.58	99.86	0.50	1.70	2.20
8	3.79	0.07	0.07	0.34	42.91	5.54	2.57	99.81	0.54	1.74	2.24
9	4.26	0.07	0.07	0.39	42.88	5.59	2.57	99.75	0.59	1.79	2.29
10	4.74	0.08	0.08	0.43	42.86	5.63	2.57	99.69	0.63	1.83	2.33
11	5.21	0.09	0.09	0.47	42.83	5.67	2.57	99.62	0.67	1.87	2.37
12	5.68	0.10	0.10	0.52	42.80	5.72	2.57	99.55	0.72	1.92	2.42
13	6.16	0.11	0.11	0.56	42.76	5.76	2.57	99.47	0.76	1.96	2.46
14	6.63	0.12	0.12	0.60	42.72	5.80	2.56	99.38	0.80	2.00	2.50
15	7.11	0.12	0.12	0.64	42.68	5.84	2.56	99.28	0.84	2.04	2.54
16	7.58	0.13	0.13	0.69	42.64	5.89	2.56	99.18	0.89	2.09	2.59
17	8.05	0.14	0.14	0.73	42.59	5.93	2.56	99.07	0.93	2.13	2.63

18	8.53	0.15	0.15	0.77	42.54	5.97	2.55	98.96	0.97	2.17	2.67
19	9.00	0.16	0.16	0.81	42.49	6.01	2.55	98.83	1.01	2.21	2.71
20	9.47	0.17	0.16	0.86	42.43	6.06	2.55	98.70	1.06	2.26	2.76
21	9.95	0.17	0.17	0.90	42.37	6.10	2.54	98.57	1.10	2.30	2.80
22	10.42	0.18	0.18	0.94	42.31	6.14	2.54	98.43	1.14	2.34	2.84
23	10.89	0.19	0.19	0.98	42.25	6.18	2.53	98.28	1.18	2.38	2.88
24	11.37	0.20	0.20	1.02	42.18	6.22	2.53	98.12	1.22	2.42	2.92
25	11.84	0.21	0.21	1.07	42.11	6.27	2.53	97.96	1.27	2.47	2.97
26	12.32	0.21	0.21	1.11	42.04	6.31	2.52	97.79	1.31	2.51	3.01
27	12.79	0.22	0.22	1.15	41.96	6.35	2.52	97.61	1.35	2.55	3.05
28	13.26	0.23	0.23	1.19	41.88	6.39	2.51	97.43	1.39	2.59	3.09
29	13.74	0.24	0.24	1.23	41.80	6.43	2.51	97.24	1.43	2.63	3.13
30	14.21	0.25	0.25	1.28	41.72	6.48	2.50	97.04	1.48	2.68	3.18
31	14.68	0.26	0.25	1.32	41.63	6.52	2.50	96.84	1.52	2.72	3.22
32	15.16	0.26	0.26	1.36	41.54	6.56	2.49	96.63	1.56	2.76	3.26
33	15.63	0.27	0.27	1.40	41.45	6.60	2.49	96.41	1.60	2.80	3.30
34	16.11	0.28	0.28	1.44	41.35	6.64	2.48	96.19	1.64	2.84	3.34
35	16.58	0.29	0.29	1.48	41.25	6.68	2.48	95.96	1.68	2.88	3.38
36	17.05	0.30	0.29	1.52	41.15	6.72	2.47	95.72	1.72	2.92	3.42
37	17.53	0.31	0.30	1.57	41.05	6.77	2.46	95.48	1.77	2.97	3.47
38	18.00	0.31	0.31	1.61	40.94	6.81	2.46	95.23	1.81	3.01	3.51
39	18.47	0.32	0.32	1.65	40.83	6.85	2.45	94.98	1.85	3.05	3.55
40	18.95	0.33	0.32	1.69	40.72	6.89	2.44	94.72	1.89	3.09	3.59
41	19.42	0.34	0.33	1.73	40.60	6.93	2.44	94.45	1.93	3.13	3.63
42	19.89	0.35	0.34	1.77	40.48	6.97	2.43	94.17	1.97	3.17	3.67
43	20.37	0.36	0.35	1.81	40.36	7.01	2.42	93.89	2.01	3.21	3.71
44	20.84	0.36	0.36	1.85	40.24	7.05	2.41	93.60	2.05	3.25	3.75
