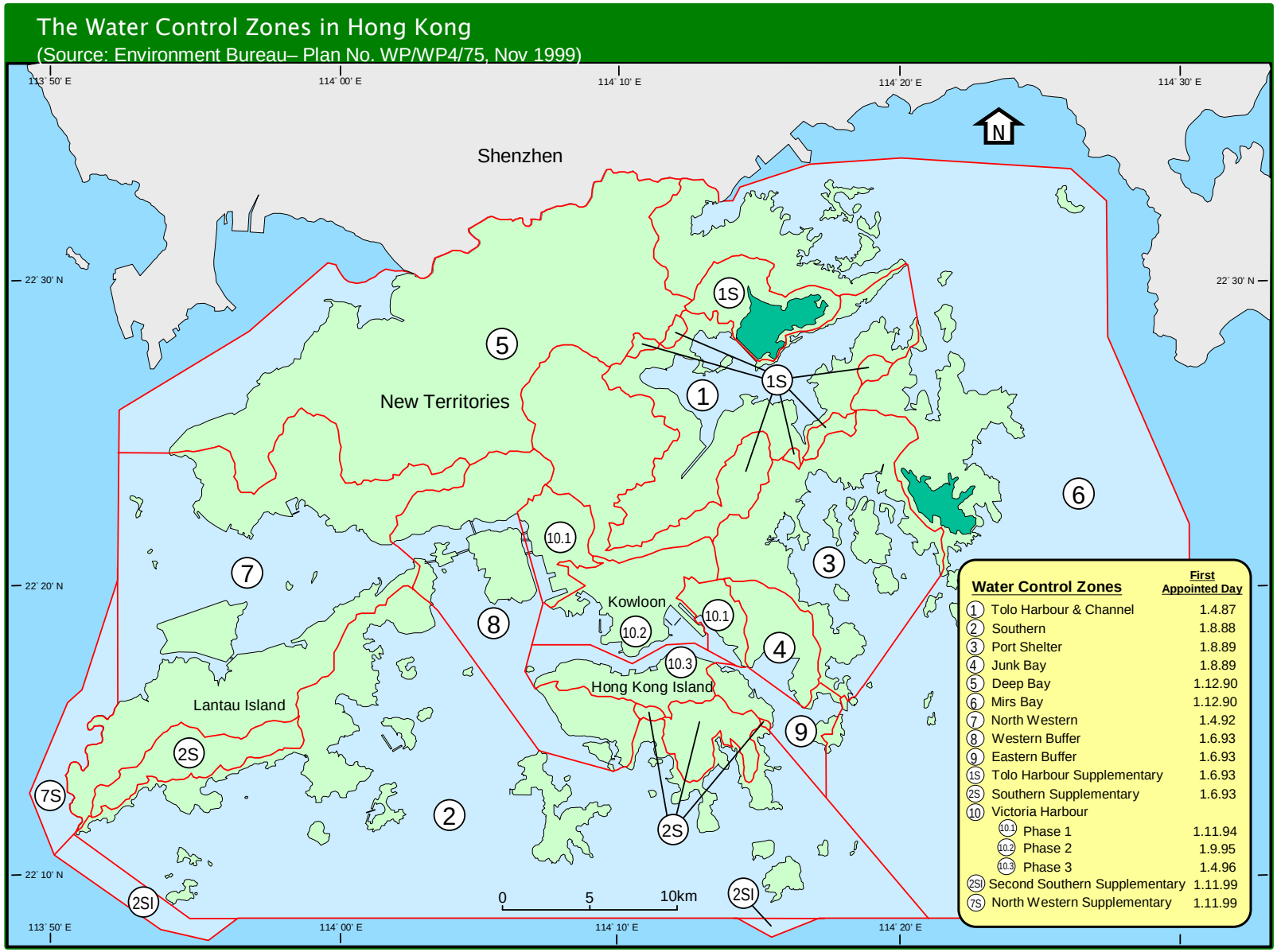
Appendix A


The Water Control Zones in Hong Kong
(Source: Environment Bureau– Plan No. WP/WP4/75, Nov 1999)
113° 50' E
114° 00' E
114° 10' E
114° 20' E
114° 30' E
22° 30' N
22° 20' N
22° 10' N
N
Shenzhen
New Territories
Kowloon
Hong Kong Island
Lantau Island
1
1S
2
2S
2SI
3
4
5
6
7
7S
8
9
10.1
10.2
10.3
0
5
10km
Water Control Zones
First Appointed Day
1 Tolo Harbour & Channel 1.4.87
2 Southern 1.8.88
3 Port Shelter 1.8.89
4 Junk Bay 1.8.89
5 Deep Bay 1.12.90
6 Mirs Bay 1.12.90
7 North Western 1.4.92
8 Western Buffer 1.6.93
9 Eastern Buffer 1.6.93
1S Tolo Harbour Supplementary 1.6.93
2S Southern Supplementary 1.6.93
10 Victoria Harbour
10.1 Phase 1 1.11.94
10.2 Phase 2 1.9.95
10.3 Phase 3 1.4.96
2SI Second Southern Supplementary 1.11.99
7S North Western Supplementary 1.11.99

Appendix B

Summary of Water Quality Objectives (WQOs) for Marine Waters of Hong Kong

Parameter	Water Quality Objective	Water Control Zone (WCZ) / Part(s) of zone / Subzone to which the WQO applies
Aesthetic Appearance	There should be no objectionable odours or discolouration of the water Tarry residues, floating wood, articles made of glass, plastic, rubber or of any other substances should be absent Mineral oil should not be visible on the surface. Surfactants should not give rise to a lasting foam There should be no recognisable sewage-derived debris Floating, submerged