

IN THE MATTER OF

The Environment Canterbury
(Temporary Commissioners and
Improved Water Management Act)
2010 and The Resource
Management Act 1991

AND

IN THE MATTER OF

The hearing of submissions on the
Proposed Land and Water
Regional Plan.

EVIDENCE OF FIONA ANNE AMBURY

INTRODUCTION

- 1 My name is Fiona Anne Ambury I hold a Bachelor of Engineering degree with honours in Natural Resources from the University of Canterbury. I have been employed as an Environmental Engineer at Pattle Delamore Partners for 12 years and my experience relates to on-site wastewater and stormwater treatment, management of hazardous substances, air assessments, as well as the preparation of assessments of environmental effects.
- 2 I have been involved in a number of on-site wastewater assessments over the past 12 years, mainly for sites that require resource consents. These sites typically have sensitive receiving environments and site constraints that require special care in the design of the disposal system. I also have an on-site wastewater system on my rural lifestyle block.
- 3 A copy of my CV is attached to my evidence as Appendix A.
- 4 I have read the Expert Code of Conduct contained in the Environment Court's Practice Note 2011 and I agree to comply with it. I have prepared this evidence in accordance with the Practice Note.

SCOPE OF EVIDENCE

- 5 I have been engaged by Oasis Clearwater Environmental Systems (Oasis) to prepare this evidence. The evidence I will present is with respect to the on-site site wastewater rules and how these will have unnecessary cost implications for home owners needing to install on-site waste water treatment and disposal systems in many parts of Canterbury.
- 6 Whilst the pLWRP does not directly affect Oasis, they have recognised that home owners are not well placed to make a submission themselves.

POINTS OF SUBMISSION

The Plan in General

- 7 Oasis supports rules for on-site wastewater treatment and disposal systems that seek to protect the environment and to promote the sustainable management of natural and physical resources.
- 8 In accordance with section 5 of the RMA people and communities should be enabled to provide for their social, economic and cultural wellbeing while ensuring that adverse effects on the natural environment are avoided, remedied, or mitigated.
- 9 While Oasis is supportive of the overall philosophy within much of the pLWRP it is concerned that the means of achieving the objectives is not the most effective means with respect to on-site wastewater treatment and disposal systems. In addition, I consider that the shift from the rules in the Natural Resources Regional Plan (NRRP) to the seemingly simplified approach in the pLWRP rules will result in many home owners needing to pay consultant and resource consent fees when in actual fact the specifics of their site would mean that the discharge should be able to meet a permitted activity status.

Page 5-3 of the PLWRP Rule 5.7: The discharge of wastewater from an existing on-site wastewater treatment system onto or into land in circumstances where a contaminant may enter water

- 10 Rule 5.7 outlines the permitted activity conditions for the discharge from existing on-site wastewater systems. If an on-site wastewater system was legally installed (for example it met the permitted activity rules of the NRRP) and is performing well but is not within the “Septic tank suitability – Area A” (STSA) then a retrospective resource consent is required. .
- 11 If the on-site wastewater system was installed after 2000, then the disposal field should have been designed in accordance with the ASNZS 1547: 2000 standard for on-site domestic wastewater management. This standard includes design solutions for poorly drained soils. In addition, systems installed after June 2004 would have to meet the conditions of the permitted activity rule in the proposed NRRP or as from June 2011 the NRRP to avoid needing a resource consent. These permitted activity rules include conditions, such as no wastewater is to pond on the ground surface. Therefore if an existing system can meet these requirements there would be no benefit to the environment from the home owner being required to apply for and pay for a retrospective resource consent.
- 12 Under the NRRP, old systems that need to be upgraded are required to meet the permitted activity conditions or apply for a resource consent. This seems to be an appropriate means to capturing old or failing systems that were lawfully established in their day but are not meeting modern design standards.
- 13 In their submission Oasis sought to have the STSA planning map removed from Rule 5.7. The Section 42A officers report recommends removing the STSA from Rule 5.7 and I support this recommendation.

