

ECan Hearing Commissioners
Plan Change 4 (Omnibus)
ENVIRONMENT CANTERBURY
Box 345
CHRISTCHURCH
Attention: Tera Maika

Dear Tera,

Expert Witness Comments: Omnibus Plan Change 4

I enclose the comments of John Cocks and Herb Familton on the questions raised by Commissioners at the recent Omnibus Hearing.

These matters concerned the ECan response to three Hearing Commissioners Questions on the s42A report and the ECan response to Hearing Commissioners Questions.

Please contact me in the first instance if you wish to discuss any of the matters raised in this memo at hfamilton@doc.govt.nz or 03 3713751.

Yours sincerely



Herb Familton
Resource Management Planner
For Director-General

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As I understand it, the section 70 (e) matter is a matter of law that Council needs to be satisfied that, after reasonable mixing, that none of the (c) to (g) effects will occur.

Council needs to be satisfied on the effects of the proposed permitted activity rules under section 70, and the need to meet all of these tests after reasonable mixing. The act states that the test Council needs to apply is that it is to be satisfied *that none of these effects are likely to arise* (my emphasis). It is a matter, in my view, that Council and Council officers cannot ignore.

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I think the practical difficulty with having this matter covered in the air plan is that in practise it may be difficult for Farming users to consider this an air discharge matter as well. Most applicants in my view would see this as one a discharge rather than a discharge of contaminants as well as an air discharge issue.

If Council wished to pursue this option, then I believe that an advisory note to the rule should stipulate that the 70 (1) (e) matters were covered by the relevant rule in the air plan.

I do not have a strong view on this matter and I can see the RMA rationale and legal and logical consistency for including odour in the Regional Air Plan Rule.

Some extra ECan information on the permitted activity rules, in my view would also be useful to ensure that people were aware of the need to comply with both sets of discharge permitted activity rules.

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Based on the advice of John Cocks provided in his response to Commissioners, I recommend that Proposed Rule 5.8A Condition 2 be changed so that it reads as follows.

1. Condition 2

“The treatment and disposal system is designed, built, operated and maintained in accordance with Sections 5 and 6 of New Zealand Standard AS/NZS 1547:2012 – On-site Domestic Wastewater Management or the Hut Procurement Manual Part F Toilets and Grey Water as referred to in the Compliance Document for the New Zealand Building Code for Backcountry Huts.”

Addition to Herb Familton Appendix 1

Take and Use Surface Water Rule 5.123

1. Delete the ~~“50%”~~ in condition 2 and replace with “90%”

Commissioners requested I provide information in response to two matters that were raised at the hearing :

1. To provide a full reference for the DOC Standard Operating Procedure (SOP) for wastewater. This is the *Guidelines for Human Waste and Sullage Management at Backcountry Huts Standard Operating Procedure*, which is dated 2003. This SOP was reviewed in 2012 and the name changed to *Human Waste Management at Back Country Huts and Campsites (New or Replacement)*.
2. To provide an equivalent to proposed Rule 5.8 condition 4 for the proposed new rule 5.8A. Also, it was pointed out that the condition 5.8A Condition 2 needs to be worded so as to be measurable.

With respect to paragraph 20 of my evidence, the current SOP is *Guidelines for Human Waste and Sullage Management at Backcountry Huts Standard Operating Procedure*. The SOP is in the process of review, with the current draft being termed *Human Waste Management at Back Country Huts and Campsites (New or Replacement)*.

With respect to Q2, I recommend that Proposed Rule 5.8A Condition 2 be changed so that it refers to the relevant documents. Mr Familton will provide advice on the wording of the rule, but the documents are:

- Sections 5 and 6 of New Zealand Standard AS/NZS 1547:2012 – *On-site Domestic Wastewater Management*, and
- the *Hut Procurement Manual Part F Toilets and Grey Water* as referred to in the Compliance Document for the New Zealand Building Code for Backcountry Huts.

Also, the Commissioners asked about the quality of discharge. At the hearing, my response was that the treatment process includes the wastewater passing through a prescribed depth of unsaturated soil. Current provisions (as given in the documents referred in the recommended condition 2 rule in Mr Familton’s proposed rule and outlined above) give guidance on the type of soil which is acceptable in this context and solutions where it is not.

The quality of a permitted wastewater discharge is determined largely by the depth and type of unsaturated soil beneath the land application system. Guidance on the quality of such a discharge is provided in documents that include the US EPA *Onsite Wastewater Treatment Systems Manual* (2002) and in the *Engineering Design of a Modern Soil Treatment Unit* by Robert L. Siegrist. Conference Proceedings, Innovation in Soil-Based Onsite Wastewater Treatment, April 7-8, 2014 Albuquerque, NM, Soil Science Society of America.

An extract from the latter reference follows.

Table 1. Wastewater constituents and treatment expectations from a well-designed and properly operated soil treatment unit treating 1 to 5 cm/d of domestic septic tank effluent (Siegrist et al., 2012).

Constituents of concern	Basis for concern over wastewater constituent	Example unit of measure (units)	Domestic septic tank effluent ¹	Treatment efficiency in a STU ²
Oxygen demanding substances	Can create anoxic or anaerobic conditions and can contribute to soil clogging	BOD ₅ (mg/L)	140 to 200	>90%
Particulate solids	Contributes to soil pore filling and accelerated soil clogging	TSS (mg/L)	50 to 100	>90%
Nitrogen	Can contribute to oxygen demand, can be toxic via drinking water ingestion, can upset ecosystems	Total N (mg-N/L)	40 to 100	10 to 20%
Phosphorus	Can cause increased productivity in sensitive surface waters	Total P (mg-P/L)	5 to 15	100 to 0% ³
Bacteria	Infectious disease transmission via drinking water, contact with seepage, or recreational waters	Fecal coliforms (org./100 mL)	10 ⁶ to 10 ⁸	>99.99%
Virus	Infectious disease transmission via drinking water, contact with seepage, or recreational waters	Specific virus (pfu/mL)	0 to 10 ⁵ (episodically high levels)	>99.9%
Heavy metals	Potential toxicants to humans by ingestion in drinking water or to ecosystem biota	Individual metals (ug/L)	0 to low levels	>99%
Trace organic compounds	Potential health effects to humans by ingestion of drinking water or vapor inhalation during showering or effects to ecosystem biota	Organics in consumer products, pharmaceuticals, pesticides, flame retardants (ng/L or ug/L)	0 to trace levels	Low to >99% ⁴

¹Note: STE concentrations given are representative of those for residential dwelling units. However, commercial sources such as restaurants can produce STE that is markedly higher in some pollutants (e.g., BOD₅, COD, TSS, trace organics) while other sources can produce STE that is markedly lower in some pollutants (e.g., laundry can have lower total nitrogen and pathogen levels). ²Efficiencies given are representative of concentrations in soil solution at 60 to 90 cm depth in a well-designed, installed and operated STU. ³P-removal is highly dependent on media sorption capacity and P loading rates and time of operation. ⁴Removal of trace organic compounds (e.g., nonylphenol, Triclosan, EDTA, caffeine) is highly dependent on the properties of the organic compound and conditions within the soil treatment unit (e.g., conditions conducive to sorption and biotransformation during adequately long hydraulic retention times).