and semi-submerged objects of a size likely to interfere with the free movement of vessels, or cause damage to vessels, should be absent The waters should not contain substances which settle to form objectionable deposits	All WCZs (whole zone)
Dissolved Oxygen (bottom)	Not less than 2 mg/L for 90% of samples.	Marine waters of all WCZs except Tolo Harbour & Channel WCZ
Dissolved Oxygen (Depth-averaged)	Not less than 4 mg/L for 90% of samples.	Marine waters of all WCZs except Tolo Harbour & Channel WCZ
Dissolved Oxygen (bottom)	Not less than 2mg/L	Harbour Subzone in Tolo Harbour & Channel WCZ
	Not less than 3mg/L	Buffer Subzone in Tolo Harbour & Channel WCZ
	Not less than 4mg/L	Channel Subzone in Tolo Harbour & Channel WCZ
Dissolved Oxygen (surface to 2m above bottom)	Not less than 4mg/L	Harbour Subzone and Buffer Subzone in Tolo Harbour & Channel WCZ
Dissolved Oxygen (all depths)	Not less than 4mg/L	Channel Subzone in Tolo Harbour & Channel WCZ
Nutrients	Annual mean depth-averaged total inorganic nitrogen not to exceed 0.1 mg/L	Marine waters of Southern WCZ and Port Shelter WCZ
	Annual mean depth-averaged total inorganic nitrogen not to exceed 0.3 mg/L	Marine waters of Mirs Bay WCZ, Junk Bay WCZ, North Western WCZ (Castle Peak Subzone)
	Annual mean depth-averaged total inorganic nitrogen not to exceed 0.4 mg/L	Marine waters of Eastern Buffer WCZ, Western Buffer WCZ, Victoria Harbour WCZ.