Page 5-3 of the pLWRP Rule 5.9: The discharge of wastewater from a new or upgraded on-site domestic wastewater treatment system onto or into land in circumstances where a contaminant may enter water – permitted activity

- 14 Condition 2 of Rule 5.9 states that the discharge must be within the area marked "Septic tank suitability - Area A" on the planning maps to meet be considered a permitted activity, conditional of the activity meeting the other conditions of the rule. According to the Section 32 report the areas not included in this planning map are based on areas with high groundwater levels, poor drainage or steep slopes. No comment is made in the Section 32 report as to the trigger groundwater depth, soil categories or the trigger slope.
- 15 The STSA planning map uses a soils map developed by Trevor Webb from Landcare Research. At an industry group meeting held on the 16 January 2013 Trevor Webb explained that the areas that are not included within the STSA are:
- (i) A1: Strongly sloping land (> 15 degrees)
 - (ii) A2: Very slow permeability soils. This includes all fragipan soils on downs, soils underlain by pans and soils with less than one metre to massive rock.
 - (iii) A3: Areas with a persistently high water table, for example near the sea or areas where the water table is controlled by sea level within the top one metre of the soil and therefore the water table is not able to be controlled. Note that this assessment looks only at soil type and does not map actual water level data.
 - (iv) In addition, areas that have not been mapped have been excluded from the STSA. Although I note that the Section 42A report recommends that all unmapped areas be included in the STSA.
- 16 If a site is not located within the STSA then a resource consent will be required irrespective of:

- (i) The actual slope of the land being used for the disposal field (for example the general area may be hilly but the house site is often located on a localised flat area);
- (ii) The level of treatment being provided;
- (iii) The design of the disposal system; or
- (iv) The actual soil types present in the disposal area.

- 17 The Landcare soils map was done on a macro scale with soil samples being collected approximately once every kilometre. Therefore, as a land application system is designed on the micro scale (e.g may only be 300 m²) it is not going to be accurate on a site by site basis.
- 18 In the Section 32 report it states "the Canterbury Regional Council has decided to adopt the New Zealand standard [ASNZS 1547: 2012] as the basis for managing onsite effluent disposal systems in Canterbury".
- 19 The Section 32 report also states "...there are significant areas of Canterbury that suffer from high groundwater levels, poor drainage or steep slopes where more detailed design consideration is required ..."
- 20 This comment implies that ASNZS 1547: 2012 does not address these issues. On the contrary, the soil categories in ASNZS 1547: 2012 include all soil drainage types from very free draining soils (Category 1) to very poorly drained soils (Category 6). The design of the land application system in accordance with ASNZS 1547: 2012 requires the designer to test the soils within the proposed disposal area and then use the recommended application rates based on soil type, treatment provided (primary or secondary) and disposal field type (trench, mound, drip irrigation etc).
- 21 As the Canterbury Regional Council is proposing to adopt ASNZS 1547: 2012 it seems unnecessary to have a planning rule based on

soil type (the STSA planning map). The planning rules should be based on actual effects on the environment on a site by site basis.

- 22 I consider that the simplified approach proposed in the pLWRP will result in home owners incurring unnecessary cost, result in a significant increase in the number of resource consent applications that need to be processed by ECan and for no obvious environmental gain.
- 23 I am also concerned that in a bid to save money, ECan will not be reviewing permitted activity forms and that the permitted activity status is directly linked to the STSA planning map. If a site is within the STSA, there may still be site constraints, such as poorly drained soils and a high groundwater table that will require careful design. But under Rule 5.9, if the site is within the STSA, ECan will not review the design to check that it has been designed in accordance with AS/NZS 1547:2012 (Condition 4). Inexperienced designers may assume that if a site is within the STSA that there will be no site constraints that will require special design constraints.
- 24 The STSA is not site specific enough to be able to apply to a permitted activity status in this way. In my opinion this is likely to result in poor design of the disposal fields and an increase in failing systems within the STSA.
- 25 The Section 42A report raises the issue regarding the current cost to audit a certificate of compliance for an on-site wastewater disposal discharge. At present ECan do not charge for this, which differs from all other certificates of compliance, which incur a cost of \$230. If this is a problem then I see no reason why ECan should not charge the standard certificate of compliance cost.
- 26 In summary I oppose the use of a soils map to determine if a site requires a resource consent for an on-site wastewater treatment system and seek to have the proposed Rule 5.9 replaced with the current NRRP Rule WQL9. The only amendment to the current NRRP Rule WQL9 sought by Oasis would be a new condition permitting the discharge to ground (using a pressure compensated

dripper system) from a secondary treatment system that includes membrane and UV treatment as long as there is at least 600 mm separation distance between the dripper lines and the highest expected groundwater level.

