APPENDIX IV

UNDER-KEEL CLEARANCE

To promote safety and efficiency of navigation and environmental protection, the Marine Communications and Traffic Services Officer (MCTSO) has the power to issue, in some cases, directions to a vessel under section 126 of the 2001 Canada Shipping Act. In exercising its powers, the MCTSO will consider the under-keel clearance for the vessels transiting the areas shown below. The MCTSO will determine the required under-keel clearance of the vessel according to the parameters given in the tables below:

Vessel beam not exceeding (metres)	Vessel's speed not exceeding (Knots)							
	7	**8**	**9**	**10**	**11**	**12**	**13**	**14**
	St Lawrence River, below Québec (Traverse du Nord) Required under-keel clearance (metres; this includes the estimated squat and the manoeuvrability/safety margin)							
31 m	0.86	0.95	1.06	1.17	1.38	1.60	1.84	2.09
34 m	0.87	0.97	1.08	1.20	1.41	1.64	1.89	2.15
37 m	0.89	0.98	1.10	1.22	1.44	1.68	1.93	2.20
40 m	0.90	1.00	1.11	1.25	1.47	1.72	1.97	2.25
43 m	0.91	1.01	1.13	1.27	1.50	1.75	2.01	2.29
46 m	0.92	1.03	1.15	1.29	1.53	1.78	2.05	2.34
49 m	0.93	1.04	1.17	1.32	1.56	1.81	2.09	2.38
52 m	0.94	1.05	1.18	1.34	1.58	1.85	2.13	2.42
	Estimated squat (metres)							
31 m	0.25	0.34	0.45	0.56	0.70	0.84	1.00	1.18
34 m	0.27	0.36	0.47	0.59	0.73	0.88	1.05	1.23
37 m	0.28	0.37	0.49	0.62	0.76	0.92	1.09	1.28
40 m	0.29	0.39	0.51	0.64	0.79	0.95	1.14	1.33
43 m	0.30	0.40	0.52	0.66	0.82	0.99	1.18	1.38
46 m	0.31	0.42	0.54	0.68	0.84	1.02	1.21	1.42
49 m	0.32	0.43	0.56	0.71	0.87	1.05	1.25	1.47
52 m	0.33	0.44	0.57	0.73	0.90	1.08	1.29	1.51
	Manoeuvrability/safety margin (metres)							
	0.61	0.61	0.61	0.61	0.69	0.76	0.84	0.91

Vessel beam not exceeding (metres)	Vessel's speed not exceeding (Knots)								
	7	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**
	St Lawrence River, Québec to Montréal **Container Ships** Required under-keel clearance (metres; this includes the estimated squat and the manoeuvrability/safety margin)								
24 m	0.79	0.88	0.96	1.04	1.22	1.41	1.63	1.88	2.17
26 m	0.83	0.90	0.98	1.07	1.25	1.45	1.68	1.93	2.23
28 m	0.84	0.91	1.00	1.09	1.28	1.48	1.72	1.98	2.29
30 m	0.86	0.93	1.01	1.11	1.31	1.52	1.76	2.03	2.34
32 m	0.87	0.94	1.03	1.14	1.34	1.55	1.80	2.08	2.40
34 m	0.88	0.96	1.05	1.16	1.36	1.58	1.84	2.12	2.45
36 m	0.89	0.97	1.07	1.18	1.39	1.62	1.88	2.16	2.50
38 m	0.90	0.98	1.08	1.20	1.42	1.65	1.92	2.20	2.55
40 m	0.91	1.00	1.10	1.22	1.44	1.68	1.96	2.24	2.60
42 m	0.92	1.01	1.12	1.24	1.47	1.71	1.99	2.29	2.65
44 m	0.93	1.02	1.13	1.26	1.49	1.74	2.03	2.33	2.70
	Estimated squat (metres)								
24 m	0.21	0.27	0.35	0.43	0.53	0.65	0.79	0.97	1.18
26 m	0.22	0.29	0.37	0.46	0.56	0.69	0.84	1.02	1.24
28 m	0.23	0.30	0.39	0.48	0.59	0.72	0.88	1.07	1.30
30 m	0.25	0.32	0.40	0.50	0.62	0.76	0.92	1.12	1.35
32 m	0.26	0.33	0.42	0.53	0.65	0.79	0.96	1.17	1.41
34 m	0.27	0.35	0.44	0.55	0.67	0.82	1.00	1.21	1.46
36 m	0.28	0.36	0.46	0.57	0.70	0.86	1.04	1.25	1.51
38 m	0.29	0.37	0.47	0.59	0.73	0.89	1.08	1.29	1.56
40 m	0.30	0.39	0.49	0.61	0.75	0.92	1.12	1.33	1.61
42 m	0.31	0.40	0.51	0.63	0.78	0.95	1.15	1.38	1.66
44 m	0.32	0.41	0.52	0.65	0.80	0.98	1.19	1.42	1.71
	Manoeuvrability/safety margin (metres)								
	0.61	0.61	0.61	0.61	0.69	0.76	0.84	0.91	0.99

