

Tabled at Hearing 28/02/2013

In the Matter of the Resource Management Act 1991

And

In the Matter of the hearing of submissions and further submissions on
the Proposed Land and Water Regional Plan

Supplementary Evidence of Robert John Potts on
behalf of

Lyttelton Port Company Limited

Dated: 28 February 2013

1.1 My primary evidence related to the technical issues arising from the stormwater rules only; Rules 5.72 and 5.73.

1.2 In that evidence, Mr Purves and I considered that the following amendments to Condition 2 (d) of Rule 5.72A, as recommended by the Reporting Officer, be adopted (or similar):

“(d) (i) *The discharge, **other than discharges directly associated with Earthworks, does not result in** meets the water quality standards in **Tables A and B of Schedule 5 not being met** after reasonable mixing with the receiving waters, ~~in accordance with Schedule 5.~~*

(ii) The discharge directly associated with Earthworks does not result in the water quality standards in Table A of Schedule 5 not being met after reasonable mixing with the receiving waters.”

1.3 I also considered that the Reporting Officer’s Condition 2 (d) (ii) needs either rewording or clarification i.e.

“(ii) *The concentration of total suspended solids in the discharge shall not exceed:*

- *50 g/m³ where the discharge is to any spring-fed river, Banks Peninsula river, or to a lake ; or*
- *100 g/m³ where the discharge is to any other river or to an artificial water course; and”*

1.4 This was because every Canterbury River has a spring feed in its upper catchment which would put it into the bullet point 1 category.

1.5 I considered the clearest way would be along the lines of the first table in Schedule 5 (we suggested it be called Table A), i.e. set limits on Hill-fed – upland at 50 g/m³ and Hill-fed lower at 100 mg/L.

1.6 This would also mean that Rule 72A (d) (iii) above would not be required, with Schedule 5, Table A having the final column presently labelled “Toxicants” replaced with a column labelled “Discharge Suspended Solids” and either put 50 or 100 g/m³ beside each river category.

1.7 Since preparing my primary evidence we decided to annotate the changes into Schedule 5. As a result we have made some further amendments to the rule and to Schedule 5 which is attached in **Appendix A**.

1.8 This is because the limits on suspended solids relate to the discharge, whereas the other limits relate to the receiving waters after reasonable mixing.

“(d) (i) The discharge, **other than discharges directly associated with Earthworks, does not result in** meets the water quality standards in **Tables A, B and C of Schedule 5 not being met** after reasonable mixing with the receiving waters, in accordance with Schedule 5.

(ii) The discharge directly associated with Earthworks does not result in the water quality standards in Table A of Schedule 5 not being met after reasonable mixing with the receiving waters.

Delete Clause (III)

Robert John Potts

28 February 2013

Appendix 1: Recommended Amendments to Schedule 5

Schedule 5 - Mixing Zones and Receiving Water Standards

Mixing Zones

The area (and underlying volume) of a receiving water where the water quality standards specified for rivers, artificial watercourses and lakes do not have to be met is referred to as the Mixing Zone.

The Mixing Zone, as a result of a point source discharge of a contaminant, is:

1. For river and artificial watercourse locations with flowing water present at all times;
 - (i) no longer than 200 m along the longest axis of the zone, and
 - (ii) occupies no greater than two-thirds of the wetted channel width¹ at the estimated 7DMALF² for that location;
2. For river and artificial watercourse locations, with intermittent flows, no longer than 20 m at times of flow and 0 m at no flow;
3. For lake locations:
 - (a) if the discharge location is within 50m of the lake water edge³ at any time, a circle with a diameter of 50 m; or
 - (b) if the discharge location is greater than 50m from the lake water edge³ at all times, a circle with a diameter of 100 m; and
4. When within a Group or Community Drinking Water Protection Zone, as set out in Schedule 1, 0 m.

Notes:

- ¹ The wetted channel width is estimated by a suitably experienced and qualified person for the proposed discharge location. For a braided river the wetted channel width is the width of water in the braid receiving the discharge.
- ² The 7DMALF for a specific location is estimated using a generally accepted calculation method undertaken by a suitably experienced and qualified person.
- ³ The lake water edge is estimated by a suitably experienced and qualified person for the proposed discharge location at the lowest lake level with a ten year reoccurrence interval.

Receiving Water Standards

(Refer to tables on the following pages).

Table A: Water quality standards for waters not classified as NATURAL

Water quality class	DOC*	Temperature	pH	Visual clarity	Colour	DIN*	DRP*	E. coli*	Suspended Sediment
	After reasonable mixing change shall be less than (mg/l)	After reasonable mixing average change shall not exceed (°C)	After reasonable mixing shall be between (no units)	After reasonable mixing % change shall not exceed	After reasonable mixing % change shall not exceed (Munsell units)	After reasonable mixing shall be less than (mg/l)	After reasonable mixing shall be less than (mg/l)	After reasonable mixing 95% of samples shall be less than (E. coli per 100ml)	The discharge shall not exceed the following (mg/l)
Alpine-upland				20	5	0.08	0.005	260	100
Alpine-lower						0.18	0.007	550	100
Hill-fed - upland						0.21	0.006	260	100
Hill-fed - lower				20	5	0.47	0.006	550	100
Hill-fed - lower - urban						0.47	0.006		100
Lake-fed				20	5	0.21	0.003	260	100
Banks Peninsula	2.0	2.0	6.5 - 8.5	35	10	0.09	0.025	550	50
Spring-fed - upland				20	5	0.10	0.007	260	50
Spring-fed - lower basin				35	10	0.47	0.010	550	50
Spring-fed - plains				35	10	1.50	0.016	550	50
Spring-fed - plains - urban				20	5	1.50	0.016	550	50
Lakes						TN*	TP*		
Large high country lakes	2.0	2.0	6.5 - 8.5	20	5	0.073	0.004	260	50
Small to medium high country lakes						0.016	0.009	260	50
Coastal lakes and lagoons						0.340	0.020	550	50
Artificial - on-river						0.016	0.009	260	100
Artificial - other						0.340	0.020	260	100