CONCLUSION

- 27 With a clear understanding of how the STSA map was developed it is obvious to me that the map does not provide sufficient detail to enable a fair assessment of the risk of onsite disposal at a particular location. Therefore I conclude that the map does not create the benefits claimed in the 32 report.
- 28 The changes sought by Oasis to the pLWRP that I have presented will help ensure that home owners will only need to apply for a resource consent where there are actual site constraints that require special design consideration.

A handwritten signature in blue ink, appearing to read 'Fiona Ambury', is centered on the page.

Fiona Ambury, 4/2/13

On behalf of Oasis Clearwater Environmental Systems

Submitter ID 201



Curriculum Vitae

Fiona Anne Ambury

Fiona is a Natural Resources Engineering graduate who specialises in the area of hazardous substance management, stormwater treatment via natural processes, industrial air discharges, waste minimisation and water resources. Fiona has recently completed a university course in carbon accounting. She has been working with Pattle Delamore Partners for 12 years and over this time has developed strong project management skills and technical skills.

Nationality	New Zealand
Qualifications	BE Hons (Nat.Res), 2001, University of Canterbury
Personal Affiliations	<ul style="list-style-type: none">✦ Engineers for Social Responsibility✦ IPENZ Graduate Member
Expertise	<ul style="list-style-type: none">✦ Environmental assessments of ground, groundwater, surface water quality and air quality from a variety of activities✦ Preparation of management plans for the storage and use of hazardous substances✦ Design of on-site wastewater and stormwater treatment and disposal systems✦ Air quality assessments and AUSPLUME modelling✦ Environmental auditing, environmental sampling and monitoring✦ Resource consent assessment, application and processing
Employment Record	<ul style="list-style-type: none">✦ November 2000 – Present Environmental Engineer Pattle Delamore Partners Ltd, Christchurch

Project Experience

HAZAROUS SUBSTANCE MANAGEMENT

Industrial Site Assessments: Assessment of on-site management of hazardous substances and Preparation of Environmental Impact Assessments for various sites in Canterbury.

Smith Crane Construction: Review of site management of hazardous substances, assessment of risks to the environment and preparation of expert evidence for a Christchurch City Council land use consent hearing. Preparation of hazardous substances management plan and application for landuse and stormwater consents from Environment Canterbury.

Grace Ltd: Audit of hazardous substance management and assessment of risks to the environment at a chemical mixing factory. This audit was part of an international audit to check compliance with local and national rules and regulations.

ENVIRONMENTAL AUDITING

Christchurch International Airport Ltd: Project manager for 12 years for the auditing of environmental compliance for various industrial sites, including the quarantine waste and medical incinerator, storage of hazardous substances and stormwater disposal.

New Zealand Army: Providing technical assistance to the New Zealand army in the preparation of public health risk management plans in accordance with the Ministry of Health Drinking Water Standards.

WASTEWATER

British High Commission, Pitcairn Island: Review of domestic on-site wastewater disposal systems, domestic water supply and solid waste disposal. This involved a site visit to Pitcairn Island in which there was only three days to gather the required information for the review. The field work included interviewing residents, inspecting the on-site facilities and a general inspection of the island with respect to environmental issues. The aim of the review was to identify any environmental issues (both with respect to human health and the wider environment) from the current sanitation, water supply and solid waste systems, and to provide options for the future development of the island.

On-site Wastewater Disposal: Design of septic tank disposal systems for rural properties in Canterbury.

Silver Fern Farms Ltd: Pareora Effluent Irrigation System: Review of wastewater irrigation system design for a meat processing plant in Canterbury and undertaking tender process in accordance with NZS3910 for the installation of the design.

Environmental Impact Assessments: Preparation of Environmental Impact Assessments and consent applications for various on-site wastewater systems in Canterbury.