45	21.32	0.37	0.36	1.89	40.11	7.09	2.41	93.31	2.09	3.29	3.79
46	21.79	0.38	0.37	1.93	39.98	7.13	2.40	93.01	2.13	3.33	3.83
47	22.26	0.39	0.38	1.97	39.85	7.17	2.39	92.70	2.17	3.37	3.87
48	22.74	0.40	0.39	2.01	39.72	7.21	2.38	92.39	2.21	3.41	3.91

49	23.21	0.41	0.39	2.05	39.58	7.25	2.37	92.07	2.25	3.45	3.95
50	23.68	0.41	0.40	2.09	39.44	7.29	2.37	91.74	2.29	3.49	3.99
51	24.16	0.42	0.41	2.13	39.30	7.33	2.36	91.41	2.33	3.53	4.03
52	24.63	0.43	0.42	2.17	39.15	7.37	2.35	91.07	2.37	3.57	4.07
53	25.11	0.44	0.42	2.21	39.00	7.41	2.34	90.73	2.41	3.61	4.11
54	25.58	0.45	0.43	2.25	38.85	7.45	2.33	90.38	2.45	3.65	4.15
55	26.05	0.45	0.44	2.28	38.70	7.48	2.32	90.02	2.48	3.68	4.18
56	26.53	0.46	0.45	2.32	38.54	7.52	2.31	89.66	2.52	3.72	4.22
57	27.00	0.47	0.45	2.36	38.38	7.56	2.30	89.29	2.56	3.76	4.26
58	27.47	0.48	0.46	2.40	38.22	7.60	2.29	88.91	2.60	3.80	4.30
59	27.95	0.49	0.47	2.44	38.06	7.64	2.28	88.53	2.64	3.84	4.34
60	28.42	0.50	0.48	2.47	37.89	7.67	2.27	88.14	2.67	3.87	4.37
61	28.89	0.50	0.48	2.51	37.72	7.71	2.26	87.75	2.71	3.91	4.41
62	29.37	0.51	0.49	2.55	37.55	7.75	2.25	87.35	2.75	3.95	4.45
63	29.84	0.52	0.50	2.59	37.38	7.79	2.24	86.95	2.79	3.99	4.49
64	30.32	0.53	0.50	2.62	37.20	7.82	2.23	86.53	2.82	4.02	4.52
65	30.79	0.54	0.51	2.66	37.02	7.86	2.22	86.12	2.86	4.06	4.56
66	31.26	0.55	0.52	2.70	36.84	7.90	2.21	85.69	2.90	4.10	4.60
67	31.74	0.55	0.53	2.74	36.65	7.94	2.20	85.27	2.94	4.14	4.64
68	32.21	0.56	0.53	2.77	36.47	7.97	2.19	84.83	2.97	4.17	4.67
69	32.68	0.57	0.54	2.81	36.28	8.01	2.18	84.39	3.01	4.21	4.71
70	33.16	0.58	0.55	2.84	36.09	8.04	2.17	83.94	3.04	4.24	4.74
71	33.63	0.59	0.55	2.88	35.89	8.08	2.15	83.49	3.08	4.28	4.78
72	34.10	0.60	0.56	2.92	35.70	8.12	2.14	83.03	3.12	4.32	4.82
73	34.58	0.60	0.57	2.95	35.50	8.15	2.13	82.57	3.15	4.35	4.85
74	35.05	0.61	0.57	2.99	35.29	8.19	2.12	82.10	3.19	4.39	4.89
75	35.53	0.62	0.58	3.02	35.09	8.22	2.11	81.63	3.22	4.42	4.92
76	36.00	0.63	0.59	3.06	34.88	8.26	2.09	81.14	3.26	4.46	4.96
77	36.47	0.64	0.59	3.09	34.67	8.29	2.08	80.66	3.29	4.49	4.99
78	36.95	0.64	0.60	3.13	34.46	8.33	2.07	80.17	3.33	4.53	5.03
79	37.42	0.65	0.61	3.16	34.25	8.36	2.05	79.67	3.36	4.56	5.06

80	37.89	0.66	0.61	3.19	34.03	8.39	2.04	79.17	3.39	4.59	5.09
81	38.37	0.67	0.62	3.23	33.82	8.43	2.03	78.66	3.43	4.63	5.13