Vessel beam not exceeding (metres)	Vessel's speed not exceeding (Knots)								
	7	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**
	St Lawrence River, Québec to Montrél Other Ships (Other than container ships) Required under-keel clearance (metres; this includes the estimated squat and the manoeuvrability/safety margin)								
24 m	0.80	0.90	0.97	1.06	1.24	1.44	1.66	1.92	2.21
26 m	0.85	0.92	1.00	1.09	1.29	1.49	1.73	1.99	2.29
28 m	0.86	0.94	1.03	1.13	1.33	1.54	1.79	2.06	2.37
30 m	0.88	0.96	1.05	1.16	1.37	1.59	1.85	2.13	2.46
32 m	0.89	0.98	1.08	1.19	1.41	1.64	1.91	2.19	2.53
34 m	0.91	1.00	1.10	1.23	1.45	1.69	1.97	2.26	2.61
36 m	0.93	1.02	1.13	1.26	1.49	1.74	2.02	2.32	2.69
38 m	0.94	1.04	1.16	1.29	1.53	1.78	2.08	2.39	2.77
40 m	0.96	1.06	1.18	1.32	1.57	1.83	2.13	2.44	2.84
42 m	0.97	1.08	1.21	1.36	1.61	1.88	2.18	2.51	2.91
44 m	0.99	1.10	1.23	1.39	1.65	1.93	2.24	2.57	2.98
	Estimated squat (metres)								
24 m	0.22	0.29	0.36	0.45	0.55	0.68	0.82	1.01	1.22
26 m	0.24	0.31	0.39	0.48	0.60	0.73	0.89	1.08	1.30
28 m	0.25	0.33	0.42	0.52	0.64	0.78	0.95	1.15	1.38
30 m	0.27	0.35	0.44	0.55	0.68	0.83	1.01	1.22	1.47
32 m	0.28	0.37	0.47	0.58	0.72	0.88	1.07	1.28	1.54
34 m	0.30	0.39	0.49	0.62	0.76	0.93	1.13	1.35	1.62
36 m	0.32	0.41	0.52	0.65	0.80	0.98	1.18	1.41	1.70
38 m	0.33	0.43	0.55	0.68	0.84	1.02	1.24	1.48	1.78
40 m	0.35	0.45	0.57	0.71	0.88	1.07	1.29	1.53	1.85
42 m	0.36	0.47	0.60	0.75	0.92	1.12	1.34	1.60	1.92
44 m	0.38	0.49	0.62	0.78	0.96	1.17	1.40	1.66	1.99
	Manoeuvrability/safety margin (metres)								
	0.61	0.61	0.61	0.61	0.69	0.76	0.84	0.91	0.99

***** *An exception to the margin of safety / manoeuvrability is allowed for a ship with a width not exceeding 24 m at a speed of 6 to 7 knots. Only in this case, a margin of 0.58 m is accepted instead of 0.61 m*

The above parameters are presented on the basis that the vessel's Master or Officer-in-charge has given consideration to other specific elements which may have an impact on under-keel clearance, some of which are: the accurate determination of water level (including tides) during vessel's transit; the vessel's speed; the wind and waves effects and the vessel's response to it; the estimation of the vessel'sdraught (changes in ballast); and any additional squat effects due to passing within close proximity to the bank of the channel or when meeting/overtaking another vessel. The vessel's Master or Officer-in-charge has the ultimate responsibility for the vessel's safety at all times.