GROUNDWATER AND SURFACE WATER ASSESSMENTS

Waimakariri Irrigation Ltd: Groundwater monitoring to assess the affects of irrigation on groundwater quality and quantity. This project is managed by Fiona.

New Zealand Army: Groundwater monitoring to assess the affects of land application of treated wastewater on groundwater quality.

Canterbury Waste Services: Supervision of the installation of monitoring bores for preliminary monitoring of groundwater in preparation for the hydrological investigation of the proposed regional landfill site.

Canterbury Waste Services: Monitoring of river flow and surface water quality analyses.

Environment Canterbury: Monthly and annual groundwater monitoring throughout the Canterbury region.

AIR QUALITY ASSESSMENTS

Nuzeal Ltd: Air dispersion modelling and preparation of Environmental Impact Assessment report for a barley juice drying factory in Christchurch. Odour was one of the concerns raised by neighbours from the adjacent residential area.

Christchurch International Airport: Air dispersion modelling and preparation of Environmental Impact Assessment report for liquid petroleum boilers and diesel generators at Christchurch International Airport.

Fulton Hogan Canterbury Ltd: Air dispersion modelling and preparation of Environmental Impact Assessment report for a waste-oil fired asphalt plant. Consent was granted in a non-notified manner.

Highline Equipment: Air dispersion modelling and preparation of Environmental Impact Assessment for a waste oil fired burner in Nelson.

Rockgas Ltd: Air dispersion modelling and preparation of Environmental Impact Assessment report for liquid petroleum boilers at two new liquid petroleum bulk storage sites in Christchurch.

Pratt and Whitney: Air dispersion modelling and preparation of Environmental Impact Assessment report for a plasma arc pain facility at Christchurch Airport.

SEW Eurodrive: Preparation of a resource consent application and assessment of environmental effects for SEW Eurodrive for a discharge of contaminants to air from a spray painting booth. The booth is used for painting electrical motors, gear reducers and motor controls after assembly at Ferrymead, Christchurch. This assessment included air dispersion modelling. This site is adjacent to a preschool and possible air quality issues and odour were of great importance.

STORMWATER

University of Canterbury: Prepared and presented a series of lectures on applied stormwater design to final year Natural Resources Engineering students (course: Ecological Engineering).

Asset Management Ltd: Conceptual design of a stormwater treatment system (infiltration basin and rain gardens) for a proposed materials recycling centre located at a former timber treatment site that had historical site contamination and was located over a sensitive aquifer. Preparation of Assessment of Environmental Effects report to support a consent application to discharge stormwater and a truck wash water to ground, and presentation of expert evidence at the resource consent hearing.

Participation in Environment Court mediation for the consent application.

Christchurch International Airport Ltd: Preparation of Environmental Impact Assessment reports for the discharge of stormwater to ground from various airport sites. Preparation of stormwater management plans to assist Christchurch International Airport Ltd and their tenants in complying with their resource consents. Preparation of an environmental management plan to assist Christchurch International Airport Ltd in complying with the RMA and their resource consents. General advice with respect to stormwater system design and compliance with resource consents. The Airport is located over a very sensitive groundwater system that requires specialist design work.

Environment Canterbury: Investigating Officer for stormwater resource consent applications in Canterbury for residential subdivisions and industrial sites.

Eliot Sinclair Partners Ltd: Calculation of contaminant loading and accumulation for residential stormwater basins.

Various Industrial/Commercial Sites: Design of on-site stormwater treatment systems and preparation of Environmental Impact Assessment reports for the discharge of stormwater to surface water or ground soakage throughout the Canterbury region.

Selected Publications

“Managing a Generic Stormwater Consent - A case study at Christchurch International Airport”; Conference Proceedings of The 4th South Pacific Conference on Stormwater and Aquatic Resource Protection; Auckland, New Zealand, May 2005.

“Minimisation of Solid Waste in the Christchurch Paper Printing Industry”; WasteMINZ conference 2003.

“Using Fuzzy Expert Systems to Design a Compost Toilet for Rural Samoa”; International Ecological Engineering Conference 2001.

Relevant Courses

Swinburne University Course in Carbon Accounting (developing a carbon inventory and developing a carbon inventory report); 2010

On-site Wastewater Management Training Course held by the Centre for Environmental Training; 2001