Key to Abbreviations

DOC = Dissolved organic carbon
 DRP = Dissolved reactive phosphorus

TN = Total nitrogen
 E. coli = *Escherichia coli*

DIN = Dissolved inorganic nitrogen
 TP = Total phosphorus

Table B: Toxicant water quality standards for all water classes except Class NATURAL

Water quality class	Toxicants After reasonable mixing, shall not exceed the concentration specified in Table C below WQL-17 for the relevant level of protection (see note below)
Rivers and artificial watercourses	
Alpine-upland	99%
Alpine-lower	95%
Hill-fed – upland	99%
Hill-fed – lower	95%
Hill-fed – lower – urban	90%
Lake-fed	99%
Banks Peninsula	99%
Spring-fed - upland	99%
Spring-fed - lower basin	95%
Spring-fed - plains	95%
Spring-fed - plains – urban	90%
Lakes	
Large high country lakes	99%
Small to medium high country lakes	99%
Coastal lakes and lagoons	95%
Artificial – on-river	99%
Artificial – other	95%



Table C: Toxicant water quality standards for all water classes except Class NATURAL

CHEMICAL	LEVEL OF PROTECTION (% species)		
	99%	95%	90%
	Narrative Standards (after reasonable mixing)		
	Adverse effects on aquatic organisms are less than negligible.	Adverse effects on aquatic organisms are less than minor.	Adverse effects on aquatic organisms are minor.
	Numerical standards (after reasonable mixing)		
	(µg/l)	(µg/l)	(µg/l)
METALS AND METALLOIDS			
Aluminium	27	55	80
Arsenic (As III)	1	24	94
Arsenic (AsV)	0.8	13	42
Boron	90	370	680
Cadmium	0.06	0.2	0.4
Chromium (CrVI)	0.01	1.0	6
Copper	1.0	1.4	1.8
Lead	1.0	3.4	5.6
Manganese	1200	1900	2500
Mercury (Inorganic)	0.06	0.06	1.9
Nickel	8	11	13
Selenium (Total)	5	11	18
Silver	0.02	0.05	0.1
Zinc	2.4	8.0	15
NON-METALLIC INORGANICS			
Ammonia (Total N)	320	For values see Table WQL17.1	
Chlorine (Total Cl)	0.4	3	6
Cyanide (Unionised, as CN)	4	7	11
Hydrogen sulphide (Un-ionised as S)	0.5	1.0	1.5
AROMATIC HYDROCARBONS			
Benzene	600	950	1300
o-xylene	200	350	470
p-xylene	140	200	250
CHLOROETHANES			
1,1,2-TRICHLOROETHANE	5400	6500	
HEXACHLOROETHANE	290	290	
ANILINES			
ANILINE	8	8	
2,4-DICHLOROANILINE	0.6	7	
3,4-DICHLOROANILINE	1.3	3	
POLYCYCLIC AROMATIC HYDROCARBONS			
Naphthalene	2.5	16	37
NITROBENZENES			
Nitrobenzene	230	550	
NITROTOLUENES			

CHEMICAL	LEVEL OF PROTECTION (% species)		
	99%	99%	99%
2,4-dinitrotoluene	16	16	
2,4,6-trinitrotoluene	100	140	
CHLOROBENZENES			
1,2-dichlorobenzene	120	160	
1,3-dichlorobenzene	160	260	
1,4-dichlorobenzene	40	60	
1,2,3-trichlorobenzene	3	10	
1,2,4-trichlorobenzene	85	85	
PHENOLS			
Phenol	85	320	
2-chlorophenol	340	340	
4-chlorophenol	160	220	
2,4-dichlorophenol	120	120	
2,4,6-trichlorophenol	3	3	
2,3,4,6-tetrachlorophenol	10	10	
2,4-dinitrophenol	13	45	
PHTHALATES			
Dimethylphthalate	3000	3700	
Diethylphthalate	900	1000	
Dibutylphthalate	9.9	9.9	
MISCELLANEOUS INDUSTRIAL CHEMICALS			
Poly(acrylonitrile-co-butadiene-costyrene)	200	530	
ORGANOPHOSPHORUS PESTICIDES			
Azinphos methyl	0.01	0.02	0.05
Chloropyrifos	0.00004	0.00004	0.11
Diazinon	0.000003	0.01	0.2
Dimethoate	0.1	0.15	0.2
Fenitrothion	0.1	0.2	0.3
Malathion	0.002	0.05	0.2
Carbofuran	0.06	0.06	4
Methomyl	0.5	3.5	9.5
HERBICIDES AND FUNGICIDES			
Diquat	0.01	1.4	10
2,4-D	140	280	450
Molinate	0.1	3.4	14
Thiobencarb	1	2.8	4.6
Thiram	0.01	0.2	0.8
Atrazine	0.7	13	45
Simazine	0.2	3.2	11
Tebuthiuron	0.02	2.2	20
Glyphosate	370	1200	2000
Trifluralin	2.6	2.6	6
SURFACTANTS			
Linear alkylbenzene sulfonates (LAS)	65	280	520
Alcohol ethoxylated sulfate (AES)	340	650	850
Alcohol ethoxylated surfactants (AE)	50	140	220