

# On-site '03

## **Proceedings of On-site '03 Conference: Future Directions for On-site Systems: Best Management Practice**

held at  
University of New England

30th September – 2<sup>nd</sup> October 2003

Edited by

Robert A. Patterson and Malcolm J. Jones

Lanfax Laboratories  
Armidale Australia

# Table of Contents

	Page
<b>KEYNOTE PAPERS</b>	
<b>Peter Beavers</b> <i>The Role of the Regulator in Advancing Research and Development on On-site Systems</i>	3 – 10
<b>Phillip Geary</b> <i>On-site Wastewater Systems – Research, Education and Training</i>	11 – 18
<b>Ian Gunn</b> <i>Future Directions and Best Management Practice for On-site Wastewater Systems</i>	19 – 26
<b>Robert Rubin</b> <i>On-site Wastewater Treatment - What are some Options – Some Opportunities</i>	27 – 33
<b>Robert Van De Graaff</b> <i>Interactions between Science and Current Guidelines – Conflicts, Wins and Losses</i>	35 – 42
<b>TECHNICAL PAPERS</b>	
<b>Roy Ames and Matt Etherington</b> <i>Novel Waste Treatment System</i>	45 – 52
<b>Grant Austin</b> <i>Consistency for On-Site Effluent Management in Different Local Government Areas</i>	53 – 59
<b>Dale Barnes and Jay Rousell</b> <i>On-Site Disposal of Treated Wastewater with Wasteflow<sup>®</sup> Subsurface Drip Irrigation</i>	61 – 67
<b>Cara Beal, Ted Gardner, Alison Vieritz and Neal Menzies</b> <i>Can We Predict Failure of Septic Tank Absorption Trenches? A Review of Their Hydrology and Biogeochemistry</i>	69 – 76
<b>Paul Beavis, Sven Lundie and Michael Dean</b> <i>Comparing Wastewater Systems for a Growing City</i>	77 – 84
<b>Michael J Brennan, Donald P Dingsdag and Shelley Burgin</b> <i>Water: An 'Eco-Currency'</i>	85 – 92
<b>Steven Carroll, Ashantha Goonetilleke and Evan Thomas</b> <i>Risk-Based Approach to On-Site Wastewater Treatment</i>	93 – 100
<b>Katrina Charles, Jack Schijven, Christobel Ferguson, David Roser, Dan Deere and Nicholas Ashbolt</b> <i>Designing On-Site Sewage Disposal Systems to Protect Public Health</i>	101 – 108
<b>Rob Cumming</b> <i>The Variability of Typical Domestic Wastewater Flow Rates</i>	109
<b>Brent Davey</b> <i>Design and Evaluation of a Demonstration Peat Biofilter for Recycling Nursery Runoff</i>	111 – 113

<b>Leigh Davison and Sam Walker</b> <i>Study of Owner-Built Composting Toilets in Lismore, NSW</i>	115 – 122
<b>Les Dawes and Ashantha Goonetilleke</b> <i>Using Soil Properties to Predict Long-Term Effluent Treatment Potential</i>	123 – 130
<b>Therese Flapper</b> <i>To Meet or Not Meet the NSW Health Guidelines- A Field Perspective</i>	131 – 136
<b>Paul Futter and Frances Graham</b> <i>Managing Septic Tanks in the Bay of Plenty, New Zealand – Environment Bay of Plenty's Septic Tank Maintenance Programme</i>	137 – 144
<b>Ted Gardner and Grant Millar</b> <i>The Performance of a Greywater System at the Healthy Home in South East Queensland – Three Years of Data</i>	145 – 152
<b>Phillip Geary</b> <i>The Use of Tracers in Assessing On-Site System Failure in Port Stephens</i>	153 – 160
<b>Phillip Geary and David Stafford</b> <i>Performance Evaluation of a Small Domestic Sand Filter</i>	161 – 168
<b>Thomas Headley and Leigh Davison</b> <i>Design Models for the Removal of BOD and Total Nitrogen in Reed Beds</i>	169 – 176
<b>Owen Hill</b> <i>Developing a Universal Platform for Remote Monitoring and Management Reporting for Private On-Site Sewage Management Facilities</i>	177 – 183
<b>Robert Irvine, Steven Kenway, Greg Chapman and Michael Barry</b> <i>Implementing an On-Site Sewage Risk Assessment (OSRAS) System in Hawkesbury Lower Nepean Basin</i>	185 – 192
<b>Ben Kele, David J. Midmore, Keith Harrower, Barry Hood, Brendan McKennarney, Graham Doyle, David G. Saunders and Peter Macey</b> <i>Sustainable On-Site System Design for an Ecotourism Site</i>	193 – 200
<b>Ben Kele, David J. Midmore, Steve Walmsley, Keith Harrower &amp; Barry Hood</b> <i>On-Site System Design for Seasonal Variations in Wastewater Generation at Caravan Parks</i>	201 – 207
<b>Mohsen Khalifé, Bas Baskaran and Rohan Dyall</b> <i>Review of Greywater Reuse Practices in Victoria</i>	209 – 216
<b>Mohsen Khalifé</b> <i>Modifications to Conventional Septic Systems and Improved Quality Effluent</i>	217 – 224
<b>Wael Al-Shiekh Khalil, Ashantha Goonetilleke and Les Dawes</b> <i>Correlation of Soil Data with Treatment Performance of Subsurface Effluent Disposal Systems</i>	225 – 232
<b>Michael Linich</b> <i>Analysing Wastewater using DNA Fingerprint Analysis</i>	233 – 240
<b>Terry Lustig</b> <i>Dispersion of Microbes and Pollutants with Distance from a Failed Trench</i>	241 – 248