82	38.84	0.68	0.63	3.26	33.60	8.46	2.02	78.15	3.46	4.66	5.16
83	39.32	0.69	0.63	3.29	33.37	8.49	2.00	77.63	3.49	4.69	5.19
84	39.79	0.69	0.64	3.33	33.15	8.53	1.99	77.11	3.53	4.73	5.23
85	40.26	0.70	0.65	3.36	32.92	8.56	1.98	76.58	3.56	4.76	5.26
86	40.74	0.71	0.65	3.39	32.69	8.59	1.96	76.04	3.59	4.79	5.29
87	41.21	0.72	0.66	3.43	32.46	8.63	1.95	75.50	3.63	4.83	5.33
88	41.68	0.73	0.67	3.46	32.22	8.66	1.93	74.96	3.66	4.86	5.36
89	42.16	0.74	0.67	3.49	31.99	8.69	1.92	74.41	3.69	4.89	5.39
90	42.63	0.74	0.68	3.52	31.75	8.72	1.90	73.85	3.72	4.92	5.42
91	43.10	0.75	0.68	3.55	31.51	8.75	1.89	73.29	3.75	4.95	5.45
92	43.58	0.76	0.69	3.58	31.27	8.78	1.88	72.73	3.78	4.98	5.48
93	44.05	0.77	0.70	3.62	31.02	8.82	1.86	72.16	3.82	5.02	5.52
94	44.53	0.78	0.70	3.65	30.77	8.85	1.85	71.58	3.85	5.05	5.55
95	45.00	0.79	0.71	3.68	30.52	8.88	1.83	71.00	3.88	5.08	5.58
96	45.47	0.79	0.71	3.71	30.27	8.91	1.82	70.42	3.91	5.11	5.61
97	45.95	0.80	0.72	3.74	30.02	8.94	1.80	69.83	3.94	5.14	5.64
98	46.42	0.81	0.72	3.77	29.76	8.97	1.79	69.24	3.97	5.17	5.67
99	46.89	0.82	0.73	3.80	29.51	9.00	1.77	68.64	4.00	5.20	5.70
100	47.37	0.83	0.74	3.83	29.25	9.03	1.75	68.03	4.03	5.23	5.73
101	47.84	0.83	0.74	3.85	28.99	9.05	1.74	67.42	4.05	5.25	5.75
102	48.32	0.84	0.75	3.88	28.72	9.08	1.72	66.81	4.08	5.28	5.78
103	48.79	0.85	0.75	3.91	28.46	9.11	1.71	66.19	4.11	5.31	5.81
104	49.26	0.86	0.76	3.94	28.19	9.14	1.69	65.57	4.14	5.34	5.84
105	49.74	0.87	0.76	3.97	27.92	9.17	1.68	64.95	4.17	5.37	5.87
106	50.21	0.88	0.77	4.00	27.65	9.20	1.66	64.32	4.20	5.40	5.90
107	50.68	0.88	0.77	4.02	27.38	9.22	1.64	63.68	4.22	5.42	5.92
108	51.16	0.89	0.78	4.05	27.10	9.25	1.63	63.04	4.25	5.45	5.95
109	51.63	0.90	0.78	4.08	26.82	9.28	1.61	62.40	4.28	5.48	5.98
110	52.10	0.91	0.79	4.10	26.55	9.30	1.59	61.75	4.30	5.50	6.00

111	52.58	0.92	0.79	4.13	26.26	9.33	1.58	61.10	4.33	5.53	6.03
112	53.05	0.93	0.80	4.16	25.98	9.36	1.56	60.44	4.36	5.56	6.06
113	53.53	0.93	0.80	4.18	25.70	9.38	1.54	59.78	4.38	5.58	6.08
114	54.00	0.94	0.81	4.21	25.41	9.41	1.52	59.11	4.41	5.61	6.11
115	54.47	0.95	0.81	4.23	25.13	9.43	1.51	58.44	4.43	5.63	6.13
116	54.95	0.96	0.82	4.26	24.84	9.46	1.49	57.77	4.46	5.66	6.16
117	55.42	0.97	0.82	4.28	24.54	9.48	1.47	57.10	4.48	5.68	6.18