Parameter	Water Quality Objective	Water Control Zone (WCZ) / Part(s) of zone / Subzone to which the WQO applies
	Annual mean depth-averaged total inorganic nitrogen not to exceed 0.5 mg/L	Marine waters of Deep Bay WCZ (Outer Subzone) and North Western WCZ (Whole zone except Castle Peak Subzone).
	Annual mean depth-averaged total inorganic nitrogen not to exceed 0.7 mg/L	Marine waters of Deep Bay WCZ (Inner Subzone)
Unionised ammonia	Annual mean not to exceed 0.021 mg/L	All WCZs (whole zone) except Tolo Harbour & Channel WCZ
E. coli	Annual geometric mean not to exceed 610 cfu/100mL	Secondary contact recreation subzones in Tolo Harbour & Channel WCZ, Southern WCZ, Port Shelter WCZ, Mirs Bay WCZ, Deep Bay WCZ, North Western WCZ, Western Buffer WCZ.
	Annual geometric mean not to exceed 610 cfu/100mL	Fish culture subzones in Tolo Harbour & Channel WCZ, Southern WCZ, Port Shelter WCZ, Junk Bay, Mirs Bay WCZ, Deep Bay WCZ, Eastern Buffer WCZ, Western Buffer WCZ.
pH	To be in the range 6.5 - 8.5, change due to waste discharge not to exceed 0.2	Marine waters of all WCZs except Tolo Harbour & Channel WCZ
	Change due to waste discharge not to be greater than ±0.5	Harbour Subzone in Tolo Harbour & Channel WCZ
	Change due to waste discharge not to be greater than ±0.3	Buffer Subzone in Tolo Harbour & Channel WCZ
	Change due to waste discharge not to be greater than ±0.1	Channel Subzone in Tolo Harbour & Channel WCZ
Salinity	Change due to waste discharge not to exceed 10% of natural ambient level	All WCZs (Whole zone) except Tolo Harbour & Channel WCZ
	Change due to waste discharge not to be greater than ±3%	Tolo Harbour & Channel WCZ
Temperature	Change due to waste discharge not to exceed 2°C	All WCZs (Whole zone) except Tolo Harbour & Channel WCZ
	Change due to waste discharge not to exceed 1°C	Tolo Harbour & Channel WCZ
Suspended solids	Waste discharge not to raise the natural ambient level by 30% nor cause the accumulation of suspended solids which may adversely affect aquatic communities	Marine waters of all WCZs except Tolo Harbour & Channel WCZ
Toxicants	Not to be present at levels producing significant toxic effect	All WCZs (Whole zone)
Chlorophyll-*a*	Not to exceed 20mg/m^3 (µg/L) calculated as running arithmetic mean of 5 daily measurements for any location and depth	Harbour Subzone in Tolo Harbour & Channel WCZ
	Not to exceed 10mg/m^3 (µg/L) calculated as running arithmetic mean of 5 daily measurements for any location and depth	Buffer Subzone in Tolo Harbour & Channel WCZ
	Not to exceed 6mg/m^3 (µg/L) calculated as running arithmetic mean of 5 daily measurements for any location and depth	Channel Subzone in Tolo Harbour & Channel WCZ

Appendix C

Proposed List of WQO Parameters or Indicators that are to be Further Reviewed

Category	Parameters and Indicators	
Nutrients-related	• The narrative nutrient WQO • Total inorganic nitrogen • One nitrogen-related parameter (e.g. total nitrogen) • One phosphorus-related parameter (e.g. total phosphorus)	• Chlorophyll-*a* • Silica • Turbidity • Dissolved Oxygen
Physical and Chemical	• Aesthetic Appearance (narrative) • Dangerous Substances (narrative) • Settleable Material (narrative) • Colour • Light penetration • pH • Salinity • Suspended Solids • Temperature • Turbidity • Dissolved Oxygen • Arsenic • Cadmium • Chromium • Copper • Lead • Mercury • Nickel	• Silver • Zinc • Phenol • Polycyclic Aromatic Hydrocarbons (PAHs) • Tributyl-tin (TBT) • Polychlorinated Biphenyls (PCBs) • Dichlorodiphenyltrichloroethane (DDT) • Dioxins • Hexachlorobenzene • Unionised Ammonia • Cyanide • Sulphide • Surfactants • Oil and Grease • Total Petroleum Hydrocarbons • Total Residual Chlorine • Chlorination by-products
Microbiological	• *E. coli* • *Enterococci* • *Faecal streptococci*	• *Clostridium perfringens* • *Faecal coliforms*

Appendix D

Comparison of the Types of Water Quality Objectives/Standards in Hong Kong and Overseas

WQO parameters	Local practices	Overseas practices
Natural	Narrative and numerical level	Narrative and numerical level
Nutrients	Narrative, and WQO for total inorganic nitrogen with numerical level	A range of nutrient parameters, each with numerical level
Chemical	Narrative	Numerical level
Biological	None	Numerical level*
Bathing Waters	Numerical level using *E. coli*	Numerical level using *Enterococci* alone, or both *E.coli* and *Enterococci*
Mariculture		
- for proliferation of cultured products	WQO for *E.coli* with numerical level	Numerical level
- for meeting with food standards	None	Some with numerical level

* Guideline values for fresh water and estuarine environment only, and biological objectives for marine environment still under development.