<b>Robert Martin</b> <i>Measuring Compliance against the NSW Government's AWTS Guideline.</i>	249 – 256
<b>Antony McCardell and Leigh Davison</b> <i>Greywater Pollutant Attenuation in a Basaltic Soil</i>	257 – 264
<b>Robert McGuinness and Daniel Martens</b> <i>GIS Based Model to Assess Potential Risk of Individual On-Site Effluent Management Systems – Development Assessment Module</i>	265 – 271
<b>Mohammad Mowlaei, Dharma Dharmappa and Muttucumaru Sivakumar</b> <i>Performance Evaluation of a Three Compartment Septic Tank with Biomedia Filters</i>	273 – 280
<b>Noelene O'Keefe</b> <i>On-Site Greywater Reuse</i>	281 – 287
<b>Avanish Panikkar and Steven Riley</b> <i>Organic On-Site Waste Treatment for Houses</i>	289 – 295
<b>John Parkinson and Chris Palmer</b> <i>Trialling Innovative and Sustainable Domestic Wastewater Treatment &amp; Disposal Systems</i>	297 – 304
<b>Robert Patterson</b> <i>Temporal Variability of Septic Tank Effluent</i>	305 – 312
<b>Robert Patterson</b> <i>Nitrogen in Wastewater and its Role in Constraining On-Site Planning</i>	313 – 320
<b>Gregory Priest, Martin Anda and Kuruvilla Mathew</b> <i>Developments in Domestic Greywater Recycling in Western Australia</i>	321 – 327
<b>Mark Saunders and Joe Whitehead</b> <i>Media Properties and Media Selection for Filter and Mound Systems</i>	329
<b>Rick Soar and Rob Tinholt</b> <i>Recirculating Sandfilters : Meeting Environmental and Social Needs</i>	331 – 337
<b>Donald Sorensen</b> <i>Reducing the Wastewater - Managing the Problem</i>	339 – 345
<b>Nathan Szymanski and Robert Patterson</b> <i>Effective Microorganism (EM) and Wastewater Systems</i>	347 – 354
<b>Greg Vaughan</b> <i>BioStreme<sup>™</sup> Micronutrient Technology</i>	355 – 361
<b>Joe Whitehead, Mark Saunders, Phillip Geary and Greg Robertson</b> <i>GIS Based Risk Assessment for Catchment Scale On-Site Wastewater Management</i>	363 – 368
<b>Dominic Xavier and Tom Moore</b> <i>The Practical Applications of the Principles of Triple Bottom Line Sustainability for Water Management on a Subdivision Scale - A Case Study</i>	369 – 376
<b>Shuibo Xie, Ashantha Goonetilleke, Dominic Xavier and Wael Khalil</b> <i>Influence of Temperature and Recycling Rate on Wastewater Treatment Performance in Attached Growth Systems</i>	377 – 384