118	55.89	0.98	0.83	4.31	24.25	9.51	1.46	56.41	4.51	5.71	6.21
119	56.37	0.98	0.83	4.33	23.96	9.53	1.44	55.73	4.53	5.73	6.23
120	56.84	0.99	0.84	4.35	23.66	9.55	1.42	55.04	4.55	5.75	6.25
121	57.32	1.00	0.84	4.38	23.36	9.58	1.40	54.35	4.58	5.78	6.28
122	57.79	1.01	0.85	4.40	23.07	9.60	1.38	53.65	4.60	5.80	6.30
123	58.26	1.02	0.85	4.42	22.76	9.62	1.37	52.95	4.62	5.82	6.32
124	58.74	1.03	0.85	4.44	22.46	9.64	1.35	52.25	4.64	5.84	6.34
125	59.21	1.03	0.86	4.47	22.16	9.67	1.33	51.54	4.67	5.87	6.37
126	59.68	1.04	0.86	4.49	21.85	9.69	1.31	50.83	4.69	5.89	6.39
127	60.16	1.05	0.87	4.51	21.55	9.71	1.29	50.12	4.71	5.91	6.41
128	60.63	1.06	0.87	4.53	21.24	9.73	1.27	49.40	4.73	5.93	6.43
129	61.10	1.07	0.88	4.55	20.93	9.75	1.26	48.68	4.75	5.95	6.45
130	61.58	1.07	0.88	4.57	20.62	9.77	1.24	47.96	4.77	5.97	6.47
131	62.05	1.08	0.88	4.59	20.30	9.79	1.22	47.23	4.79	5.99	6.49
132	62.53	1.09	0.89	4.61	19.99	9.81	1.20	46.50	4.81	6.01	6.51
133	63.00	1.10	0.89	4.63	19.68	9.83	1.18	45.77	4.83	6.03	6.53
134	63.47	1.11	0.89	4.65	19.36	9.85	1.16	45.03	4.85	6.05	6.55
135	63.95	1.12	0.90	4.67	19.04	9.87	1.14	44.29	4.87	6.07	6.57
136	64.42	1.12	0.90	4.69	18.72	9.89	1.12	43.55	4.89	6.09	6.59
137	64.89	1.13	0.91	4.71	18.40	9.91	1.10	42.80	4.91	6.11	6.61
138	65.37	1.14	0.91	4.73	18.08	9.93	1.08	42.05	4.93	6.13	6.63
139	65.84	1.15	0.91	4.74	17.76	9.94	1.07	41.30	4.94	6.14	6.64
140	66.32	1.16	0.92	4.76	17.43	9.96	1.05	40.55	4.96	6.16	6.66
141	66.79	1.17	0.92	4.78	17.11	9.98	1.03	39.79	4.98	6.18	6.68

142	67.26	1.17	0.92	4.80	16.78	10.00	1.01	39.03	5.00	6.20	6.70
143	67.74	1.18	0.93	4.81	16.45	10.01	0.99	38.27	5.01	6.21	6.71
144	68.21	1.19	0.93	4.83	16.12	10.03	0.97	37.50	5.03	6.23	6.73
145	68.68	1.20	0.93	4.84	15.79	10.04	0.95	36.74	5.04	6.24	6.74
146	69.16	1.21	0.93	4.86	15.46	10.06	0.93	35.97	5.06	6.26	6.76
147	69.63	1.22	0.94	4.87	15.13	10.07	0.91	35.19	5.07	6.27	6.77
148	70.10	1.22	0.94	4.89	14.80	10.09	0.89	34.42	5.09	6.29	6.79
149	70.58	1.23	0.94	4.90	14.46	10.10	0.87	33.64	5.10	6.30	6.80
150	71.05	1.24	0.95	4.92	14.13	10.12	0.85	32.86	5.12	6.32	6.82
151	71.53	1.25	0.95	4.93	13.79	10.13	0.83	32.08	5.13	6.33	6.83
152	72.00	1.26	0.95	4.95	13.45	10.15	0.81	31.30	5.15	6.35	6.85
153	72.47	1.26	0.95	4.96	13.12	10.16	0.79	30.51	5.16	6.36	6.86
154	72.95	1.27	0.96	4.97	12.78	10.17	0.77	29.72	5.17	6.37	6.87
155	73.42	1.28	0.96	4.98	12.44	10.18	0.75	28.93	5.18	6.38	6.88
156	73.89	1.29	0.96	5.00	12.10	10.20	0.73	28.14	5.20	6.40	6.90
157	74.37	1.30	0.96	5.01	11.76	10.21	0.71	27.34	5.21	6.41	6.91
158	74.84	1.31	0.97	5.02	11.41	10.22	0.68	26.55	5.22	6.42	6.92
159	75.32	1.31	0.97	5.03	11.07	10.23	0.66	25.75	5.23	6.43	6.93
160	75.79	1.32	0.97	5.04	10.73	10.24	0.64	24.95	5.24	6.44	6.94
161	76.26	1.33	0.97	5.05	10.38	10.25	0.62	24.15	5.25	6.45	6.95
162	76.74	1.34	0.97	5.06	10.04	10.26	0.60	23.35	5.26	6.46	6.96
163	77.21	1.35	0.98	5.07	9.69	10.27	0.58	22.54	5.27	6.47	6.97
164	77.68	1.36	0.98	5.08	9.34	10.28	0.56	21.73	5.28	6.48	6.98
165	78.16	1.36	0.98	5.09	9.00	10.29	0.54	20.93	5.29	6.49	6.99
166	78.63	1.37	0.98	5.10	8.65	10.30	0.52	20.12	5.30	6.50	7.00
167	79.10	1.38	0.98	5.11	8.30	10.31	0.50	19.31	5.31	6.51	7.01
168	79.58	1.39	0.98	5.11	7.95	10.31	0.48	18.50	5.31	6.51	7.01
169	80.05	1.40	0.98	5.12	7.60	10.32	0.46	17.68	5.32	6.52	7.02
170	80.53	1.41	0.99	5.13	7.25	10.33	0.44	16.87	5.33	6.53	7.03
171	81.00	1.41	0.99	5.14	6.90	10.34	0.41	16.05	5.34	6.54	7.04
172	81.47	1.42	0.99	5.14	6.55	10.34	0.39	15.24	5.34	6.54	7.04

173	81.95	1.43	0.99	5.15	6.20	10.35	0.37	14.42	5.35	6.55	7.05
174	82.42	1.44	0.99	5.15	5.85	10.35	0.35	13.60	5.35	6.55	7.05
175	82.89	1.45	0.99	5.16	5.49	10.36	0.33	12.78	5.36	6.56	7.06
176	83.37	1.46	0.99	5.17	5.14	10.37	0.31	11.96	5.37	6.57	7.07
177	83.84	1.46	0.99	5.17	4.79	10.37	0.29	11.14	5.37	6.57	7.07
178	84.32	1.47	1.00	5.17	4.44	10.37	0.27	10.32	5.37	6.57	7.07
179	84.79	1.48	1.00	5.18	4.08	10.38	0.24	9.49	5.38	6.58	7.08
180	85.26	1.49	1.00	5.18	3.73	10.38	0.22	8.67	5.38	6.58	7.08
181	85.74	1.50	1.00	5.19	3.37	10.39	0.20	7.85	5.39	6.59	7.09
182	86.21	1.50	1.00	5.19	3.02	10.39	0.18	7.02	5.39	6.59	7.09
183	86.68	1.51	1.00	5.19	2.66	10.39	0.16	6.20	5.39	6.59	7.09
184	87.16	1.52	1.00	5.19	2.31	10.39	0.14	5.37	5.39	6.59	7.09
185	87.63	1.53	1.00	5.20	1.95	10.40	0.12	4.55	5.40	6.60	7.10
186	88.10	1.54	1.00	5.20	1.60	10.40	0.10	3.72	5.40	6.60	7.10
187	88.58	1.55	1.00	5.20	1.24	10.40	0.07	2.89	5.40	6.60	7.10
188	89.05	1.55	1.00	5.20	0.89	10.40	0.05	2.07	5.40	6.60	7.10
189	89.53	1.56	1.00	5.20	0.53	10.40	0.03	1.24	5.40	6.60	7.10
190	90.00	1.57	1.00	5.20	0.18	10.40	0.01	0.41	5.40	6.60	7.10